

# SIEMENS



# Products for Totally Integrated Automation


SIMATIC

Catalog  
ST 70

Edition  
2015

[siemens.com/tia](http://siemens.com/tia)

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# Products for Totally Integrated Automation

## SIMATIC



### Catalog ST 70 · 2015

Supersedes:  
Catalog ST 70 · 2013  
Catalog News ST 70 N · 2014

Refer to the Industry Mall for current updates of this catalog:

[www.siemens.com/industrymall](http://www.siemens.com/industrymall)

The products contained in this catalog can also be found in the Interactive Catalog CA 01.  
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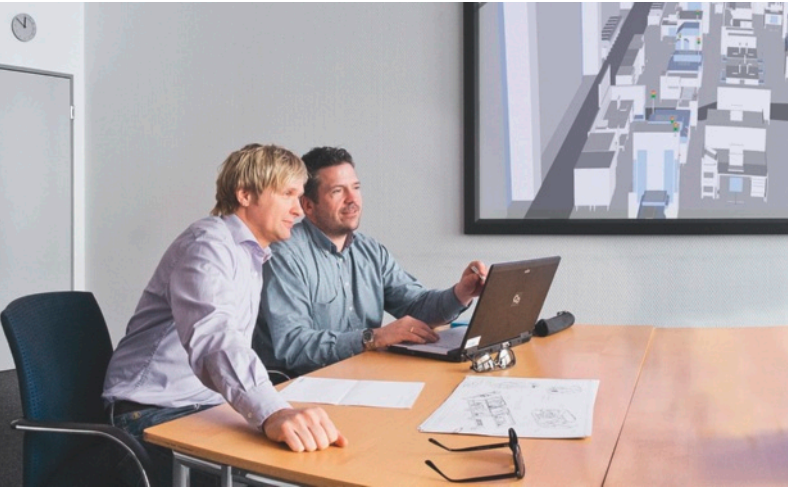
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## Answers for industry.

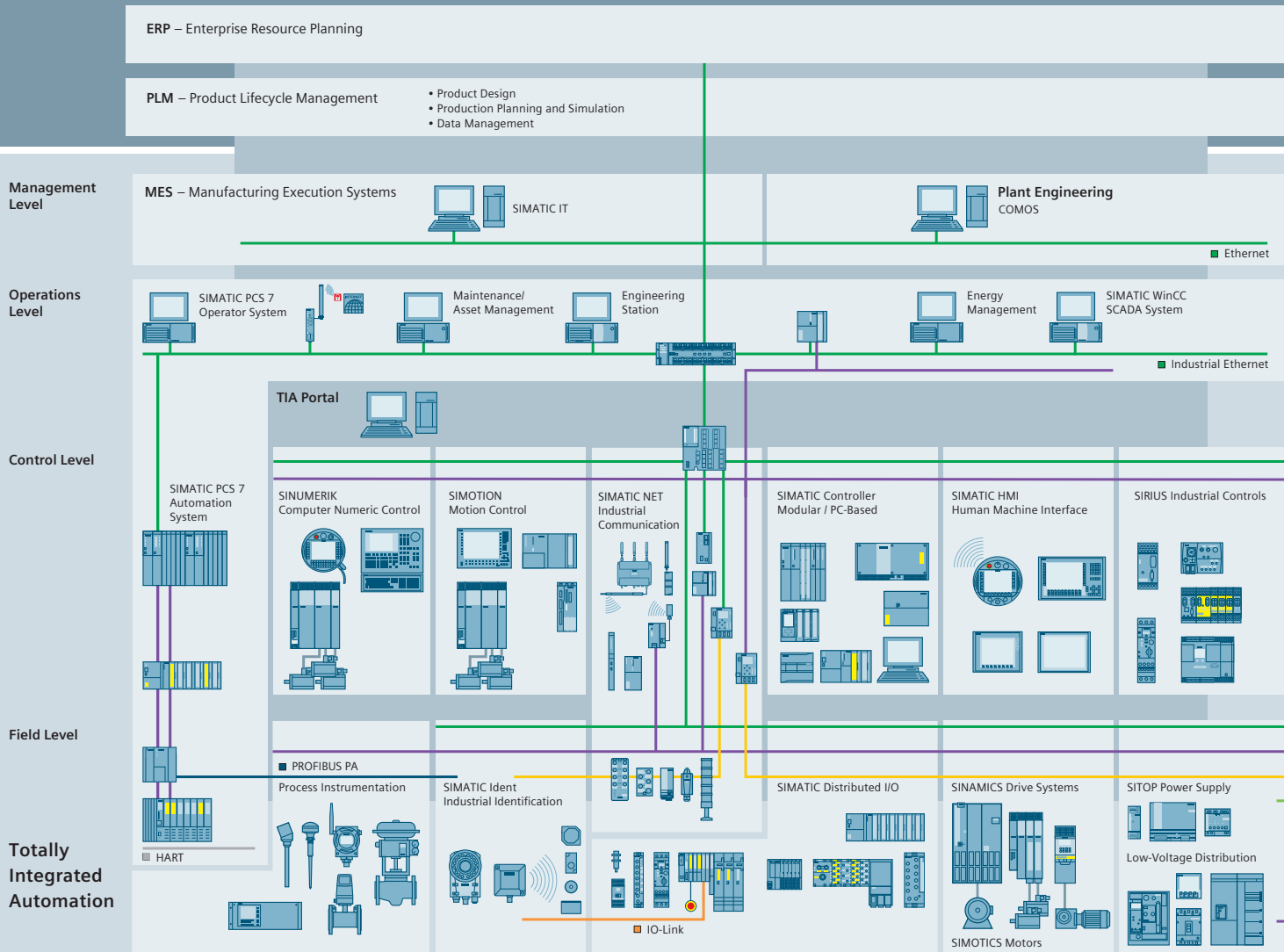
Integrated technologies, vertical market expertise and services for greater productivity, energy efficiency, and flexibility.

Siemens is the world's leading supplier of innovative and environmentally friendly products and solutions for industrial companies. End-to-end automation technology and industrial software, solid market expertise, and technology-based services are the levers we use to increase our customers' productivity, efficiency and flexibility.

We consistently rely on integrated technologies and, thanks to our bundled portfolio, we can respond more quickly and flexibly to our customers' wishes. With our globally unmatched range of automation technology, industrial control and drive technology as well as industrial software, we equip companies with exactly what they need over their entire value chain – from product design and development to production, sales and service. Our industrial customers benefit from our comprehensive portfolio, which is tailored to their market and their needs.

Market launch times can be reduced by up to 50% due to the combination of powerful automation technology and industrial software. At the same time, the costs for energy or waste water for a manufacturing company can be reduced significantly. In this way, we increase our customers' competitive strength and make an important contribution to environmental protection with our energy-efficient products and solutions.

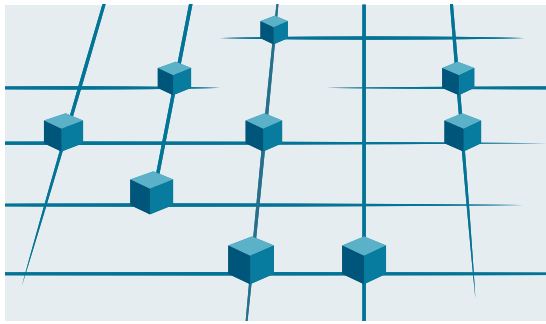




## Efficient automation starts with efficient engineering.

**Totally Integrated Automation: Efficiency driving productivity.**

Efficient engineering is the first step toward better production that is faster, more flexible, and more intelligent. With all components interacting efficiently, Totally Integrated Automation (TIA) delivers enormous time savings right from the engineering phase. The result is lower costs, faster time-to-market, and greater flexibility.



Totally Integrated Automation  
Efficient interoperability of all automation components



■ PROFINET  
■ Industrial Ethernet  
■ PROFIBUS  
■ AS-Interface  
■ KNX GAMMA instabus

Totally  
Integrated  
Power

## A unique complete approach for all industries

As one of the world's leading automation suppliers, Siemens provides an integrated, comprehensive portfolio for all requirements in process and manufacturing industries. All components are mutually compatible and system-tested. This ensures that they reliably perform their tasks in industrial use and interact efficiently, and that each automation solution can be implemented with little time and effort based on standard products. The integration of many separate individual engineering tasks into a single engineering environment, for example, provides enormous time and cost savings.

With its comprehensive technology and industry-specific expertise, Siemens is continuously driving progress in manufacturing industries – and Totally Integrated Automation plays a key role.

Totally Integrated Automation creates real value added in all automation tasks, especially for:

- **Integrated engineering**  
Consistent, comprehensive engineering throughout the entire product development and production process
- **Industrial data management**  
Access to all important data occurring in productive operation – along the entire value chain and across all levels
- **Industrial communication**  
Integrated communication based on international cross-vendor standards that are mutually compatible
- **Industrial security**  
Systematic minimization of the risk of an internal or external attack on plants and networks
- **Safety Integrated**  
Reliable protection of personnel, machinery, and the environment thanks to seamless integration of safety technologies into the standard automation

## Making things right with Totally Integrated Automation

Totally Integrated Automation, industrial automation from Siemens, stands for the efficient interoperability of all automation components. The open system architecture covers the entire production process and is based on end-to-end shared characteristics: consistent data management, global standards, and uniform hardware and software interfaces.

Totally Integrated Automation lays the foundation for comprehensive optimization of the production process:

- Time and cost savings due to efficient engineering
- Minimized downtime due to integrated diagnostic functions
- Simplified implementation of automation solutions due to global standards
- Better performance due to interoperability of system-tested components



## Totally Integrated Power We bring power to the point – safely and reliably.



Comprehensive answers for power distribution in complex energy systems – from Siemens

Efficient, reliable, safe: These are the demands placed on electrification and especially power distribution. And our answer – for all application areas of the energy system – is Totally Integrated Power (TIP). It's based on our comprehensive range of products, systems, and solutions for low and medium voltage, rounded out by our support throughout the entire lifecycle – from planning with our own software tools to installation, operation, and services.

Smart interfaces allow linking to industrial or building automation, making it possible to fully exploit all the optimization potential of an integrated solution. This is how we provide our customers around the world with answers to their challenges. With highly efficient, reliable, and safe power distribution, we lay the foundation for sustainable infrastructure and cities, buildings, and industrial plants. We bring power to the point – wherever and whenever it is needed.

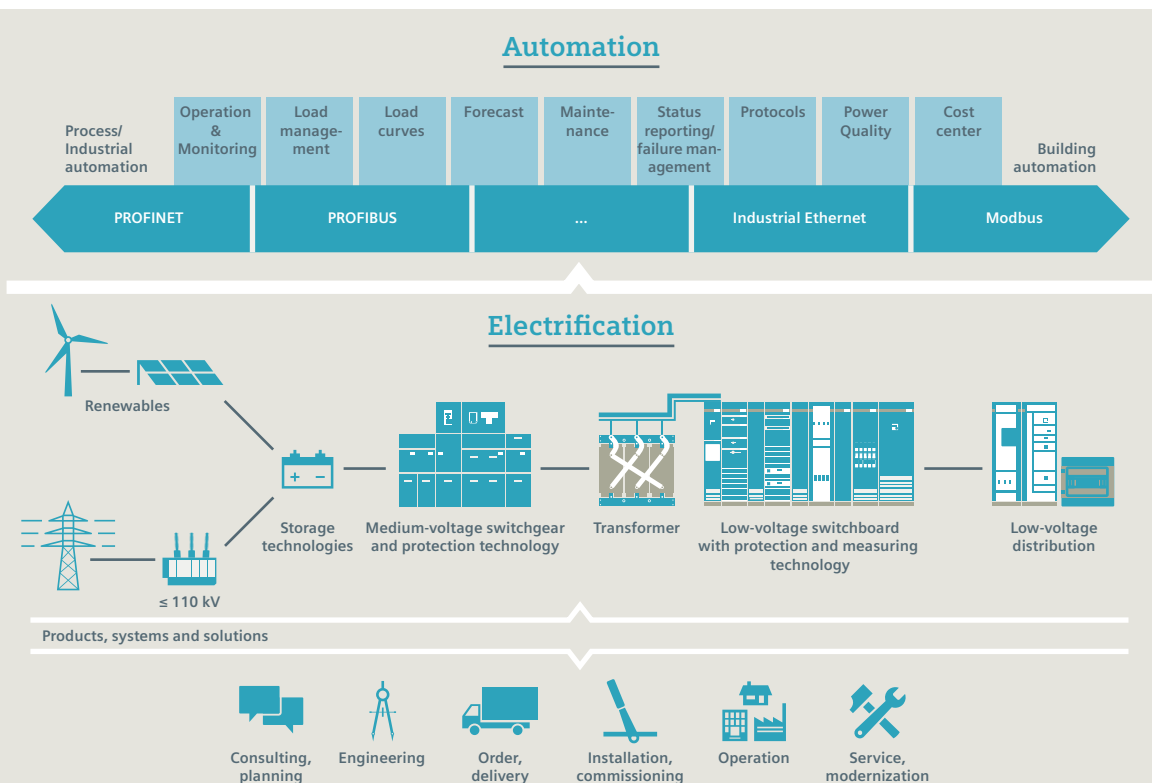
More information: [www.siemens.com/tip](http://www.siemens.com/tip)



# Totally Integrated Power offers more:

- **Consistency:**  
For simplified plant engineering and commissioning as well as smooth integration into automation solutions for building or production processes
- **One-stop-shop:**  
A reliable partner with a complete portfolio for the entire process and lifecycle – from the initial idea to after-sales service
- **Safety:**  
A comprehensive range of protection components for personnel safety and line and fire protection, safety by means of type testing
- **Reliability:**  
A reliable partner who works with customers to develop long-lasting solutions that meet the highest quality standards
- **Efficiency:**  
Bringing power to the point means greater plant availability and maximum energy efficiency in power distribution
- **Flexibility:**  
End-to-end consistency and modular design of Totally Integrated Power for any desired expansions and adaptation to future requirements
- **Advanced technology:**  
Reliable power distribution especially for applications in which supply is critical, continuous refinement of the technology

## Challenges are our speciality





## Introduction



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### **Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

[www.siemens.com/simatic/printmaterial](http://www.siemens.com/simatic/printmaterial)



## Introduction

### LOGO!

#### LOGO! logic module

#### Overview

##### LOGO!:

##### *Easy-to-use technology with a future*

The compact, easy-to-use and low-cost solution for simple control tasks. Universally applicable in industry, and in functional or residential buildings. Replaces wiring by linking functions. Operates in a similar way to a programmable logic controller. With integrated operating and display unit for direct input on the device and display of message texts/variables, or as a version without display or keys.

Simple operation:

- Interconnection of functions by mouse click on the PC or at the press of a button on the device

Minimum time requirements:

- Wiring solely of the inputs and outputs
- Parallel creation of circuit diagram and assembly of control cabinet

Reduced costs:

- Many integral functions of switching technology

High level of flexibility:

- Simple modification of functionality at the press of a button
- Versions for different operating voltages
- Modular design, therefore expandable at any time

LOGO! 8 versions:

- Ethernet interface for programming and communication with SIMATIC Controllers, SIMATIC Panels and PCs
- Networking of max. 9 LOGO! devices
- Use of micro SD cards
- Data logging, user-defined functions (macro blocks), astronomical clock
- Integral Web server in all LOGO! 8 devices



For further information, refer to:

[www.siemens.com/logo](http://www.siemens.com/logo)

LOGO! 8 <sup>1)</sup>	24CE 24CEo	24RCE 24RCEo	12/24 RCE 12/24 RCEo	230 RCE 230 RCEo
Supply voltage	24 V DC	24 V AC/DC	12/24 V DC	115/230 V AC/DC
Inputs	8 (of which 4 for use in analog mode)	8	8 (of which 4 for use in analog mode)	8
Outputs	4, transistor	4, relay		
Continuous current	0.3 A	10 A (with resistive load), 3 A (with inductive load)		
Short-circuit protection	Electric (1 A)	External fuse required		
Integral time switches/ power reserve	● Power reserve 480 h			
Ambient temperature	0 to +55 °C			
Radio interference suppression	In accordance with EN 50 011 (limit class B)			
Degree of protection	IP20			
Certification	In accordance with VDE 0631, IEC 1131, FM, Class 1, Div 2, cULus, C-Tick, CSA, marine approvals			
Installation	On 35 mm DIN rail or wall mounting			
Dimensions (W x H x D)	72 x 90 x 55 mm (4 modular widths)			
Programming cable	Standard Ethernet			

— = cannot be used/not available  
● = can be used/available

<sup>1)</sup> For further LOGO! versions, see Catalog section 2

## Overview

**SIMATIC S7-1200:  
Controller with compact design for simple automation tasks**

- Scalable and flexible design:  
The SIMATIC S7-1200 controller family has been designed with maximum flexibility to fit your individual machine requirements. This allows you to custom design your controller systems to meet your needs; it also makes future system expansions quick and easy.
- Integrated Industrial Ethernet/PROFINET interface:  
The Industrial Ethernet/PROFINET interface integrated into SIMATIC S7-1200 offers seamless communication with distributed I/O with SIMATIC HMI Panels for visualization and additional controllers for CPU-to-CPU communication. Also with devices from third parties for extended integration possibilities as well as the SIMATIC STEP 7/TIA Portal engineering framework for configuring and programming.
- Integrated technology functions:  
Technology functions ranging from closed-loop control tasks and weighing, through high-speed counting and positioning, to telecontrol and identification are integrated in the controller. This wide variety of functionality enables you to solve a wide array of applications.

SIMATIC S7-1200 basic controllers are the ideal choice for simple and autonomous tasks in the low-end to mid performance ranges.

Fail-safe CPUs can execute not only standard, but also safety-related programs.



For further information, refer to:

[www.siemens.com/s7-1200](http://www.siemens.com/s7-1200)

SIMATIC S7-1200, CPU	1211C	1212C	1214C	1215C	1217C	1214FC	1215FC
<b>Work memory</b>	50 KB	75 KB	100 KB	125 KB	150 KB	125 KB	150 KB
<b>Processing times (µs)</b> Bit/word/floating point	0.085/1.7/2.3						
<b>Interfaces</b>	<ul style="list-style-type: none"> <li>DP master ● (via CM 1243-5)</li> <li>DP slaves ● (via CM 1242-5)</li> <li>PtP communication ● (via CM 1241)</li> <li>PROFINET ●</li> </ul>						
<b>Integral standard inputs/outputs</b>							
DI/DO	6/4	8/6	14/10	14/10	14 <sup>1)</sup> /10	14/10	14/10
AI/AO	2/0	2/0	2/0	2/2	2/2	2/0	2/2
<b>Integrated functions</b>							
Counters	3 (100 kHz)	4 (3 x 100 kHz, 1 x 30 kHz)	6 (3 x 100 kHz, 3 x 30 kHz)	6 (3 x 100 kHz, 3 x 30 kHz)	6 (2 x 1 kHz, 4 x 100 kHz)	6 (3 x 100 kHz, 3 x 30 kHz)	6 (3 x 100 kHz, 3 x 30 kHz)
Pulse outputs	4 (100 kHz)	4 (100 kHz)	4 (100 kHz)	4 (100 kHz)	4 (2 x 1 MHz, 2x 100 kHz)	4 (100 kHz)	4 (100 kHz)
Closed-loop control/positioning	●	●	●	●	●	●	●
<b>Mounting dimensions</b> W x H x D (mm)	90 x 100 x 75	90 x 100 x 75	110 x 100 x 75	130 x 100 x 75	150 x 100 x 75	110 x 100 x 75	130 x 100 x 75

<sup>1)</sup> In addition, the CPU 1217 has a Line Driver IO in order to control stepper motor positioners up to a frequency of 1 MHz.

— = cannot be used/not available

● = can be used/available

## Introduction

### SIMATIC advanced controller

#### SIMATIC S7-1500

#### Overview

##### **SIMATIC S7-1500:** **Maximum productivity and efficiency**

The SIMATIC S7-1500 advanced controller with its many innovations sets new standards for maximum productivity. This is a benefit both for small series machines and for complex plants with high demands in terms of speed and deterministic response. The SIMATIC S7-1500 is perfectly integrated into the Totally Integrated Automation Portal (TIA Portal) for maximum engineering efficiency.

- **Scalability:**  
The S7-1500 has a modular structure and is scalable in its functionality. Upward compatibility and expandability ensure cost-efficiency and security of investment.
- **Performance:**  
The S7-1500 reduces the machine response times, permits greater productivity by means of shorter cycles, and offers an extended scope of programs with a consistent cycle time.
- **User-friendly display operation:**  
The display with detailed plain text information that is integrated into the CPU achieves a high level of user-friendliness and full plant transparency.
- **Technology Integrated:**  
The S7-1500 enables the integration of motion control without any additional modules. PROFIdrive-capable drives are connected by means of standardized PLCopen blocks.
- **One controller for standard and fail-safe:**  
Safety Integrated permits the connection of PROFIsafe devices via PROFIBUS and PROFINET. Safety-related applications up to SIL 3 acc. to IEC 62061 and PL e acc. to ISO 13849 are possible. With STEP 7 Safety V13 SP1 you can create both standard and fail-safe applications.
- **Security Integrated:**  
The S7-1500 offers optimized security, even protecting against unauthorized access to components and programs. This protects investments and ensures a high level of plant availability.



- **Integrated system diagnostics:**  
The S7-1500 offers a diagnostic functionality that is already integrated in the system, without the need for any further programming. A standardized display concept enables error messages to be visualized identically as plain text information in STEP 7 and WinCC, in the web server, and in the display of the CPU.
- **Engineering in the TIA Portal:**  
The S7-1500 is seamlessly integrated into the TIA Portal – the innovative engineering framework for all automation tasks.

For further information, refer to:

[www.siemens.com/s7-1500](http://www.siemens.com/s7-1500)

SIMATIC S7-1500, CPU	1511-1 PN 1511F-1 PN <sup>1)</sup>	1513-1 PN 1513F-1 PN <sup>1)</sup>	1515-2 PN 1515F-2 PN <sup>1)</sup>	1516-3 PN/DP 1516F-3 PN/DP <sup>1)</sup>	1517-3 PN/DP 1517F-3 PN/DP <sup>1)</sup>	1518-4 PN/DP 1518F-4 PN/DP <sup>1)</sup>
<b>Display</b>						
Screen diagonals	3.45 cm	3.45 cm	6.1 cm	6.1 cm	6.1 cm	6.1 cm
<b>Memory</b>						
Work memory	150 (225 <sup>1)</sup> ) KB for program 1 MB for data	300 (450 <sup>1)</sup> ) KB for program 1.5 MB for data	500 (750 <sup>1)</sup> ) KB for program 3 MB for data	1 (1,5 <sup>1)</sup> ) MB for program 5 MB for data	2 (3 <sup>1)</sup> ) MB for program 8 MB for data	4 (6 <sup>1)</sup> ) MB for program 20 MB for data
<b>Instruction times (ns)</b>						
Bit/word/fixed point/floating point	60/72/96/384	40/48/64/256	30/36/48/192	10/12/16/64	2/3/3/12	1/2/2/6
<b>S7 timers/S7 counters</b>	2048/2048					
<b>I/O</b>						
Digital / analog channels	262 144 / 16 384					
<b>Interfaces</b>						
PtP communication	● (via CM PtP)	● (via CM PtP)	● (via CM PtP)	● (via CM PtP)	● (via CM PtP)	● (via CM PtP)
PROFIBUS	● <sup>2)</sup>	● <sup>2)</sup>	● <sup>2)</sup>	● <sup>3)</sup>	● <sup>3)</sup>	● <sup>3)</sup>
PROFINET IO	1 x (2-port switch)	1 x (2-port switch)	1 x (2-port switch)	1 x (2-port switch)	1 x (2-port switch)	1 x (2-port switch)
Miscellaneous	–	–	1 x PROFINET <sup>4)</sup>	1 x PROFINET <sup>4)</sup>	1 x PROFINET <sup>4)</sup>	2 x PROFINET <sup>4)</sup>
Web server	●	●	●	●	●	●
<b>Dimensions W x H x D (mm)</b>	35 x 147 x 129	35 x 147 x 129	70 x 147 x 129	70 x 147 x 129	175 x 147 x 129	175 x 147 x 129

— = cannot be used/not available  
● = can be used/available

<sup>1)</sup> Fail-safe CPU  
<sup>3)</sup> 1 x PB and via CM 1542-5

<sup>2)</sup> via CM 1542-5  
<sup>4)</sup> e.g. for network separation



## Overview

**SIMATIC S7-300:**  
**The modular controller for system solutions in the manufacturing industry**

The SIMATIC S7-300 has been designed for system solutions with the focus on manufacturing engineering and, as a universal automation system, it can be used in applications with centralized and distributed configurations:

- The ability to integrate powerful CPUs with Industrial Ethernet/PROFINET interface, technological functions or fail-safe designs into one system makes additional investments unnecessary.
- The S7-300 can be set up in a modular configuration without the need for slot rules for I/O modules. There is a wide range of modules available both for the centralized and the distributed configuration with ET200M.
- The Micro Memory Card as a data and program memory does away with the backup battery, and with it, part of the maintenance costs.



SIMATIC S7-300, CPU	312/314	315-2 DP 315-2 PN/DP	317-2 DP 317-2 PN/DP	319-3 PN/DP	315F-2 DP/ 315F-2 PN/DP	317F-2 DP/ 317F-2 PN/DP	319F-3 PN/DP
<b>Work memory</b>	32/128 <sup>1)</sup> KB	256/384 <sup>2)</sup> KB	1024 KB	2 MB	384/512 <sup>3)</sup> KB	1.5 MB	2.5 MB
Instructions	10/42 <sup>1)</sup> K	85/128 <sup>2)</sup> K	340 K	680 K			
<b>Processing times (µs)</b>							
Bit/word/fixed point/ floating point	0,1/0,06/0,24/ 0,12; 0,32/0,16/1,1/ 0,59 <sup>1)</sup>	0,05/0,09/0,12/ 0,45	0,025/0,03/0,04/ 0,16	0,004/0,01/0,01 /0,04	0,05/0,09/0,12/ 0,45	0,025/0,03/0,04/ 0,16	0,004/0,01/0,01/ 0,04
<b>Interfaces</b>							
DP master syst. int./ CP 342-5	—/●	●/●	●/●	●/●	●/●	●/●	●/●
DP slaves	—	●	●	●	●	●	●
PtP communication	—	—	—	—	—	—	—
MPI	●	●	●	●	●	●	●
PROFINET IO	—	● <sup>2)</sup>	●	●	● <sup>3)</sup>	● <sup>4)</sup>	●
<b>Integrated inputs/outputs</b>							
DI/DO	—	—	—	—	—	—	—
AI/AO	—	—	—	—	—	—	—
<b>Integrated functions</b>							
Counters/frequency meters	—	—	—	—	—	—	—
Pulse outputs	—	—	—	—	—	—	—
Closed-loop control/positioning	—/—	—/—	—/—	—/—	—	—	—
<b>Mounting dimensions</b>	40 x 125 x 130	40 x 125 x 130	40 x 125 x 130	120 x 125 x 130	40 x 125 x 130	40 x 125 x 130	120 x 125 x 130
W x H x D (mm)							

— = cannot be used/not available  
● = can be used/available

<sup>1)</sup> CPU 314  
<sup>2)</sup> CPU 315-2 PN/DP

<sup>3)</sup> CPU 315F-2 PN/DP  
<sup>4)</sup> CPU 317F-2 PN/DP

## Introduction

### SIMATIC advanced controller

#### SIMATIC S7-300

1

#### Overview (continued)

- In addition to standard automation, safety technology and motion control can also be integrated in an S7-300 controller.
- Many of the S7-300 components are also available in a SIPLUS extreme version for extreme environmental conditions, e.g. extended temperature range (-40/-25 ... +60/+70 °C) and for use where there is corrosive atmosphere/condensation. For more detailed information, visit [www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

For further information, refer to:

[www.siemens.com/s7-300](http://www.siemens.com/s7-300)



SIMATIC S7-300, CPU	312C/313C	313C-2 PtP/ 313C-2 DP	314C-2 PtP / DP / PN/DP	315T-3 PN/DP	317T-3 PN/DP 317TF-3 PN/DP
<b>Work memory</b>	64/128 <sup>1)</sup> KB	128 KB	192 KB	384 KB	1/1.5 <sup>7)</sup> MB
Instructions	21/42 <sup>1)</sup> K	42 K	64 K	128 K	340/500 <sup>7)</sup> K
<b>Processing times (µs)</b>					
Bit/word/fixed point/floating point	0,1/0,24/0,32/1,1; 0,07/0,15/0,2/0,72 <sup>1)</sup>	0,07/0,15/0,2/0,72	0,06/0,12/0,16/0,59	0,05/0,09/0,12/0,45	0,025/0,03/0,04/0,16
<b>Interfaces</b>					
DP master syst. int./CP 342-5	—/●	—/● (●/●) <sup>2)</sup>	—/● (●/●) <sup>5)</sup>	●/●	●/●
DP slaves	—	● (●) <sup>2)</sup>	● (●) <sup>5)</sup>	●	●
PtP communication	—	ASCII, RK512, 3964R <sup>3)</sup>	ASCII, RK512, 3964R <sup>4)</sup>	—	—
MPI	●	●	●	●	●
PROFINET IO	—	—	● <sup>6)</sup>	—	—
<b>Integrated inputs/outputs</b>					
DI/DO	10/6 (24/16) <sup>1)</sup>	16/16	24/16	4/8	4/8
AI/AO	4/2 <sup>1)</sup>	—	4/2	—	—
<b>Integrated functions</b>				Technological functions, e.g. gearing/camming, path interpolation, travel to fixed stop, print mask correction by means of probes, travel/time-dependent Cam switching, position-controlled positioning, pressure-controlled hydraulic axes	
Counters/frequency meters	2 (10 kHz)/ 3 (30 kHz) <sup>1)</sup>	3 (30 kHz)	4 (60 kHz)		
Pulse outputs	2 (2.5 kHz)/ 3 (2.5 kHz) <sup>1)</sup>	3 (2.5 kHz)	4 (2.5 kHz)		
Closed-loop control/positioning	●/—	●/—	●/●		
<b>Mounting dimensions</b>					
W x H x D (mm)	80/120 x 125 x 130	80 x 125 x 130	120 x 125 x 130	40/80 x 125 x 130	80/40 x 125 x 130

— = cannot be used/not available  
● = can be used/available

<sup>1)</sup> CPU 313C  
<sup>2)</sup> CPU 313C-2 DP  
<sup>3)</sup> CPU 313C-2 PtP

<sup>4)</sup> CPU 314C-2 PtP  
<sup>5)</sup> CPU 314C-2 DP  
CPU 314C-2 PN/DP

<sup>6)</sup> CPU 314C-2 PN/DP  
<sup>7)</sup> CPU 317TF-3 PN/DP

## Overview

**SIMATIC S7-400:**  
**The powerful controller for system solutions in the manufacturing and process industries**

Within the controller family, the SIMATIC S7-400 is designed for system solutions in the manufacturing and process automation industry.

- The S7-400 is especially suitable for data-intensive tasks in the process industry. High processing speeds and deterministic response times guarantee short machine cycle times on high-speed machines in the manufacturing industry. The high-speed backplane bus of S7-400 ensures efficient linking of central I/O modules.
- The S7-400 is used preferably to coordinate complete plants and to control lower-level devices/stations; this is guaranteed by the high communication power and the integral interfaces.
- The performance is scalable thanks to a graded range of CPUs; the I/O capacity is almost unlimited.
- The power reserves of the CPUs enable new functions to be integrated without further hardware investment, e.g. processing of quality data, user-friendly diagnostics, integration into higher-level MES solutions or high-speed communication via bus systems.



SIMATIC S7-400, CPU	412-1 / 412-2	412-2 PN <sup>4)</sup>	414-2 / 414-3	414-3 PN/DP <sup>4)</sup>	416-2 / 416-3 <sup>4)</sup>	416-3 PN/DP <sup>4)</sup>	417-4 <sup>4)</sup>
<b>Work memory</b>	288/512 <sup>1)</sup> KB	1 MB	1/2.8 <sup>2)</sup> MB	4 MB	5.6/11.2 <sup>3)</sup> MB	16 MB	30 MB
<b>Processing times (ns)</b>							
Bit/word/fixed point/floating point	75/75/75/225	75/75/75/225	45/45/45/135	45/45/45/135	30/30/30/90	30/30/30/90	18/18/18/54
<b>Timers/counters</b>	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048
<b>Address range</b>							
Digital inputs/outputs	32768 each	32768 each	65536 each	65536 each	131072 each	131072 each	131072 each
Analog inputs/outputs	2048 each	2048 each	4096 each	4096 each	8192 each	8192 each	8192 each
<b>DP interfaces</b>							
Number of MPI/DP interfaces	1	1	1	1	1	1	1
Number of DP interfaces	— / 1 <sup>1)</sup>	—	1	—	1	1	1
Number of DP slaves per MPI/DP	32	32	32	32	32	32	32
Number of DP slaves per DP	64	—	96 each	125 each	125 each	125 each	125 each
Plug-in interface modules	—	—	— / 1 x DP <sup>2)</sup>	1 x DP	— / 1 x DP <sup>3)</sup>	1 x DP	2 x DP
Data set gateway	●	●	●	●	●	●	●
<b>PN interfaces</b>							
Number of PN interfaces	—	1 (2 ports)	—	1 (2 ports)	—	1 (2 ports)	—
PROFINET IO	—	●	—	●	—	●	—
PROFINET with IRT	—	●	—	●	—	●	—
PROFINET CBA	—	●	—	●	—	●	—
TCP/IP	—	●	—	●	—	●	—
UDP	—	●	—	●	—	●	—
Web server	—	●	—	●	—	●	—
ISO-on-TCP (RFC 1006)	—	●	—	●	—	●	—
<b>Mounting dimensions</b> W x H x D (mm)	25 x 290 x 219	25 x 290 x 219	25 x 290 x 219, 50 x 290 x 219 <sup>2)</sup>	50 x 290 x 219	25 x 290 x 219, 50 x 290 x 219 <sup>3)</sup>	50 x 290 x 219	50 x 290 x 219

— = cannot be used/not available  
● = can be used/available

<sup>1)</sup> CPU 412-2

<sup>2)</sup> CPU 414-3

<sup>3)</sup> CPU 416-3

<sup>4)</sup> also as SIPLUSextreme component for corrosive atmosphere/condensation

## Introduction

### SIMATIC advanced controller

#### SIMATIC S7-400

1

#### Overview (continued)

- The S7-400 can be structured in a modular way without any slot rules; there is a wide range of modules available both for centralized configurations and distributed structures.
- The configuration of the distributed I/O of the S7-400 can be modified during operation. In addition signal modules can be removed and inserted while live (hot swapping). This makes it very easy to expand the system or replace modules in the event of a fault.
- Storage of the entire project data, including symbols and comments, on the CPU simplifies service and maintenance calls.
- Safety engineering and standard automation can be integrated into a single S7-400; plant availability can be increased through the redundant structure of the S7-400.
- Many S7-400 components are also available in a SIPLUS extreme version for extreme environmental conditions, e.g. for use where there is a corrosive atmosphere/condensation. For more detailed information, visit [www.siemens.com/siplus-extreme](http://www.siemens.com/siplus-extreme)

For further information, refer to:

[www.siemens.com/simatic-s7-400](http://www.siemens.com/simatic-s7-400)



SIMATIC S7-400, CPU	412-5H <sup>4)</sup>	414-5H <sup>4)</sup>	416-5H <sup>4)</sup>	417-5H <sup>4)</sup>	414F-3 PN/DP	416F-2	416F-3 PN/DP
<b>Work memory</b>	1 MB	4 MB	16 MB	32 MB	4 MB	5.6 MB	16 MB
<b>Processing times (ns)</b>							
Bit/word/ fixed point/floating point	31,25/31,25/ 31,25/62,5	18,75/18,75/ 18,75/37,5	12,5/12,5/ 12,5/25	7,5/7,5/ 7,5/15	45/45/ 45/135	30/30/ 30/90	30/30/ 30/90
<b>Timers/counters</b>	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048
<b>Address ranges</b>							
Digital inputs/outputs	65536 each	65536 each	131072 each	131072 each	65536 each	131072 each	131072 each
Analog inputs/outputs	4096 each	4096 each	8192 each	8192 each	4096 each	8192 each	8192 each
<b>DP interfaces</b>							
Number of MPI/DP interfaces	1	1	1	1	1	1	1
Number of DP interfaces	1	1	1	1	1	1	1
Number of DP slaves per MPI/DP	32	32	32	32	32	32	32
Number of DP slaves per DP	64	96	125	125	125 each	125	125 each
Plug-in interface modules	—	—	—	—	1 x DP	—	1 x DP
Data set gateway	●	●	●	●	●	●	●
<b>PN interfaces</b>							
Number of PN interfaces	1 (2 ports)	1 (2 ports)	1 (2 ports)	1 (2 ports)	1 (2 ports)	—	1 (2 ports)
PROFINET IO	●	●	●	●	●	—	●
PROFINET with IRT	—	—	—	—	●	—	●
PROFINET CBA	—	—	—	—	●	—	●
TCP/IP	●	●	●	●	●	—	●
UDP	●	●	●	●	●	—	●
Web server	—	—	—	—	●	—	●
ISO-on-TCP (RFC 1006)	●	●	●	●	●	—	●
<b>Mounting dimensions</b>							
W x H x D (mm)	50 x 290 x 219	50 x 290 x 219	50 x 290 x 219	50 x 290 x 219	50 x 290 x 219	25 x 290 x 219	50 x 290 x 219

— = cannot be used/not available  
● = can be used/available

<sup>4)</sup> also as SIPLUSextreme component for corrosive atmosphere/condensation

### Overview

The SIMATIC ET 200 CPU distributed controllers combine a compact design with versatility. Especially in the mid performance range for machines with distributed intelligence or series machines offering little space, the distributed controllers are the perfect solution for standard and fail-safe applications.

Regarding distributed controllers, not only the SIMATIC ET 200SP CPUs and the new SIMATIC ET 200SP open controller, but also the tried and tested controllers for SIMATIC ET 200S and ET 200pro systems are also available.

Thanks to their compact design, distributed controllers are suitable for series machine construction. They can be mounted directly on the machine in small control boxes. In networked plants they are connected to the central control cabinet of a production line via PROFINET.

The relocation of the intelligence from the central control cabinet to distributed controllers at the individual stations has a positive effect on the availability of a plant. If a fault should occur at one station, this can be cleared without bringing the entire plant to a standstill.

### **SIMATIC ET 200SP – the new generation of distributed I/O**



Interface modules with integrated CPU and PROFINET connections are available for SIMATIC ET 200SP. The functionality of the CPUs corresponds to that of the S7-1500. Various connection technologies can be implemented with the three integrated Ethernet ports. Thanks to the I-Device functionality, the connection to a higher-level CPU can be made in just the same way as with a standard interface module. The CPUs support additional functions such as PROFIenergy, isochronous mode, configuration control (option handling) and DP master.

### Standard CPUs:



- CPU 1510SP-1PN
- CPU 1512SP-1PN

The fail-safe ET 200SP CPUs allow the processing of standard and safety programs. They are certified in accordance with EN 61508 (2nd Edition) for functional safety and are suitable for use in safety-relevant applications up to SIL 3 according to IEC 62061 and PL e according to ISO 13849.

### Fail-safe CPUs:



- CPU 1510SP F-1 PN
- CPU 1512SP F-1 PN



## Introduction

### SIMATIC distributed controllers

#### Distributed controllers - the central modules of the ET 200

1

#### Overview (continued)

A new addition to the distributed controllers is the compact **SIMATIC ET 200SP Open Controller**.



The first controller of this type, it combines the functions of a PC-based software controller with visualization, Windows applications and central I/O in a single, compact device.

In terms of its functionality, the ET 200SP Open Controller corresponds to the S7-1500. It can be flexibly expanded with standard ET 200SP modules and optimized for machines with distributed architecture.

#### Highlights:

- "All-in-one"
  - Control with central I/Os
  - Visualization and Windows applications
  - PC interfaces for monitor, mouse and keyboard
  - Gigabit Ethernet
- High system availability
  - Software controller independent of Windows
  - Windows can be restarted while controller is running
- Compact and modular
  - Small footprint
  - Extensive range of I/O modules
  - Single-row expansion with up to 64 modules
- Ruggedness
  - Continuous operation at up to 60° C ambient temperature without loss of performance
  - Easy to maintain thanks to fanless design
  - High EMC
  - Resistant to vibration and shock loading
- User-friendly design
  - Externally accessible bulk memory, protected against unauthorized access
  - Integral Run/Stop switch for the controller
  - Additional memory capacity through SD card
  - PROFINET onboard: replaceable bus-adapter for flexible connection
- Efficient engineering in the TIA Portal
  - No Windows settings necessary for the software controller
  - Reusability of S7 programs on other hardware platforms

#### **SIMATIC ET 200S – multifunctional and ultra-modular**



Interface modules with CPU functionality are available for SIMATIC ET 200S in both standard and safety versions, providing connection to PROFINET or PROFIBUS.

An extensive range of modules completes the offering.

Apart from power modules and digital and analog signal modules, technology modules, an IO-Link master, motor starters or pneumatic connections are available.

#### **SIMATIC ET 200pro – particularly small, rugged and powerful**



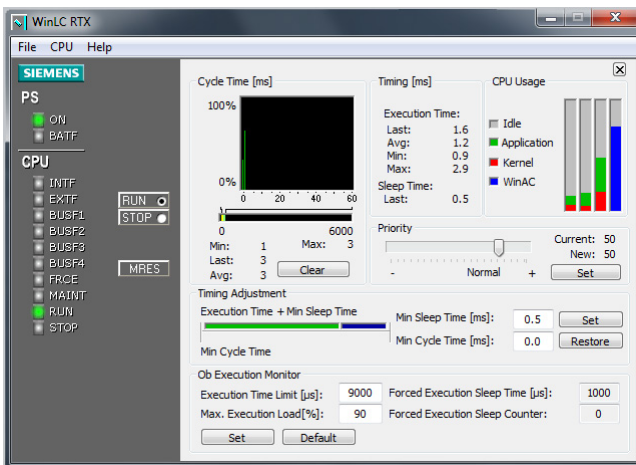
Interface modules with IP65/67 degree of protection are available for the I/O system in both standard and fail-safe versions offering CPU functionality for connection to PROFINET or PROFIBUS. An extensive range of modules completes the offering. Apart from power modules, digital and analog signal modules, motor starters and an RFID module are also available. Thanks to its rugged construction, ET 200pro can also be used under conditions of high mechanical stress.



**Overview****SIMATIC WinAC RTX (F) / Embedded Bundles**

SIMATIC PC-based Automation uses the real-time-capable software controller WinAC RTX or its fail-safe version WinAC RTX F on the basis of Windows operating systems. Any PC applications, operator control and monitoring tasks, as well as technological functions can simply be combined here to form an overall automation solution.

Thanks to their rugged design and pre-installed, ready-to-use automation software, the SIMATIC Embedded Bundles allow the advantages of PC-based Automation to be used at the machine.

**SIMATIC WinAC RTX (F)**

SIMATIC WinAC (Windows Automation Center) is the PC-based software controller from Siemens with a real-time response. The WinAC RTX PC-based controller is used when high performance, high data volumes and hard real time are required at the same time. WinAC uses a real-time core for real-time and deterministic behavior. WinAC RTX offers an open data interface to the standard software of the office world on the basis of OPC.

WinAC RTX is programmed using the standard SIMATIC programming tools, and is code-compatible with SIMATIC S7, i.e. program components can be used in SIMATIC S7 and WinAC RTX.

WinAC RTX F provides a TÜV-certified (German Technical Inspectorate), fail-safe software controller for safety-oriented applications. The S7 Distributed Safety software is used for programming the fail-safe program. The PROFIsafe profile permits fail-safe communication via PROFIBUS DP and PROFINET IO.

WinAC RTX is open for integration of technological applications. C/C++/C# programs can also be integrated into the WinAC RTX control program. This makes for highly flexible solutions with access to all the hardware and software components of the PC. C/C++/C# is frequently used to program complex technology functions.

C/C++/C# encapsulates these programs. The openness of WinAC RTX can therefore also be used to protect know-how in customized functions.

**Embedded Bundles**

SIMATIC Embedded Bundles are a ready-to-use combination of hardware and software for control and HMI applications. This results in simple handling and fast commissioning for automation solutions at machine level. Embedded Bundles combine the openness of PC-based controllers with the ruggedness of conventional controllers. In addition, they boast flexible software installed on powerful, scalable hardware in an open, compact combination.

SIMATIC Embedded Bundles are available based on the following hardware:

- SIMATIC IPC227D
- SIMATIC IPC427D
- SIMATIC IPC277D
- SIMATIC HMI IPC477D (PRO)
- SIMATIC S7-mEC Embedded Controller

Thanks to their fan-free and disk-free design, the SIMATIC Embedded Bundles can be used direct at the machine in harsh environments. Windows Embedded Standard is used as the embedded operating system.



For further information, refer to:

[www.siemens.com/pc-based-automation](http://www.siemens.com/pc-based-automation)

## Introduction

### SIMATIC programming devices

#### SIMATIC Field PG M4

#### Overview

##### **SIMATIC Field PG M4: High-performance industrial notebook with new design**

The latest SIMATIC Field PG M4, a member of the SIMATIC family, offers you a whole range of advantages in addition to wireless technology and Bluetooth at an attractive price/performance ratio:

- Powerful Intel Core processor
- High-resolution 15.6" widescreen display, 16:9 aspect ratio
- Integrated data backup concept
- Powerful battery with intelligent smart phone charging concept and compact power supply unit
- Retractable carry-handle
- Easily replaceable hard disk

All the standard S5 and S7 interfaces required for industrial applications are already onboard the rugged device, which is certified in accordance with the US military standard MIL-STD-810G.

In other words: The ready-to-run SIMATIC Field PG M4 with pre-installed SIMATIC engineering software for controllers and HMI is the ideal industrial notebook – optimized for mobile use in configuring, commissioning, servicing, and maintaining your automation system.

With support from TPM 1.2, the hard disk tool ensures greater security, and iAMT / WoL simplifies the remote administration within the IT infrastructure of your company.

##### **Applications**

- Suitable for use in harsh industrial environments due to state-of-the-art material technology.
- Protected against shock and vibration: Rugged magnesium die-cast enclosure with protector strips on exposed parts of the enclosure.
- Safe grip in mobile use: Sturdy, retractable carry-handle.
- Dirt-resistant: Industrial design with dark colors and keyboard with abrasion-resistant laser inscription.
- Protection against electromagnetic interference in harsh industrial environments by means of fully shielded magnesium enclosure (EMC/EMS-tested).
- Lightweight, compact power supply unit.

##### **Interfaces**

- 2x fully-featured Ethernet interfaces with high data throughput (10 / 100 / 1000 Mbit) permit a clear separation of office and machine networks.
- Two USB 2.0 and two USB 3.0 interfaces provide  $\geq 1$  A for a stable power supply for external devices, with a 1.5 A charging function for mobile devices in power-off mode (Apple-compatible).
- Two Industrial WLAN antennas, based on the WLAN standards 802.11 a, b, g and n, permit secure and wireless communication with programmable controllers. The radio link to the terminal equipment is monitored cyclically in the IWLAN and is safe and reliable even in critical situations.
- Bluetooth for the synchronization and transmission of data to Bluetooth-compatible devices such as PDAs or cell phones.
- PROFIBUS DP/MPI interface as well as SIMATIC Memory Card and MultiMedia Card slot.
- S5 interface COM 1 / TTY for SIMATIC S5 PLC connection



##### **Powerful hardware components**

- The very latest Intel Core i7 processor offers maximum performance with lowest energy consumption.
- Lithium-ion battery with more than five hours operating time and a discharge time well in excess of five months.
- High-resolution 15.6" widescreen display, 16:9 aspect ratio, with selectable display resolution: protects the eyes and supports ergonomic working up to full HD.
- The integrated Intel HD4000 graphics card, operating via the display port with a resolution of 2560 x 1600 pixels, increases the working screen area by more than 90%.
- High-performance work memory with up to 16 GB DDR3 SDRAM – 1600 MHz: for fast execution and parallel processing of several applications.
- Easily swappable hard drive (320 GB or 1 TB HDD) or super-fast solid-state drive (300/480 GB SSD): easily replaceable, depending on environment and required software status.
- Status LED: readable whether display cover is open or closed

##### **Operating system (optionally 2 operating systems, also dual boot)**

Microsoft Windows XP Professional SP3 MUI,  
Microsoft Windows 7 Ultimate SP 1 (64 bit) MUI

For further information, refer to:

[www.siemens.com/simatic-pg](http://www.siemens.com/simatic-pg)

## Overview



SIMATIC IPC family

**SIMATIC Industrial PC**

Our reliable and innovative industrial PCs are the optimal PC hardware platform for PC-based Automation from Siemens.

**Rack PC**

Rack PCs are flexible, high-availability industrial PC systems for powerful yet compact applications using 19" technology.

**Box PC**

SIMATIC Box PCs provide mechanical engineers, plant engineers and control cabinet makers with particularly rugged industrial PC systems for use in powerful yet compact applications.

**Panel PC**

SIMATIC Panel PCs are suitable thanks to their high industrial compatibility for use in control cabinets, consoles and control panels, as well as directly on the machine. Typical areas of application can be found in both factory and process automation.

**Industrial monitors and thin clients**

Flexible operator input concepts can be implemented via Flat Panel monitors or thin clients. These are industry-standard LCD monitors with high-contrast displays that can be located up to 30 m away from the PC, or low-cost, rugged thin clients that offer HMI functionality over the network in larger plants spread over wide areas.

**Ruggedness and industrial compatibility for 24-hour continuous use in an industrial environment**

- Compact, space-saving enclosure (Box PC and Panel PC)
- Suitable for installing in space-saving control cabinets, only 500 mm deep (Rack PC)
- All-metal enclosure with a high degree of electromagnetic compatibility for use in industrial areas and in domestic, business and commercial environments and for a degree of protection up to IP65/NEMA 4
- The mounting position of the devices can be varied by means of wall, portrait or control cabinet mounting (Box PC), rail mounting (SIMATIC IPC427D or IPC227D only) and horizontal or vertical mounting position in the 19" cabinet or with the appropriate kit as an industrial tower PC (Rack PC).
- High resistance to shock/vibration thanks to special hard disk mountings, locked connectors, and card retainers
- Maintenance-free due to design without hard disk or fans using SIMATIC CFast memory cards or solid-state drive (SIMATIC IPC427D/IPC477D and SIMATIC IPC227D/IPC277D)
- Service-friendly, modular device design for replacement of defective components
- Integral industrial power supplies (according to NAMUR) for safe power supplies protected against system disturbances
- Attractive product design with dirt-repelling fronts and coated surfaces
- Dust protection thanks to a pressurized cooling concept, front-mounted fans and dust filters (Rack PC)

For further information, refer to:

[www.siemens.com/simatic-ipc](http://www.siemens.com/simatic-ipc)

## Introduction

### SIMATIC software

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#### Overview

##### **Efficient engineering for all SIMATIC controllers**

SIMATIC software is a core component of Totally Integrated Automation and provides the optimum tool for every automation task and every phase of a project. SIMATIC software enables the potential in the engineering workflow to be fully exploited.

- Fewer interfaces thanks to integrated engineering environment for logic, HMI and motion control.
- Design and implementation times are shortened by structured, process-oriented programming methodology.
- The costs of subsequent projects are reduced because blocks are easy to reuse.
- Efficient process error diagnostics increase plant availability

##### **Totally Integrated Automation Portal (TIA Portal)**

The engineering framework – Totally Integrated Automation Portal (TIA Portal) – is the basis for all engineering systems for configuring, programming and commissioning programmable controllers. As an integral component of the various engineering systems

- SIMATIC STEP 7 for S7 controllers (PLC)
- SIMATIC WinCC for machine-level operation (HMI)
- SIMATIC Startdrive for SINAMICS drives
- SCOUT for the SIMOTION Motion Control Systems

the engineering framework automatically ensures a standardized and consistent system behavior by providing shared services and properties.

SIMATIC STEP 7, based on the TIA Portal, offers the standardized operating concept and uses the automatic data consistency and shared services such as configuration, communication and integrated system diagnostics. STEP 7 is suitable for all current SIMATIC controllers and offers the user an integrated, efficient and intuitive solution.

##### **Engineering systems for SIMATIC controllers – based on TIA Portal**

- STEP 7 Basic V13 (including WinCC Basic), shared engineering for SIMATIC S7-1200 and SIMATIC HMI Basic Panels.
- STEP 7 Professional V13 (incl. WinCC Basic), the easy-to-use, uniform engineering system for all SIMATIC controllers and SIMATIC HMI panels.



##### **Highlights:**

- Powerful language innovations:  
Efficient program editors, integrated symbolic programming
- User-friendly online functionalities:  
Hardware detection, software upload, module expansion during operation, simulation (PLCSim) for S7-1500 and S7-1200, Download in RUN, Undo
- Integrated system diagnosis as a firmware function:  
Uniform display concept for STEP 7, CPU display, Web server and HMI without any configuration overhead, up to 4 real-time traces
- Integrated technology:  
Technology objects for motion sequences (rotational speed and relative synchronous operation) and PID control functions with self-optimization
- Multi-level security concept:  
Integrated protection functions for project and plant protection:
  - Know-how protection for program blocks,
  - Copy protection for the program through coupling with hardware,
  - 4-level protection against unauthorized access to CPU, HMI, communication,
  - Manipulation protection by means of lead seals.

##### **New with STEP 7 V13 SP1:**

- Integrated system diagnosis at all times and locations, without having to create one line of code
- Motion Integrated for the straightforward engineering of drives and motion control
- Faster commissioning of PROFINET networks by means of simple PN initialization

For further information, refer to:

[www.siemens.com/simatic-software](http://www.siemens.com/simatic-software)

**Overview****The right solution for every application**

With SIMATIC ET 200 a wide range of distributed I/O systems is available – for solutions in the control cabinet or without a control cabinet directly at the machine, as well as for applications in hazardous areas. SIMATIC ET 200 systems for cabinet-free configurations are installed in a rugged, fiber-glass reinforced plastic enclosure, making them resistant to shock and dirt, as well as watertight. Furthermore, you need fewer additional components, save on cabling, and profit from extremely fast response times.

The modular design makes it possible to scale and expand the ET 200 systems simply and in small stages. Already integrated additional modules reduce costs, and at the same time offer a widely diverse range of possible applications. You can choose from a wide range of possible combinations: digital and analog inputs/outputs, intelligent modules with CPU functionality, safety engineering, motor starters, pneumatic systems, frequency converters, and diverse technology modules.

Communication over PROFINET and PROFIBUS, uniform engineering, transparent diagnostics options as well as optimum interfacing to SIMATIC controllers and HMI devices prove the unique integration of

Totally Integrated Automation.

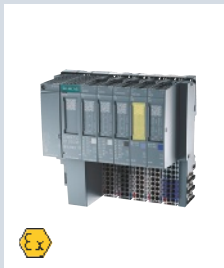
In addition to the fieldbus systems, the point-to-point connection I/O-Link is also available for intelligent connection of sensors and actuators.

For further information, refer to:

[www.siemens.com/et200](http://www.siemens.com/et200)

**In a control cabinet (IP20)****ET 200SP**

A new generation of scalable IO

**ET 200S**

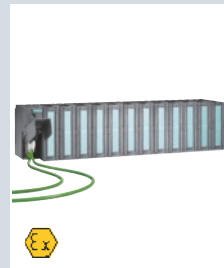
Discretely modular design and multi-functional

**ET 200MP**

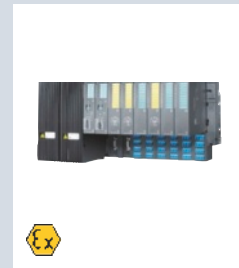
Multi-channel and multi-functional S7-1500 I/O system

**ET 200M**

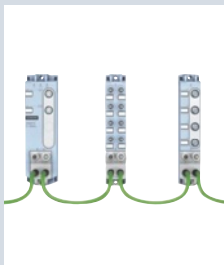
Modular design with S7-300 modules

**ET 200iSP**

Intrinsically safe version for hazardous area

**Without control cabinet (IP65/67)****ET 200AL**

Digital und analog I/O is extremely easy to install

**ET 200pro**

Modular design and multifunctional

**ET 200eco PN**

Low-cost, space-saving block I/O

**ET 200eco**

Low-cost, digital block I/O





## Introduction

### SIMATIC HMI

1

#### Overview



#### **SIMATIC HMI human-machine interface systems – efficient to a new level**

With the innovative human-machine interface products, HMI solutions at the machine level and SCADA solutions can be implemented even more quickly, economically and efficiently.

A new level of efficiency is assured by the complete range of engineering and visualization software, with SIMATIC WinCC (TIA Portal), SIMATIC WinCC and SIMATIC WinCC Open Architecture, as well as the brilliant and rugged family of SIMATIC HMI and SIMATIC IPC operator panels, for the panel-based visualization as well as PC-based standalone and multi-user solutions.

SIMATIC HMI – Efficient to a new level

<http://www.siemens.com/hmi>

#### Efficient solutions for plant-floor control and monitoring

Using the perfectly coordinated combination of efficient engineering with SIMATIC WinCC in the TIA Portal and the rugged series of SIMATIC HMI operator panels, machine-level solutions and added value can be achieved quickly and economically.

**Efficient engineering** – with minimum effort, the visualization can be generated faster and more easily than ever before:

- Shared data storage and the intelligent graphics editor avoid redundant multiple inputs and prevent errors.
- The library concept and the easy replacement of devices reduce the engineering effort to a minimum.

**Innovation in design and operation** – as the best advertisement for the automation solution, and for a unique flexibility that pays for itself, SIMATIC HMI offers

- styles and designs that enable an individual response to customer requirements.
- Intuitive multi-touch and gesture operation offering excellent usability.

**Brilliant operator panels** – the perfect standard for the highest quality solutions for every application:

- High-resolution displays in widescreen format offer a very wide viewing angle for maximum readability.
- Rugged industrial quality, featuring maintenance-free operation and long-term availability.
- Universal application, thanks to cross-industry standards and customer-specific operator panels.

**Safety and security** – for investments, know-how and operation:

- Problem-free change of generations offers maximum security of investment.
- Security Integrated, the integrated security concept for protection of the solution.
- Safety Integrated offers reliable protection for man, machine and environment.

**Fast commissioning** – no time wasted on testing and servicing:

- visualization enables error detection to be simulated in advance.
- Automatic backup eliminates need for manual backup and expensive replacement of equipment.
- Intelligent system diagnosis and remote access facilitate fast clearance of faults and secure, global access.

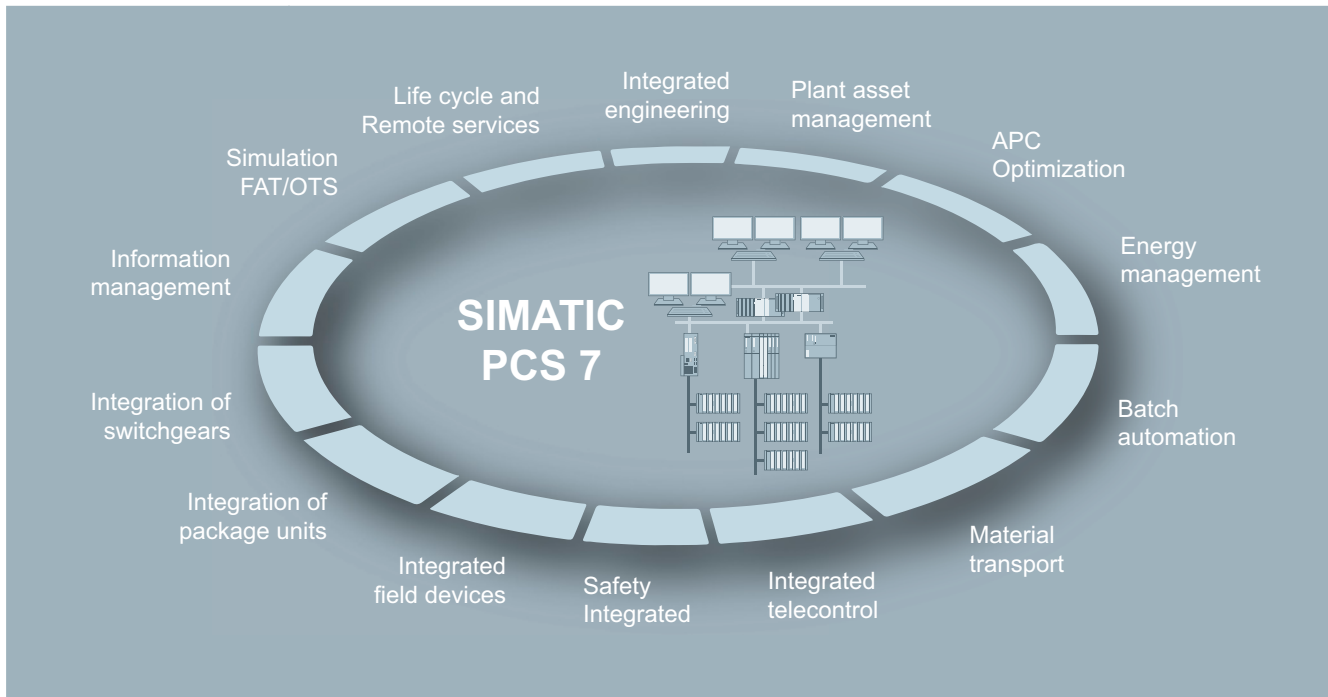
#### SIMATIC WinCC in the TIA Portal (Totally Integrated Automation Portal)

SIMATIC WinCC in the TIA Portal (Totally Integrated Automation Portal) is part of the integrated engineering framework which offers a uniform engineering environment for programming and configuring of control, visualization and drive solutions.

SIMATIC WinCC (TIA Portal), the successor to SIMATIC WinCC flexible, is the software for all HMI applications. It enables almost the entire range of SIMATIC operator panels to be configured. The functionality covers both visualization tasks on the machine level and SCADA applications on PC-based multi-user systems.

<http://www.siemens.com/tia-portal>

## Overview

**Progress you can trust**

The homogenous and uniform SIMATIC PCS 7 process control system, with its unique scalable architecture and outstanding system characteristics, is an ideal basis for cost-effective implementation and economic operation of process control plants. Perfect interplay of all components makes it possible for you to sustainably produce in higher quality and to establish new products significantly faster on the market.

Depending on the process-typical automation or individual customer requirements, the basic control system functionality can be expanded with specific system and technology components, e.g. for:

- Diagnostics and maintenance (SIMATIC PCS 7 Maintenance Station)
- Batch process automation (SIMATIC BATCH)
- Route control for material transport (SIMATIC Route Control)
- Functional safety and protection functions (Safety Integrated for Process Automation)
- Industrial security
- Telecontrol of remote units (SIMATIC PCS 7 TeleControl)
- Automation of electrical switchgear (SIMATIC PCS 7 PowerControl)
- Energy management
- Advanced Process Control
- Industrial applications (Industry Library, CEMAT, MINERALS AUTOMATION STANDARD)
- Process Analytical Technology
- IT connection
- Simulation and virtual commissioning (SIMIT Simulation Framework)

Additional functionality can be integrated using add-on products. The migration of obsolescent or third-party systems is supported by innovative migration products and solutions.

For further information, refer to:

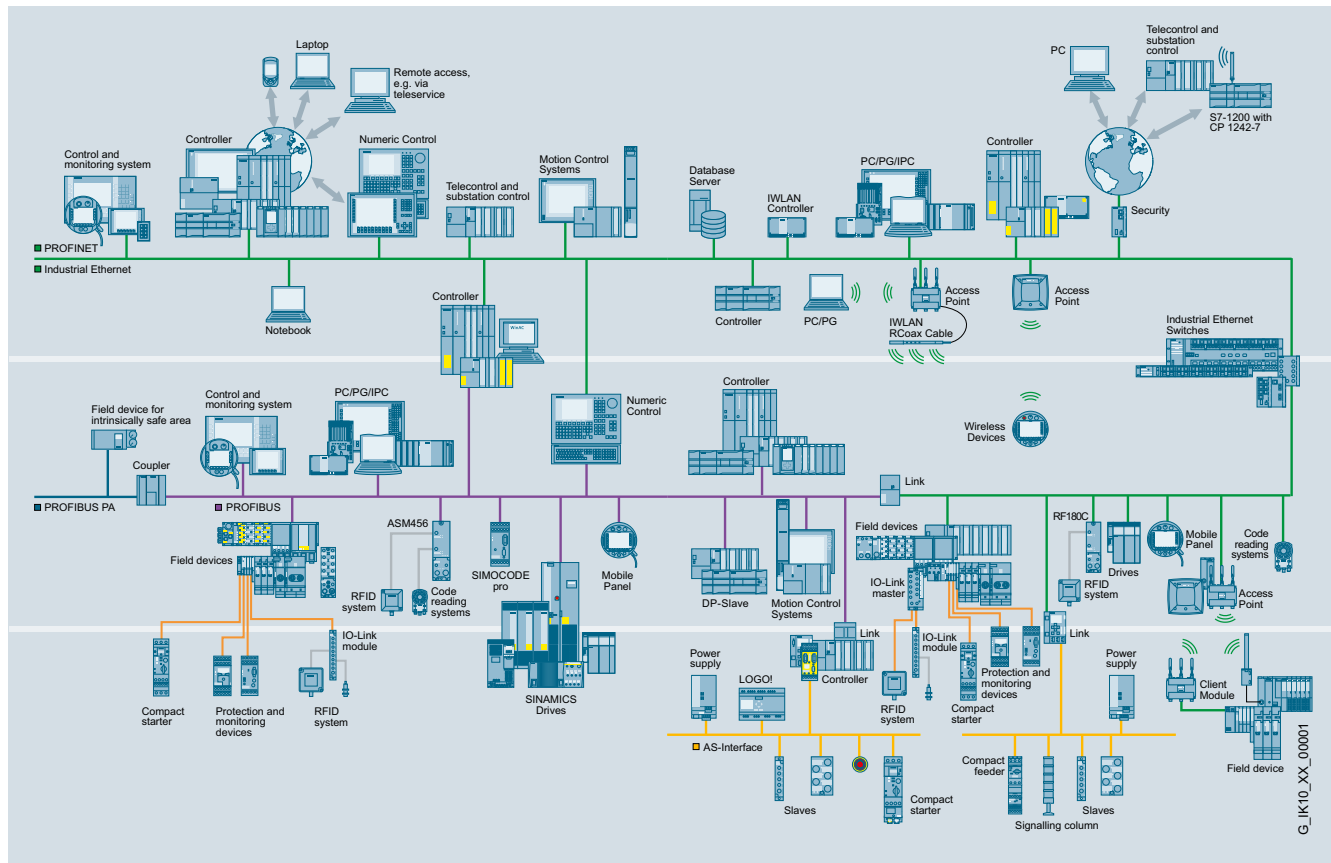
[www.siemens.com/simatic-pcs7](http://www.siemens.com/simatic-pcs7)

# Introduction

## SIMATIC NET

1

### Overview



### Networking for Industry

Communication networks are of utmost importance for automation solutions. SIMATIC NET stands for a diverse range of modular blocks – designed for industry – for an efficient solution to your communications tasks.

SIMATIC NET offers solutions which both maximize the benefits of Ethernet and simply integrate fieldbus systems.

Noticeable examples are:

- The development of the field level for the use of Industrial Ethernet.
- Complete integration from the field level to the corporate management level.
- The promotion of wireless communication.
- The integration of IT technologies.

SIMATIC NET supports the following communications systems:

**Industrial Ethernet** (in accordance with IEEE 802.3) – the international standard for area networking is currently the number one network in the LAN environment. Powerful communications networks with long ranges can be established via Industrial Ethernet.

The international standard **PROFINET** (IEC 61158/61784) uses Industrial Ethernet and allows real-time communication all the way to the field level, but also integrates the enterprise level. With full utilization of existing IT standards, PROFINET also allows isochronous motion control applications on the Industrial Ethernet, efficient cross-vendor engineering, and high availability of machines and plants on the Industrial Ethernet.

**PROFIBUS** (IEC 61158/61784) – the international standard for the field level is the global market leader among fieldbus systems. It is the only fieldbus to allow communication both in manufacturing applications and in process-oriented applications.

**AS-Interface** (IEC 62026-2/EN 50295) – as a low-cost alternative to the cable harness, the AS-Interface connects sensors and actuators via twisted-pair cable.

**IO-Link** – the standard for intelligently connecting sensors and actuators from the field level to the MES level.

**Industrial Remote Communication** – product portfolio for worldwide access to outlying plants, distant machines, and for mobile applications.

**Industrial Wireless Communication** – wireless communication over mobile radio (Wireless Remote Networks), with Industrial Wireless LAN (IWLAN in accordance with IEEE 802.11), and for connection of field devices in process automation with the WirelessHART radio standard.

For further information, refer to:

[www.siemens.com/simatic-net](http://www.siemens.com/simatic-net)

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## LOGO! logic module



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2/11	LOGO! modular pure variants
2/15	SIPLUS LOGO! modular pure variants
2/17	LOGO! modular expansion modules
2/27	SIPLUS LOGO! modular expansion modules
<b>2/30</b>	<b>LOGO! modular communication modules</b>
2/30	LOGO! CM EIB/KNX communication modules
2/31	LOGO! CSM unmanaged
2/33	LOGO! CMR (wireless communication)
2/37	AS-Interface connection for LOGO!
<b>2/38</b>	<b>LOGO!Power</b>
<b>2/49</b>	<b>SIPLUS LOGO!Power</b>
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<b>2/51</b>	<b>LOGO! Software</b>
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2/52	SIPLUS LOGO! PROM

**Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

[www.siemens.com/simatic/printmaterial](http://www.siemens.com/simatic/printmaterial)

## LOGO! logic module

### Introduction

#### LOGO! logic module

#### Overview



#### LOGO! logic module

- The compact, easy-to-use and low-cost solution for simple control tasks
- Compact, easy to operate, universally applicable without accessories
- "All in one": Integrated display and operator panel
- 36 different functions can be connected at the click of a button or by means of PC software; up to 130 times over
- LOGO! 8: 38 / 43 different functions can be linked at the press of a button or using PC software; up to 200/400 times
- Functions are easily changed at the press of a key. No more time-consuming rewiring

#### SIPLUS LOGO!

- The controller for use in the toughest environmental conditions
- With extended temperature range from -40/-25 °C to +70 °C
- Suitable for medial exposure (harmful gas atmosphere)
- Condensation permissible
- With the proven PLC technology of LOGO!
- Easy to handle, program, maintain, and service
- Ideal for use in automotive engineering, environmental engineering, mining, chemical plants, material handling, food industry, etc.

#### Accessories:

- The front panel mounting set also allows simple and reliable installation of the logic modules in front panels; IP65 protection is thus possible.
- In order to ensure dependable operation of SIPLUS devices supplied by the battery in conjunction with combustion engines, it is necessary to put in a SIPLUS upmiter upstream device between the battery and the SIPLUS LOGO!.

For further information, please go to:

<http://www.siemens.com/siplus-extreme>

#### General technical specifications SIPLUS LOGO!

Ambient temperature range	-40/-25 ... +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
<b>Ambient conditions</b>	
Extended ambient conditions	
<ul style="list-style-type: none"> <li>• Relative to ambient temperature-atmospheric pressure-installation altitude</li> </ul>	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
<ul style="list-style-type: none"> <li>• With condensation, max.</li> </ul>	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance	
<ul style="list-style-type: none"> <li>• against biologically active substances / conformity with EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
<ul style="list-style-type: none"> <li>• against chemically active substances / conformity with EN 60721-3-3</li> </ul>	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!
<ul style="list-style-type: none"> <li>• against mechanically active substances / conformity with EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!



## Overview



- The space-saving basic variants
- Interface for the connection of expansion modules, up to 24 digital inputs, 20 (16) digital outputs, 8 analog inputs and 8 (2) analog outputs can be addressed
- With connection option for LOGO! TD text display (can be connected to all LOGO! 0BA6 and 0BA7 basic versions); LOGO! TDE can be connected with LOGO! 8 or higher

### New for LOGO! 8

- All basic units with integrated web server
- Same enclosure width as LOGO! 0BA6 (4 MW)
- All basic units with Ethernet interface for communication with LOGO!, SIMATIC Controllers, SIMATIC Panels and PCs
- Use of standard micro CF cards

### LOGO! 0BA7 versions:

- Ethernet interface for communication with SIMATIC Controller, SIMATIC Panel and PC
- Networking of max. 8 LOGO! devices
- Use of standard CF card or SIMATIC memory card

## Technical specifications

Article number	6ED1052-1CC01-0BA8	6ED1052-1MD00-0BA8	6ED1052-1HB00-0BA8	6ED1052-1FB00-0BA8
	LOGO! 24CE, 8DI(4AI)/4DO, 400 BLOCKS	LOGO! 12/24RCE, 8DI(4AI)/4DO, 400 BLOCKS	LOGO! 24RCE, 8DI/4DO, 400 BLOCKS	LOGO! 230RCE, 8DI/4DO, 400 BLOCKS
<b>Product type designation</b>				
<b>Installation type/mounting</b>				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
<b>Supply voltage</b>				
Rated value (DC)				
• 12 V DC		Yes		
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes
permissible range, lower limit (DC)	20.4 V	10.8 V	20.4 V	100 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	253 V
Rated value (AC)				
• 24 V AC			Yes	
• 115 V AC				Yes
• 230 V AC				Yes
<b>Time of day</b>				
<b>Time switching clocks</b>				
• Number	190	8	8	8
• Power reserve	480 h	480 h	480 h	480 h
<b>Digital inputs</b>				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8; Of which 4 can be used in analog mode (0 to 10 V)	8	8
<b>Digital outputs</b>				
Number of digital outputs	4; Transistor	4; Relays	4; Relays	4; Relays
short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
<b>Output current</b>				
• for signal "1" permissible range for 0 to 55 °C, max.	0.3 A	10 A		
<b>Relay outputs</b>				
<b>Switching capacity of contacts</b>				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		10 A	10 A	10 A

**LOGO! logic module**

LOGO! modular

**LOGO! modular basic variants****Technical specifications (continued)**

Article number	<b>6ED1052-1CC01-0BA8</b> LOGO! 24CE, 8DI(4AI)/4DO, 400 BLOCKS	<b>6ED1052-1MD00-0BA8</b> LOGO!12/24RCE, 8DI(4AI)/4DO, 400 BLOCKS	<b>6ED1052-1HB00-0BA8</b> LOGO! 24RCE, 8DI/4DO, 400 BLOCKS	<b>6ED1052-1FB00-0BA8</b> LOGO!230RCE, 8DI/4DO, 400 BLOCKS
<b>EMC</b>				
<b>Emission of radio interference acc. to EN 55 011</b>				
• Limit class B, for use in residential areas	Yes; Radio interference suppression according to EN 55011, Limit Value Class B	Yes	Yes	Yes
<b>Degree and class of protection</b>				
Degree of protection to EN 60529				
• IP20	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>				
CSA approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
Developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes	Yes
<b>Marine approval</b>				
• Marine approval	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	0 °C	0 °C	0 °C	0 °C
• max.	55 °C	55 °C	55 °C	55 °C
<b>Dimensions</b>				
Width	71.5 mm	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	60 mm	60 mm	60 mm	60 mm
Article number	<b>6ED1052-1MD00-0BA7</b> LOGO!12/24RCE, 8DI(4AI)/4DO, 400 BLOCKS		<b>6ED1052-1FB00-0BA7</b> LOGO! 230RCE, 8DI/4DO, 400 BLOCKS	
<b>Product type designation</b>				
<b>Installation type/mounting</b>				
Mounting	on 35 mm DIN rail, 6 spacing units wide		on 35 mm DIN rail, 6 spacing units wide	
<b>Supply voltage</b>				
Rated value (DC)				
• 12 V DC	Yes			
• 24 V DC	Yes			
• 115 V DC			Yes	
• 230 V DC			Yes	
permissible range, lower limit (DC)	10.8 V		100 V	
permissible range, upper limit (DC)	28.8 V		253 V	
Rated value (AC)				
• 115 V AC			Yes	
• 230 V AC			Yes	
<b>Time of day</b>				
<b>Time switching clocks</b>				
• Number	333		333	
• Power reserve	480 h		480 h	
<b>Digital inputs</b>				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)		8	
<b>Digital outputs</b>				
Number of digital outputs	4; Relays		4; Relays	
short-circuit protection	No; external fusing necessary		No; external fusing necessary	
<b>Relay outputs</b>				
<b>Switching capacity of contacts</b>				
- with inductive load, max.	3 A		3 A	
- with resistive load, max.	10 A		10 A	

**Technical specifications (continued)**

Article number	<b>6ED1052-1MD00-0BA7</b> LOGO! 12/24RCE, 8DI(4AI)/4DO, 400 BLOCKS	<b>6ED1052-1FB00-0BA7</b> LOGO! 230RCE, 8DI/4DO, 400 BLOCKS		
<b>EMC</b>				
<b>Emission of radio interference acc. to EN 55 011</b>				
• Limit class B, for use in residential areas	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes; Radio interference suppression according to EN55011, Limit Value Class B		
<b>Degree and class of protection</b>				
Degree of protection to EN 60529				
• IP20	Yes	Yes		
<b>Standards, approvals, certificates</b>				
CSA approval	Yes	Yes		
UL approval	Yes	Yes		
FM approval	Yes	Yes		
Developed in accordance with IEC 61131	Yes	Yes		
according to VDE 0631	Yes	Yes		
<b>Marine approval</b>				
• Marine approval	Yes	Yes		
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	0 °C	0 °C		
• max.	55 °C	55 °C		
<b>Dimensions</b>				
Width	107 mm	107 mm		
Height	90 mm	90 mm		
Depth	55 mm	55 mm		
<hr/>				
Article number	<b>6ED1052-1CC01-0BA6</b> LOGO! 24C, 8DI(4AI)/4DO, 200 BLOCKS	<b>6ED1052-1MD00-0BA6</b> LOGO! 12/24RC, 8DI(4AI)/4DO, 200 BLOCKS	<b>6ED1052-1HB00-0BA6</b> LOGO! 24RC, 8DI/4DO, 200 BLOCKS	<b>6ED1052-1FB00-0BA6</b> LOGO! 230RC, 8DI/4DO, 200 BLOCKS
<b>Product type designation</b>				
<b>Installation type/mounting</b>				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
<b>Supply voltage</b>				
Rated value (DC)				
• 12 V DC		Yes		
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes
permissible range, lower limit (DC)	20.4 V	10.8 V	20.4 V	100 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	253 V
Rated value (AC)				
• 24 V AC			Yes	
• 115 V AC				Yes
• 230 V AC				Yes
<b>Time of day</b>				
<b>Time switching clocks</b>				
• Number	190	8	8	8
• Power reserve	80 h	80 h	80 h	80 h
<b>Digital inputs</b>				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8; Of which 4 can be used in analog mode (0 to 10 V)	8	8

**LOGO! logic module**

LOGO! modular

**LOGO! modular basic variants****Technical specifications (continued)**

Article number	<b>6ED1052-1CC01-0BA6</b> LOGO! 24C, 8DI(4AI)/4DO, 200 BLOCKS	<b>6ED1052-1MD00-0BA6</b> LOGO! 12/24RC, 8DI(4AI)/4DO, 200 BLOCKS	<b>6ED1052-1HB00-0BA6</b> LOGO! 24RC, 8DI/4DO, 200 BLOCKS	<b>6ED1052-1FB00-0BA6</b> LOGO! 230RC, 8DI/4DO, 200 BLOCKS
<b>Digital outputs</b>				
Number of digital outputs	4; Transistor	4; Relays	4; Relays	4; Relays
short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
<b>Output current</b>				
• for signal "I" permissible range for 0 to 55 °C, max.	0.3 A			
<b>Relay outputs</b>				
<b>Switching capacity of contacts</b>				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		10 A	10 A	10 A
<b>EMC</b>				
<b>Emission of radio interference acc. to EN 55 011</b>				
• Limit class B, for use in residential areas	Yes; Radio interference suppression according to EN 55011, Limit Value Class B	Yes	Yes	Yes
<b>Degree and class of protection</b>				
Degree of protection to EN 60529				
• IP20	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>				
CSA approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
Developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes	Yes
<b>Marine approval</b>				
• Marine approval	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	0 °C	0 °C	0 °C	0 °C
• max.	55 °C	55 °C	55 °C	55 °C
<b>Dimensions</b>				
Width	72 mm	72 mm	72 mm	72 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	55 mm	55 mm	55 mm	55 mm

Ordering data	Article No.	Article No.
<b>LOGO! 8 logic module</b>		<b>LOGO! 6 logic module</b>
<b>LOGO! 24CE</b> Supply voltage 24 V DC, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integrated time switch Ethernet interface; 400 function blocks can be interlinked, modular expansion capability	<b>6ED1052-1CC01-0BA8</b>	<b>LOGO! 24C logic module</b> 24 V DC supply voltage, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integrated time switch; 200 function blocks can be interlinked, modular expansion capability
<b>LOGO! 12/24RCE</b> Supply voltage 12...24 V DC, 8 digital inputs 12/24 V DC, of which 4 can be used in analog mode (0 to 10 V) 4 relay outputs 10 A, integral time switch Ethernet interface; 400 function blocks can be interlinked, modular expansion capability	<b>6ED1052-1MD00-0BA8</b>	<b>LOGO! 12/24RC logic module</b> 12/24 V DC power supply, 8x 12/24 V DC digital inputs, of which 4 can be used in analog mode (0 to 10 V) 4x 10 A relay outputs, integral time switch; 200 function blocks can be interlinked, modular expansion capability
<b>LOGO! 24RCE</b> Supply voltage 24 V AC/DC, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integral time switch Ethernet interface; 400 function blocks can be interlinked, modular expansion capability	<b>6ED1052-1HB00-0BA8</b>	<b>LOGO! 24RC logic module</b> 24 V AC/DC power supply, 8x 24 V AC/DC digital inputs, 4x 10 A relay outputs, integral time switch; 200 function blocks can be interlinked, modular expansion capability
<b>LOGO! 230RCE</b> Supply voltage 115...230 V AC/DC, 8 digital inputs 115...230 V AC/DC, 4 relay outputs 10 A, integral time switch Ethernet interface; 400 function blocks can be interlinked, modular expansion capability	<b>6ED1052-1FB00-0BA8</b>	<b>LOGO! 230RC logic module</b> 115/230 V AC/DC power supply, 8x 115/230 V AC/DC digital inputs, 4x 10 A relay outputs, integral time switch; 200 function blocks can be interlinked, modular expansion capability
<b>LOGO! 7 logic module</b>		<b>Accessories for LOGO! 8</b>
<b>LOGO! 12/24RCE logic module</b> Supply voltage 12/24 V DC, 8 digital inputs 12/24 V DC, of which 4 can be used in analog mode (0 to 10 V) 4 relay outputs 10 A, integral time switch; 400 function blocks can be interlinked, Ethernet interface, modular expansion capability	<b>6ED1052-1MD00-0BA7</b>	<b>LOGO! 8 text display HMI</b> 6-line text display, can be connected to all LOGO! 8 Basic and Pure versions, with 2 Ethernet interfaces; including installation accessories. Requires additional 12 V DC or 24 V AC/DC power supply
<b>LOGO! 230RCE logic module</b> 115/230 V AC/DC supply voltage, 8 digital inputs 115/230 V AC/DC, 4 relay outputs 10 A, integral time switch; 400 function blocks can be interlinked, Ethernet interface, modular expansion capability	<b>6ED1052-1FB00-0BA7</b>	<b>LOGO!Soft Comfort V8</b> For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD
		<b>LOGO!Soft Comfort V8 Upgrade</b> Upgrade from V1.0 to V8, on DVD



**LOGO! logic module**

LOGO! modular

**LOGO! modular basic variants**

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Ordering data	Article No.	Ordering data	Article No.
<b>LOGO! 8 Starter Kits</b> In TANOS Box, with LOGO! 8, LOGO! Soft Comfort V8, WinCC Basic V13, Ethernet cable		<b>LOGO! Memory Card</b> Program module for copying, with know-how protection	<b>6ED1056-1DA00-0BA0</b>
<b>LOGO! 8 12/24 V Starter Kit</b> With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A	<b>6ED1057-3BA00-0AA8</b>	<b>LOGO! battery card</b> Battery module for backing up the integral real-time clock (not LOGO! 24)	<b>6ED1056-6XA00-0BA0</b>
<b>LOGO! 8 230V Starter Kit</b> With LOGO! 230RCE	<b>6ED1057-3BA02-0AA8</b>	<b>LOGO! memory/battery card</b> Combined program and battery module, with know-how protection and backup of the integral real-time clock (not LOGO! 24)	<b>6ED1056-7DA00-0BA0</b>
<b>LOGO! 8 TDE Starter Kit</b> With LOGO! 12/24RCEO, LOGO! Power 24 V, 1.3 A, LOGO! TDE	<b>6ED1057-3BA10-0AA8</b>	<b>LOGO! PROM</b> Programming device used to simultaneously reproduce program module contents on up to 8 program modules	<b>6AG1057-1AA01-0BA6</b>
<b>LOGO! 8 KP300 Basic Starter Kit</b> With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KP300 Basic mono PN	<b>6AV2132-0HA00-0AA1</b>	<b>LOGO!Soft Comfort V8</b> For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	<b>6ED1058-0BA08-0YA1</b>
<b>LOGO! 8 KTP400 Basic Starter Kit</b> With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP400 Basic	<b>6AV2132-0KA00-0AA1</b>	<b>LOGO!Soft Comfort V8 Upgrade</b> Upgrade from V1.0 to V8, on DVD	<b>6ED1058-0CA08-0YE1</b>
<b>LOGO! 8 KTP700 Basic Starter Kit</b> With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP700 Basic	<b>6AV2132-3GB00-0AA1</b>	<b>LOGO! PC cable</b> For program transfer between LOGO! and the PC	<b>6ED1057-1AA00-0BA0</b>
<b>Accessories for LOGO! 6, LOGO! 7</b>		<b>LOGO! USB PC cable</b> For transferring the program between LOGO! and PC, including driver on CD-ROM	<b>6ED1057-1AA01-0BA0</b>
<b>LOGO! TD text display</b> 4-line text display, can be connected to all LOGO! 0BA6 Basic and Pure versions, including connecting cable	<b>6ED1055-4MH00-0BA0</b>	<b>LOGO! modem cable</b> Adapter cable for analog modem communication	<b>6ED1057-1CA00-0BA0</b>
<b>SIPLUS LOGO! TD text display</b> (extended temperature range -10 ... +60 °C and medial loading) 4-line text display, can be connected to all LOGO! Basic and Pure versions as of -0BA6, including connecting cable	<b>6AG1055-4MH00-2BA0</b>	<b>Front panel mounting set</b> Width 4 width units Width 4 width units, with keys Width 8 width units Width 8 width units, with keys	<b>6AG1057-1AA00-0AA0</b> <b>6AG1057-1AA00-0AA3</b> <b>6AG1057-1AA00-0AA1</b> <b>6AG1057-1AA00-0AA2</b>

**Overview**


- The space-saving basic variants
- Interface for the connection of expansion modules, up to 24 digital inputs, 16 digital outputs, 8 analog inputs and 2 analog outputs can be addressed
- With connection option for LOGO! text display TD (can be connected to all LOGO! 0BA6 basic versions)

**New in LOGO! 0BA7 variants:**

- Ethernet interface for communication with SIMATIC Controller, SIMATIC Panel and PC
- Networking of max. 8 LOGO! devices
- Use of standard SD card or SIMATIC memory card

**Note:**

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	6AG1052-1CC01-2BA6	6AG1052-1MD00-2BA6	6AG1052-1HB00-2BA6	6AG1052-1FB00-2BA6
Based on	6ED1052-1CC01-0BA6 SIPLUS LOGO! 24C	6ED1052-1MD00-0BA6 SIPLUS LOGO! 12/24RC	6ED1052-1HB00-0BA6 SIPLUS LOGO! 24RC	6ED1052-1FB00-0BA6 SIPLUS LOGO! 230RC
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>				
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**LOGO! logic module**

LOGO! modular

**SIPLUS LOGO! modular basic variants****Technical specifications (continued)**

Article number	<b>6AG1052-1MD00-2BA7</b>	<b>6AG1052-1FB00-2BA7</b>
Based on	<b>6ED1052-1MD00-0BA7</b> SIPLUS LOGO!12/24RCE	<b>6ED1052-1FB00-0BA7</b> SIPLUS LOGO! 230RCE
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax	70 °C; = Tmax
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>		
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.****Article No.****SIPLUS LOGO! 24**

24 V DC supply voltage,  
8 digital inputs 24 V DC,  
of which 4 can be used in analog mode (0 to 10 V),  
4 digital outputs 24 V DC, 0.3 A;  
integrated time switch;  
200 function blocks can be interlinked,  
modular expansion capability

Extended temperature range and exposure to media

**6AG1052-1CC01-2BA6****SIPLUS LOGO! 230RC**

115/230 V AC/DC supply voltage,  
8 digital inputs 115/230 V AC/DC,  
4 relay outputs 10 A,  
integral time switch;  
200 function blocks can be interlinked,  
modular expansion capability

Extended temperature range and exposure to media

**6AG1052-1FB00-2BA6****SIPLUS LOGO! 230RCE**

115/230 V AC/DC supply voltage,  
8 digital inputs 115/230 V AC/DC,  
4 relay outputs 10 A,  
integral time switch;  
400 function blocks can be interlinked,  
Ethernet interface,  
modular expansion capability

Extended temperature range and exposure to media

**6AG1052-1FB00-2BA7****SIPLUS LOGO! 24RC**

24 V AC/DC supply voltage,  
8 digital inputs 24 V AC/DC,  
4 relay outputs 10 A,  
integral time switch;  
200 function blocks can be interlinked,  
modular expansion capability

Extended temperature range and exposure to media

**6AG1052-1HB00-2BA6****SIPLUS LOGO! 12/24RC**

12/24 V DC power supply,  
8x 12/24 V DC digital inputs, of which 4 can be used in analog mode (0 to 10 V)  
4x 10 A relay outputs,  
integral time switch;  
200 function blocks can be interlinked,  
modular expansion capability

Extended temperature range and exposure to media

**6AG1052-1MD00-2BA6****SIPLUS LOGO! 12/24RCE**

12/24 V DC supply voltage,  
8 digital inputs 12/24 V DC, of which 4 can be used in analog mode (0 to 10 V)  
4 relay outputs 10 A,  
integral time switch;  
400 function blocks can be interlinked,  
Ethernet interface,  
modular expansion capability

Extended temperature range and exposure to media

**6AG1052-1MD00-2BA7****Accessories****SIPLUS Upmiter upstream device**

for reliable operation at the battery of combustion engines

**6AG1053-1AA00-2AA0****Further accessories**

See LOGO! modular basic variants, page 2/7

## Overview



- Basic variants optimized for costs
- Interface for the connection of expansion modules, up to 24 digital inputs, 16 (20) digital outputs, 8 analog inputs and 2 (8) analog outputs can be addressed
- With connection option for LOGO! TD text display (can be connected to all LOGO! 0BA6 basic variants)

### New LOGO! 8

- All basic units with integrated Web server
- Enclosure width as LOGO! 0BA6 (4 MW)
- All basic units with Ethernet interface for communication with LOGO!, SIMATIC Controllers, SIMATIC Panels and PCs
- Use of standard micro SD cards

## Technical specifications

Article number	6ED1052-2CC01-0BA8	6ED1052-2MD00-0BA8	6ED1052-2HB00-0BA8	6ED1052-2FB00-0BA8
	LOGO! 24CEO, 8DI(4AI)/4DO, 400 BLOCKS	LOGO!12/24RCEO, 8DI(4AI)/4DO, 400 BLOCKS	LOGO! 24RCEO, 8DI/4DO, 400 BLOCKS	LOGO!230RCEO, 8DI/4DO, 400 BLOCKS
<b>Product type designation</b>				
<b>Installation type/mounting</b>				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
<b>Supply voltage</b>				
Rated value (DC)		Yes		
• 12 V DC		Yes		
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes
permissible range, lower limit (DC)	20.4 V	10.8 V	20.4 V	100 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	253 V
Rated value (AC)				
• 24 V AC			Yes	
• 115 V AC				Yes
• 230 V AC				Yes
<b>Time of day</b>				
<b>Time switching clocks</b>				
• Number	190	8	8	8
• Power reserve	480 h	480 h	480 h	480 h
<b>Digital inputs</b>				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8; Of which 4 can be used in analog mode (0 to 10 V)	8	8
<b>Digital outputs</b>				
Number of digital outputs	4; Transistor	4; Relays	4; Relays	4; Relays
short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
<b>Output current</b>				
• for signal "I" permissible range for 0 to 55 °C, max.	0.3 A	10 A		
<b>Relay outputs</b>				
<b>Switching capacity of contacts</b>				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		10 A	10 A	10 A
<b>EMC</b>				
<b>Emission of radio interference acc. to EN 55 011</b>				
• Limit class B, for use in residential areas	Yes; Radio interference suppression according to EN 55011, Limit Value Class B	Yes	Yes	Yes

**LOGO! logic module**

LOGO! modular

**LOGO! modular pure variants****Technical specifications (continued)**

Article number	<b>6ED1052-2CC01-0BA8</b> LOGO! 24CEO, 8DI(4AI)/4DO, 400 BLOCKS	<b>6ED1052-2MD00-0BA8</b> LOGO! 12/24RCEO, 8DI(4AI)/4DO, 400 BLOCKS	<b>6ED1052-2HB00-0BA8</b> LOGO! 24RCEO, 8DI/4DO, 400 BLOCKS	<b>6ED1052-2FB00-0BA8</b> LOGO! 230RCEO, 8DI/4DO, 400 BLOCKS
<b>Degree and class of protection</b>				
Degree of protection to EN 60529				
• IP20	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>				
CSA approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
Developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes	Yes
<b>Marine approval</b>				
• Marine approval	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	0 °C	0 °C	0 °C	0 °C
• max.	55 °C	55 °C	55 °C	55 °C
<b>Dimensions</b>				
Width	71.5 mm	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm	58 mm
<hr/>				
Article number	<b>6ED1052-2CC01-0BA6</b> LOGO! 24CO, 8DI(4AI)/4DO, 200 BLOCKS	<b>6ED1052-2MD00-0BA6</b> LOGO! 12/24RCO, 8DI(4AI)/4DO, 200 BLOCKS	<b>6ED1052-2HB00-0BA6</b> LOGO! 24RCO, 8DI/4DO, 200 BLOCKS	<b>6ED1052-2FB00-0BA6</b> LOGO! 230RCO, 8DI/4DO, 200 BLOCKS
<b>Product type designation</b>				
<b>Installation type/mounting</b>				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
<b>Supply voltage</b>				
Rated value (DC)				
• 12 V DC		Yes		
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes
permissible range, lower limit (DC)	20.4 V	10.8 V	20.4 V	100 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	253 V
Rated value (AC)				
• 24 V AC			Yes	
• 115 V AC				Yes
• 230 V AC				Yes
<b>Time of day</b>				
<b>Time switching clocks</b>				
• Number	190	8	8	8
• Power reserve	80 h	80 h	80 h	80 h
<b>Digital inputs</b>				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8; Of which 4 can be used in analog mode (0 to 10 V)	8	8
<b>Digital outputs</b>				
Number of digital outputs	4; Transistor	4; Relays	4; Relays	4; Relays
short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
<b>Output current</b>				
• for signal "1" permissible range for 0 to 55 °C, max.	0.3 A			
<b>Relay outputs</b>				
<b>Switching capacity of contacts</b>				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		10 A	10 A	10 A



**Technical specifications (continued)**

Article number	6ED1052-2CC01-0BA6	6ED1052-2MD00-0BA6	6ED1052-2HB00-0BA6	6ED1052-2FB00-0BA6
	LOGO! 24CO, 8DI(4AI)/4DO, 200 BLOCKS	LOGO! 12/24RCO, 8DI(4AI)/4DO, 200 BLOCKS	LOGO! 24RCO, 8DI/4DO, 200 BLOCKS	LOGO! 230RCO, 8DI/4DO, 200 BLOCKS
<b>EMC</b>				
<b>Emission of radio interference acc. to EN 55 011</b>				
• Limit class B, for use in residential areas	Yes; Radio interference suppression according to EN 55011, Limit Value Class B	Yes	Yes	Yes
<b>Degree and class of protection</b>				
Degree of protection to EN 60529				
• IP20	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>				
CSA approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
Developed in acc. with IEC 61131 according to VDE 0631	Yes	Yes	Yes	Yes
<b>Marine approval</b>				
• Marine approval	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	0 °C	0 °C	0 °C	0 °C
• max.	55 °C	55 °C	55 °C	55 °C
<b>Dimensions</b>				
Width	72 mm	72 mm	72 mm	72 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	55 mm	55 mm	55 mm	55 mm

**Ordering data**

Article No.	Article No.
<b>LOGO! 8 logic module</b>	<b>LOGO! 6 logic module</b>
<b>LOGO! 24CEo logic module</b> 24 V DC supply voltage, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integral time switch Ethernet interface; without display and keyboard; 400 function blocks can be interlinked, modular expansion capability	<b>LOGO! 24Co logic module</b> 24 V DC supply voltage, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integrated time switch; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability
<b>LOGO! 12/24RCEo logic module</b> 12...24 V DC supply voltage, 8 digital inputs 12...24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 relay outputs 10 A, integral time switch; without display and keyboard; 400 function blocks can be interlinked, modular expansion capability	<b>LOGO! 12/24RCo logic module</b> 12/24 V DC supply voltage, 8 digital inputs 12/24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 relay outputs 10 A, integral time switch; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability
<b>LOGO! 24RCEo logic module</b> 24 V AC/DC supply voltage, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integral time switch; without display and keyboard; 400 function blocks can be interlinked, modular expansion capability	<b>LOGO! 24RCo logic module</b> 24 V AC/DC supply voltage, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integral time switch; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability
<b>LOGO! 230RCEo logic module</b> 115...230 V AC/DC supply voltage, 8 digital inputs 115...230 V AC/DC, 4 relay outputs 10 A, integral time switch; without display and keyboard; 400 function blocks can be interlinked, modular expansion capability	<b>LOGO! 230RCo logic module</b> 115/230 V AC/DC supply voltage, 8 digital inputs 115/230 V AC/DC, 4 relay outputs 10 A, integral time switch; without display and keyboard; 200 function blocks can be interlinked, modular expansion capability
<b>6ED1052-2CC01-0BA8</b>	<b>6ED1052-2CC01-0BA6</b>
<b>6ED1052-2MD00-0BA8</b>	<b>6ED1052-2MD00-0BA6</b>
<b>6ED1052-2HB00-0BA8</b>	<b>6ED1052-2HB00-0BA6</b>
<b>6ED1052-2FB00-0BA8</b>	<b>6ED1052-2FB00-0BA6</b>

**LOGO! logic module**

LOGO! modular

**LOGO! modular pure variants**

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<b>Ordering data</b>	<b>Article No.</b>	<b>Ordering data</b>	<b>Article No.</b>
<b>Accessories for LOGO! 8</b>		<b>Accessories for LOGO! 6</b>	
<b>LOGO! TDE text display</b> 6-line text display, can be connected to all LOGO! 8 Basic and Pure versions, with 2 Ethernet interfaces; including installation accessories. Requires additional 12 V DC or 24 V AC/DC power supply	<b>6ED1055-4MH00-0BA1</b>	<b>LOGO! TD text display</b> 4-line text display, can be connected to all LOGO! 0BA6 Basic and Pure versions, including connecting cable	<b>6ED1055-4MH00-0BA0</b>
<b>LOGO!Soft Comfort V8</b> For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	<b>6ED1058-0BA08-0YA1</b>	<b>SIPLUS LOGO! TD text display</b> (Extended temperature range -10 ... +60 °C and medial loading)	<b>6AG1055-4MH00-2BA0</b>
<b>LOGO!Soft Comfort V8 Upgrade</b> Upgrade from V1.0 to V8, on DVD	<b>6ED1058-0CA08-0YE1</b>	<b>LOGO! Memory Card</b> Program module for copying, with know-how protection	<b>6ED1056-1DA00-0BA0</b>
<b>LOGO! 8 Starter Kits</b> In TANOS Box, with LOGO! 8, LOGO! Soft Comfort V8, WinCC Basic V13, Ethernet cable,		<b>LOGO battery card</b> Battery module for backing up the integral real-time clock (not LOGO! 24)	<b>6ED1056-6XA00-0BA0</b>
<b>LOGO! 8 12/24 V Starter Kit</b> With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A	<b>6ED1057-3BA00-0AA8</b>	<b>LOGO! memory/battery card</b> Combined program and battery module, with know-how protection and buffer for the integral real-time clock (not LOGO! 24o)	<b>6ED1056-7DA00-0BA0</b>
<b>LOGO! 8 230V Starter Kit</b> With LOGO! 230RCE	<b>6ED1057-3BA02-0AA8</b>	<b>LOGO! PROM</b> Programming device used to simultaneously reproduce program module contents on up to 8 program modules	<b>6AG1057-1AA01-0BA6</b>
<b>LOGO! 8 TDE Starter Kit</b> With LOGO! 12/24RCEO, LOGO! Power 24 V, 1.3 A, LOGO! TDE	<b>6ED1057-3BA10-0AA8</b>	<b>LOGO!Soft Comfort V8</b> For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	<b>6ED1058-0BA08-0YA1</b>
<b>LOGO! 8 KP300 Basic Starter Kit</b> With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KP300 Basic mono PN	<b>6AV2132-0HA00-0AA1</b>	<b>LOGO!Soft Comfort V8 Upgrade</b> Upgrade from V1.0 to V8, on DVD	<b>6ED1058-0CA08-0YE1</b>
<b>LOGO! 8 KTP400 Basic Starter Kit</b> With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP400 Basic	<b>6AV2132-0KA00-0AA1</b>	<b>LOGO! PC cable</b> For program transfer between LOGO! and the PC	<b>6ED1057-1AA00-0BA0</b>
<b>LOGO! 8 KTP700 Basic Starter Kit</b> With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP700 Basic	<b>6AV2132-3GB00-0AA1</b>	<b>LOGO! USB PC cable</b> For transferring the program between LOGO! and PC, including driver on CD-ROM	<b>6ED1057-1AA01-0BA0</b>
		<b>LOGO! modem cable</b> Adapter cable for analog modem communication	<b>6ED1057-1CA00-0BA0</b>

**Overview**


- Basic variants optimized for costs
- Interface for the connection of expansion modules, up to 24 digital inputs, 16 digital outputs, 8 analog inputs and 2 analog outputs can be addressed
- With connection option for LOGO! text display TD (can be connected to all LOGO! 0BA6 basic versions)

**Note:**

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	6AG1052-2CC01-2BA6	6AG1052-2MD00-2BA6	6AG1052-2HB00-2BA6	6AG1052-2FB00-2BA6
Based on	6ED1052-2CC01-0BA6 SIPLUS LOGO! 24CO	6ED1052-2MD00-0BA6 SIPLUS LOGO! 12/24RCO	6ED1052-2HB00-0BA6 SIPLUS LOGO! 24RCO	6ED1052-2FB00-0BA6 SIPLUS LOGO! 230RCO
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• max.	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>				
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**LOGO! logic module**

LOGO! modular

**SIPLUS LOGO! modular pure variants****Ordering data****Article No.****Article No.****SIPLUS LOGO! 24o**

24 V DC supply voltage,  
8 digital inputs 24 V DC,  
of which 4 can be used in analog  
mode (0 to 10 V),  
4 digital outputs 24 V DC, 0.3 A,  
integrated time switch;  
without display and keyboard;  
200 function blocks can be  
interlinked,  
modular expansion capability

Extended temperature range and  
exposure to media

**6AG1052-2CC01-2BA6****SIPLUS LOGO! 230RCo**

115/230 V AC/DC supply voltage,  
8 digital inputs 115/230 V AC/DC,  
4 relay outputs 10 A,  
integral time switch;  
without display and keyboard;  
200 function blocks can be  
interlinked,  
modular expansion capability

Extended temperature range and  
exposure to media

**6AG1052-2FB00-2BA6****SIPLUS LOGO! 24RCo**

24 V AC/DC supply voltage,  
8 digital inputs 24 V AC/DC,  
4 relay outputs 10 A,  
integral time switch;  
without display and keyboard;  
200 function blocks can be  
interlinked,  
modular expansion capability

Extended temperature range and  
exposure to media

**6AG1052-2HB00-2BA6****SIPLUS LOGO! 12/24RCo**

12/24 V DC supply voltage,  
8 digital inputs 12/24 V DC, of  
which 4 can be used in analog  
mode (0 to 10 V),  
4 relay outputs 10 A,  
integral time switch;  
without display and keyboard;  
200 function blocks can be  
interlinked,  
modular expansion capability

Extended temperature range and  
exposure to media

**6AG1052-2MD00-2BA6****Accessories****SIPLUS Upmiter upstream device**

for reliable operation at the battery  
of combustion engines

**6AG1053-1AA00-2AA0****Further accessories**

See LOGO! modular pure  
variants, page 2/14

2

**Overview**


- Expansion modules for connection to LOGO! modular
- With digital inputs and outputs, analog inputs, or analog outputs

2

**Technical specifications**

Article number	<b>6ED1055-1CB00-0BA2</b> LOGO! DM8 24 EXP. MOD., 4DI/4DO	<b>6ED1055-1HB00-0BA2</b> LOGO! DM8 24R EXP. MOD. 2DU, 4DI/4DO	<b>6ED1055-1MB00-0BA2</b> LOGO! DM8 12/24R EXP. MOD. 2DU, 4DI/DO	<b>6ED1055-1FB00-0BA2</b> LOGO! DM8 230R EXP. MOD. 2DU, 4DI/4DO
<b>Product type designation</b>				
<b>Installation type/mounting</b>				
Mounting	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide
<b>Supply voltage</b>				
Rated value (DC)				
• 12 V DC			Yes	
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes
permissible range, lower limit (DC)	20.4 V	20.4 V	10.8 V	100 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	253 V
Rated value (AC)				
• 24 V AC		Yes		
• 115 V AC				Yes
• 230 V AC				Yes
<b>Line frequency</b>				
• permissible frequency range, upper limit		63 Hz		63 Hz
<b>Digital inputs</b>				
Number of digital inputs	4	4	4	4
<b>Input voltage</b>				
• Type of input voltage	DC	AC/DC	DC	AC/DC
• for signal "0"	< 5V DC	< 5 V AC/DC	< 5V DC	< 40 V AC; < 30 V DC
• for signal "1"	> 12V DC	> 12 V AC/DC	> 8.5 V	> 79 V AC, > 79 V DC
<b>Input current</b>				
• for signal "0", max. (permissible quiescent current)	0.88 mA	1.1 mA	0.88 mA	0.06 mA; 0.05 mA with AC, 0.06 mA with DC
• for signal "1", typ.	4 mA	5.5 mA	4.2 mA	0.37 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>				
- at "0" to "1", max.	1.5 ms	1.5 ms	1.5 ms	40 ms
- at "1" to "0", max.	1.5 ms	15 ms	1.5 ms	75 ms



**LOGO! logic module**

LOGO! modular

**LOGO! modular expansion modules****Technical specifications (continued)**

Article number	<b>6ED1055-1CB00-0BA2</b> LOGO! DM8 24 EXP. MOD., 4DI/4DO	<b>6ED1055-1HB00-0BA2</b> LOGO! DM8 24R EXP. MOD. 2DU, 4DI/4DO	<b>6ED1055-1MB00-0BA2</b> LOGO! DM8 12/24R EXP. MOD. 2DU, 4DI/DO	<b>6ED1055-1FB00-0BA2</b> LOGO! DM8 230R EXP. MOD. 2DU, 4DI/4DO
<b>Digital outputs</b>				
Number of digital outputs	4	4; Relays	4; Relays	4; Relays
short-circuit protection	Yes	No	No	No
Controlling a digital input		Yes	Yes	Yes
<b>Switching capacity of the outputs</b>				
• on lamp load, max.		1 000 W	1 000 W	1 000 W
<b>Parallel switching of 2 outputs</b>				
• for increased power	No	No	No	No
<b>Switching frequency</b>				
• with resistive load, max.	10 Hz	2 Hz	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• mechanical, max.		10 Hz	10 Hz	10 Hz
<b>Relay outputs</b>				
<b>Switching capacity of contacts</b>				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		5 A	5 A	5 A
- Thermal continuous current, max.	0.3 A			
<b>EMC</b>				
<b>Emission of radio interference acc. to EN 55 011</b>				
• Limit class B, for use in residential areas	Yes	Yes	Yes	Yes
<b>Degree and class of protection</b>				
Degree of protection to EN 60529				
• IP20	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>				
CSA approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
Developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes		Yes
<b>Marine approval</b>				
• Marine approval	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	0 °C	0 °C	0 °C	0 °C
• max.	55 °C	55 °C	55 °C	55 °C
<b>Dimensions</b>				
Width	35.5 mm	35.5 mm	35.5 mm	35.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm	58 mm

**Technical specifications (continued)**

Article number	<b>6ED1055-1CB10-0BA2</b> LOGO! DM16 24 EXP. MOD., 4DU, 8DI/8DO	<b>6ED1055-1NB10-0BA2</b> LOGO! DM16 24R EXP. MOD. 4DU, 8DI/8DO	<b>6ED1055-1FB10-0BA2</b> LOGO! DM16 230R EXP. MOD. 4DU, 8DI/8DO
<b>Product type designation</b>			
<b>Installation type/mounting</b>			
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	Yes	Yes	
• 115 V DC			Yes
• 230 V DC			Yes
permissible range, lower limit (DC)	20.4 V	20.4 V	100 V
permissible range, upper limit (DC)	28.8 V	28.8 V	253 V
Rated value (AC)			
• 115 V AC			Yes
• 230 V AC			Yes
<b>Line frequency</b>			
• permissible frequency range, upper limit			63 Hz
<b>Digital inputs</b>			
Number of digital inputs	8	8	8
<b>Input voltage</b>			
• Type of input voltage	DC	DC	AC/DC
• for signal "0"	< 5V DC	< 5V DC	< 40 V AC; < 30 V DC
• for signal "1"	> 12V DC	> 12V DC	> 79 V AC; > 79 V DC
<b>Input current</b>			
• for signal "0", max. (permissible quiescent current)	0.85 mA	0.85 mA	0.06 mA; 0.05 mA with AC, 0.06 mA with DC
• for signal "1", typ.	3.5 mA	3.5 mA	0.37 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>			
- at "0" to "1", max.	1.5 ms	1.5 ms	40 ms
- at "1" to "0", max.	1.5 ms	1.5 ms	75 ms
<b>Digital outputs</b>			
Number of digital outputs	8	8; Relays	8
short-circuit protection	Yes	No	No
Controlling a digital input	Yes	Yes	Yes
<b>Switching capacity of the outputs</b>			
• on lamp load, max.		1 000 W	1 000 W
<b>Parallel switching of 2 outputs</b>			
• for increased power	No	No	No
<b>Switching frequency</b>			
• with resistive load, max.	10 Hz	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• mechanical, max.		10 Hz	10 Hz
<b>Relay outputs</b>			
<b>Switching capacity of contacts</b>			
- with inductive load, max.		3 A	3 A
- with resistive load, max.		5 A	5 A
<b>EMC</b>			
<b>Emission of radio interference acc. to EN 55 011</b>			
• Limit class B, for use in residential areas	Yes	Yes	Yes
<b>Degree and class of protection</b>			
Degree of protection to EN 60529			
• IP20	Yes	Yes	Yes

**LOGO! logic module**

LOGO! modular

**LOGO! modular expansion modules****Technical specifications (continued)**

Article number	<b>6ED1055-1CB10-0BA2</b> LOGO! DM16 24 EXP. MOD., 4DU, 8DI/8DO	<b>6ED1055-1NB10-0BA2</b> LOGO! DM16 24R EXP. MOD. 4DU, 8DI/8DO	<b>6ED1055-1FB10-0BA2</b> LOGO! DM16 230R EXP. MOD. 4DU, 8DI/8DO
<b>Standards, approvals, certificates</b>			
CSA approval	Yes	Yes	Yes
UL approval	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
Developed in accordance with IEC 61131	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes
<b>Marine approval</b>			
• Marine approval	Yes	Yes	Yes
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	0 °C	0 °C	0 °C
• max.	55 °C	55 °C	55 °C
<b>Dimensions</b>			
Width	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm
Article number	<b>6ED1055-1MA00-0BA2</b> LOGO! AM2 EXP. MOD., 12/24V, 2AI	<b>6ED1055-1MD00-0BA2</b> LOGO! AM2 RDT, 2AI, -50..+200DECR/C	
<b>Product type designation</b>			
<b>Installation type/mounting</b>			
Mounting	on 35 mm DIN rail, 2 spacing units wide		on 35 mm DIN rail, 2 spacing units wide
<b>Supply voltage</b>			
Rated value (DC)			
• 12 V DC	Yes; 10.8V DC to 28.8V DC		Yes; 10.8V DC to 28.8V DC
• 24 V DC	Yes; 10.8V DC to 28.8V DC		Yes; 10.8V DC to 28.8V DC
<b>Analog inputs</b>			
Number of analog inputs	2		2; 2 or 3 wire connection
<b>Input ranges</b>			
• Voltage	Yes		No
• Current	Yes		No
• Resistance thermometer	No		Yes; For PT100/PT1000 sensors
<b>Input ranges (rated values), voltages</b>			
• 0 to +10 V	Yes		No
<b>Input ranges (rated values), currents</b>			
• 0 to 20 mA	Yes		No
<b>Input ranges (rated values), resistance thermometer</b>			
• Pt 100	No		Yes
<b>EMC</b>			
<b>Emission of radio interference acc. to EN 55 011</b>			
• Limit class B, for use in residential areas	Yes		Yes
<b>Degree and class of protection</b>			
Degree of protection to EN 60529			
• IP20	Yes		Yes

**Technical specifications (continued)**

Article number	<b>6ED1055-1MA00-0BA2</b> LOGO! AM2 EXP. MOD., 12/24V, 2AI	<b>6ED1055-1MD00-0BA2</b> LOGO! AM2 RDT, 2AI, -50..+200DECR/C
<b>Standards, approvals, certificates</b>		
CSA approval	Yes	Yes
UL approval	Yes	Yes
FM approval	Yes	Yes
Developed in accordance with IEC 61131	Yes	Yes
according to VDE 0631	Yes	
<b>Marine approval</b>		
• Marine approval	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	0 °C	0 °C
• max.	55 °C	55 °C
<b>Dimensions</b>		
Width	35.5 mm	35.5 mm
Height	90 mm	90 mm
Depth	58 mm	58 mm

Article number	<b>6ED1055-1MM00-0BA2</b> LOGO! AM2 AQ, 2AQ, 0-10V, 0/4-20MA
<b>Product type designation</b>	
<b>Installation type/mounting</b>	
Mounting	on 35 mm DIN rail, 2 spacing units wide
<b>Supply voltage</b>	
Rated value (DC)	
• 12 V DC	No
• 24 V DC	Yes
<b>Analog outputs</b>	
Number of analog outputs	2
<b>Output ranges, voltage</b>	
• 0 to 10 V	Yes
<b>EMC</b>	
<b>Emission of radio interference acc. to EN 55 011</b>	
• Limit class B, for use in residential areas	Yes
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP20	Yes

Article number	<b>6ED1055-1MM00-0BA2</b> LOGO! AM2 AQ, 2AQ, 0-10V, 0/4-20MA
<b>Standards, approvals, certificates</b>	
CSA approval	Yes
UL approval	Yes
FM approval	Yes
Developed in accordance with IEC 61131	Yes
according to VDE 0631	Yes
<b>Marine approval</b>	
• Marine approval	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	0 °C
• max.	55 °C
<b>Dimensions</b>	
Width	35.5 mm
Height	90 mm
Depth	58 mm

**LOGO! logic module**

LOGO! modular

**LOGO! modular expansion modules****Technical specifications (continued)**

Article number	<b>6ED1055-1CB00-0BA0</b> LOGO! DM8 24 EXP. MOD., 4DI/4DO	<b>6ED1055-1HB00-0BA0</b> LOGO! DM8 24R EXP. MOD. 2DU, 4DI/4DO	<b>6ED1055-1MB00-0BA1</b> LOGO! DM8 12/24R EXP. MOD. 2DU, 4DI/DO	<b>6ED1055-1FB00-0BA1</b> LOGO! DM8 230R EXP. MOD. 2DU, 4DI/4DO
<b>Product type designation</b>				
<b>Installation type/mounting</b>				
Mounting	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide
<b>Supply voltage</b>				
Rated value (DC)				
• 12 V DC			Yes	
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes
permissible range, lower limit (DC)	20.4 V	20.4 V	10.8 V	100 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	253 V
Rated value (AC)				
• 24 V AC		Yes		
• 115 V AC				Yes
• 230 V AC				Yes
<b>Digital inputs</b>				
Number of digital inputs	4	4	4	4
<b>Input voltage</b>				
• Type of input voltage	DC	AC/DC	DC	AC/DC
<b>Digital outputs</b>				
Number of digital outputs	4	4; Relays	4; Relays	4; Relays
short-circuit protection	Yes	No	No	No
<b>Relay outputs</b>				
<b>Switching capacity of contacts</b>				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		5 A	5 A	5 A
- Thermal continuous current, max.	0.3 A			
<b>EMC</b>				
<b>Emission of radio interference acc. to EN 55 011</b>				
• Limit class B, for use in residential areas	Yes	Yes	Yes	Yes
<b>Degree and class of protection</b>				
Degree of protection to EN 60529				
• IP20	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>				
CSA approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
Developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes	Yes
<b>Marine approval</b>				
• Marine approval	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	0 °C	0 °C	0 °C	0 °C
• max.	55 °C	55 °C	55 °C	55 °C
<b>Dimensions</b>				
Width	36 mm; 2 DU	36 mm; 2 DU	36 mm; 2 DU	36 mm; 2 DU
Height	90 mm	90 mm	90 mm	90 mm
Depth	55 mm	55 mm	55 mm	55 mm



**Technical specifications (continued)**

Article number	<b>6ED1055-1CB10-0BA0</b> LOGO! DM16 24, EXP. MOD., 4DU, 8DI/DO	<b>6ED1055-1NB10-0BA0</b> LOGO! DM16 24R, EXP. MOD., 4DU, 8DI/DO	<b>6ED1055-1FB10-0BA0</b> LOGO! DM16 230R, EXP. MOD., 4DU, 8DI/DO
<b>Product type designation</b>			
<b>Installation type/mounting</b>			
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on DIN rail 25 mm, 4 module spaces wide
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	Yes	Yes	
• 115 V DC			Yes
• 230 V DC			Yes
permissible range, lower limit (DC)	20.4 V	20.4 V	100 V
permissible range, upper limit (DC)	28.8 V	28.8 V	253 V
Rated value (AC)			
• 115 V AC			Yes
• 230 V AC			Yes
<b>Line frequency</b>			
• permissible frequency range, upper limit			63 Hz
<b>Digital inputs</b>			
Number of digital inputs	8	8	8
<b>Input voltage</b>			
• Type of input voltage	DC	DC	AC/DC
• for signal "0"	< 5V DC	< 5V DC	< 40 V AC; < 30 V DC
• for signal "1"	> 12V DC	> 12V DC	> 79 V AC; > 79 V DC
<b>Input current</b>			
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA	0.03 mA
• for signal "1", typ.	2 mA	2 mA	0.08 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>			
- at "0" to "1", max.	1.5 ms	1.5 ms	50 ms
- at "1" to "0", max.	1.5 ms	1.5 ms	50 ms
<b>Digital outputs</b>			
Number of digital outputs	8	8; Relays	8; Relays
short-circuit protection	Yes	No	No
Controlling a digital input	Yes	Yes	Yes
<b>Switching capacity of the outputs</b>			
• on lamp load, max.		1 000 W	1 000 W
<b>Parallel switching of 2 outputs</b>			
• for increased power	No	No	No
<b>Switching frequency</b>			
• with resistive load, max.	10 Hz	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• mechanical, max.		10 Hz	10 Hz
<b>Relay outputs</b>			
<b>Switching capacity of contacts</b>			
- with inductive load, max.		3 A	3 A
- with resistive load, max.		5 A	5 A
- Thermal continuous current, max.	0.3 A		
<b>EMC</b>			
<b>Emission of radio interference acc. to EN 55 011</b>			
• Limit class B, for use in residential areas	Yes	Yes	Yes
<b>Degree and class of protection</b>			
Degree of protection to EN 60529			
• IP20	Yes	Yes	Yes

**LOGO! logic module**

LOGO! modular

**LOGO! modular expansion modules****Technical specifications (continued)**

Article number	<b>6ED1055-1CB10-0BA0</b> LOGO! DM16 24, EXP. MOD., 4DU, 8DI/DO	<b>6ED1055-1NB10-0BA0</b> LOGO! DM16 24R, EXP. MOD., 4DU, 8DI/DO	<b>6ED1055-1FB10-0BA0</b> LOGO! DM16 230R, EXP. MOD., 4DU, 8DI/DO
<b>Standards, approvals, certificates</b>			
CSA approval	Yes	Yes	Yes
UL approval	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
Developed in accordance with IEC 61131	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes
<b>Marine approval</b>			
• Marine approval	Yes	Yes	Yes
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	0 °C	0 °C	0 °C
• max.	55 °C	55 °C	55 °C
<b>Dimensions</b>			
Width	72 mm; 4 WU	72 mm; 4 WU	72 mm; 4 WU
Height	90 mm	90 mm	90 mm
Depth	53 mm	53 mm	53 mm
Article number	<b>6ED1055-1MA00-0BA0</b> LOGO! AM2 EXP. MOD., 12/24V, 2AI, 0-10V	<b>6ED1055-1MD00-0BA1</b> LOGO! AM2 RDT, 2AI, -50..+200DECR/C	
<b>Product type designation</b>			
<b>Installation type/mounting</b>			
Mounting	on 35 mm DIN rail, 2 spacing units wide		
<b>Supply voltage</b>			
Rated value (DC)			
• 12 V DC	Yes	Yes; 10.8V DC to 28.8V DC	
• 24 V DC	Yes	Yes; 10.8V DC to 28.8V DC	
<b>Analog inputs</b>			
Number of analog inputs	2	2; 2 or 3 wire connection	
<b>Input ranges</b>			
• Voltage	Yes	No	
• Current	Yes	No	
• Resistance thermometer	No	Yes; For PT100/PT1000 sensors	
<b>Input ranges (rated values), voltages</b>			
• 0 to +10 V	Yes		
<b>Input ranges (rated values), currents</b>			
• 0 to 20 mA	Yes		
<b>EMC</b>			
<b>Emission of radio interference acc. to EN 55 011</b>			
• Limit class B, for use in residential areas	Yes	Yes; Radio interference suppression according to EN55011, Limit Value Class B	
<b>Degree and class of protection</b>			
Degree of protection to EN 60529			
• IP20	Yes	Yes	

**Technical specifications (continued)**

Article number	<b>6ED1055-1MA00-0BA0</b> LOGO! AM2 EXP. MOD., 12/24V, 2AI, 0-10V	<b>6ED1055-1MD00-0BA1</b> LOGO! AM2 RDT, 2AI, -50..+200DECR/C
<b>Standards, approvals, certificates</b>		
CSA approval	Yes	Yes; C22.2 Number 142
UL approval	Yes	Yes; UL 508
FM approval	Yes	Yes; FM-Standards No. 3611, 3600, 3810 Class I, Division 2, Group A, B, C, D
Developed in accordance with IEC 61131	Yes	Yes; EN 61131-2 (IEC 1131-2)
according to VDE 0631	Yes	
<b>Marine approval</b>		
• Marine approval	Yes	Yes; ABS, BV, DNV, GL, LRS, Class NK
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	0 °C	0 °C
• max.	55 °C	55 °C
<b>Dimensions</b>		
Width	36 mm	36 mm
Height	90 mm	90 mm
Depth	55 mm	53 mm
Article number	<b>6ED1055-1MM00-0BA1</b> LOGO! AM2 AQ, 2AQ, 0-10V, 0/4-20MA	Article number <b>6ED1055-1MM00-0BA1</b> LOGO! AM2 AQ, 2AQ, 0-10V, 0/4-20MA
<b>Product type designation</b>		
<b>Installation type/mounting</b>		
Mounting	on 35 mm DIN rail, 2 spacing units wide	
<b>Supply voltage</b>		
Rated value (DC)		
• 12 V DC	No	
• 24 V DC	Yes	
<b>Analog outputs</b>		
Number of analog outputs	2	
<b>Output ranges, voltage</b>		
• 0 to 10 V	Yes	
<b>EMC</b>		
<b>Emission of radio interference acc. to EN 55 011</b>		
• Limit class B, for use in residential areas	Yes; Radio interference suppression according to EN 55011, Limit Value Class B	
<b>Degree and class of protection</b>		
Degree of protection to EN 60529		
• IP20	Yes	
<b>Standards, approvals, certificates</b>		
CSA approval	Yes	
UL approval	Yes	
FM approval	Yes	
Developed in accordance with IEC 61131	Yes	
according to VDE 0631	Yes	
<b>Marine approval</b>		
• Marine approval	Yes	
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	0 °C	
• max.	55 °C	
<b>Dimensions</b>		
Width	36 mm	
Height	90 mm	
Depth	55 mm	

**LOGO! logic module**

LOGO! modular

**LOGO! modular expansion modules**

2

Ordering data	Article No.	Article No.
<b>LOGO! 8 expansion modules</b>		
<b>LOGO! DM8 24</b> 24 V DC supply voltage, 4 digital inputs 24 V DC, 4 digital outputs 24 V DC, 0.3 A	6ED1055-1CB00-0BA2	<b>LOGO! DM8 24R</b> 24 V AC/DC supply voltage, 4 digital inputs 24 V AC/DC, 4 relay outputs 5 A
<b>LOGO! DM16 24</b> 24 V DC supply voltage, 8 digital inputs 24 V DC, 8 digital outputs 24 V DC, 0.3 A	6ED1055-1CB10-0BA2	<b>LOGO! DM16 24R</b> 24 V DC supply voltage, 8 digital inputs 24 V DC, 8 relay outputs 5 A
<b>LOGO! DM8 12/24R</b> 12...24 V DC supply voltage, 4 digital inputs 12...24 V DC, 4 relay outputs 5 A	6ED1055-1MB00-0BA2	<b>LOGO! DM8 230R</b> 115/230 V AC/DC supply voltage, 4 digital inputs 115/230 V AC/DC, 4 relay outputs 5 A
<b>LOGO! DM8 24R</b> 24 V AC/DC supply voltage, 4 digital inputs 24 V AC/DC, 4 relay outputs 5 A	6ED1055-1HB00-0BA2	<b>LOGO! DM16 230R</b> 115/230 V AC/DC supply voltage, 8 digital inputs 115/230 V AC/DC, 8 relay outputs 5 A
<b>LOGO! DM16 24R</b> 24 V DC supply voltage, 8 digital inputs 24 V DC, 8 relay outputs 5 A	6ED1055-1NB10-0BA2	<b>LOGO! AM2</b> 12/24 V DC supply voltage, 2 analog inputs 0 to 10 V or 0 to 20 mA, 10-bit resolution
<b>LOGO! DM8 230R</b> 115...230 V AC/DC supply voltage, 4 digital inputs 115...230 V AC/DC, 4 relay outputs 5 A	6ED1055-1FB00-0BA2	<b>LOGO! AM2 PT 100</b> 12/24 V DC supply voltage, 2 analog inputs Pt100, temperature range -50 °C ... 200 °C
<b>LOGO! DM16 230R</b> 115...230 V AC/DC supply voltage, 8 digital inputs 115...230 V AC/DC, 8 relay outputs 5 A	6ED1055-1FB10-0BA2	<b>LOGO! AM2 AQ</b> 24 V DC supply voltage, 2 analog outputs 0 to 10 V, 0/4 to 20 mA
<b>LOGO! AM2</b> 12...24 V DC supply voltage, 2 analog inputs 0 to 10 V or 0 to 20 mA, resolution 10 bits	6ED1055-1MA00-0BA2	<b>Accessories for LOGO! 8</b>
<b>LOGO! AM2 PT 100</b> 12...24 V DC supply voltage, 2 analog inputs Pt100, temperature range -50 °C to 200 °C	6ED1055-1MD00-0BA2	<b>LOGO!Soft Comfort V8</b> For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD
<b>LOGO! AM2 AQ</b> 24 V DC supply voltage, 2 analog outputs 0 to 10 V, 0/4 to 20 mA	6ED1055-1MM00-0BA2	<b>LOGO!Soft Comfort V8 Upgrade</b> Upgrade from V1.0 to V8, on DVD
<b>LOGO! 6 expansion modules</b>		<b>Accessories for LOGO! 6</b>
<b>LOGO! DM8 24</b> 24 V DC supply voltage, 4 digital inputs 24 V DC, 4 digital outputs 24 V DC, 0.3 A	6ED1055-1CB00-0BA0	<b>LOGO! Memory Card</b> For copying, with know-how protection
<b>LOGO! DM16 24</b> 24 V DC supply voltage, 8 digital inputs 24 V DC, 8 digital outputs 24 V DC, 0.3 A	6ED1055-1CB10-0BA0	<b>LOGO!Soft Comfort V8</b> For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD
<b>LOGO! DM8 12/24R</b> 12/24 V DC supply voltage, 4 digital inputs 12/24 V DC, 4 relay outputs 5 A	6ED1055-1MB00-0BA1	<b>LOGO!Soft Comfort V8 Upgrade</b> Upgrade from V1.0 to V8, on DVD
		<b>LOGO! PC cable</b> For program transfer between LOGO! and the PC

**Overview**


- Expansion modules for connection to LOGO! modular
- With digital inputs and outputs, analog inputs, or analog outputs

**Note:**

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	<b>6AG1055-1CB00-2BY0</b>	<b>6AG1055-1PB00-2BY0</b>	<b>6AG1055-1HB00-2BY0</b>	<b>6AG1055-1MB00-2BY1</b>
Based on	<b>6ED1055-1CB00-0BA0</b> SIPLUS LOGO! DM8 24	<b>6ED1055-1PB00-0BA0</b> SIPLUS LOGO! DM8 12/24	<b>6ED1055-1HB00-0BA0</b> SIPLUS LOGO! DM8 24R (-2BY0)	<b>6ED1055-1MB00-0BA1</b> SIPLUS LOGO! DM8 12/24R
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• max.	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!



**LOGO! logic module**

LOGO! modular

**SIPLUS LOGO! modular expansion modules****Technical specifications** (continued)

Article number	<b>6AG1055-1FB00-2XB1</b>	<b>6AG1055-1FB00-2BY1</b>	<b>6AG1055-1NB10-2BA0</b>
Based on	<b>6ED1055-1FB00-0BA1</b> SIPLUS LOGO! DM8 230R	<b>6ED1055-1FB00-0BA1</b> SIPLUS LOGO! DM8 230R	<b>6ED1055-1NB10-0BA0</b> SIPLUS LOGO! DM16 24R EXPANSION MODULE
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-25 °C; = Tmin	-40 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use	70 °C; = Tmax; 55 °C @ UL/cUL use
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>			
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Technical specifications (continued)**

Article number	<b>6AG1055-1MA00-2BY0</b>
Based on	<b>6ED1055-1MA00-0BA0</b> SIPLUS LOGO! AM2
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-40 °C; = Tmin
• max.	70 °C; = Tmax; 55 °C @ UL/cUL use
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Article number	<b>6AG1055-1MM00-2BY1</b>
Based on	<b>6ED1055-1MM00-0BA1</b> SIPLUS LOGO!_AM2_AQ
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-40 °C; = Tmin
• max.	70 °C; = Tmax; 55 °C @ UL/cUL use
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data**
**Article No.**
**Article No.**
**SIPLUS LOGO! DM8 24**

24 V DC supply voltage,  
4 digital inputs 24 V DC,  
4 digital outputs 24 V DC, 0.3 A

Extended temperature range and exposure to media

**6AG1055-1CB00-2BY0**
**SIPLUS LOGO! DM8 230R**

115/230 V AC/DC supply voltage,  
4 digital inputs 115/230 V AC/DC,  
4 relay outputs 5 A

Extended temperature range and exposure to media

**6AG1055-1FB00-2BY1**
**SIPLUS LOGO! DM8 24R**

24 V AC/DC supply voltage,  
4 digital inputs 24 V AC/DC,  
4 relay outputs 5 A

Extended temperature range and exposure to media

**6AG1055-1HB00-2BY0**
**SIPLUS LOGO! AM2**

12/24 V DC supply voltage,  
2 analog inputs 0 ... 10 V or  
0 ... 20 mA, 10-bit resolution

Extended temperature range and exposure to media

**6AG1055-1MA00-2BY0**
**SIPLUS LOGO! DM8 12/24R**

12/24 V DC supply voltage,  
4 digital inputs 12/24 V DC,  
4 relay outputs 5 A

Extended temperature range and exposure to media

**6AG1055-1MB00-2BY1**
**SIPLUS LOGO! AM2 AQ**

24 V DC supply voltage,  
2 analog inputs 0 ... 10 V,  
0/4 ... 20 mA, 10-bit resolution

Extended temperature range and exposure to media

**6AG1055-1MM00-2BY1**
**SIPLUS LOGO! DM16 24R**

24 V DC supply voltage,  
8 digital outputs 24 V DC,  
8 relay outputs 5 A

Extended temperature range and exposure to media

**6AG1055-1NB10-2BA0**
**SIPLUS LOGO! DM8 12/24**

12/24 V DC supply voltage,  
4 digital inputs 12/24 V DC,  
4 digital outputs 24 V DC, 0.3 A

Extended temperature range and exposure to media

**6AG1055-1PB00-2BY0**
**Accessories**

**SIPLUS Upmiter upstream device**  
for reliable operation at the battery  
of combustion engines

**6AG1053-1AA00-2AA0**
**Further accessories**

See LOGO! modular pure variants, page 2/26

## LOGO! logic module

### LOGO! modular communication modules

#### LOGO! modular communication modules

##### Overview

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- Communication modules for connecting LOGO! modular to different bus systems.

##### Note on compatibility:

Communication module	Can be used with:
LOGO! CM EIB/KNX communication module	LOGO! to ...0BA7
LOGO! CSM 12/24	LOGO! ...0BA7/...0BA8
LOGO! CSM 230	LOGO! ...0BA7
LOGO! CMR2020	LOGO! ...0BA8
LOGO! CMR2040	LOGO! ...0BA8
AS-Interface connection for LOGO!	LOGO! to ...0BA7

#### LOGO! CM EIB/KNX communication modules

##### Overview



- Expansion module for LOGO! basic versions
- For communication between the LOGO! master and external EIB components through EIB

##### Technical specifications

CM EIB/KNX	
Supply voltage	24 V AC/DC
Inputs, max.	16 DI/12 DO/8 AI/2 AO
Outputs, max.	16 digital
Continuous current	25 mA
Short-circuit protection	External fuse protection is required
Integrated time switches/power reserve	-
Ambient temperature	0 ... +55°C
RI specification	To EN 55 011 (limit class B)
Degree of protection	IP20
Certification	to VDE 0631, IEC61131-2, cULus, FM
Mounting	On DIN rail 35 mm, 2 module widths wide
Dimensions (W x H x D) in mm	36 (2 MW) x 90 x 55

##### Ordering data

###### LOGO! CM EIB KNX communication module

For connection to EIB,  
24 V DC supply voltage;  
for LOGO! to ...0BA7

##### Article No.

**6BK1700-0BA00-0AA2**

### Overview



The module is used to connect a LOGO! and up to three other nodes to an Industrial Ethernet network with 10/100 Mbit/s in an electrical linear, tree or star topology.

The essential features of the LOGO! CSM are:

- Unmanaged 4-port switch, of which one port is on the front for easy diagnostics access
- Two versions for the voltage ranges 12/24 V DC or 230 V AC/DC
- Problem-free connection using four RJ45 standard connectors
- Space-saving, optimized for connection to LOGO!
- Low-cost solution for implementing small, local Ethernet networks
- Stand-alone use for networking any Ethernet devices

### Technical specifications

Article number	6GK7177-1FA10-0AA0	6GK7177-1MA20-0AA0
Product type designation	LOGO! CSM 230	LOGO! CSM 12/24
<b>Transmission rate</b>		
Transfer rate	10 Mbit/s, 100 Mbit/s	10 Mbit/s, 100 Mbit/s
<b>Interfaces</b>		
Number of electrical/optical connections		
• for network components or terminal equipment maximum	4	4
Number of electrical connections		
• for network components or terminal equipment	4	4
Type of electrical connection		
• for network components or terminal equipment	RJ45 port / 1 connection on front of module	RJ45 port / 1 connection on front of module
• for power supply	3-pole terminal block	3-pole terminal block
<b>Supply voltage, current consumption, power loss</b>		
Type of voltage of the supply voltage	AC/DC 115...240 V	DC 12/24 V
Supply voltage		
• external	230 V	24 V
• external	100 ... 240 V	10.2 ... 30.2 V
Product component fusing at power supply input	Yes	Yes
Consumed current maximum	0.02 A	0.15 A
Active power loss		
• for DC at 24 V		1.5 W
• with AC at 230 V	1.8 W	
<b>Permitted ambient conditions</b>		
Ambient temperature		
• during operation	0 ... 55 °C	0 ... 55 °C
• during storage	-40 ... +70 °C	-40 ... +70 °C
• during transport	-40 ... +70 °C	-40 ... +70 °C
Relative humidity		
• at 25 °C without condensation during operation maximum	90 %	90 %
Protection class IP	IP20	IP20

**LOGO! logic module**

## LOGO! modular communication modules

**LOGO! CSM unmanaged****Technical specifications (continued)**

Article number	<b>6GK7177-1FA10-0AA0</b>	<b>6GK7177-1MA20-0AA0</b>
Product type designation	LOGO! CSM 230	LOGO! CSM 12/24
<b>Design, dimensions and weight</b>		
Design	LOGO! module	LOGO! module
Width	72 mm	71.5 mm
Height	90 mm	90 mm
Depth	55 mm	58.2 mm
Net weight	0.155 kg	0.15 kg
Mounting type		
• 35 mm DIN rail mounting	Yes	Yes
• wall mounting	Yes	Yes
• S7-300 rail mounting	No	No
• S7-1500 rail mounting	No	No
<b>Product functions management, configuration</b>		
Product function		
• multiport mirroring	No	No
• switch-managed	No	No
<b>Standards, specifications, approvals</b>		
Standard		
• for FM	FM3600 and 3611: CL I, Div2, Group A,B,C,D T4, CL I, Zone 2, Group IIC, T4, Ta=0 +55°C	
• for hazardous zone	no	ATEX: EN 60079-0 : 2009, EN 60079-15 :2010 (Directive 94/9/EC), IECEx: IEC 60079-0 :2011, IEC 60079-15 :2010
• for safety from CSA and UL	UL60079-0, UL60079-15, CSA C22.2	UL 508, CSA C22.2 No. 142
• for hazardous zone from CSA and UL		Haz-Loc ANSI/ISA 12.12.01: CL I, Div2, Group A,B,C,D T4, CL I, Zone 2, Group IIC, T4, Ta=0 +55°C
Certificate of suitability		
• CE marking	Yes	Yes
• RCM	Yes	Yes
• KC approval	No	No
Marine classification association		
• American Bureau of Shipping Europe Ltd. (ABS)	No	No
• Bureau Veritas (BV)	No	No
• Det Norske Veritas (DNV)	No	No
• Germanische Lloyd (GL)	No	No
• Lloyds Register of Shipping (LRS)	No	No
• Nippon Kaiji Kyokai (NK)	No	No
• Polski Rejestr Statkow (PRS)	No	No

**Ordering data****Article No.****Article No.****LOGO! CSM compact switch modules**

Unmanaged switch for connection of one LOGO! and up to three further nodes on Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; LED diagnostics, LOGO! module

- **LOGO! CSM 12/24**  
external 12 V DC or 24 V DC power supply, for LOGO! ... 0BA7/... 0BA8

**6GK7177-1MA20-0AA0**

- **LOGO! CSM 230**  
external 115 ... 240 V AC power supply, for LOGO! ... 0BA7

**6GK7177-1FA10-0AA0****Accessories****IE TP Cord RJ45/RJ45**

TP cable 4 x 2 with 2 RJ45 plugs

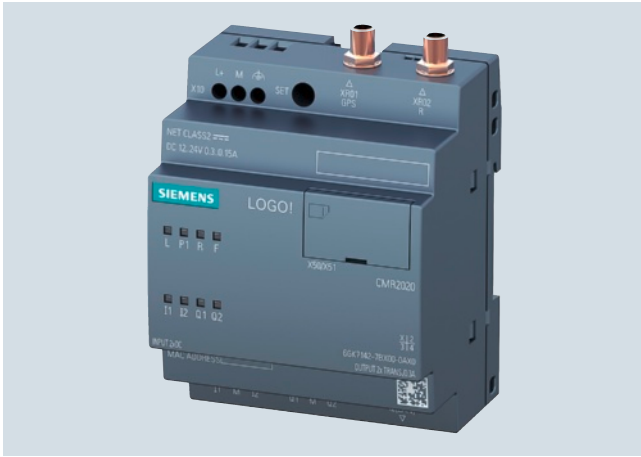
- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

**6XV1870-3QE50****6XV1870-3QH10****6XV1870-3QH20****6XV1870-3QH60****6XV1870-3QN10****IE FC Outlet RJ45**

For connection of Industrial Ethernet FC cables and TP Cords; graded prices from 10 and 50 units

**6GK1901-1FC00-0AA0**

#### Overview



LOGO! CMR in combination with the LOGO! module is a cost-efficient communication system for monitoring and controlling distributed plants and systems via text message.

LOGO! CMR can send text messages to predefined mobile network numbers and it can also receive text messages from predefined mobile network numbers.

Sending a text message can be initiated by events in the LOGO! basic module as well as by the two digital alarm inputs of the LOGO! CMR. The values in the LOGO! basic module can be directly influenced by receiving a text message.

The two digital outputs can also be switched remotely by incoming text messages/emails.

LOGO! CMR determines the current position of the module based on the GPS signal received by the GPS antenna. In addition, LOGO! BM can be time-synchronized by means of the time included in the GPS signal.

Determining the time by means of an NTP server or from the data of the mobile network provider, offers more options for synchronization of the LOGO! BM with the current time of day.

#### Product variant:

- LOGO! CMR2020 for use in GSM/GPRS mobile wireless networks
- LOGO! CMR2040 for use in in LTE mobile wireless networks

Warning! The country-specific mobile network approvals must be observed:

DE: [www.siemens.de/mobilfunkzulassungen](http://www.siemens.de/mobilfunkzulassungen)

EN: [www.siemens.com/mobilenetwork-approvals](http://www.siemens.com/mobilenetwork-approvals)

#### Technical specifications

Article number	6GK7142-7BX00-0AX0	6GK7142-7EX00-0AX0
Product type designation	LOGO! CMR2020	LOGO! CMR2040
<b>Transmission rate</b>		
Transfer rate		
• at the 1st interface	10 ... 100 Mbit/s	10 ... 100 Mbit/s
• for GPRS transmission with downlink maximum	80 kbit/s	85.6 kbit/s
• for GPRS transmission with uplink maximum	40 kbit/s	85.6 kbit/s
• for LTE transmission with downlink maximum		100 Mbit/s
• for LTE transmission with uplink maximum		50 Mbit/s
<b>Interfaces</b>		
Number of interfaces acc. to Industrial Ethernet	1	1
Number of electrical connections		
• at the 1st interface acc. to Industrial Ethernet	1	1
• for external antenna(s)	2	2
• for power supply	1	1
Number of slots		
• for SIM cards	1	1
• for memory cards	1	1
Type of electrical connection		
• at the 1st interface acc. to Industrial Ethernet	RJ45 port	RJ45 port
• for external antenna(s)	SMA socket (50 ohms)	SMA socket (50 ohms)
• for power supply	3-pole terminal block	3-pole terminal block
Type of antenna		
• at port 1 connectable	GPS Antenna	GPS Antenna
• at port 2 connectable	Mobile radio antenna (GPRS/GSM)	Mobile radio antenna (GPRS/GSM)
Slot version		
• for SIM card	Standard	Standard
• of the memory card	microSD	microSD



**LOGO! logic module**

## LOGO! modular communication modules

**LOGO! CMR (wireless communication)****Technical specifications (continued)**

Article number	<b>6GK7142-7BX00-0AX0</b>	<b>6GK7142-7EX00-0AX0</b>
Product type designation	LOGO! CMR2020	LOGO! CMR2040
Storage capacity of the memory card maximum	8 Gbyte	8 Gbyte
Performance class of the memory card minimum necessary	Class 6	Class 6
Type of file system of the memory card	FAT32	FAT32
<b>Signal-Inputs/outputs</b>		
Number of electrical connections for digital input signals	2	2
Type of electrical connection for digital input signals	3 pole terminal block	3 pole terminal block
Digital input version	not potential seperated	not potential seperated
Input voltage at digital input		
• with signal <0> for DC	0 ... 5 V	0 ... 5 V
• for signal <1> for DC	8.5 ... 24 V	8.5 ... 24 V
Input current at digital input for signal <1> maximum	5.5 mA	5.5 mA
Number of electrical connections for digital output signals	2	2
Type of electrical connection for digital output signals	3 pole terminal block	3 pole terminal block
Digital output version	transistor, not potential seperated	transistor, not potential seperated
Output voltage at digital output		
• for signal <1>	12 ... 24 V; value of the actual supply voltage	12 ... 24 V; value of the actual supply voltage
• for signal <0>	0 ... 5 V	0 ... 5 V
Output current at digital output for signal <1> maximum	0.3 A	0.3 A
<b>Wireless technology</b>		
Type of mobile wireless service		
• is supported	SMS, GPRS	SMS, GPRS
• Note	GPRS (Multislot Class 10, Mobile Station Class B)	LTE
Type of mobile network is supported	GSM	GSM, UMTS, LTE
Operating frequency		
• for GSM transmission	850 MHz, 900 MHz, 1800 MHz, 1900 MHz	850 MHz, 900 MHz, 1800 MHz, 1900 MHz
• with UMTS transmission		900 MHz, 2100 MHz
• for LTE transmission		800 MHz, 1800 MHz, 2600 MHz
<b>Supply voltage, current consumption, power loss</b>		
Type of voltage of the supply voltage	DC	DC
Supply voltage external	12 ... 24 V	12 ... 24 V
Supply voltage for GPS antenna maximum	3.8 V; at 5 mA: 3,575 V / at 10 mA: 3,35 V / at 15 mA: 3,125 V	3.8 V; at 5 mA: 3,575 V / at 10 mA: 3,35 V / at 15 mA: 3,125 V
Relative positive tolerance for DC at 24 V	20 %	20 %
Relative negative tolerance for DC at 12 V	10 %	10 %
Consumed current		
• from external supply voltage for DC at 12 V maximum	0.25 A	0.25 A
• from external supply voltage for DC at 24 V maximum	0.125 A	0.125 A
Output current for GPS antenna maximum	15 mA	15 mA
Active power loss	3 W	3 W

**Technical specifications** (continued)

Article number	<b>6GK7142-7BX00-0AX0</b>	<b>6GK7142-7EX00-0AX0</b>
Product type designation	LOGO! CMR2020	LOGO! CMR2040
<b>Permitted ambient conditions</b>		
Ambient temperature		
• during operation	-20 ... +70 °C	-20 ... +70 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
• during transport	-40 ... +85 °C	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %	95 %
Protection class IP	IP20	IP20
<b>Design, dimensions and weight</b>		
Module format	Compact module, for rail mounting	Compact module, for rail mounting
Width	71.5 mm	71.5 mm
Height	90 mm	90 mm
Depth	58.2 mm	58.2 mm
Net weight	0.16 kg	0.16 kg
Mounting type		
• 35 mm DIN rail mounting	Yes	Yes
• wall mounting	Yes	Yes
<b>Performance data</b>		
Number of possible connections to the LOGO! logic module	1	1
Number of users/telephon numbers definable maximum	20	20
Number of user groups definable maximum	20	20
Number of signals for monitoring or device control definable maximum	32	32
Number of events for monitoring definable maximum	32	32
number of actions definable maximum	32	32
<b>Product functions management, configuration</b>		
Configuration software		
• required	WEB-Interface	WEB-Interface
<b>Product functions Diagnosis</b>		
Product function Web-based diagnostics	Yes	Yes
<b>Product functions Security</b>		
Product function		
• password protection for Web applications	Yes	Yes
• switch-off of non-required services	Yes	Yes
• log file for unauthorized access	Yes	Yes
<b>Product functions Time</b>		
Product function pass on time synchronization	Yes	Yes
time synchronization		
• from NTP-server	Yes	Yes
• from GPS-signal	Yes	Yes
• from mobile network provider	Yes	Yes
<b>Product functions Position recognition</b>		
Product function position detection with GPS	Yes	Yes

**LOGO! logic module**

LOGO! modular communication modules

**LOGO! CMR (wireless communication)**

2

Ordering data	Article No.	Article No.
<b>Communication Module Radio LOGO! CMR</b> Communication modules for connection of LOGO! 0BA8 to GSM/GPRS or LTE network; 1x RJ45 port for Industrial Ethernet connection; 2x digital input; 2x digital output; read/write access to LOGO! tags; possible to send/receive text messages; GPS position detection; time-of-day synchronization/forwarding with real time clock; configuration and diagnostics per Web interface; observe country approval		
<b>LOGO! CMR2020</b> For connecting LOGO! 0BA8 to a GSM/GPRS network	<b>6GK7142-7BX00-0AX0</b>	
<b>LOGO! CMR2040</b> For connecting LOGO! 0BA8 to an LTE network;	<b>6GK7142-7EX00-0AX0</b>	
<b>Accessories</b>		
<b>Mobile radio antennas</b>		
<b>ANT794-4MR</b> For indoor and outdoor use; 5 m connecting cable permanently connected to antenna; SMA connector; incl. installation bracket, screws, wall plugs	<b>6NH9860-1AA00</b>	
<b>ANT896-4MA</b> Rod antenna for direct mounting on device; SMA male connector	<b>6GK5896-4MA00-0AA3</b>	
<b>ANT896-4ME</b> Cylinder-shaped antenna for remote installation, e.g. on a control cabinet; N-Connect female connector	<b>6GK5896-4ME00-0AA0</b>	
<b>GPS antenna</b>		
<b>ANT895-6ML</b> GPS/Glonass antenna for remote installation indoor and outdoor, magnet or screw mounting, 30 cm cable with N-Connect female connector	<b>6GK5895-6ML00-0AA0</b>	
		<b>Antenna adapter cable</b> N-Connect/SMA male/male Flexible Connection Cable, pre-fabricated, connection cable; suitable for 0 ... 6 GHz, IP68 <ul style="list-style-type: none"> <li>• 0.3 m</li> <li>• 1 m</li> <li>• 2 m</li> <li>• 5 m</li> </ul>
		<b>IWLAN RCoax/antenna N-Connect male/male Flexible connection cable</b> Flexible connecting cable for connecting an RCoax cable or antenna to a SCALANCE W-700 access point with N-Connect connections; pre-assembled with two N-Connect male connections; suitable from 0 ... 6 GHz, IP68 <ul style="list-style-type: none"> <li>• 1 m</li> <li>• 2 m</li> <li>• 5 m</li> <li>• 10 m</li> </ul>
		<b>Cabinet feedthrough</b> IWLAN RCOAX N-Connect/ N-Connect female/female Panel Feedthrough; control cabinet feedthrough for wall thickness max. 4.5 mm; 2.4 GHz and 5 GHz, suitable for 0 ... 6 GHz, IP67
		<b>Lightning protector LP798-2N</b> Lightning protector with N/N female/female connection for ANT 790 antennas, IP67 (-40 to +85 °C), frequency range: 0 ... 6 GHz
		<b>Patch cable</b>
		<b>IE TP Cord RJ45/RJ45</b> TP cable 4 x 2 with 2 RJ45 plugs <ul style="list-style-type: none"> <li>• 0.5 m</li> <li>• 1 m</li> <li>• 2 m</li> <li>• 6 m</li> <li>• 10 m</li> </ul>
		<b>IE FC Outlet RJ45</b> For connection of Industrial Ethernet FC cables and TP cords; graduated prices for 10 and 50 units or more
		<b>6XV1875-5LE30</b> <b>6XV1875-5LH10</b> <b>6XV1875-5LH20</b> <b>6XV1875-5LH50</b>
		<b>6XV1875-5AH10</b> <b>6XV1875-5AH20</b> <b>6XV1875-5AH50</b> <b>6XV1875-5AN10</b>
		<b>6GK5798-2PP00-2AA6</b>
		<b>6GK5798-2LP00-2AA6</b>
		<b>6XV1870-3QE50</b> <b>6XV1870-3QH10</b> <b>6XV1870-3QH20</b> <b>6XV1870-3QH60</b> <b>6XV1870-3QN10</b>
		<b>6GK1901-1FC00-0AA0</b>

### Overview

**Every LOGO! can now be connected to the AS-Interface system**



AS-Interface connection for LOGO!

Using the AS-Interface connection for LOGO!, an intelligent slave can be integrated in the AS-Interface system. With the modular interface it becomes possible to integrate the different basic units in the system according to their functionality. Similarly, functionalities can be quickly and easily adapted to new requirements by exchanging the basic unit.

The interface module provides four inputs and four outputs on the system. These inputs and outputs do not actually exist in hardware terms, however, but are only virtually present through the interface on the bus.

### Ordering data

### Article No.

AS-Interface connection for LOGO!

3RK1400-0CE10-0AA2

**LOGO! logic module**

LOGO!Power

LOGO!Power

**Overview**

2

**The flat power supply unit for distribution boards**

Our new miniature power supply units in the same design as the logic modules offer great performance in the smallest space: Efficiency has been improved across the entire load range, and the low power losses in no-load operation ensure efficient operation. The wide-range input for 1-phase networks as well as

operation with direct voltage, the wide operating temperature range, comprehensive certifications as well as the switch-on behavior optimized for capacitive loads makes them suitable for universal use. These reliable power supplies with their flat, stepped profile can be used extremely flexibly in numerous applications such as in distribution boards, for example.

To further increase the 24 V availability, the LOGO!Power power supplies can be combined with **DC UPS, redundancy** and **selectivity modules**.

**Main product highlights**

- 5 V DC/ 3 A and 6.3 A, 12 V DC/ 1.9 A and 4.5 A, 15 V DC/ 1.9 A and 4 A as well as 24 V DC/ 1.3 A, 2.5 A and 4 A
- 1-phase, wide-range input for 85 V to 264 V AC or 110 V to 300 V DC
- Flat LOGO! design with an installation depth of only 55 mm
- High efficiency across the entire load range, low no-load losses
- Power reserve on starting up through 1.5 times the rated current for capacitive loads
- Wide temperature range from -20 to +70 °C
- Comprehensive certifications, such as cULus, CB, FM, ATEX, cCSAus Class I Div. 2, GL and ABS

**Technical specifications**

Article number	<b>6EP1311-1SH03</b>	<b>6EP1311-1SH13</b>
Product	LOGO!Power	LOGO!Power
Power supply, type	5 V/3 A	5 V/6.3 A
<b>Input</b>		
Input	1-phase AC or DC	1-phase AC or DC
Rated voltage value $V_{in rated}$	100 ... 240 V	100 ... 240 V
Voltage range AC	85 ... 264 V	85 ... 264 V
Input voltage		
• for DC	110 ... 300 V	110 ... 300 V
Wide-range input	Yes	Yes
Overvoltage resistance	$2.3 \times V_{in rated}$ , 1.3 ms	$2.3 \times V_{in rated}$ , 1.3 ms
Mains buffering at $I_{out rated}$ , min.	40 ms; at $V_{in} = 187 V$	40 ms; at $V_{in} = 187 V$
Rated line frequency	50 ... 60 Hz	50 ... 60 Hz
Rated line range	47 ... 63 Hz	47 ... 63 Hz
Input current		
• at rated input voltage 120 V	0.36 A	0.71 A
• at rated input voltage 230 V	0.22 A	0.37 A
Switch-on current limiting (+25 °C), max.	26 A	50 A
$I^2t$ , max.	0.8 A <sup>2</sup> ·s	3 A <sup>2</sup> ·s
Built-in incoming fuse	internal	internal
Protection in the mains power input (IEC 60898)	Recommended miniature circuit breaker: from 16 A characteristic B or from 10 A characteristic C	Recommended miniature circuit breaker: from 16 A characteristic B or from 10 A characteristic C

**Technical specifications** (continued)

	<b>6EP1311-1SH03</b>	<b>6EP1311-1SH13</b>
Article number	6EP1311-1SH03	6EP1311-1SH13
Product	LOGO!Power	LOGO!Power
Power supply, type	5 V/3 A	5 V/6.3 A
<b>Output</b>		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $V_{out}$ DC	5 V	5 V
Total tolerance, static $\pm$	3 %	3 %
Static mains compensation, approx.	0.2 %	0.1 %
Static load balancing, approx.	1.5 %	2 %
Residual ripple peak-peak, max.	100 mV	100 mV
Residual ripple peak-peak, typ.	10 mV	15 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	100 mV	100 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	20 mV	70 mV
Adjustment range	4.6 ... 5.4 V	4.6 ... 5.4 V
Product function Output voltage adjustable	Yes	Yes
Output voltage setting	via potentiometer	via potentiometer
Status display	Green LED for output voltage OK	Green LED for output voltage OK
On/off behavior	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)
Startup delay, max.	0.5 s	0.5 s
Voltage rise, typ.	20 ms	10 ms
Rated current value $I_{out\ rated}$	3 A	6.3 A
Current range	0 ... 3 A	0 ... 6.3 A
• Note	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K
Active power supplied typical	15 W	30 W
Parallel switching for enhanced performance	Yes	Yes
Numbers of parallel switchable units for enhanced performance	2	2
<b>Efficiency</b>		
Efficiency at $V_{out\ rated}$ , $I_{out\ rated}$ , approx.	77 %	83 %
Power loss at $V_{out\ rated}$ , $I_{out\ rated}$ , approx.	4 W	6 W
Active power loss during no-load operation maximum	1.5 W	1.5 W
<b>Closed-loop control</b>		
Dynamic mains compensation ( $V_{in\ rated} \pm 15\%$ ), max.	0.2 %	0.2 %
Dynamic load smoothing ( $I_{out}$ : 10/90/10 %), $U_{out} \pm$ typ.	3 %	3 %
Load step setting time 10 to 90%, typ.	2 ms	2 ms
Load step setting time 90 to 10%, typ.	2 ms	2 ms
<b>Protection and monitoring</b>		
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1
Current limitation, typ.	3.8 A	8.2 A
Property of the output Short-circuit proof	Yes	Yes
Short-circuit protection	Constant current characteristic	Constant current characteristic
Enduring short circuit current RMS value		
• maximum	5 A	10 A
Overload/short-circuit indicator	-	-



# LOGO! logic module

## LOGO!Power

### LOGO!Power

#### Technical specifications (continued)

Article number	<b>6EP1311-1SH03</b>	<b>6EP1311-1SH13</b>
Product	LOGO!Power	LOGO!Power
Power supply, type	5 V/3 A	5 V/6.3 A
<b>Safety</b>		
Primary/secondary isolation	Yes	Yes
Galvanic isolation	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178
Protection class	Class II (without protective conductor)	Class II (without protective conductor)
CE mark	Yes	Yes
UL/CSA approval	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273
Explosion protection	ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4	ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4
Certificate of suitability IECEx	No	No
Certificate of suitability NEC Class 2	Yes	No
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes
Marine approval	GL, ABS	GL, ABS
Degree of protection (EN 60529)	IP20	IP20
<b>EMC</b>		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	not applicable	not applicable
Noise immunity	EN 61000-6-2	EN 61000-6-2
<b>Operating data</b>		
Ambient temperature		
• during operation	-20 ... +70 °C	-20 ... +70 °C
- Note	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation
<b>Mechanics</b>		
Connection technology	screw-type terminals	screw-type terminals
Connections		
• Supply input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded
• Output	+, -: 2 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>	+, -: 2 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>
• Auxiliary	-	-
Width of the enclosure	54 mm	72 mm
Height of the enclosure	90 mm	90 mm
Depth of the enclosure	52.6 mm	52.6 mm
Weight, approx.	0.17 kg	0.25 kg
Product property of the enclosure housing for side-by-side mounting	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

**Technical specifications (continued)**

	<b>6EP1321-1SH03</b>	<b>6EP1322-1SH03</b>
Article number	6EP1321-1SH03	6EP1322-1SH03
Product	LOGO!Power	LOGO!Power
Power supply, type	12 V/1.9 A	12 V/4.5 A
<b>Input</b>		
Input	1-phase AC or DC	1-phase AC or DC
Rated voltage value $V_{in\ rated}$	100 ... 240 V	100 ... 240 V
Voltage range AC	85 ... 264 V	85 ... 264 V
Input voltage		
• for DC	110 ... 300 V	110 ... 300 V
Wide-range input	Yes	Yes
Overvoltage resistance	$2.3 \times V_{in\ rated}$ , 1.3 ms	$2.3 \times V_{in\ rated}$ , 1.3 ms
Mains buffering at $I_{out\ rated}$ , min.	40 ms; at $V_{in} = 187\text{ V}$	40 ms; at $V_{in} = 187\text{ V}$
Rated line frequency	50 ... 60 Hz	50 ... 60 Hz
Rated line range	47 ... 63 Hz	47 ... 63 Hz
Input current		
• at rated input voltage 120 V	0.53 A	1.13 A
• at rated input voltage 230 V	0.3 A	0.61 A
Switch-on current limiting (+25 °C), max.	25 A	55 A
$I^2t$ , max.	0.8 A <sup>2</sup> ·s	3 A <sup>2</sup> ·s
Built-in incoming fuse	internal	internal
Protection in the mains power input (IEC 60898)	Recommended miniature circuit breaker: from 16 A characteristic B or from 10 A characteristic C	Recommended miniature circuit breaker: from 16 A characteristic B or from 10 A characteristic C
<b>Output</b>		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $V_{out\ DC}$	12 V	12 V
Total tolerance, static ±	3 %	3 %
Static mains compensation, approx.	0.1 %	0.1 %
Static load balancing, approx.	1.5 %	1.5 %
Residual ripple peak-peak, max.	200 mV	200 mV
Residual ripple peak-peak, typ.	10 mV	10 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	300 mV	300 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	20 mV	70 mV
Adjustment range	10.5 ... 16.1 V	10.5 ... 16.1 V
Product function Output voltage adjustable	Yes	Yes
Output voltage setting	via potentiometer	via potentiometer
Status display	Green LED for output voltage OK	Green LED for output voltage OK
On/off behavior	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)
Startup delay, max.	0.5 s	0.5 s
Voltage rise, typ.	10 ms	10 ms
Rated current value $I_{out\ rated}$	1.9 A	4.5 A
Current range	0 ... 1.9 A	0 ... 4.5 A
• Note	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K
Active power supplied typical	23 W	50 W
Parallel switching for enhanced performance	Yes	Yes
Numbers of parallel switchable units for enhanced performance	2	2
<b>Efficiency</b>		
Efficiency at $V_{out\ rated}$ , $I_{out\ rated}$ , approx.	80 %	85 %
Power loss at $V_{out\ rated}$ , $I_{out\ rated}$ , approx.	5 W	10 W
Active power loss during no-load operation maximum	1.8 W	1.9 W

# LOGO! logic module

## LOGO!Power

### LOGO!Power

#### Technical specifications (continued)

Article number	<b>6EP1321-1SH03</b>	<b>6EP1322-1SH03</b>
Product	LOGO!Power	LOGO!Power
Power supply, type	12 V/1.9 A	12 V/4.5 A
<b>Closed-loop control</b>		
Dynamic mains compensation ( $V_{in rated} \pm 15\%$ ), max.	0.2 %	0.2 %
Dynamic load smoothing ( $I_{out}: 10/90/10\%$ ), $U_{out} \pm typ.$	3 %	4 %
Load step setting time 10 to 90%, typ.	1 ms	1 ms
Load step setting time 90 to 10%, typ.	1 ms	1 ms
<b>Protection and monitoring</b>		
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1
Current limitation, typ.	2.8 A	5.8 A
Property of the output	Yes	Yes
Short-circuit proof		
Short-circuit protection	Constant current characteristic	Constant current characteristic
Enduring short circuit current RMS value		
• maximum	3.6 A	7 A
Overload/short-circuit indicator	-	-
<b>Safety</b>		
Primary/secondary isolation	Yes	Yes
Galvanic isolation	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178
Protection class	Class II (without protective conductor)	Class II (without protective conductor)
CE mark	Yes	Yes
UL/CSA approval	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273
Explosion protection	ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4	ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4
Certificate of suitability IECEx	No	No
Certificate of suitability NEC Class 2	Yes	No
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes
Marine approval	GL, ABS	GL, ABS
Degree of protection (EN 60529)	IP20	IP20
<b>EMC</b>		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	not applicable	not applicable
Noise immunity	EN 61000-6-2	EN 61000-6-2
<b>Operating data</b>		
Ambient temperature		
• during operation	-20 ... +70 °C	-20 ... +70 °C
- Note	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation

**Technical specifications (continued)**

Article number	<b>6EP1321-1SH03</b>	<b>6EP1322-1SH03</b>
Product	LOGO!Power	LOGO!Power
Power supply, type	12 V/1.9 A	12 V/4.5 A
<b>Mechanics</b>		
Connection technology	screw-type terminals	screw-type terminals
Connections		
• Supply input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded
• Output	+, -: 2 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>	+, -: 2 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>
• Auxiliary	-	-
Width of the enclosure	54 mm	72 mm
Height of the enclosure	90 mm	90 mm
Depth of the enclosure	52.6 mm	52.6 mm
Weight, approx.	0.17 kg	0.25 kg
Product property of the enclosure housing for side-by-side mounting	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)
Article number	<b>6EP1351-1SH03</b>	<b>6EP1352-1SH03</b>
Product	LOGO!Power	LOGO!Power
Power supply, type	15 V/1.9 A	15 V/4 A
<b>Input</b>		
Input	1-phase AC or DC	1-phase AC or DC
Rated voltage value $V_{in rated}$	100 ... 240 V	100 ... 240 V
Voltage range AC	85 ... 264 V	85 ... 264 V
Input voltage		
• for DC	110 ... 300 V	110 ... 300 V
Wide-range input	Yes	Yes
Overvoltage resistance	$2.3 \times V_{in rated}, 1.3 \text{ ms}$	$2.3 \times V_{in rated}, 1.3 \text{ ms}$
Mains buffering at $I_{out rated}, \text{ min.}$	40 ms; at $V_{in} = 187 \text{ V}$	40 ms; at $V_{in} = 187 \text{ V}$
Rated line frequency	50 ... 60 Hz	50 ... 60 Hz
Rated line range	47 ... 63 Hz	47 ... 63 Hz
Input current		
• at rated input voltage 120 V	0.63 A	1.24 A
• at rated input voltage 230 V	0.33 A	0.68 A
Switch-on current limiting (+25 °C), max.	25 A	55 A
$I^2t, \text{ max.}$	0.8 A <sup>2</sup> ·s	3 A <sup>2</sup> ·s
Built-in incoming fuse	internal	internal
Protection in the mains power input (IEC 60898)	Recommended miniature circuit breaker: from 16 A characteristic B or from 10 A characteristic C	Recommended miniature circuit breaker: from 16 A characteristic B or from 10 A characteristic C

**LOGO! logic module**

## LOGO!Power

## LOGO!Power

**Technical specifications** (continued)

Article number	<b>6EP1351-1SH03</b>	<b>6EP1352-1SH03</b>
Product	LOGO!Power	LOGO!Power
Power supply, type	15 V/1.9 A	15 V/4 A
<b>Output</b>		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $V_{out}$ DC	15 V	15 V
Total tolerance, static $\pm$	3 %	3 %
Static mains compensation, approx.	0.1 %	0.1 %
Static load balancing, approx.	1.5 %	1.5 %
Residual ripple peak-peak, max.	200 mV	200 mV
Residual ripple peak-peak, typ.	10 mV	10 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	300 mV	300 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	30 mV	70 mV
Adjustment range	10.5 ... 16.1 V	10.5 ... 16.1 V
Product function	Yes	Yes
Output voltage adjustable		
Output voltage setting	via potentiometer	via potentiometer
Status display	Green LED for output voltage OK	Green LED for output voltage OK
On/off behavior	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)
Startup delay, max.	0.5 s	0.5 s
Voltage rise, typ.	15 ms	15 ms
Rated current value $I_{out\ rated}$	1.9 A	4 A
Current range	0 ... 1.9 A	0 ... 4 A
• Note	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K
Active power supplied typical	23 W	50 W
Parallel switching for enhanced performance	Yes	Yes
Numbers of parallel switchable units for enhanced performance	2	2
<b>Efficiency</b>		
Efficiency at $V_{out\ rated}$ , $I_{out\ rated}$ , approx.	81 %	85 %
Power loss at $V_{out\ rated}$ , $I_{out\ rated}$ , approx.	7 W	11 W
Active power loss during no-load operation maximum	2 W	2.3 W
<b>Closed-loop control</b>		
Dynamic mains compensation ( $V_{in\ rated} \pm 15\%$ ), max.	0.2 %	0.2 %
Dynamic load smoothing ( $I_{out}$ : 10/90/10 %), $U_{out} \pm$ typ.	2.8 %	3 %
Load step setting time 10 to 90%, typ.	1 ms	1 ms
Load step setting time 90 to 10%, typ.	1 ms	1 ms
<b>Protection and monitoring</b>		
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1
Current limitation, typ.	2.7 A	5.7 A
Property of the output	Yes	Yes
Short-circuit proof		
Short-circuit protection	Constant current characteristic	Constant current characteristic
Enduring short circuit current RMS value		
• maximum	3.6 A	7 A
Overload/short-circuit indicator	-	-

**Technical specifications (continued)**

	<b>6EP1351-1SH03</b>	<b>6EP1352-1SH03</b>
Article number	6EP1351-1SH03	6EP1352-1SH03
Product	LOGO!Power	LOGO!Power
Power supply, type	15 V/1.9 A	15 V/4 A
<b>Safety</b>		
Primary/secondary isolation	Yes	Yes
Galvanic isolation	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178
Protection class	Class II (without protective conductor)	Class II (without protective conductor)
CE mark	Yes	Yes
UL/CSA approval	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)
Explosion protection	ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4	ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4
Certificate of suitability IECEx	No	No
Certificate of suitability NEC Class 2	Yes	Yes
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes
Marine approval	GL, ABS	GL, ABS
Degree of protection (EN 60529)	IP20	IP20
<b>EMC</b>		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	not applicable	not applicable
Noise immunity	EN 61000-6-2	EN 61000-6-2
<b>Operating data</b>		
Ambient temperature		
• during operation	-20 ... +70 °C	-20 ... +70 °C
- Note	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation
<b>Mechanics</b>		
Connection technology	screw-type terminals	screw-type terminals
Connections		
• Supply input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded
• Output	+, -: 2 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>	+, -: 2 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>
• Auxiliary	-	-
Width of the enclosure	54 mm	72 mm
Height of the enclosure	90 mm	90 mm
Depth of the enclosure	52.6 mm	52.6 mm
Weight, approx.	0.17 kg	0.25 kg
Product property of the enclosure housing for side-by-side mounting	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)



# LOGO! logic module

## LOGO!Power

### LOGO!Power

#### Technical specifications (continued)

Article number	<b>6EP1331-1SH03</b>	<b>6EP1332-1SH43</b>	<b>6EP1332-1SH52</b>
Product	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	24 V/1.3 A	24 V/2.5 A	24 V/4 A
<b>Input</b>			
Input	1-phase AC or DC	1-phase AC or DC	1-phase AC or DC
Rated voltage value $V_{in rated}$	100 ... 240 V	100 ... 240 V	100 ... 240 V
Voltage range AC	85 ... 264 V	85 ... 264 V	85 ... 264 V
Input voltage			
• for DC	110 ... 300 V	110 ... 300 V	110 ... 300 V
Wide-range input	Yes	Yes	Yes
Overvoltage resistance	$2.3 \times V_{in rated}$ , 1.3 ms	$2.3 \times V_{in rated}$ , 1.3 ms	$2.3 \times V_{in rated}$ , 1.3 ms
Mains buffering at $I_{out rated}$ , min.	40 ms; at $V_{in} = 187$ V	40 ms; at $V_{in} = 187$ V	40 ms; at $V_{in} = 187$ V
Rated line frequency	50 ... 60 Hz	50 ... 60 Hz	50 ... 60 Hz
Rated line range	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
Input current			
• at rated input voltage 120 V	0.7 A	1.22 A	1.95 A
• at rated input voltage 230 V	0.35 A	0.66 A	0.97 A
Switch-on current limiting (+25 °C), max.	25 A	46 A	30 A
$I^2t$ , max.	0.8 A <sup>2</sup> ·s	3 A <sup>2</sup> ·s	2.5 A <sup>2</sup> ·s
Built-in incoming fuse	internal	internal	internal
Protection in the mains power input (IEC 60898)	Recommended miniature circuit breaker: from 16 A characteristic B or from 10 A characteristic C	Recommended miniature circuit breaker: from 16 A characteristic B or from 10 A characteristic C	Recommended miniature circuit breaker: from 16 A characteristic B or from 10 A characteristic C
<b>Output</b>			
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $V_{out DC}$	24 V	24 V	24 V
Total tolerance, static ±	3 %	3 %	3 %
Static mains compensation, approx.	0.1 %	0.1 %	0.1 %
Static load balancing, approx.	1.5 %	1.5 %	1.5 %
Residual ripple peak-peak, max.	200 mV	200 mV	200 mV
Residual ripple peak-peak, typ.	10 mV	10 mV	30 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	300 mV	300 mV	300 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	20 mV	50 mV	60 mV
Adjustment range	22.2 ... 26.4 V	22.2 ... 26.4 V	22.2 ... 26.4 V
Product function	Yes	Yes	Yes
Output voltage adjustable			
Output voltage setting	via potentiometer	via potentiometer	via potentiometer
Status display	Green LED for output voltage OK	Green LED for output voltage OK	Green LED for output voltage OK
On/off behavior	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)
Startup delay, max.	0.5 s	0.5 s	0.5 s
Voltage rise, typ.	15 ms	10 ms	15 ms
Rated current value $I_{out rated}$	1.3 A	2.5 A	4 A
Current range	0 ... 1.3 A	0 ... 2.5 A	0 ... 4 A
• Note	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K
Active power supplied typical	30 W	60 W	96 W
Parallel switching for enhanced performance	Yes	Yes	Yes
Numbers of parallel switchable units for enhanced performance	2	2	2
<b>Efficiency</b>			
Efficiency at $V_{out rated}$ , $I_{out rated}$ , approx.	85 %	88 %	89 %
Power loss at $V_{out rated}$ , $I_{out rated}$ , approx.	6 W	8 W	12 W
Active power loss during no-load operation maximum	2 W	1.8 W	2 W

## Technical specifications (continued)

Article number	6EP1331-1SH03	6EP1332-1SH43	6EP1332-1SH52
Product	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	24 V/1.3 A	24 V/2.5 A	24 V/4 A
<b>Closed-loop control</b>			
Dynamic mains compensation ( $V_{in rated} \pm 15\%$ ), max.	0.2 %	0.2 %	0.2 %
Dynamic load smoothing ( $I_{out}: 10/90/10\%$ ), $U_{out} \pm$ typ.	1 %	2 %	1.5 %
Load step setting time 10 to 90%, typ.	1 ms	1 ms	1 ms
Load step setting time 90 to 10%, typ.	1 ms	1 ms	1 ms
<b>Protection and monitoring</b>			
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1	Yes, according to EN 60950-1
Current limitation, typ.	1.7 A	3.3 A	5.2 A
Property of the output Short-circuit proof	Yes	Yes	Yes
Short-circuit protection	Constant current characteristic	Constant current characteristic	Constant current characteristic
Enduring short circuit current RMS value			
• maximum	2.4 A	4.8 A	7.9 A
Overload/short-circuit indicator	-	-	-
<b>Safety</b>			
Primary/secondary isolation	Yes	Yes	Yes
Galvanic isolation	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178
Protection class	Class II (without protective conductor)	Class II (without protective conductor)	Class II (without protective conductor)
CE mark	Yes	Yes	Yes
UL/CSA approval	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273
Explosion protection	ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4	ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4	ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4
Certificate of suitability IECEx	No	No	No
Certificate of suitability NEC Class 2	Yes	Yes	No
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes	Yes
Marine approval	GL, ABS, BV, DNV, LRS	GL, ABS, BV, DNV, LRS	GL, ABS, BV, DNV, LRS
Degree of protection (EN 60529)	IP20	IP20	IP20
<b>EMC</b>			
Emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	not applicable	not applicable	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
<b>Operating data</b>			
Ambient temperature			
• during operation	-20 ... +70 °C	-20 ... +70 °C	-20 ... +70 °C
- Note	with natural convection	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation	Climate class 3K3, no condensation

**LOGO! logic module**

## LOGO!Power

## LOGO!Power

**Ordering data Article No. Article No. (continued)**

Article number	<b>6EP1331-1SH03</b>	<b>6EP1332-1SH43</b>	<b>6EP1332-1SH52</b>
Product	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	24 V/1.3 A	24 V/2.5 A	24 V/4 A
<b>Mechanics</b>			
Connection technology	screw-type terminals	screw-type terminals	screw-type terminals
Connections			
• Supply input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded
• Output	+, -: 2 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>	+, -: 2 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>	+, -: 2 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>
• Auxiliary	-	-	-
Width of the enclosure	54 mm	72 mm	90 mm
Height of the enclosure	90 mm	90 mm	90 mm
Depth of the enclosure	52.6 mm	52.6 mm	52.6 mm
Weight, approx.	0.17 kg	0.25 kg	0.34 kg
Product property of the enclosure housing for side-by-side mounting	Yes	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

**Ordering data****Article No.****Article No.****LOGO!Power 1-phase, 5 V DC/3 A**

Stabilized power supply  
Input: 100 ... 240 V AC  
Output: 5 V DC/3 A

**6EP1311-1SH03****LOGO!Power 1-phase, 5 V DC/6.3 A**

Stabilized power supply  
Input: 100 ... 240 V AC  
Output: 5 V DC/6.3 A

**6EP1311-1SH13****LOGO!Power 1-phase, 12 V DC/1.9 A**

Stabilized power supply  
Input: 100 ... 240 V AC  
Output: 12 V DC/1.9 A

**6EP1321-1SH03****LOGO!Power 1-phase, 12 V DC/4.5 A**

Stabilized power supply  
Input: 100 ... 240 V AC  
Output: 12 V DC/4.5 A

**6EP1322-1SH03****LOGO!Power 1-phase, 15 V DC/1.9 A**

Stabilized power supply  
Input: 100 ... 240 V AC  
Output: 15 V DC/1.9 A

**6EP1351-1SH03****LOGO!Power 1-phase, 15 V DC/4 A**

Stabilized power supply  
Input: 100 ... 240 V AC  
Output: 15 V DC/4 A

**6EP1352-1SH03****LOGO!Power 1-phase, 24 V DC/1.3 A**

Stabilized power supply  
Input: 100 ... 240 V AC  
Output: 24 V DC/1.3 A

**6EP1331-1SH03****LOGO!Power 1-phase, 24 V DC/2.5 A**

Stabilized power supply  
Input: 100 ... 240 V AC  
Output: 24 V DC/2.5 A

**6EP1332-1SH43****LOGO!Power 1-phase, 24 V DC/4 A**

Stabilized power supply  
Input: 100 ... 240 V AC  
Output: 24 V DC/4 A

**6EP1332-1SH52****More information**

In addition to various power supply product lines, the perfectly coordinated complete SITOP range offers a unique range of add-on modules with which the 24 V power supply can be additionally protected against interference on the primary and secondary side – right up to all-round protection:

- Redundancy module for setting up a redundant power supply
- Uninterruptible 24 V power supplies with batteries or maintenance-free capacitors for continued operation in the event of power failure
- Selectivity modules for electronic protection of 24 V branches from overload and short-circuit

You can find more information in Catalog KT 10.1 and on the Internet at:

[www.siemens.com/sitop](http://www.siemens.com/sitop)

Select the appropriate power supply quickly and easily with the SITOP Selection Tool:

<http://www.siemens.com/sitop-selection-tool>

**Overview**Note:

SIPLUS extreme products are based on Siemens Industry standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

<b>SIPLUS LOGO!Power 1.3 A</b>	
<b>Article number</b>	<b>6AG1331-1SH03-7AA0</b>
<b>Article number based on</b>	<b>6EP1331-1SH03</b>
Ambient temperature range	-25 °C to +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold spores, fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

**Ordering data****Article No.****SIPLUS LOGO!Power 24 V 1.3 A**

Input 100 ... 240 V AC  
Output 24 V DC, 1.3 A

Extended temperature range and exposure to media

**6AG1331-1SH03-7AA0****SIPLUS LOGO!Power 24 V 2.5 A**

Input 100 ... 240 V AC  
Output 24 V DC, 2.5 A

Extended temperature range and exposure to media

**6AG1332-1SH43-7AA0****SIPLUS LOGO!Power 24 V 4 A**

Input 100 ... 240 V AC  
Output 24 V DC, 4 A

Extended temperature range and exposure to media

**6AG1332-1SH52-7AA0**

**LOGO! logic module**

LOGO!Contact

**LOGO!Contact****Overview**

- Switching module for the direct switching of resistive loads and motors

**Technical specifications**

Article number	<b>6ED1057-4CA00-0AA0</b>	<b>6ED1057-4EA00-0AA0</b>
Product type designation	LOGO! CONTACT MOD., DC 24V, 3NO/1NC	LOGO! CONTACT MOD., AC 230V, 3NO/1NC
<b>Weights</b>		
Weight, approx.	160 g	160 g

**Ordering data****LOGO!Contact**

Switching module for direct switching of resistive loads up to 20 A and motors up to 4 kW

Switching voltage 24 V

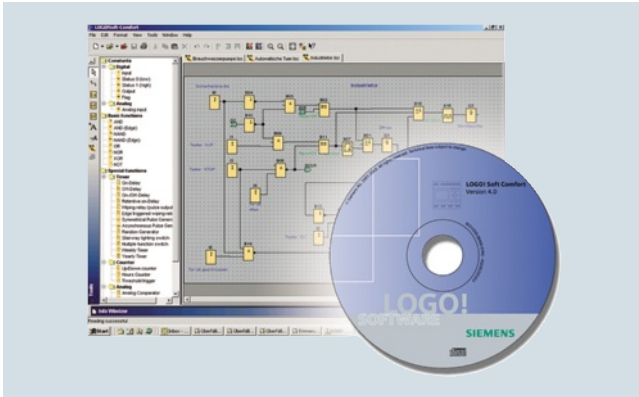
Switching voltage 230 V

**Article No.**

**6ED1057-4CA00-0AA0**

**6ED1057-4EA00-0AA0**

## Overview



- The user-friendly software for generating switching programs on the PC for single-user mode and network mode
- Generation of switching programs in a function block diagram (FBD) or ladder logic (LAD)
- Furthermore, testing, simulation, online testing and archiving of the switching programs
- Professional documentation due to manifold comment and print functions

### Minimum system requirements

#### Windows XP (32-bit), 7 (32/64-bit) or 8 (32/64-bit)

- PC Pentium IV
- 150 MB free disk capacity
- 256 MB RAM
- SVGA graphics card with minimum resolution 800 x 600 (256 colors)
- DVD-ROM

#### Mac OS X

- Mac OS X 10.4

#### Linux

- Tested with SUSE Linux 11.3 SP2, kernel 3.0.76
- Runs on all Linux distributions on which Java 2 runs.
- Please refer to your relevant Linux distribution for the necessary hardware requirements.

## Ordering data

## Article No.

### LOGO!Soft Comfort V8

6ED1058-0BA08-0YA1

for programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD

### LOGO!Soft Comfort V8 Upgrade

6ED1058-0CA08-0YE1

Upgrade from V1.0 to V8.0



**LOGO! logic module**

SIPLUS add-ons

**SIPLUS LOGO! PROM****Overview**

LOGO! PROM is the programming device for easy reproduction of up to 8 LOGO! program modules. Copying is performed from a master module or via the PC program LOGO! Soft Comfort.

LOGO! PROM supports yellow and red program modules. Only yellow modules can be used as master modules, because red modules cannot be copied due to the know-how protection implemented.

A multi-colored LED on each module slot provides detailed information about the status of the respective program module and the copying procedure.

**Ordering data****Article No.****LOGO! PROM**

Programming device used to simultaneously reproduce program module contents on up to 8 program modules

**6AG1057-1AA01-0BA6****LOGO! mounting kits****Overview**

LOGO! and SIPLUS LOGO! are designed for quick and easy mounting on standard rails. With the mounting kit, these devices can also be easily and safely installed in front panels. If the supplied washer and seals are used, the devices are reliably protected against harsh environmental conditions up to the IP65 degree of protection.

**Ordering data****Article No.****Front panel mounting kit**

Width 4 width units

**6AG1057-1AA00-0AA0**

Width 4 width units, with keys

**6AG1057-1AA00-0AA3**

Width 8 width units

**6AG1057-1AA00-0AA1**

Width 8 width units, with keys

**6AG1057-1AA00-0AA2****SIPLUS upmiters****Overview**

The SIPLUS upmiter upstream device ensures reliable operation of SIPLUS devices connected to the batteries of internal combustion engines. SIPLUS upmiter provides the devices with a constant voltage supply.

**Ordering data****Article No.****SIPLUS upmiter upstream device**

for reliable operation when connected to the batteries of combustion engines

Output current 1.25 A (LOGO! style)

**6AG1053-1AA00-2AA0**

Output current 4 A (S7-300 style)

**6AG1305-1AA00-2AA0**

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3/92 SIPLUS SM 1231 analog input modules

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3/96 SIPLUS SM 1234 analog input/output modules

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3/110 CM 1242-5

3/112 CM 1243-2

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3/115 CSM 1277 unmanaged

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**Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

[www.siemens.com/simatic/  
printmaterial](http://www.siemens.com/simatic/printmaterial)

## SIMATIC S7-1200 basic controller

### Introduction

#### S7-1200

#### Overview



- The new modular miniature controller from the SIMATIC S7 family
- Comprising:
  - Controller with integrated PROFINET IO controller interface for communication between SIMATIC controllers, HMI, programming device or other automation components
  - Communication module with PROFIBUS DP master interface
  - Communication module PROFIBUS DP slave interface
  - GPRS module for connection to GSM/G mobile phone networks
  - Integrated web server with standard and user-specific web pages
  - Data logging functionality for archiving of data at runtime from the user program
  - Powerful, integrated technology functions such as counting, measuring, closed-loop control, and motion control
  - Integrated digital and analog inputs/outputs
  - Signal boards for direct use in a controller
  - Signal modules for expansion of controllers by input/output channels
  - Communication modules for expansion of controllers with additional communications interfaces
  - Accessories, e.g. power supply, switch module or SIMATIC Memory Card
- The miniature controller that offers maximum automation at minimum cost.
- Extremely simple installation, programming and operation.
- Large-scale integration, space-saving, powerful.
- Suitable for small to medium-size automation engineering applications.
- Can be used both for simple controls and for complex automation tasks.
- All CPUs can be used in stand-alone mode, in networks and within distributed structures.
- Suitable for applications where programmable controllers would not have been economically viable in the past.
- With exceptional real-time performance and powerful communication options.

## Technical specifications

General technical specifications SIMATIC S7-1200	
Degree of protection	IP20 acc. to IEC 529
Ambient temperature	
• Operation (95% humidity)	
- Horizontal installation	-20 ... +60 °C
- Vertical installation	-20 ... +50 °C
• Transportation and storage	
- With 95% humidity	-40 ... +70 °C 25 ... 55 °C
Insulation	
• 5/24 V DC circuits	500 V AC test voltage
• 115/230 V AC circuits to ground	1500 V AC test voltage
• 115/230 V AC circuits to 115/230 V AC circuits	1500 V AC test voltage
• 230 V AC circuits to 5/24 V DC circuits	1500 V AC test voltage
• 115 V AC circuits to 5/24 V DC circuits	1500 V AC test voltage
Electromagnetic compatibility	Requirements of the EMC directive
• Noise immunity acc. to EN 50082-2	Test acc. to: IEC 801-2, IEC 801-3, IEC 801-4, EN 50141, EN 50204, IEC 801-5, VDE 0160
• Emitted interference acc. to EN 50081-1 and EN 50081-2	Test according to EN 55011, Class A, Group 1
Mechanical strength	
• Vibrations, test acc. to / tested with	IEC 68, Part 2-6: 10 ... 57 Hz; constant amplitude 0.3 mm; 58 ... 150 Hz; constant acceleration 1 g (mounted on DIN rail) or 2 g (mounted in switchboard); mode of vibration: frequency sweeps with a sweep rate of 1 octave/minute; duration of vibration: 10 frequency sweeps per axis in each direction of the three mutually perpendicular axes
• Shocks, test acc. to / tested with	IEC 68, Part 2-27/half-sine: magnitude of shock 15 g (peak value), duration 11 ms, 6 shocks in each of the three mutually perpendicular axes

General technical specifications SIMATIC S7-1200	
Ambient temperature range	-40/-25/-20 ... +55/60/70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
<b>Ambient conditions</b>	
Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
• With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance	
• against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
• against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
• against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

## SIMATIC S7-1200 basic controller

Central processing units  
Standard CPUs

### CPU 1211C

#### Overview



- The clever compact solution
- With 10 integral input/outputs
- Expandable by:
  - 1 signal board (SB) or communication board (CB)
  - Max. 3 communication modules (CM)

#### Technical specifications

Article number	6ES7211-1BE40-0XB0	6ES7211-1AE40-0XB0	6ES7211-1HE40-0XB0
	CPU 1211C, AC/DC/RELAY, 6DI/4DO/2AI	CPU 1211C, DC/DC/DC, 6DI/4DO/2AI	CPU 1211C, DC/DC/RELAY, 6DI/4DO/2AI
<b>Product type designation</b>			
<b>General information</b>			
<b>Engineering with</b>			
• Programming package	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher
<b>Supply voltage</b>			
Rated value (DC)		Yes	Yes
• 24 V DC			
Rated value (AC)	Yes		
• 120 V AC	Yes		
• 230 V AC	Yes		
<b>Encoder supply</b>			
<b>24 V encoder supply</b>			
• 24 V		L+ minus 4 V DC min.	L+ minus 4 V DC min.
<b>Power losses</b>			
Power loss, typ.	10 W	8 W	8 W
<b>Memory</b>			
<b>Work memory</b>			
• Integrated	50 kbyte	50 kbyte	50 kbyte
<b>Load memory</b>			
• Integrated	1 Mbyte	1 Mbyte	1 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
<b>Backup</b>			
• without battery	Yes	Yes	Yes
<b>CPU processing times</b>			
for bit operations, typ.	0.085 µs; / instruction	0.085 µs; / instruction	0.085 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.5 µs; / instruction	2.5 µs; / instruction	2.5 µs; / instruction
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Number, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
<b>Process image</b>			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte

## Technical specifications (continued)

Article number	6ES7211-1BE40-0XB0 CPU 1211C, AC/DC/RELAY, 6DI/4DO/2AI	6ES7211-1AE40-0XB0 CPU 1211C, DC/DC/DC, 6DI/4DO/2AI	6ES7211-1HE40-0XB0 CPU 1211C, DC/DC/RELAY, 6DI/4DO/2AI
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time clock)	Yes	Yes	Yes
<b>Digital inputs</b>			
Number of digital inputs	6; Integrated	6; Integrated	6; Integrated
• of which, inputs usable for technological functions	3; HSC (High Speed Counting)	3; HSC (High Speed Counting)	3; HSC (High Speed Counting)
<b>Digital outputs</b>			
Number of digital outputs	4; Relays	4	4; Relays
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
<b>Analog inputs</b>			
Integrated channels (AI)	2; 0 to 10 V	2; 0 to 10 V	2; 0 to 10 V
<b>Input ranges</b>			
• Voltage	Yes	Yes	Yes
<b>1st interface</b>			
Interface type	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
<b>Functionality</b>			
• PROFINET IO Device	Yes	Yes	Yes
• PROFINET IO Controller	Yes	Yes	Yes
<b>Communication functions</b>			
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>Open IE communication</b>			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
<b>Web server</b>			
• supported	Yes	Yes	Yes
<b>Number of connections</b>			
• overall	16; dynamically	16; dynamically	16; dynamically
<b>Integrated Functions</b>			
Number of counters	3	3	3
Counter frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency meter	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		4	
Limit frequency (pulse)		100 kHz	
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
<b>Pollutant concentrations</b>			
- SO2 at RH < 60% without condensation	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
<b>Configuration</b>			
<b>programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
<b>Dimensions</b>			
Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weights</b>			
Weight, approx.	420 g	370 g	380 g

**SIMATIC S7-1200 basic controller**Central processing units  
Standard CPUs**CPU 1211C****Ordering data****Article No.****Article No.****CPU 1211C**

**Compact CPU, AC/DC/relay;**  
integral program/data memory  
50 KB, load memory 1 MB;  
wide-range power supply  
85 ... 264 V AC;  
Boolean execution times  
0.1 µs per operation;  
6 digital inputs,  
4 digital outputs (relays),  
2 analog inputs;  
expandable by up to  
3 communication modules and  
1 signal board/communication  
board;  
digital inputs can be used  
as HSC at 100 kHz

**6ES7211-1BE40-0XB0**

**Compact CPU, DC/DC/DC;**  
integrated program/data memory  
50 KB, load memory 1 MB;  
power supply 24 V DC;  
Boolean execution times  
0.1 µs per operation;  
6 digital inputs,  
4 digital outputs,  
2 analog inputs;  
expandable by up to  
3 communication modules and  
1 signal board/communication  
board;  
digital inputs can be used  
as HSC at 100 kHz,  
24 V DC digital outputs can be  
used as pulse outputs (PTO) or  
pulse-width modulated outputs  
(PWM) at 100 kHz

**6ES7211-1AE40-0XB0**

**Compact CPU, DC/DC/relay;**  
integrated program/data memory  
50 KB, load memory 1 MB;  
power supply 24 V DC;  
Boolean execution times  
0.1 µs per operation;  
6 digital inputs,  
4 digital outputs (relays),  
2 analog inputs;  
expandable by up to  
3 communication modules and  
1 signal board/communication  
board;  
digital inputs can be used  
as HSC at 100 kHz

**6ES7211-1HE40-0XB0****SB 1221 signal board**

4 inputs, 5 V DC, 200 kHz

**6ES7221-3AD30-0XB0**

4 inputs, 24 V DC, 200 kHz

**6ES7221-3BD30-0XB0****SB 1222 signal board**

4 outputs, 5 V DC, 0.1 A, 200 kHz

**6ES7222-1AD30-0XB0**

4 outputs, 24 V DC, 0.1 A, 200 kHz

**6ES7222-1BD30-0XB0****SB 1223 signal board**2 inputs, 24 V DC,  
IEC type 1 current sinking;  
2 x 24 V DC transistor outputs,  
0.5 A, 5 W;  
can be used as HSC  
at up to 30 kHz**6ES7223-0BD30-0XB0**2 inputs, 5 V DC, 200 kHz  
2 outputs 5 V DC, 0.1 A, 200 kHz**6ES7223-3AD30-0XB0**2 inputs, 24 V DC, 200 kHz  
2 outputs 24 V DC, 0.1 A, 200 kHz**6ES7223-3BD30-0XB0****SB 1231 signal board**1 analog input, ±10 V with 12 bits or  
0 ... 20 mA with 11 bits**6ES7231-4HA30-0XB0****Thermocouple signal board  
SB 1231**1 input +/- 80 mV, resolution 15 bits  
+ sign, thermocouples type J, K**6ES7231-5QA30-0XB0****RTD signal board SB 1231**1 input for resistance temperature  
sensors Pt 100, Pt 200, Pt 500,  
Pt 1000, resolution 15 bits + sign**6ES7231-5PA30-0XB0****SB 1232 signal board**1 analog output, ±10 V with 12 bits  
or 0 to 20 mA with 11 bits**6ES7232-4HA30-0XB0****Communication board  
CB 1241 RS 485**for point-to-point connection,  
with 1 RS 485 interface**6ES7241-1CH30-1XB0****Digital input simulator  
Simulator Module SIM 1274  
(optional)**8 input switches,  
for CPU 1211C / CPU 1212C**6ES7274-1XF30-0XA0****Analog input simulator  
Simulator Module SIM 1274  
(optional)**

2 potentiometers

**6ES7274-1XA30-0XA0**



Ordering data	Article No.	Article No.
<b>SIMATIC Memory Card (optional)</b>		<b>STEP 7 Professional / Basic V13 SP1</b>
4 MB	<b>6ES7954-8LC02-0AA0</b>	<i>Target system:</i> SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC
12 MB	<b>6ES7954-8LE02-0AA0</b>	<i>Requirement:</i> Windows 7 Professional SP1 (64-bit), Windows 7 Enterprise SP1 (64-bit), Windows 7 Ultimate SP1 (64-bit), Windows 8.1 (64-bit), Windows 8.1 Professional (64-bit), Windows 8.1 Enterprise (64-bit), Windows Server 2008 R2 StdE (full installation), Windows Server 2012 StdE (full installation)
24 MB	<b>6ES7954-8LF02-0AA0</b>	<i>Available in:</i> German, English, Chinese, Italian, French, Spanish
256 MB	<b>6ES7954-8LL02-0AA0</b>	STEP 7 Professional V13 SP1, floating license
2 GB	<b>6ES7954-8LP01-0AA0</b>	STEP 7 Professional V13 SP1, floating license, software download incl. license key <sup>1)</sup>
<b>Terminal block (spare part)</b>		Email address required for delivery
for CPU 1211C/1212C		STEP 7 Basic V13 SP1, floating license
For DI, with 14 screws, tin-plated; 4 units	<b>6ES7292-1AH30-0XA0</b>	STEP 7 Basic V13 SP1, floating license, software download incl. license key <sup>1)</sup>
For DO, with 8 screws, tin-plated; 4 units	<b>6ES7292-1AP30-0XA0</b>	Email address required for delivery
For AI, with 3 screws, tin-plated; 4 units	<b>6ES7292-1BC30-0XA0</b>	
<b>RJ45 cable grip</b>		
4 units per pack		
Single port	<b>6ES7290-3AA30-0XA0</b>	
<b>Front flap set (spare part)</b>		
for CPU 1211C/1212C	<b>6ES7291-1AA30-0XA0</b>	

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

## SIMATIC S7-1200 basic controller

Central processing units  
Standard CPUs

### CPU 1212C

#### Overview



- The superior compact solution
- With 14 integral input/outputs
- Expandable by:
  - 1 signal board (SB) or communication board (CB)
  - 2 signal modules (SM)
  - Max. 3 communication modules (CM)

#### Technical specifications

Article number	6ES7212-1BE40-0XB0	6ES7212-1AE40-0XB0	6ES7212-1HE40-0XB0
	CPU 1212C, AC/DC/RELAY, 8DI/6DO/2AI	CPU 1212C, DC/DC/DC, 8DI/6DO/2AI	CPU 1212C, DC/DC/RELAY, 8DI/6DO/2AI
<b>Product type designation</b>			
<b>General information</b>			
<b>Engineering with</b>			
• Programming package	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher
<b>Supply voltage</b>			
Rated value (DC)		Yes	Yes
• 24 V DC			
Rated value (AC)	Yes		
• 120 V AC	Yes		
• 230 V AC	Yes		
<b>Encoder supply</b>			
<b>24 V encoder supply</b>			
• 24 V		L+ minus 4 V DC min.	L+ minus 4 V DC min.
<b>Power losses</b>			
Power loss, typ.	11 W	9 W	9 W
<b>Memory</b>			
<b>Work memory</b>			
• Integrated	75 kbyte	75 kbyte	75 kbyte
<b>Load memory</b>			
• Integrated	1 Mbyte	1 Mbyte	1 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
<b>Backup</b>			
• without battery	Yes	Yes	Yes
<b>CPU processing times</b>			
for bit operations, typ.	0.085 µs; / instruction	0.085 µs; / instruction	0.085 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.5 µs; / instruction	2.5 µs; / instruction	2.5 µs; / instruction
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Number, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
<b>Process image</b>			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte

**Technical specifications (continued)**

Article number	<b>6ES7212-1BE40-0XB0</b> CPU 1212C, AC/DC/RELAY, 8DI/6DO/2AI	<b>6ES7212-1AE40-0XB0</b> CPU 1212C, DC/DC/DC, 8DI/6DO/2AI	<b>6ES7212-1HE40-0XB0</b> CPU 1212C, DC/DC/RELAY, 8DI/6DO/2AI
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time clock)	Yes	Yes	Yes
<b>Digital inputs</b>			
Number of digital inputs	8; Integrated	8; Integrated	8; Integrated
• of which, inputs usable for technological functions	4; HSC (High Speed Counting)	4; HSC (High Speed Counting)	4; HSC (High Speed Counting)
<b>Digital outputs</b>			
Number of digital outputs	6; Relays	6	6; Relays
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
<b>Analog inputs</b>			
Integrated channels (AI)	2; 0 to 10 V	2; 0 to 10 V	2; 0 to 10 V
<b>Input ranges</b>			
• Voltage	Yes	Yes	Yes
<b>1st interface</b>			
Interface type	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
<b>Functionality</b>			
• PROFINET IO Device	Yes	Yes	Yes
• PROFINET IO Controller	Yes	Yes	Yes
<b>Communication functions</b>			
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>Open IE communication</b>			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
<b>Web server</b>			
• supported	Yes	Yes	Yes
<b>Number of connections</b>			
• overall	16; dynamically	16; dynamically	16; dynamically
<b>Integrated Functions</b>			
Number of counters	4	4	4
Counter frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency meter	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		4	
Limit frequency (pulse)		100 kHz	
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-20 °C	-20 °C	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical
<b>Pollutant concentrations</b>			
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free

**SIMATIC S7-1200 basic controller**

Central processing units  
Standard CPUs

**CPU 1212C****Technical specifications (continued)**

Article number	<b>6ES7212-1BE40-0XB0</b> CPU 1212C, AC/DC/RELAY, 8DI/6DO/2AI	<b>6ES7212-1AE40-0XB0</b> CPU 1212C, DC/DC/DC, 8DI/6DO/2AI	<b>6ES7212-1HE40-0XB0</b> CPU 1212C, DC/DC/RELAY, 8DI/6DO/2AI
<b>Configuration</b>			
<b>programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
<b>Dimensions</b>			
Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weights</b>			
Weight, approx.	425 g	370 g	385 g

**Ordering data****Article No.****Article No.**

<b>CPU 1212C</b>		<b>SB 1221 signal board</b>	
<b>Compact CPU, AC/DC/relay;</b> integral program/data memory 75 KB, load memory 1 MB; wide-range power supply 85 ... 264 V AC; Boolean execution times 0.1 µs per operation; 8 digital inputs, 6 digital outputs (relays), 2 analog inputs; expandable by up to 3 communication modules, 2 signal modules and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz	<b>6ES7212-1BE40-0XB0</b>	4 inputs, 5 V DC, 200 kHz 4 inputs, 24 V DC, 200 kHz	<b>6ES7221-3AD30-0XB0</b> <b>6ES7221-3BD30-0XB0</b>
<b>Compact CPU, DC/DC/DC;</b> integrated program/data memory 75 KB, load memory 1 MB; power supply 24 V DC; Boolean execution times 0.1 µs per operation; 8 digital inputs, 6 digital outputs, 2 analog inputs; expandable by up to 3 communication modules, 2 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	<b>6ES7212-1AE40-0XB0</b>	<b>SB 1222 signal board</b> 4 outputs, 5 V DC, 0.1 A, 200 kHz 4 outputs, 24 V DC, 0.1 A, 200 kHz	<b>6ES7222-1AD30-0XB0</b> <b>6ES7222-1BD30-0XB0</b>
<b>Compact CPU, DC/DC/relay;</b> integrated program/data memory 75 KB, load memory 2 MB; power supply 24 V DC; Boolean execution times 0.1 µs per operation; 8 digital inputs, 6 digital outputs (relays), 1 analog inputs; expandable by up to 3 communication modules, 2 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz	<b>6ES7212-1HE40-0XB0</b>	<b>SB 1223 signal board</b> 2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	<b>6ES7223-0BD30-0XB0</b>
		2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	<b>6ES7223-3AD30-0XB0</b> <b>6ES7223-3BD30-0XB0</b>
		2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	
		<b>SB 1231 signal board</b> 1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	<b>6ES7231-4HA30-0XB0</b>
		<b>Thermocouple signal board SB 1231</b> 1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	<b>6ES7231-5QA30-0XB0</b>
		<b>RTD signal board SB 1231</b> 1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	<b>6ES7231-5PA30-0XB0</b>
		<b>SB 1232 signal board</b> 1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits	<b>6ES7232-4HA30-0XB0</b>
		<b>Communication board CB 1241 RS 485</b> for point-to-point connection, with 1 RS 485 interface	<b>6ES7241-1CH30-1XB0</b>

Ordering data	Article No.	Article No.
<b>Digital input simulator Simulator Module SIM 1274 (optional)</b> 8 input switches, for CPU 1211C / CPU 1211C	<b>6ES7274-1XF30-0XA0</b>	<b>STEP 7 Professional / Basic V13 SP1</b>  <b>Target system:</b> SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC <b>Requirement:</b> Windows 7 Professional SP1 (64-bit), Windows 7 Enterprise SP1 (64-bit), Windows 7 Ultimate SP1 (64-bit), Windows 8.1 (64-bit), Windows 8.1 Professional (64 bit), Windows 8.1 Enterprise (64-bit), Windows Server 2008 R2 StdE (full installation), Windows Server 2012 StdE (full installation) <b>Available in:</b> German, English, Chinese, Italian, French, Spanish  STEP 7 Professional V13 SP1, floating license  STEP 7 Professional V13 SP1, floating license, software download incl. license key <sup>1)</sup> Email address required for delivery  STEP 7 Basic V13 SP1, floating license  STEP 7 Basic V13 SP1, floating license, software download incl. license key <sup>1)</sup> Email address required for delivery
<b>Analog input simulator Simulator Module SIM 1274 (optional)</b> 2 potentiometers	<b>6ES7274-1XA30-0XA0</b>	
<b>SIMATIC Memory Card (optional)</b> 4 MB	<b>6ES7954-8LC02-0AA0</b>	
12 MB	<b>6ES7954-8LE02-0AA0</b>	
24 MB	<b>6ES7954-8LF02-0AA0</b>	
256 MB	<b>6ES7954-8LL02-0AA0</b>	
2 GB	<b>6ES7954-8LP01-0AA0</b>	
<b>Extension cable for two-tier configuration</b>  for connecting digital/analog signal modules; length 2 m	<b>6ES7290-6AA30-0XA0</b>	
<b>Starter box CPU 1212C AC/DC/relay</b>  Complete offer SIMATIC S7-1200, starter box, comprising: CPU 1212C AC/DC/relay, simulator, STEP 7 BASIC CD, manual CD, info material, in Systainer	<b>6ES7212-1BD34-4YB0</b>	
<b>Terminal block (spare part)</b>  for CPU 1211C/1212C  For DI, with 14 screws, tin-plated; 4 units	<b>6ES7292-1AH30-0XA0</b>	
For DO, with 8 screws, tin-plated; 4 units	<b>6ES7292-1AP30-0XA0</b>	
For AI, with 3 screws, tin-plated; 4 units	<b>6ES7292-1BC30-0XA0</b>	
<b>RJ45 cable grip</b>  4 units per pack Single port	<b>6ES7290-3AA30-0XA0</b>	
<b>Front flap set (spare part)</b>  for CPU 1211C/1212C	<b>6ES7291-1AA30-0XA0</b>	

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

## SIMATIC S7-1200 basic controller

Central processing units  
Standard CPUs

### CPU 1214C

#### Overview



- The compact high-performance CPU
- With 24 integral input/outputs
- Expandable by:
  - 1 signal board (SB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communication modules (CM)

#### Technical specifications

Article number	6ES7214-1BG40-0XB0	6ES7214-1AG40-0XB0	6ES7214-1HG40-0XB0
	CPU 1214C, AC/DC/RELAY, 14DI/10DO/2AI	CPU 1214C, DC/DC/DC, 14DI/10DO/2AI	CPU 1214C, DC/DC/RELAY, 14DI/10DO/2AI
<b>Product type designation</b>			
<b>General information</b>			
<b>Engineering with</b>			
• Programming package	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher
<b>Supply voltage</b>			
Rated value (DC)		Yes	Yes
• 24 V DC			
Rated value (AC)	Yes		
• 120 V AC	Yes		
• 230 V AC	Yes		
<b>Encoder supply</b>			
<b>24 V encoder supply</b>			
• 24 V		L+ minus 4 V DC min.	L+ minus 4 V DC min.
<b>Power losses</b>			
Power loss, typ.	14 W	12 W	12 W
<b>Memory</b>			
<b>Work memory</b>			
• Integrated	100 kbyte	100 kbyte	100 kbyte
<b>Load memory</b>			
• Integrated	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
<b>Backup</b>			
• without battery	Yes	Yes	Yes
<b>CPU processing times</b>			
for bit operations, typ.	0.085 µs; / instruction	0.085 µs; / instruction	0.085 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.5 µs; / instruction	2.5 µs; / instruction	2.5 µs; / instruction
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Number, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area

**Technical specifications (continued)**

Article number	<b>6ES7214-1BG40-0XB0</b> CPU 1214C, AC/DC/RELAY, 14DI/10DO/2AI	<b>6ES7214-1AG40-0XB0</b> CPU 1214C, DC/DC/DC, 14DI/10DO/2AI	<b>6ES7214-1HG40-0XB0</b> CPU 1214C, DC/DC/RELAY, 14DI/10DO/2AI
<b>Process image</b>			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time clock)	Yes	Yes	Yes
<b>Digital inputs</b>			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
• of which, inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
<b>Digital outputs</b>			
Number of digital outputs	10; Relays	10	10; Relays
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
<b>Analog inputs</b>			
Integrated channels (AI)	2; 0 to 10 V	2; 0 to 10 V	2; 0 to 10 V
<b>Input ranges</b>			
• Voltage	Yes	Yes	Yes
<b>1st interface</b>			
Interface type	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
<b>Functionality</b>			
• PROFINET IO Device	Yes	Yes	Yes
• PROFINET IO Controller	Yes	Yes	Yes
<b>Communication functions</b>			
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>Open IE communication</b>			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
<b>Web server</b>			
• supported	Yes	Yes	Yes
<b>Number of connections</b>			
• overall	16; dynamically	16; dynamically	16; dynamically
<b>Integrated Functions</b>			
Number of counters	6	6	6
Counter frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency meter	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		4	
Limit frequency (pulse)		100 kHz	
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-20 °C	-20 °C	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical
<b>Pollutant concentrations</b>			
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free



**SIMATIC S7-1200 basic controller**

Central processing units  
Standard CPUs

**CPU 1214C****Technical specifications (continued)**

Article number	<b>6ES7214-1BG40-0XB0</b> CPU 1214C, AC/DC/RELAY, 14DI/10DO/2AI	<b>6ES7214-1AG40-0XB0</b> CPU 1214C, DC/DC/DC, 14DI/10DO/2AI	<b>6ES7214-1HG40-0XB0</b> CPU 1214C, DC/DC/RELAY, 14DI/10DO/2AI
<b>Configuration</b>			
<b>programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
<b>Dimensions</b>			
Width	110 mm	110 mm	110 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weights</b>			
Weight, approx.	455 g	415 g	435 g

**Ordering data****Article No.****Article No.**

<b>CPU 1214C</b>		<b>SB 1221 signal board</b>	
<b>Compact CPU, AC/DC/relay;</b> integral program/data memory 100 KB, load memory 2 MB; wide-range power supply 85 ... 264 V AC; Boolean execution times 0.1 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs; expandable by up to 3 communication modules, 8 signal modules and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz	<b>6ES7214-1BG40-0XB0</b>	4 inputs, 5 V DC, 200 kHz 4 inputs, 24 V DC, 200 kHz	<b>6ES7221-3AD30-0XB0</b> <b>6ES7221-3BD30-0XB0</b>
<b>Compact CPU, DC/DC/DC;</b> integrated program/data memory 100 KB, load memory 2 MB; power supply 24 V DC; Boolean execution times 0.1 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs; expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	<b>6ES7214-1AG40-0XB0</b>	<b>SB 1222 signal board</b> 4 outputs, 5 V DC, 0.1 A, 200 kHz 4 outputs, 24 V DC, 0.1 A, 200 kHz	<b>6ES7222-1AD30-0XB0</b> <b>6ES7222-1BD30-0XB0</b>
<b>Compact CPU, DC/DC/relay;</b> integrated program/data memory 100 KB, load memory 2 MB; power supply 24 V DC; Boolean execution times 0.1 µs per operation; 14 digital inputs, 10 digital outputs (relay), 2 analog inputs; expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz	<b>6ES7214-1HG40-0XB0</b>	<b>SB 1223 signal board</b> 2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	<b>6ES7223-0BD30-0XB0</b>
		2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	<b>6ES7223-3AD30-0XB0</b>
		2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	<b>6ES7223-3BD30-0XB0</b>
		<b>SB 1231 signal board</b> 1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	<b>6ES7231-4HA30-0XB0</b>
		<b>Thermocouple signal board SB 1231</b> 1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	<b>6ES7231-5QA30-0XB0</b>
		<b>RTD signal board SB 1231</b> 1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	<b>6ES7231-5PA30-0XB0</b>
		<b>SB 1232 signal board</b> 1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits	<b>6ES7232-4HA30-0XB0</b>
		<b>Communication board CB 1241 RS 485</b> for point-to-point connection, with 1 RS 485 interface	<b>6ES7241-1CH30-1XB0</b>

Ordering data	Article No.	Article No.
<b>Digital input simulator Simulator Module SIM 1274 (optional)</b> 14 input switches, for CPU 1214C / CPU 1215C	<b>6ES7274-1XH30-0XA0</b>	<b>STEP 7 Professional / Basic V13 SP1</b> Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Professional SP1 (64-bit), Windows 7 Enterprise SP1 (64-bit), Windows 7 Ultimate SP1 (64-bit), Windows 8.1 (64-bit), Windows 8.1 Professional (64-bit), Windows 8.1 Enterprise (64-bit), Windows Server 2008 R2 StdE (full installation), Windows Server 2012 StdE (full installation) Available in: German, English, Chinese, Italian, French, Spanish  STEP 7 Professional V13 SP1, floating license  STEP 7 Professional V13 SP1, floating license, software download incl. license key <sup>1)</sup> Email address required for delivery  STEP 7 Basic V13 SP1, floating license  STEP 7 Basic V13 SP1, floating license, software download incl. license key <sup>1)</sup> Email address required for delivery
<b>Analog input simulator Simulator Module SIM 1274 (optional)</b> 2 potentiometers	<b>6ES7274-1XA30-0XA0</b>	
<b>SIMATIC Memory Card (optional)</b> 4 MB	<b>6ES7954-8LC02-0AA0</b>	
12 MB	<b>6ES7954-8LE02-0AA0</b>	
24 MB	<b>6ES7954-8LF02-0AA0</b>	
256 MB	<b>6ES7954-8LL02-0AA0</b>	
2 GB	<b>6ES7954-8LP01-0AA0</b>	
<b>Extension cable for two-tier configuration</b> for connecting digital/analog signal modules; length 2 m	<b>6ES7290-6AA30-0XA0</b>	
<b>Terminal block (spare part)</b> for CPU 1214C For DI, with 20 screws, tin-plated; 4 units	<b>6ES7292-1AV30-0XA0</b>	
For DO, with 12 screws, tin-plated; 4 units	<b>6ES7292-1AM30-0XA0</b>	
For AI, with 3 screws, tin-plated; 4 units	<b>6ES7292-1BC30-0XA0</b>	
<b>RJ45 cable grip</b> 4 items per pack Single port	<b>6ES7290-3AA30-0XA0</b>	
<b>Front flap set (spare part)</b> for CPU 1214C	<b>6ES7291-1AB30-0XA0</b>	

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

## SIMATIC S7-1200 basic controller

Central processing units  
Standard CPUs

### CPU 1215C

#### Overview



- The compact high-performance CPU
- With 24 integral input/outputs
- Expandable by:
  - 1 signal board (SB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communication modules (CM)

#### Technical specifications

Article number	6ES7215-1BG40-0XB0	6ES7215-1AG40-0XB0	6ES7215-1HG40-0XB0
	CPU 1215C, AC/DC/RLY, 14DI/10DO/2AI/2AO	CPU 1215C, DC/DC/DC, 14DI/10DO/2AI/2AO	CPU 1215C, DC/DC/RLY, 14DI/10DO/2AI/2AO
<b>Product type designation</b>			
<b>General information</b>			
<b>Engineering with</b>			
• Programming package	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher
<b>Supply voltage</b>			
Rated value (DC)		Yes	Yes
• 24 V DC			
Rated value (AC)	Yes		
• 120 V AC	Yes		
• 230 V AC	Yes		
<b>Encoder supply</b>			
<b>24 V encoder supply</b>			
• 24 V		L+ minus 4 V DC min.	L+ minus 4 V DC min.
<b>Power losses</b>			
Power loss, typ.	12 W	12 W	12 W
<b>Memory</b>			
<b>Work memory</b>			
• Integrated	125 kbyte	125 kbyte	125 kbyte
<b>Load memory</b>			
• Integrated	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
<b>Backup</b>			
• without battery	Yes	Yes	Yes
<b>CPU processing times</b>			
for bit operations, typ.	0.085 µs; / instruction	0.085 µs; / instruction	0.085 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.5 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.5 µs; / instruction	2.5 µs; / instruction	2.5 µs; / instruction
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Number, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area

## Technical specifications (continued)

Article number	6ES7215-1BG40-0XB0 CPU 1215C, AC/DC/RLY, 14DI/10DO/2AI/2AO	6ES7215-1AG40-0XB0 CPU 1215C, DC/DC/DC, 14DI/10DO/2AI/2AO	6ES7215-1HG40-0XB0 CPU 1215C, DC/DC/RLY, 14DI/10DO/2AI/2AO
<b>Process image</b>			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time clock)	Yes	Yes	Yes
<b>Digital inputs</b>			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
• of which, inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
<b>Digital outputs</b>			
Number of digital outputs	10; Relays	10	10; Relays
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
<b>Analog inputs</b>			
Integrated channels (AI)	2; 0 to 10 V	2	2; 0 to 10 V
<b>Input ranges</b>			
• Voltage	Yes	Yes	Yes
<b>Analog outputs</b>			
Integrated channels (AO)	2; 0 to 20 mA	2; 0 to 20 mA	2; 0 to 20 mA
<b>Output ranges, voltage</b>			
• 0 to 10 V		Yes	
<b>Output ranges, current</b>			
• 0 to 20 mA	Yes	Yes	Yes
<b>1st interface</b>			
Interface type	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
<b>Functionality</b>			
• PROFINET IO Device	Yes	Yes	Yes
• PROFINET IO Controller	Yes	Yes	Yes
<b>Communication functions</b>			
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>Open IE communication</b>			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
<b>Web server</b>			
• supported	Yes	Yes	Yes
<b>Number of connections</b>			
• overall	16; dynamically	16; dynamically	16; dynamically
<b>Integrated Functions</b>			
Number of counters	6	6	6
Counter frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency meter	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		4	
Limit frequency (pulse)		100 kHz	
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-20 °C	-20 °C	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical
<b>Pollutant concentrations</b>			
- SO2 at RH < 60% without condensation	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free

**SIMATIC S7-1200 basic controller**

Central processing units

Standard CPUs

**CPU 1215C****Technical specifications** (continued)

Article number	<b>6ES7215-1BG40-0XB0</b> CPU 1215C, AC/DC/RLY, 14DI/10DO/2AI/2AO	<b>6ES7215-1AG40-0XB0</b> CPU 1215C, DC/DC/DC, 14DI/10DO/2AI/2AO	<b>6ES7215-1HG40-0XB0</b> CPU 1215C, DC/DC/RLY, 14DI/10DO/2AI/2AO
<b>Configuration</b>			
<b>programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
<b>Dimensions</b>			
Width	130 mm	130 mm	130 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weights</b>			
Weight, approx.	550 g	500 g	585 g

**Ordering data****Article No.****Article No.****CPU 1215C**

**Compact CPU, AC/DC/relay;**  
integrated program/data memory  
125 KB, load memory 4 MB;  
wide-range power supply  
85 ... 264 V AC;  
Boolean execution times  
0.085 µs per operation;  
14 digital inputs,  
10 digital outputs (relays),  
2 analog inputs,  
2 analog outputs;  
expandable by up to  
3 communication modules,  
8 signal modules and 1 signal  
board/communication board;  
digital inputs can be used  
as HSC at 100 kHz

**6ES7215-1BG40-0XB0**

**Compact CPU, DC/DC/DC;**  
integrated program/data memory  
125 KB, load memory 4 MB;  
power supply 24 V DC;  
Boolean execution times  
0.085 µs per operation;  
14 digital inputs,  
10 digital outputs,  
2 analog inputs,  
2 analog outputs;  
expandable by up to  
3 communication modules,  
8 signal modules, and 1 signal  
board/communication board;  
digital inputs can be used  
as HSC at 100 kHz,  
24 V DC digital outputs can be  
used as pulse outputs (PTO) or  
pulse-width modulated outputs  
(PWM) at 100 kHz

**6ES7215-1AG40-0XB0**

**Compact CPU, DC/DC/relay;**  
integrated program/data memory  
125 KB, load memory 4 MB;  
power supply 24 V DC;  
Boolean execution times  
0.085 µs per operation;  
14 digital inputs,  
10 digital outputs (relays),  
2 analog inputs,  
2 analog outputs;  
expandable by up to  
3 communication modules,  
8 signal modules, and 1 signal  
board/communication board;  
digital inputs can be used  
as HSC at 100 kHz

**6ES7215-1HG40-0XB0****SB 1221 signal board**

4 inputs, 5 V DC, 200 kHz  
4 inputs, 24 V DC, 200 kHz

**6ES7221-3AD30-0XB0****6ES7221-3BD30-0XB0****SB 1222 signal board**

4 outputs, 5 V DC, 0.1 A, 200 kHz  
4 outputs, 24 V DC, 0.1 A, 200 kHz

**6ES7222-1AD30-0XB0****6ES7222-1BD30-0XB0****SB 1223 signal board**

2 inputs, 24 V DC,  
IEC type 1 current sinking;  
2 x 24 V DC transistor outputs,  
0.5 A, 5 W;  
can be used as HSC  
at up to 30 kHz

**6ES7223-0BD30-0XB0**

2 inputs, 5 V DC, 200 kHz  
2 outputs 5 V DC, 0.1 A, 200 kHz  
2 inputs, 24 V DC, 200 kHz  
2 outputs 24 V DC, 0.1 A, 200 kHz

**6ES7223-3AD30-0XB0****6ES7223-3BD30-0XB0****SB 1231 signal board**

1 analog input, ±10 V with 12 bits or  
0 ... 20 mA with 11 bits

**6ES7231-4HA30-0XB0****Thermocouple signal board  
SB 1231**

1 input +/- 80 mV, resolution 15 bits  
+ sign, thermocouples type J, K

**6ES7231-5QA30-0XB0****RTD signal board SB 1231**

1 input for resistance temperature  
sensors Pt 100, Pt 200, Pt 500,  
Pt 1000, resolution 15 bits + sign

**6ES7231-5PA30-0XB0****SB 1232 signal board**

1 analog output, ±10 V with 12 bits  
or 0 to 20 mA with 11 bits

**6ES7232-4HA30-0XB0****Communication board  
CB 1241 RS 485**

for point-to-point connection,  
with 1 RS 485 interface

**6ES7241-1CH30-1XB0****BB 1297 battery board**

for long-term backup of real-time  
clock; can be plugged into the signal  
board slot of an S7-1200 CPU in  
FW version 3.0 or higher;  
battery (CR 1025) is not included

**6ES7297-0AX30-0XA0**

Ordering data	Article No.	Article No.
<b>Digital input simulator Simulator Module SIM 1274 (optional)</b> 14 input switches, for CPU 1214C / CPU 1215C	<b>6ES7274-1XH30-0XA0</b>	<b>STEP 7 Professional / Basic V13 SP1</b>  <b>Target system:</b> SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC <b>Requirement:</b> Windows 7 Professional SP1 (64-bit), Windows 7 Enterprise SP1 (64-bit), Windows 7 Ultimate SP1 (64-bit), Windows 8.1 (64-bit), Windows 8.1 Professional (64-bit), Windows 8.1 Enterprise (64-bit), Windows Server 2008 R2 StdE (full installation), Windows Server 2012 StdE (full installation) <b>Available in:</b> German, English, Chinese, Italian, French, Spanish  STEP 7 Professional V13 SP1, floating license  STEP 7 Professional V13 SP1, floating license, software download incl. license key <sup>1)</sup> Email address required for delivery  STEP 7 Basic V13 SP1, floating license  STEP 7 Basic V13 SP1, floating license, software download incl. license key <sup>1)</sup> Email address required for delivery
<b>Analog input simulator Simulator Module SIM 1274 (optional)</b> 2 potentiometers	<b>6ES7274-1XA30-0XA0</b>	
<b>SIMATIC Memory Card (optional)</b> 4 MB	<b>6ES7954-8LC02-0AA0</b>	
12 MB	<b>6ES7954-8LE02-0AA0</b>	
24 MB	<b>6ES7954-8LF02-0AA0</b>	
256 MB	<b>6ES7954-8LL02-0AA0</b>	
2 GB	<b>6ES7954-8LP01-0AA0</b>	
<b>Extension cable for two-tier configuration</b> for connecting digital/analog signal modules; length 2 m	<b>6ES7290-6AA30-0XA0</b>	
<b>Terminal block (spare part)</b> for CPU 1215C For DI, with 20 screws, tin-plated; 4 units	<b>6ES7292-1AV30-0XA0</b>	
For DO, with 12 screws, tin-plated; 4 units	<b>6ES7292-1AM30-0XA0</b>	
For analog units, with 6 screws, gold-plated; 4 units	<b>6ES7292-1BF30-0XB0</b>	
<b>Front flap set (spare part)</b> for CPU 1215C	<b>6ES7291-1AC30-0XA0</b>	
<b>RJ45 cable grip</b> 4 items per pack Single port	<b>6ES7290-3AA30-0XA0</b>	
Dual port	<b>6ES7290-3AB30-0XA0</b>	

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

## SIMATIC S7-1200 basic controller

Central processing units  
Standard CPUs

### CPU 1217C

#### Overview



- The compact high-performance CPU
- With 24 integrated I/Os
- Expandable by:
  - 1 Signal Board (SB) or Communication Board (CB)
  - 8 signal modules (SM)
  - Max. 3 communication modules (CM)

#### Technical specifications

Article number	<b>6ES7217-1AG40-0XB0</b> CPU 1217C, DC/DC/DC, 14DI/10DQ/2AI/2AQ
<b>Product type designation</b>	
<b>General information</b>	
<b>Engineering with</b>	
• Programming package	STEP 7 V13 SP1 or higher
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
<b>Encoder supply</b>	
<b>24 V encoder supply</b>	
• 24 V	L+ minus 4 V DC min.
<b>Power losses</b>	
Power loss, typ.	12 W
<b>Memory</b>	
<b>Work memory</b>	
• Integrated	150 kbyte
<b>Load memory</b>	
• Integrated	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card
<b>Backup</b>	
• without battery	Yes
<b>CPU processing times</b>	
for bit operations, typ.	0.085 µs; / Operation
for word operations, typ.	1.5 µs; / Operation
for floating point arithmetic, typ.	2.5 µs; / Operation
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Number, max.	8 kbyte; Size of bit memory address area
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	1 024 byte
• Outputs	1 024 byte

Article number	<b>6ES7217-1AG40-0XB0</b> CPU 1217C, DC/DC/DC, 14DI/10DQ/2AI/2AQ
<b>Process image</b>	
• Inputs, adjustable	1 kbyte
• Outputs, adjustable	1 kbyte
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time clock)	Yes
<b>Digital inputs</b>	
Number of digital inputs	14; Integrated
• of which, inputs usable for technological functions	6; HSC (High Speed Counting)
<b>Digital outputs</b>	
Number of digital outputs	10
• of which high-speed outputs	4; 100 kHz Pulse Train Output
<b>Analog inputs</b>	
Integrated channels (AI)	2; 0 to 10 V
<b>Input ranges</b>	
• Voltage	Yes
<b>Analog outputs</b>	
Integrated channels (AO)	2; 0 to 20 mA
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
<b>1st interface</b>	
Interface type	PROFINET
Physics	Ethernet
<b>Functionality</b>	
• PROFINET IO Device	Yes
• PROFINET IO Controller	Yes
<b>Communication functions</b>	
<b>S7 communication</b>	
• supported	Yes
<b>Open IE communication</b>	
• TCP/IP	Yes
• ISO-on-TCP (RFC1006)	Yes
• UDP	Yes



Technical specifications (continued)		Ordering data	Article No.	
Article number	<b>6ES7217-1AG40-0XB0</b> CPU 1217C, DC/DC/DC, 14DI/10DQ/2AI/2AQ	<b>CPU 1217C</b>	<b>6ES7217-1AG40-0XB0</b>	
<b>Web server</b> • supported	Yes	<b>Compact CPU, DC/DC/DC;</b> integrated program/data memory 125 KB, load memory 4 MB; power supply 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs (10 digital 24 V DC inputs, 4 digital 1.5 V DC differential inputs), 10 digital outputs (6 digital 24 V DC outputs, 4 digital 1.5 V DC differential outputs), 2 analog inputs, 2 analog outputs; expandable by up to 3 communication modules, 8 signal modules, and 1 Signal Board/Communication Board; digital inputs can be used as HSC at 1 MHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz		
<b>Number of connections</b> • overall	16; dynamically	<b>SB 1221 signal board</b> 4 inputs, 5 V DC, 200 kHz 4 inputs, 24 V DC, 200 kHz		<b>6ES7221-3AD30-0XB0</b> <b>6ES7221-3BD30-0XB0</b>
<b>Integrated Functions</b>		<b>SB 1222 signal board</b> 4 outputs, 5 V DC, 0.1 A, 200 kHz 4 outputs, 24 V DC, 0.1 A, 200 kHz		<b>6ES7222-1AD30-0XB0</b> <b>6ES7222-1BD30-0XB0</b>
Number of counters	6	<b>SB 1223 signal board</b> 2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz		<b>6ES7223-0BD30-0XB0</b>
Counter frequency (counter) max.	1 MHz	2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz		<b>6ES7223-3AD30-0XB0</b>
Frequency meter	Yes	2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz		<b>6ES7223-3BD30-0XB0</b>
controlled positioning	Yes	<b>SB 1231 signal board</b> 1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits		<b>6ES7231-4HA30-0XB0</b>
PID controller	Yes	<b>Thermocouple signal board SB 1231</b> 1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K		<b>6ES7231-5QA30-0XB0</b>
Number of alarm inputs	4	<b>RTD signal board SB 1231</b> 1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign		<b>6ES7231-5PA30-0XB0</b>
Number of pulse outputs	4	<b>SB 1232 signal board</b> 1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits		<b>6ES7232-4HA30-0XB0</b>
Limit frequency (pulse)	1 MHz			
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b> • Min. • max.	-20 °C 60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical			
<b>Pollutant concentrations</b> - SO2 at RH < 60% without condensation	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free			
<b>Configuration</b>				
<b>programming</b>				
<b>Programming language</b> - LAD - FBD - SCL	Yes Yes Yes			
<b>Dimensions</b>				
Width	150 mm			
Height	100 mm			
Depth	75 mm			
<b>Weights</b>				
Weight, approx.	500 g			

**SIMATIC S7-1200 basic controller**

Central processing units  
Standard CPUs

**CPU 1217C**

Ordering data	Article No.	Ordering data	Article No.
<b>Communication board CB 1241 RS 485</b> for point-to-point connection, with 1 RS 485 interface	<b>6ES7241-1CH30-1XB0</b>	<b>RJ45 cable grip</b> 4 items per pack Dual port	<b>6ES7290-3AB30-0XA0</b>
<b>BB 1297 battery board</b> for long-term backup of real-time clock; can be plugged into the signal board slot of an S7-1200 CPU in FW version 3.0 or higher; battery (CR 1025) is not included	<b>6ES7297-0AX30-0XA0</b>	<b>STEP 7 Professional / Basic V13 SP1</b> Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Professional SP1 (64-bit), Windows 7 Enterprise SP1 (64-bit), Windows 7 Ultimate SP1 (64-bit), Windows 8.1 (64-bit), Windows 8.1 Professional (64-bit), Windows 8.1 Enterprise (64-bit), Windows Server 2008 R2 StdE (full installation), Windows Server 2012 StdE (full installation) Available in: German, English, Chinese, Italian, French, Spanish	
<b>Digital input simulator Simulator Module SIM 1274 (optional)</b> 14 input switches, for CPU 1217C	<b>6ES7274-1XH30-0XA0</b>	STEP 7 Professional V13 SP1, floating license	<b>6ES7822-1AA03-0YA5</b>
<b>Analog input simulator Simulator Module SIM 1274 (optional)</b> 2 potentiometers	<b>6ES7274-1XA30-0XA0</b>	STEP 7 Professional V13 SP1, floating license, software download incl. license key <sup>1)</sup>	<b>6ES7822-1AE03-0YA5</b>
<b>SIMATIC Memory Card (optional)</b> 4 MB 12 MB 24 MB 256 MB 2 GB	<b>6ES7954-8LC02-0AA0</b> <b>6ES7954-8LE02-0AA0</b> <b>6ES7954-8LF02-0AA0</b> <b>6ES7954-8LL02-0AA0</b> <b>6ES7954-8LP01-0AA0</b>	Email address required for delivery STEP 7 Basic V13 SP1, floating license	<b>6ES7822-0AA03-0YA5</b>
<b>Extension cable for two-tier configuration</b> for connecting digital/analog signal modules; length 2 m	<b>6ES7290-6AA30-0XA0</b>	STEP 7 Basic V13 SP1, floating license, software download incl. license key <sup>1)</sup> Email address required for delivery	<b>6ES7822-0AE03-0YA5</b>
<b>Terminal block (spare part)</b> for CPU 1217C for DI, with 10 screws, tin-plated; 4 units for DI, with 10 screws, tin-plated; 4 units for DO, with 18 screws, tin-plated; 4 units For analog units, with 6 screws, gold-plated; 4 units	<b>6ES7292-1AK30-0XA0</b> <b>6ES7292-1AR30-0XA0</b> <b>6ES7292-1AT30-0XA0</b> <b>6ES7292-1BF30-0XB0</b>		

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

**Overview**

- The clever compact solution
- With 10 integrated I/Os
- Expandable with:
  - 1 signal board (SB) or communication board (CB); not possible with: 6AG1211-1AE31-2XB0, 6AG1211-1BE31-2XB0, 6AG1211-1HE31-2XB0
  - Max. 3 communication modules (CM)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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**Technical specifications**

Article number	<b>6AG1211-1AE31-4XB0</b>	<b>6AG1211-1AE31-2XB0</b>
Based on	<b>6ES7211-1AE31-0XB0</b> SIPLUS S7-1200 CPU1211 DC/DC/DC	<b>6ES7211-1AE31-0XB0</b> SIPLUS S7-1200 CPU1211 DC/DC/DC
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0 °C	-25 °C
<b>Relative humidity</b>		
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-1200 basic controller**Central processing units  
SIPLUS Standard CPUs**SIPLUS CPU 1211C****Technical specifications (continued)**

Article number	<b>6AG1211-1BE31-4XB0</b>	<b>6AG1211-1BE31-2XB0</b>
Based on	<b>6ES7211-1BE31-0XB0</b> SIPLUS S7-1200 CPU1211 AC/DC/RLY	<b>6ES7211-1BE31-0XB0</b> SIPLUS S7-1200 CPU1211 AC/DC/RLY
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0 °C	-25 °C
<b>Relative humidity</b>		
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
<hr/>		
Article number	<b>6AG1211-1HE31-4XB0</b>	<b>6AG1211-1HE31-2XB0</b>
Based on	<b>6ES7211-1HE31-0XB0</b> SIPLUS S7-1200 CPU1211 DC/DC/RLY	<b>6ES7211-1HE31-0XB0</b> SIPLUS S7-1200 CPU1211 DC/DC/RLY
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0 °C	-25 °C
<b>Relative humidity</b>		
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data	Article No.	Ordering data	Article No.
<p><b>SIPLUS CPU 1211C compact CPU, AC/DC/relay</b></p> <p>(Extended temperature range and medial exposure)</p> <p>Integrated program and data memory of 25 KB, load memory of 1 MB Wide-range alternating voltage supply 85 ... 264 V AC Boolean execution times of 0.1 ms per operation 6 digital inputs, 4 digital outputs (relay), 2 analog inputs Expandable with up to 3 communication modules and 1 signal board/communication board Digital inputs usable as HSC with 100 kHz</p> <ul style="list-style-type: none"> <li>for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C</li> <li>for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C</li> </ul>	<p><b>6AG1211-1BE31-4XB0</b></p> <p><b>6AG1211-1BE31-2XB0</b></p>	<p><b>SIPLUS CPU 1211C compact CPU, DC/DC/relay</b></p> <p>(Extended temperature range and medial exposure)</p> <p>Integrated program and data memory of 25 KB, load memory of 1 MB Power supply 24 V DC Boolean execution times of 0.1 ms per operation 6 digital inputs, 4 digital outputs (relay), 2 analog inputs Expandable with up to 3 communication modules and 1 signal board/communication board Digital inputs usable as HSC with 100 kHz</p> <ul style="list-style-type: none"> <li>for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C</li> <li>for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C</li> </ul>	<p><b>6AG1211-1HE31-4XB0</b></p> <p><b>6AG1211-1HE31-2XB0</b></p>
<p><b>SIPLUS CPU 1211C compact CPU, DC/DC/DC</b></p> <p>(Extended temperature range and medial exposure)</p> <p>Integrated program and data memory of 25 KB, load memory of 1 MB Power supply 24 V DC Boolean execution times of 0.1 ms per operation 6 digital inputs, 4 digital outputs, 2 analog inputs Expandable with up to 3 communication modules and 1 signal board/communication board Digital inputs usable as HSC with 100 kHz, 24 V DC digital outputs usable as pulse outputs (PTO) or pulse-width-modulated outputs (PWM) with 100 kHz</p> <ul style="list-style-type: none"> <li>for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C</li> <li>for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C</li> </ul>	<p><b>6AG1211-1AE31-4XB0</b></p> <p><b>6AG1211-1AE31-2XB0</b></p>	<p><b>Accessories</b></p> <p><b>Digital input/output SIPLUS signal board SB 1223</b></p> <p>(Extended temperature range and medial exposure)</p> <p>2 inputs, 24 V DC, IEC type 1 current sinking 2 transistor outputs 24 V DC, 0.5 A, 5 W Can be used as HSC at up to 30 kHz</p> <ul style="list-style-type: none"> <li>Suitable for areas with extraordinary medial exposure (conformal coating)</li> <li>Ambient temperature -25 ... +55 °C</li> </ul>	<p><b>6AG1223-0BD30-4XB0</b></p> <p><b>6AG1223-0BD30-5XB0</b></p>
		<p><b>SIPLUS SB 1232 analog output signal board</b></p> <p>(Extended temperature range and medial exposure)</p> <p><u>Ambient temperature range</u> -25 ... +55 °C</p> <p>1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits</p> <p><u>Ambient temperature range</u> 0 ... +55 °C</p> <p>1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits</p>	<p><b>6AG1232-4HA30-5XB0</b></p> <p><b>6AG1232-4HA30-4XB0</b></p>
		<p><b>Communication Board SIPLUS CB 1241 RS 485</b></p> <p>(extended temperature range and exposure to media)</p> <p>for point-to-point connection, with 1 RS 485 interface</p>	<p><b>6AG1241-1CH30-5XB1</b></p>
		<p><b>Additional accessories</b></p>	<p>See SIMATIC S7-1200 CPU 1211C, page 3/6</p>

## SIMATIC S7-1200 basic controller

Central processing units  
SIPLUS Standard CPUs

### SIPLUS CPU 1212C

#### Overview



- The superior compact solution
- With 14 integral input/outputs
- Expandable with:
  - 1 signal board (SB) or communication board (CB); not possible with: 6AG1212-1AE31-2XB0, 6AG1212-1BE31-2XB0, 6AG1212-1HE31-2XB0
  - 2 signal modules (SM)
  - Max. 3 communication modules (CM)

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Technical specifications

Article number	6AG1212-1AE31-4XB0	6AG1212-1AE31-2XB0
Based on	6ES7212-1AE31-0XB0 SIPLUS S7-1200 CPU1212 DC/DC/DC	6ES7212-1AE31-0XB0 SIPLUS S7-1200 CPU1212 DC/DC/DC
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0 °C	-25 °C
<b>Relative humidity</b>		
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!



**Technical specifications (continued)**

Article number	<b>6AG1212-1BE31-4XB0</b>	<b>6AG1212-1BE31-2XB0</b>
Based on	<b>6ES7212-1BE31-0XB0</b> SIPLUS S7-1200 CPU1212 AC/DC/RLY	<b>6ES7212-1BE31-0XB0</b> SIPLUS S7-1200 CPU1212 AC/DC/RLY
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0 °C	-25 °C
<b>Relative humidity</b>		
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
<hr/>		
Article number	<b>6AG1212-1HE31-4XB0</b>	<b>6AG1212-1HE31-2XB0</b>
Based on	<b>6ES7212-1HE31-0XB0</b> SIPLUS S7-1200 CPU1212 DC/DC/RLY	<b>6ES7212-1HE31-0XB0</b> SIPLUS S7-1200 CPU1212 DC/DC/RLY
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0 °C	-25 °C
<b>Relative humidity</b>		
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!



**SIMATIC S7-1200 basic controller**

Central processing units  
SIPLUS Standard CPUs

**SIPLUS CPU 1212C****Ordering data****Article No.****Article No.****SIPLUS CPU 1212C  
compact CPU, AC/DC/relay**

(Extended temperature range and medial exposure)

Integrated program and data memory of 25 KB, load memory of 1 MB  
Wide-range alternating voltage supply 85 ... 264 V AC  
Boolean execution times of 0.1 ms per operation  
8 digital inputs,  
6 digital outputs (relay),  
2 analog inputs  
Expandable with up to  
3 communication modules,  
2 signal modules, and 1 signal board/communication board  
Digital inputs usable as HSC with 100 kHz

- for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C
- For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C

**6AG1212-1BE31-4XB0****6AG1212-1BE31-2XB0****SIPLUS CPU 1212C  
compact CPU, DC/DC/DC**

(Extended temperature range and medial exposure)

Integrated program and data memory of 25 KB, load memory of 1 MB  
Power supply 24 V DC  
Boolean execution times of 0.1 ms per operation  
8 digital inputs,  
6 digital outputs,  
2 analog inputs  
Expandable with up to  
3 communication modules,  
2 signal modules and 1 signal board/communication board  
Digital inputs usable as HSC with 100 kHz, 24 V DC digital outputs usable as pulse outputs (PTO) or pulse-width-modulated outputs (PWM) with 100 kHz

- for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C

**6AG1212-1AE31-4XB0****6AG1212-1AE31-2XB0****SIPLUS CPU 1212C  
compact CPU, DC/DC/relay**

(Extended temperature range and medial exposure)

Integrated program and data memory of 25 KB, load memory of 1 MB  
Power supply 24 V DC  
Boolean execution times of 0.1 ms per operation  
8 digital inputs,  
6 digital outputs (relay),  
2 analog inputs  
Expandable with up to  
3 communication modules,  
2 signal modules and 1 signal board/communication board  
Digital inputs usable as HSC with 100 kHz

- for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C

**6AG1212-1HE31-4XB0****6AG1212-1HE31-2XB0****Accessories****Digital input/output  
SIPLUS signal board SB 1223**

(Extended temperature range and medial exposure)

2 inputs, 24 V DC,  
IEC type 1 current sinking  
2 transistor outputs 24 V DC, 0.5 A, 5 W  
Can be used as HSC at up to 30 kHz

- Suitable for areas with extraordinary medial exposure (conformal coating)
- Ambient temperature -25 ... +55 °C

**6AG1223-0BD30-4XB0****6AG1223-0BD30-5XB0****SIPLUS SB 1232 analog output  
signal board**

(Extended temperature range and medial exposure)

Ambient temperature range  
-25 ... +55 °C

1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits

**6AG1232-4HA30-5XB0**

Ambient temperature range  
0 ... +55 °C

1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits

**6AG1232-4HA30-4XB0****Communication Board  
SIPLUS CB 1241 RS 485**

(Extended temperature range and exposure to media)

for point-to-point connection, with 1 RS 485 interface

**6AG1241-1CH30-5XB1****Additional accessories**

See SIMATIC S7-1200 CPU 1212C, page 3/10

**Overview**

- The compact high-performance CPU
- With 24 integrated I/Os
- Expandable with:
  - 1 signal board (SB) or communication board (CB); not possible with: 6AG1214-1AG31-2XB0, 6AG1214-1BG31-2XB0, 6AG1214-1HG31-2XB0
  - 8 signal modules (SM)
  - Max. 3 communication modules (CM)

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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**Technical specifications**

Article number	6AG1214-1AG31-4XB0	6AG1214-1AG31-5XB0	6AG1214-1AG31-2XB0
Based on	6ES7214-1AG31-0XB0	6ES7214-1AG31-0XB0	6ES7214-1AG31-0XB0
	SIPLUS S7-1200 CPU1214 DC/DC/DC	SIPLUS S7-1200 CPU1214 DC/DC/DC	SIPLUS S7-1200 CPU1214 DC/DC/DC
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0 °C	-25 °C	-25 °C
<b>Relative humidity</b>			
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-1200 basic controller**Central processing units  
SIPLUS Standard CPUs**SIPLUS CPU 1214C****Technical specifications (continued)**

Article number	<b>6AG1214-1BG31-4XB0</b>	<b>6AG1214-1BG31-5XB0</b>	<b>6AG1214-1BG31-2XB0</b>
Based on	<b>6ES7214-1BG31-0XB0</b>	<b>6ES7214-1BG31-0XB0</b>	<b>6ES7214-1BG31-0XB0</b>
	SIPLUS S7-1200 CPU1214 AC/DC/RLY	SIPLUS S7-1200 CPU1214 AC/DC/RLY	SIPLUS S7-1200 CPU1214 AC/DC/RLY
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	60 °C	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0 °C	-25 °C	-25 °C
<b>Relative humidity</b>			
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Technical specifications (continued)**

Article number	<b>6AG1214-1HG31-4XB0</b>	<b>6AG1214-1HG31-5XB0</b>	<b>6AG1214-1HG31-2XB0</b>
Based on	<b>6ES7214-1HG31-0XB0</b>	<b>6ES7214-1HG31-0XB0</b>	<b>6ES7214-1HG31-0XB0</b>
	SIPLUS S7-1200 CPU1214 DC/DC/RLY	SIPLUS S7-1200 CPU1214 DC/DC/RLY	SIPLUS S7-1200 CPU1214 DC/DC/RLY
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0 °C	-25 °C	-25 °C
<b>Relative humidity</b>			
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-1200 basic controller**Central processing units  
SIPLUS Standard CPUs**SIPLUS CPU 1214C****Ordering data****Article No.****Article No.****SIPLUS CPU 1214C  
compact CPU, AC/DC/relay**

(Extended temperature range and medial exposure)

Integrated program and data memory of 50 KB, load memory of 2 MB  
Wide-range alternating voltage supply 85 ... 264 V AC  
Boolean execution times of 0.1 ms per operation  
14 digital inputs,  
10 digital outputs (relay),  
2 analog inputs  
Expandable with up to 3 communication modules, 8 signal modules, and 1 signal board/communication board  
Digital inputs usable as HSC with 100 kHz

- for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C

**6AG1214-1BG31-4XB0****6AG1214-1BG31-5XB0****6AG1214-1BG31-2XB0****SIPLUS CPU 1214C  
compact CPU, DC/DC/DC**

(Extended temperature range and medial exposure)

Integrated program and data memory of 50 KB, load memory of 2 MB  
Power supply 24 V DC  
Boolean execution times of 0.1 ms per operation  
14 digital inputs,  
10 digital outputs,  
2 analog inputs  
Expandable with up to 3 communication modules, 8 signal modules and 1 signal board/communication board  
Digital inputs usable as HSC with 100 kHz, 24 V DC digital outputs usable as pulse outputs (PTO) or pulse-width-modulated outputs (PWM) with 100 kHz

- for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C

**6AG1214-1AG31-4XB0****6AG1214-1AG31-5XB0****6AG1214-1AG31-2XB0****SIPLUS CPU 1214C  
compact CPU, DC/DC/relay**

(Extended temperature range and medial exposure)

Integrated program and data memory of 50 KB, load memory of 2 MB  
Power supply 24 V DC  
Boolean execution times of 0.1 ms per operation  
14 digital inputs,  
10 digital outputs (relay),  
2 analog inputs  
Expandable with up to 3 communication modules, 8 signal modules and 1 signal board/communication board  
Digital inputs usable as HSC with 100 kHz

- for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C

**6AG1214-1HG31-4XB0****6AG1214-1HG31-5XB0****6AG1214-1HG31-2XB0****Accessories****SIPLUS digital input/output  
signal board SB 1223**

(Extended temperature range and medial exposure)

2 inputs, 24 V DC,  
IEC type 1 current sinking  
2 transistor outputs 24 V DC,  
0.5 A, 5 W  
Can be used as HSC  
at up to 30 kHz

- Suitable for areas with extraordinary medial exposure (conformal coating)
- Ambient temperature -25 ... +55 °C

**6AG1223-0BD30-4XB0****6AG1223-0BD30-5XB0****SIPLUS SB 1232 analog output  
signal board**

(Extended temperature range and medial exposure)

Ambient temperature range  
-25 ... +55 °C1 analog output, ±10 V with 12 bits  
or 0 ... 20 mA with 11 bitsAmbient temperature range  
0 ... +55 °C1 analog output, ±10 V with 12 bits  
or 0 ... 20 mA with 11 bits**6AG1232-4HA30-5XB0****6AG1232-4HA30-4XB0****Communication Board  
SIPLUS CB 1241 RS 485**

(Extended temperature range and exposure to media)

for point-to-point connection,  
with 1 RS 485 interface**6AG1241-1CH30-5XB1****Additional accessories**See SIMATIC S7-1200  
CPU 1214C, page 3/14

**Overview**

- The compact high-performance CPU
- With 24 integrated I/Os
- Expandable with:
  - 1 signal board (SB) or communication board (CB); not possible with: 6AG1215-1AG31-2XB0, 6AG1215-1BG31-2XB0, 6AG1215-1HG31-2XB0
  - 8 signal modules (SM)
  - Max. 3 communication modules (CM)

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

3

**Technical specifications**

Article number	6AG1215-1AG31-4XB0	6AG1215-1AG31-5XB0	6AG1215-1AG31-2XB0
Based on	6ES7215-1AG31-0XB0	6ES7215-1AG31-0XB0	6ES7215-1AG31-0XB0
	SIPLUS S7-1200 CPU1215 DC/DC/DC	SIPLUS S7-1200 CPU1215 DC/DC/DC	SIPLUS S7-1200 CPU1215 DC/DC/DC
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0 °C	-25 °C	-25 °C
<b>Relative humidity</b>			
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!



**SIMATIC S7-1200 basic controller**

Central processing units  
SIPLUS Standard CPUs

**SIPLUS CPU 1215C****Technical specifications (continued)**

Article number	<b>6AG1215-1BG31-4XB0</b>	<b>6AG1215-1BG31-5XB0</b>	<b>6AG1215-1BG31-2XB0</b>
Based on	<b>6ES7215-1BG31-0XB0</b>	<b>6ES7215-1BG31-0XB0</b>	<b>6ES7215-1BG31-0XB0</b>
	SIPLUS S7-1200 CPU1215 AC/DC/RLY	SIPLUS S7-1200 CPU1215 AC/DC/RLY	SIPLUS S7-1200 CPU1215 AC/DC/RLY
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0 °C	-25 °C	-25 °C
<b>Relative humidity</b>			
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!



**Technical specifications (continued)**

Article number	<b>6AG1215-1HG31-4XB0</b>	<b>6AG1215-1HG31-5XB0</b>	<b>6AG1215-1HG31-2XB0</b>
Based on	<b>6ES7215-1HG31-0XB0</b>	<b>6ES7215-1HG31-0XB0</b>	<b>6ES7215-1HG31-0XB0</b>
	SIPLUS S7-1200 CPU1215 DC/DC/RLY	SIPLUS S7-1200 CPU1215 DC/DC/RLY	SIPLUS S7-1200 CPU1215 DC/DC/RLY
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	60 °C	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0 °C	-25 °C	-25 °C
<b>Relative humidity</b>			
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-1200 basic controller**Central processing units  
SIPLUS Standard CPUs**SIPLUS CPU 1215C****Ordering data****Article No.****Article No.****SIPLUS CPU 1215C  
compact CPU, AC/DC/relay**

(Extended temperature range and medial exposure)

Integrated program and data memory 100 KB, load memory 4 MB  
Wide-range power supply  
85 ... 264 V AC  
Boolean execution times  
0.085 µs per operation  
14 digital inputs,  
10 digital outputs (relay),  
2 analog inputs, 2 analog outputs  
Expandable by up to  
3 communication modules,  
8 signal modules and 1 signal board/communication board  
Digital inputs usable as HSC with 100 kHz

- for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C

**6AG1215-1BG31-4XB0****6AG1215-1BG31-5XB0****6AG1215-1BG31-2XB0****SIPLUS CPU 1215C  
compact CPU, DC/DC/DC**

(Extended temperature range and medial exposure)

Integrated program and data memory 100 KB, load memory 4 MB  
Power supply 24 V DC  
Boolean execution times  
0.085 µs per operation  
14 digital inputs,  
10 digital outputs,  
2 analog inputs,  
2 analog outputs  
Expandable by up to  
3 communication modules,  
8 signal modules and 1 signal board/communication board  
Digital inputs usable as HSC with 100 kHz  
24 V DC digital outputs usable as pulse outputs (PTO) or pulse-width-modulated outputs (PWM) with 100 kHz

- for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C

**6AG1215-1AG31-4XB0****6AG1215-1AG31-5XB0****6AG1215-1AG31-2XB0****SIPLUS CPU 1215C  
compact CPU, DC/DC/relay**

(Extended temperature range and medial exposure)

Integrated program and data memory 100 KB, load memory 4 MB  
Power supply 24 V DC  
Boolean execution times  
0.085 µs per operation  
14 digital inputs,  
10 digital outputs (relay),  
2 analog inputs,  
2 analog outputs  
Expandable by up to  
3 communication modules,  
8 signal modules and 1 signal board/communication board  
Digital inputs usable as HSC with 100 kHz

- for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C

**6AG1215-1HG31-4XB0****6AG1215-1HG31-5XB0****6AG1215-1HG31-2XB0****Accessories****Digital input/output  
SIPLUS signal board SB 1223**

(extended temperature range and medial exposure)

2 inputs, 24 V DC,  
IEC type 1 current sinking  
2 transistor outputs 24 V DC,  
0.5 A, 5 W  
Can be used as HSC  
at up to 30 kHz

- Suitable for areas with extraordinary medial exposure (conformal coating)
- Ambient temperature -25 ... +55 °C

**6AG1223-0BD30-4XB0****6AG1223-0BD30-5XB0****SIPLUS SB 1232  
analog output signal board**

(Extended temperature range and medial exposure)

Ambient temperature range  
-25 ... +55 °C

1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits

**6AG1232-4HA30-5XB0**Ambient temperature range  
0 ... +55 °C

1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits

**6AG1232-4HA30-4XB0****SIPLUS CB 1241 RS 485  
communication board**

(Extended temperature range and exposure to media)

for point-to-point connection, with 1 RS 485 interface

**6AG1241-1CH30-5XB1****Additional accessories**

See SIMATIC S7-1200 CPU 1215C, page 3/18

**Overview**

The fail-safe SIMATIC S7-1200 Controllers are based on the S7-1200 standard CPUs and offer additional safety-related functions.

They can be used for safety-oriented tasks according to IEC 61508 up to SIL 3 and ISO 13849-1 up to PL e.

Safety-related programs are created in the TIA Portal. The STEP 7 Safety engineering tool offers commands, operations and blocks for safety-related programs in the LAD and FBD languages. To this end, there is a library with pre-configured, TÜV-approved blocks for safety-related functions.

- Standard controller with integrated safety functions:
  - Standardized and convenient diagnostic functions for standard and safety
  - Uniform symbols, data consistency, ...
- Modular system with scalable range of CPUs and expandable I/O quantity structure:
  - One engineering for standard and fail-safe automation
  - Use of the standard I/O modules together with the fail-safe I/O modules in the central system
  - Integrated standard PROFINET functionalities for PROFINET controllers and PROFINET iDevice services
  - Connection of distributed standard I/O via field bus such as PROFINET or PROFIBUS
  - F-library certified by the German Technical Inspectorate (TÜV) for all common safety functions
  - Free programming of the safety logic using FBD and LAD
  - Standard-compliant printout of the F-program

- One integrated engineering for both standard and safety from S7-1200 to S7-300/400/1500 and WinAC RTX F:
  - STEP 7 Safety Basic for easy engineering of the CPU 1200 FC
  - STEP 7 Safety Advanced for the entire fail-safe SIMATIC S7 portfolio
- Integrated system diagnosis of the CPUs, for standard and safety:
  - Consistent plain text display of system diagnostic information in the TIA Portal, HMI and web server
  - Messages are updated even if the CPU is in STOP state
  - System diagnostics integrated in the CPU firmware. Configuration by user not required
  - The diagnostics is automatically updated on configuration changes
- 2 fail-safe compact controllers with graded performances in the versions DC/DC/DC and DC/DC/relay

Characteristics	CPU 1214 FC	CPU 1215 FC
Variants	DC/DC/DC, DC/DC/relay	DC/DC/DC, DC/DC/relay
Main memory, integrated	100 KB	125 KB
Load memory, integrated	4 MB	4 MB
Memory card	SIMATIC memory card (optional)	SIMATIC memory card (optional)
Standard digital inputs/outputs, integrated	14/10	14/10
Standard analog inputs, integrated	2	2
Standard analog outputs, integrated	-	2
Process image	1024 bytes for inputs, 1024 bytes for outputs	1024 bytes for inputs, 1024 bytes for outputs
Expansion by signal board	Max. 1	Max. 1
Expansion by signal modules	Max. 8	Max. 8
Expansion by communication modules	Max. 3	Max. 3

**Technical specifications**

Article number	6ES7214-1AF40-0XB0	6ES7214-1HF40-0XB0	6ES7215-1AF40-0XB0	6ES7215-1HF40-0XB0
	CPU 1214 FC, DC/DC/DC, 14DI/10DO/2AI	CPU 1214 FC, DC/DC/RELAY, 14DI/10DO/2AI	CPU 1215 FC, DC/DC/DC, 14DI/10DO/2AI/2AO	CPU 1215 FC, DC/DC/RLY, 14DI/10DO/2AI/2AO
<b>Product type designation</b>				
<b>General information</b>				
<b>Engineering with</b>				
• Programming package	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher
<b>Supply voltage</b>				
Rated value (DC)				
• 24 V DC	Yes	Yes	Yes	Yes
<b>Encoder supply</b>				
<b>24 V encoder supply</b>				
• 24 V	L+ minus 4 V DC min.	L+ minus 4 V DC min.	L+ minus 4 V DC min.	L+ minus 4 V DC min.

**SIMATIC S7-1200 basic controller**

Central processing units

Fail-safe CPUs

**CPU 1214 FC, CPU 1215 FC****Technical specifications (continued)**

Article number	<b>6ES7214-1AF40-0XB0</b> CPU 1214 FC, DC/DC/DC, 14DI/10DO/2AI	<b>6ES7214-1HF40-0XB0</b> CPU 1214 FC, DC/DC/ RELAY, 14DI/10DO/2AI	<b>6ES7215-1AF40-0XB0</b> CPU 1215 FC, DC/DC/DC, 14DI/10DO/2AI/2AO	<b>6ES7215-1HF40-0XB0</b> CPU 1215 FC, DC/DC/ RLY, 14DI/10DO/2AI/2AO
<b>Power losses</b>				
Power loss, typ.	12 W	12 W	12 W	12 W
<b>Memory</b>				
<b>Work memory</b>				
• Integrated	125 kbyte	125 kbyte	150 kbyte	150 kbyte
<b>Load memory</b>				
• Integrated	4 Mbyte	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
<b>Backup</b>				
• without battery	Yes	Yes	Yes	Yes
<b>CPU processing times</b>				
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / Operation	0.08 µs; / Operation	0.08 µs; / Operation
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / Operation	1.7 µs; / Operation	1.7 µs; / Operation
for floating point arithmetic, typ.	2.3 µs; / Operation	2.3 µs; / Operation	2.3 µs; / Operation	2.3 µs; / Operation
<b>Address area</b>				
<b>I/O address area</b>				
• Inputs	1 024 byte	1 024 byte	1 024 byte	1 024 byte
• Outputs	1 024 byte	1 024 byte	1 024 byte	1 024 byte
<b>Process image</b>				
• Inputs, adjustable	1 024 byte	1 024 byte	1 024 kbyte	1 024 kbyte
• Outputs, adjustable	1 024 byte	1 024 byte	1 024 kbyte	1 024 kbyte
<b>Time of day</b>				
<b>Clock</b>				
• Hardware clock (real-time clock)	Yes	Yes	Yes	Yes
<b>Digital inputs</b>				
Number of digital inputs	14	14	14	14
• of which, inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
<b>Digital outputs</b>				
Number of digital outputs	10	10; Relays	10	10; Relays
• of which high-speed outputs	4; 100 kHz Pulse Train Output		4; 100 kHz Pulse Train Output	
<b>Analog inputs</b>				
Integrated channels (AI)	2; 0 to 10 V	2; 0 to 10 V	2; 0 to 10 V	2; 0 to 10 V
<b>Input ranges</b>				
• Voltage	Yes; 0 to 10 V	Yes; 0 to 10 V	Yes	Yes
<b>Analog outputs</b>				
Integrated channels (AO)			2; 0 to 20 mA	2; 0 to 20 mA
<b>1st interface</b>				
Interface type	PROFINET	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet, 2-port switch, 2*RJ45	Ethernet, 2-port switch, 2*RJ45
<b>Functionality</b>				
• PROFINET IO Device	Yes	Yes	Yes	Yes
• PROFINET IO Controller	Yes	Yes	Yes	Yes
<b>Communication functions</b>				
<b>S7 communication</b>				
• supported	Yes	Yes	Yes	Yes
<b>Open IE communication</b>				
• TCP/IP	Yes	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes	Yes
• UDP	Yes	Yes	Yes	Yes
<b>Web server</b>				
• supported	Yes	Yes	Yes	Yes

## Technical specifications (continued)

Article number	6ES7214-1AF40-0XB0 CPU 1214 FC, DC/DC/DC, 14DI/10DO/2AI	6ES7214-1HF40-0XB0 CPU 1214 FC, DC/DC/ RELAY, 14DI/10DO/2AI	6ES7215-1AF40-0XB0 CPU 1215 FC, DC/DC/DC, 14DI/10DO/2AI/2AO	6ES7215-1HF40-0XB0 CPU 1215 FC, DC/DC/ RLY, 14DI/10DO/2AI/2AO
<b>Integrated Functions</b>				
Number of counters	6	6	6	6
Counter frequency (counter) max.	100 kHz	100 kHz	100 kHz	100 kHz
Frequency meter	Yes	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes	Yes
PID controller	Yes	Yes	Yes	Yes
Number of alarm inputs	4	4	4	4
Number of pulse outputs	4	4	4	4
Limit frequency (pulse)	100 kHz		100 kHz	
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	0 °C	0 °C	0 °C	0 °C
• max.	55 °C	55 °C	55 °C	55 °C
<b>Pollutant concentrations</b>				
- SO2 at RH < 60% without condensation	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
<b>Configuration</b>				
<b>programming</b>				
<b>Programming language</b>				
- LAD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- FBD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- SCL	Yes	Yes	Yes	Yes
<b>Dimensions</b>				
Width	110 mm	110 mm	130 mm	130 mm
Height	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm
<b>Weights</b>				
Weight, approx.	415 g	435 g	520 g	530 g

## Ordering data

## Article No.

## Article No.

## CPU 1214 FC

**Fail-safe compact CPU,  
DC/DC/DC;**  
integrated program/data memory  
125 KB, load memory 4 MB;  
power supply 24 V DC;  
Boolean execution times  
0.085 µs per operation;  
14 digital inputs,  
10 digital outputs,  
2 analog inputs;  
expandable by up to  
3 communication modules,  
8 signal modules, and 1 signal  
board/communication board;  
digital inputs can be used  
as HSC at 100 kHz,  
24 V DC digital outputs can be  
used as pulse outputs (PTO) or  
pulse-width modulated outputs  
(PWM) at 100 kHz

6ES7214-1AF40-0XB0

**Fail-safe compact CPU,  
DC/DC/relay;**

integrated program/data memory  
125 KB, load memory 4 MB;  
power supply 24 V DC;  
Boolean execution times  
0.085 µs per operation;  
14 digital inputs,  
10 digital outputs (relays),  
2 analog inputs;  
expandable by up to  
3 communication modules,  
8 signal modules, and 1 signal  
board/communication board;  
digital inputs can be used  
as HSC at 100 kHz

6ES7214-1HF40-0XB0

**SIMATIC S7-1200 basic controller**

Central processing units

Fail-safe CPUs

**CPU 1214 FC, CPU 1215 FC****Ordering data****Article No.****CPU 1215 FC**

**Fail-safe compact CPU, DC/DC/DC;**  
integrated program/data memory 150 KB, load memory 4 MB; power supply 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs; 2 analog outputs; expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz

**6ES7215-1AF40-0XB0**

**Fail-safe compact CPU, DC/DC/relay;**  
integrated program/data memory 150 KB, load memory 4 MB; power supply 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs; 2 analog outputs; expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz

**6ES7215-1HF40-0XB0****Accessories****Digital input simulator Simulator Module SIM 1274 (optional)**

14 input switches, for CPU 1214C / CPU 1215C

**6ES7274-1XH30-0XA0****Analog input simulator Simulator Module SIM 1274 (optional)**

2 potentiometers

**6ES7274-1XA30-0XA0****SIMATIC memory card (optional)**

4 MB

**6ES7954-8LC02-0AA0**

12 MB

**6ES7954-8LE02-0AA0**

24 MB

**6ES7954-8LF02-0AA0**

256 MB

**6ES7954-8LL02-0AA0**

2 GB

**6ES7954-8LP01-0AA0****Extension cable for two-tier configuration**

for connecting digital/analog signal modules; length 2 m

**6ES7290-6AA30-0XA0****Article No.****Terminal block (spare part)**

for CPU 1214 FC, CPU 1215 FC

- For DI, with 20 screws, tin-plated; 4 units
- For DO, with 12 screws, tin-plated; 4 units

**6ES7292-1AV30-0XA0****6ES7292-1AM30-0XA0**

for CPU 1214 FC

- For AI, with 3 screws, tin-plated; 4 units

**6ES7292-1BC30-0XA0**

for CPU 1215 FC

- For analog units, with 6 screws, gold-plated; 4 units

**6ES7292-1BF30-0XB0****Front flap set (spare part)**

for CPU 1214 FC

**6ES7291-1AB30-0XA0**

for CPU 1215 FC

**6ES7291-1AC30-0XA0****RJ45 cable grip**

4 items per pack

Single port

**6ES7290-3AA30-0XA0**

Dual port

**6ES7290-3AB30-0XA0****STEP 7 Safety Basic V13 SP1****Task:**

Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC

**Requirement:**

STEP 7 Basic V13 SP1 and higher

Floating license for 1 user, software and documentation on DVD, license key on USB stick

**6ES7833-1FB13-0YA5**Floating license for 1 user, software, documentation and license key for download<sup>1)</sup>; email address required for delivery**6ES7833-1FB13-0YH5****STEP 7 Safety Advanced V13 SP1****Task:**

Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200ISP, ET 200pro, ET 200eco

**Requirement:**

STEP 7 Professional V13 SP1

Floating license for 1 user, software and documentation on DVD, license key on USB stick

**6ES7833-1FA13-0YA5**Floating license for 1 user, software, documentation and license key for download<sup>1)</sup>; email address required for delivery**6ES7833-1FA13-0YH5**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

**Overview**

- Digital inputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the relevant task
- For subsequent expansion of the system with additional inputs

**Technical specifications**

Article number	<b>6ES7221-1BF32-0XB0</b>	<b>6ES7221-1BH32-0XB0</b>
	DIGITAL INPUT SM 1221, 8DI, 24V DC	DIGITAL INPUT SM 1221, 16DI, 24V DC
<b>Product type designation</b>		
<b>Supply voltage</b>		
Rated value (DC)		
• 24 V DC	Yes	Yes
permissible range, lower limit (DC)	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V
<b>Input current</b>		
from backplane bus 5 V DC, max.	105 mA	130 mA
<b>Digital inputs</b>		
• from load voltage L+ (without load), max.	4 mA; per channel	4 mA; per channel
<b>Output voltage</b>		
<b>Power supply to the transmitters</b>		
• present	Yes	Yes
<b>Power losses</b>		
Power loss, typ.	1.5 W	2.5 W
<b>Digital inputs</b>		
Number of digital inputs	8	16
• In groups of	2	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
<b>Number of simultaneously controllable inputs</b>		
<b>all mounting positions</b>		
- up to 40 °C, max.	8	16
<b>horizontal installation</b>		
- up to 40 °C, max.	8	16
- up to 50 °C, max.	8	16
<b>vertical installation</b>		
- up to 40 °C, max.	8	16



**SIMATIC S7-1200 basic controller**

I/O modules

Digital modules

**SM 1221 digital input modules****Technical specifications (continued)**

Article number	<b>6ES7221-1BF32-0XB0</b> DIGITAL INPUT SM 1221, 8DI, 24V DC	<b>6ES7221-1BH32-0XB0</b> DIGITAL INPUT SM 1221, 16DI, 24V DC
<b>Input voltage</b>		
• Type of input voltage	DC	DC
• Rated value (DC)	24 V	24 V
• for signal "0"	5 V DC at 1 mA	5 V DC at 1 mA
• for signal "1"	15 VDC at 2.5 mA	15 VDC at 2.5 mA
<b>Input current</b>		
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA
• for signal "1", typ.	4 mA; Typical	4 mA; Typical
<b>Input delay (for rated value of input voltage)</b>		
<b>for standard inputs</b>		
- Parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
<b>for interrupt inputs</b>		
- Parameterizable	Yes	Yes
<b>Cable length</b>		
• shielded, max.	500 m	500 m
• Unshielded, max.	300 m	300 m
<b>Digital outputs</b>		
Number of digital outputs	0	0
short-circuit protection	No	No
<b>Interrupts/diagnostics/ status information</b>		
<b>Alarms</b>		
• Alarms	Yes	Yes
• Diagnostic alarm	Yes	Yes
<b>Diagnostic messages</b>		
• Diagnostic functions	Yes	Yes
• Monitoring the supply voltage	Yes	Yes
<b>Diagnostics indication LED</b>		
• for status of the inputs	Yes	Yes
• for maintenance	Yes	Yes
• Status indicator digital input (green)	Yes	Yes
<b>Galvanic isolation</b>		
<b>Galvanic isolation digital inputs</b>		
• between the channels, in groups of	2	4
<b>Degree and class of protection</b>		
Degree of protection to EN 60529		
• IP20	Yes	Yes
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
CSA approval	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
<b>Marine approval</b>		
• Marine approval		Yes

## Technical specifications (continued)

Article number	6ES7221-1BF32-0XB0	6ES7221-1BH32-0XB0
	DIGITAL INPUT SM 1221, 8DI, 24V DC	DIGITAL INPUT SM 1221, 16DI, 24V DC
<b>Ambient conditions</b>		
<b>Free fall</b>		
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>		
• Permissible temperature range	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	
• Min.	-20 °C	-20 °C
• max.	60 °C	60 °C
• Permissible temperature change	5°C to 55°C, 3°C / minute	
<b>Storage/transport temperature</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>		
• Storage/transport, min.	660 hPa	660 hPa
• Storage/transport, max.	1 080 hPa	1 080 hPa
<b>Relative humidity</b>		
• Permissible range (without condensation) at 25 °C	95 %	
<b>Connection method</b>		
required front connector	Yes	Yes
<b>Mechanics/material</b>		
Type of housing (front)		
• plastic	Yes	Yes
<b>Dimensions</b>		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
<b>Weights</b>		
Weight, approx.	170 g	210 g

## Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>SM 1221 digital input signal module</b>		<b>Terminal block (spare part)</b>	
8 inputs, 24 V DC, isolated, current sourcing/sinking	6ES7221-1BF32-0XB0	for 8/16-channel digital signal modules	
16 inputs, 24 V DC, isolated, current sourcing/sinking	6ES7221-1BH32-0XB0	with 7 screws, zinc-plated; 4 pcs.	6ES7292-1AG30-0XA0
<b>Extension cable for two-tier configuration</b>	6ES7290-6AA30-0XA0	<b>Front flap set (spare part)</b>	
for connecting digital/analog signal modules; length 2 m		for 8/16-channel signal modules	6ES7291-1BA30-0XA0

**SIMATIC S7-1200 basic controller**

I/O modules

Digital modules

**SB 1221 digital input modules****Overview**

- Digital inputs as a supplement to the integral I/O of SIMATIC S7-1200 CPUs
- Can be plugged directly into the CPU

**Technical specifications**

Article number	<b>6ES7221-3AD30-0XB0</b>	<b>6ES7221-3BD30-0XB0</b>
	SIGNAL BOARD SB 1221, 4 DI 5VDC 200KHZ	SIGNAL BOARD SB 1221, 4 DI 24VDC 200KHZ
<b>Product type designation</b>		
<b>Input current</b>		
from backplane bus 5 V DC, typ.	50 mA	50 mA
<b>Output voltage</b>		
<b>Power supply to the transmitters</b>		
• Supply current, max.	4 mA; per channel	4 mA; per channel
<b>Power losses</b>		
Power loss, typ.	1 W	1 W
<b>Digital inputs</b>		
Number of digital inputs	4; Current-sourcing	4; Current-sourcing
• In groups of	1	1
Input characteristic curve in accordance with IEC 61131, type 1	Yes	
Input characteristic curve in accordance with IEC 61131, type 2		Yes
<b>Number of simultaneously controllable inputs</b>		
<b>all mounting positions</b>		
- up to 40 °C, max.	4	4
<b>Input voltage</b>		
• Type of input voltage	DC	DC
• Rated value (DC)	5 V	24 V
• for signal "0"	0 to 1 V	0 to 5 V
• for signal "1"	2 to 6 V	
<b>Input current</b>		
• for signal "0", max. (permissible quiescent current)	3 mA	2 mA
• for signal "1", min.	6 mA	5.8 mA
• for signal "1", typ.		14 mA
<b>Input delay (for rated value of input voltage)</b>		
<b>for standard inputs</b>		
- Parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
- at "0" to "1", max.	2 µs	2.5 µs
<b>for interrupt inputs</b>		
- Parameterizable	Yes	Yes
<b>for counter/technological functions</b>		
- Parameterizable	Yes	Yes

## Technical specifications (continued)

Article number	6ES7221-3AD30-0XB0	6ES7221-3BD30-0XB0
	SIGNAL BOARD SB 1221, 4 DI 5VDC 200KHZ	SIGNAL BOARD SB 1221, 4 DI 24VDC 200KHZ
<b>Cable length</b>		
• shielded, max.	50 m; shielded, twisted pair	50 m; Standard input: 500 m, high-speed counters: 50 m
<b>Digital outputs</b>		
Number of digital outputs	0	0
short-circuit protection	No	No
<b>Interrupts/diagnostics/ status information</b>		
<b>Alarms</b>		
• Alarms	Yes	Yes
<b>Diagnostic messages</b>		
• Diagnostic functions	Yes	Yes
<b>Diagnostics indication LED</b>		
• for status of the inputs	Yes	Yes
<b>Degree and class of protection</b>		
Degree of protection to EN 60529		
• IP20	Yes	Yes
<b>Standards, approvals, certificates</b>		
<b>Marine approval</b>		
• Germanischer Lloyd (GL)	Yes	Yes
<b>Ambient conditions</b>		
<b>Free fall</b>		
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>		
• Permissible temperature range	0 °C to 55 °C horizontal installation, 0 °C to 45 °C vertical installation	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing
• Min.	0 °C	-20 °C
• max.	55 °C	60 °C
<b>Storage/transport temperature</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>		
• Storage/transport, min.	660 hPa	660 hPa
• Storage/transport, max.	1 080 hPa	1 080 hPa
<b>Relative humidity</b>		
• Permissible range (without condensation) at 25 °C	95 %	95 %
<b>Mechanics/material</b>		
Type of housing (front)		
• plastic	Yes	Yes
<b>Dimensions</b>		
Width	38 mm	38 mm
Height	62 mm	62 mm
Depth	21 mm	21 mm
<b>Weights</b>		
Weight, approx.	40 g	40 g

## Ordering data

SB 1221 Signal Board  
digital input modules

4 inputs, 5 V DC, 200 kHz, sourcing  
4 inputs, 24 V DC, 200 kHz,  
sourcing

## Article No.

6ES7221-3AD30-0XB0  
6ES7221-3BD30-0XB0

## Article No.

## Terminal block (spare part)

for Signal Board  
with 6 screws, gold-plated; 4 pcs.

6ES7292-1BF30-0XA0

## SIMATIC S7-1200 basic controller

I/O modules

Digital modules

### SM 1222 digital output modules

#### Overview



- Digital outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the relevant task
- For subsequent expansion of the system with additional outputs

#### Technical specifications

Article number	6ES7222-1BF32-0XB0	6ES7222-1BH32-0XB0	6ES7222-1HF32-0XB0	6ES7222-1HH32-0XB0	6ES7222-1XF32-0XB0
	DIGITAL OUTPUT SM1222, 8 DO, 24V DC	DIGITAL OUTPUT SM1222, 16 DO, 24V DC	DIGITAL OUTPUT SM 1222, 8 DO, RELAY	DIGITAL OUTPUT SM1222, 16 DO, RELAY	DIGITAL OUTPUT SM 1222, 8 DO, CHANGEOVER
<b>Product type designation</b>					
<b>Supply voltage</b>					
permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	28.8 V	28.8 V
<b>Input current</b>					
from backplane bus 5 V DC, max.	120 mA	140 mA	120 mA	135 mA	140 mA
<b>Digital inputs</b>					
• from load voltage L+ (without load), max.			11 mA/relay coil	11 mA/relay coil	16.7 mA/relay coil
<b>Power losses</b>					
Power loss, typ.	1.5 W	2.5 W	4.5 W	8.5 W	5 W
<b>Digital inputs</b>					
Number of digital inputs	0	0	0	0	0
<b>Digital outputs</b>					
Number of digital outputs	8	16	8	16	8
• In groups of	1	1	2	1	1
short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	typ. (L+) -48 V	typ. (L+) -48 V			
<b>Switching capacity of the outputs</b>					
• with resistive load, max.	0.5 A	0.5 A	2 A	2 A	2 A
• on lamp load, max.	5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
<b>Output voltage</b>					
• Rated value (DC)	24 V	24 V	5 V DC to 30 V DC	5 V DC to 30 V DC	5 V DC to 30 V DC
• Rated value (AC)			5 V AC to 250 V AC	5 V AC to 250 V AC	5 V AC to 250 V AC
• for signal "0", max.	0.1 V; with 10 kOhm load	0.1 V; with 10 kOhm load			
• for signal "1", min.	20 V DC	20 V DC			
<b>Output current</b>					
• for signal "1" rated value	0.5 A	0.5 A			
• for signal "1" permissible range, max.			2 A	2 A	2 A
• for signal "0" residual current, max.	10 µA	10 µA			

## Technical specifications (continued)

Article number	6ES7222-1BF32-0XB0 DIGITAL OUTPUT SM1222, 8 DO, 24V DC	6ES7222-1BH32-0XB0 DIGITAL OUTPUT SM1222, 16 DO, 24V DC	6ES7222-1HF32-0XB0 DIGITAL OUTPUT SM 1222, 8 DO, RELAY	6ES7222-1HH32-0XB0 DIGITAL OUTPUT SM1222, 16 DO, RELAY	6ES7222-1XF32-0XB0 DIGITAL OUTPUT SM 1222, 8 DO, CHANGEOVER
<b>Output delay with resistive load</b>					
• "0" to "1", max.	50 µs	50 µs	10 ms	10 ms	10 ms
• "1" to "0", max.	200 µs	200 µs	10 ms	10 ms	10 ms
<b>Aggregate current of outputs (per group)</b>					
<b>horizontal installation</b>					
- up to 50 °C, max.	4 A; Current per mass	8 A; Current per mass	10 A; Current per mass	10 A; Current per mass	2 A; Current per mass
<b>Relay outputs</b>					
• Number of relay outputs			8	16	8
• Rated input voltage of relay coil L+ (DC)			24 V	24 V	24 V
• Number of operating cycles, max.			mechanically 10 million, at rated load voltage 100,000	mechanically 10 million, at rated load voltage 100,000	mechanically 10 million, at rated load voltage 100,000
<b>Switching capacity of contacts</b>					
- with inductive load, max.	0.5 A	0.5 A	2 A	2 A	2 A
- on lamp load, max.	5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
- with resistive load, max.	0.5 A	0.5 A	2 A	2 A	2 A
<b>Cable length</b>					
• shielded, max.	500 m	500 m	500 m	500 m	500 m
• Unshielded, max.	150 m	150 m	150 m	150 m	150 m
<b>Interrupts/diagnostics/ status information</b>					
<b>Alarms</b>					
• Alarms	Yes	Yes	Yes	Yes	Yes
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
<b>Diagnostic messages</b>					
• Diagnostic functions	Yes	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	
<b>Diagnostics indication LED</b>					
• For status of the outputs	Yes	Yes	Yes	Yes	Yes
• for maintenance	Yes	Yes	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes	Yes	Yes
<b>Galvanic isolation digital outputs</b>					
• between the channels			Relays	Relays	Relays
• between the channels, in groups of	1	1	2	4	1
• between the channels and the backplane bus	500 V AC	500 V AC	1500 V AC for 1 minute	1500 V AC for 1 minute	1500 V AC for 1 minute
<b>Permissible potential difference</b>					
between different circuits			750 V AC for 1 minute	750 V AC for 1 minute	750 V AC for 1 minute
<b>Degree and class of protection</b>					
Degree of protection to EN 60529					
• IP20	Yes	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>					
CE mark	Yes	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes	Yes
cULus	Yes	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes	Yes	Yes
<b>Marine approval</b>					
• Marine approval	Yes	Yes	Yes	Yes	Yes

**SIMATIC S7-1200 basic controller**

I/O modules

Digital modules

**SM 1222 digital output modules****Technical specifications (continued)**

Article number	<b>6ES7222-1BF32-0XB0</b> DIGITAL OUTPUT SM1222, 8 DO, 24V DC	<b>6ES7222-1BH32-0XB0</b> DIGITAL OUTPUT SM1222, 16 DO, 24V DC	<b>6ES7222-1HF32-0XB0</b> DIGITAL OUTPUT SM 1222, 8 DO, RELAY	<b>6ES7222-1HH32-0XB0</b> DIGITAL OUTPUT SM1222, 16 DO, RELAY	<b>6ES7222-1XF32-0XB0</b> DIGITAL OUTPUT SM 1222, 8 DO, CHANGEOVER
<b>Ambient conditions</b>					
<b>Free fall</b>					
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>					
• Permissible temperature range	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing
• Min.	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C	60 °C; Number of simultaneously activated outputs: 8 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 16 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated outputs: 4 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 at 55 °C horizontal or 45 °C vertical
• Permissible temperature change	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute
<b>Storage/transport temperature</b>					
• Min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>					
• Storage/transport, min.	660 hPa	660 hPa	660 hPa	660 hPa	660 hPa
• Storage/transport, max.	1 080 hPa	1 080 hPa	1 080 hPa	1 080 hPa	1 080 hPa
<b>Relative humidity</b>					
• Permissible range (without condensation) at 25 °C	95 %	95 %	95 %	95 %	95 %
<b>Connection method</b>					
required front connector	Yes	Yes	Yes	Yes	Yes
<b>Mechanics/material</b>					
Type of housing (front)					
• plastic	Yes	Yes	Yes	Yes	Yes
<b>Dimensions</b>					
Width	45 mm	45 mm	45 mm	45 mm	45 mm
Height	100 mm	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm	75 mm
<b>Weights</b>					
Weight, approx.	180 g	220 g	190 g	260 g	310 g

**Ordering data****SM 1222 digital output signal module**8 outputs, 24 V DC;  
0.5 A, 5 W, isolated**6ES7222-1BF32-0XB0**16 outputs, 24 V DC;  
0.5 A, 5 W, isolated**6ES7222-1BH32-0XB0**8 relay outputs, 5 ... 30 V DC /  
5 ... 250 V AC, 2 A, 30 W DC /  
200 W AC**6ES7222-1HF32-0XB0**8 relay outputs, change-over  
contact, 5 ... 30 V DC /  
5 ... 250 V AC, 2 A,  
30 W DC / 200 W AC**6ES7222-1XF32-0XB0**16 relay outputs, 5 ... 30 V DC /  
5 ... 250 V AC, 2 A, 30 W DC /  
200 W AC**6ES7222-1HH32-0XB0****Extension cable for two-tier configuration**for connecting digital/analog  
signal modules;  
length 2 m**6ES7290-6AA30-0XA0****Terminal block (spare part)**for 8/16-channel digital signal  
modules

with 7 screws, zinc-plated; 4 pcs.

**6ES7292-1AG30-0XA0****Front flap set (spare part)**

for 8/16-channel signal modules

**6ES7291-1BA30-0XA0**



**Overview**

- Digital outputs as a supplement to the integral I/O of SIMATIC S7-1200 CPUs
- Can be plugged directly into the CPU

**Technical specifications**

Article number	<b>6ES7222-1AD30-0XB0</b>	<b>6ES7222-1BD30-0XB0</b>
	SIGNAL BOARD SB1222, 4 DQ 5VDC 200KHZ	SIGNAL BOARD SB1222, 4 DQ 24VDC 200KHZ
<b>Product type designation</b>		
<b>Input current</b>		
from backplane bus 5 V DC, typ.	50 mA	50 mA
<b>Output voltage</b>		
<b>Power supply to the transmitters</b>		
• Supply current, max.	4 mA; per channel	4 mA; per channel
<b>Power losses</b>		
Power loss, typ.	1 W	1 W
<b>Digital inputs</b>		
Number of digital inputs	0	0
<b>Digital outputs</b>		
Number of digital outputs	4; MOSFET, solid-state (current-sinking/current-sourcing)	4; MOSFET, solid-state (current-sinking/current-sourcing)
• In groups of	1	1
short-circuit protection	No	No
<b>Switching capacity of the outputs</b>		
• with resistive load, max.	0.1 A	0.1 A
<b>Load resistance range</b>		
• upper limit	5 Ω	10 Ω
<b>Output voltage</b>		
• Rated value (DC)	5 V	24 V
• for signal "0", max.	0.4 V	0.1 V; with 10 kOhm load
• for signal "1", min.	L+ (-0.5 V)	20 V
• for signal "1", max.	6 V	
<b>Output current</b>		
• for signal "1" rated value	0.1 A	0.1 A
• for signal "1" permissible range, max.	0.11 A	
• for signal "0" residual current, max.		10 μA
<b>Cable length</b>		
• shielded, max.	50 m	50 m

**SIMATIC S7-1200 basic controller**

I/O modules

Digital modules

**SB 1222 digital output modules****Technical specifications (continued)**

Article number	<b>6ES7222-1AD30-0XB0</b>	<b>6ES7222-1BD30-0XB0</b>
	SIGNAL BOARD SB1222, 4 DQ 5VDC 200KHZ	SIGNAL BOARD SB1222, 4 DQ 24VDC 200KHZ
<b>Interrupts/diagnostics/ status information</b>		
<b>Alarms</b>		
• Alarms	Yes	Yes
<b>Diagnostic messages</b>		
• Diagnostic functions	Yes	Yes
<b>Diagnostics indication LED</b>		
• For status of the outputs	Yes	Yes
<b>Degree and class of protection</b>		
Degree of protection to EN 60529		
• IP20	Yes	Yes
<b>Standards, approvals, certificates</b>		
<b>Marine approval</b>		
• Germanischer Lloyd (GL)	Yes	Yes
<b>Ambient conditions</b>		
<b>Free fall</b>		
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>		
• Permissible temperature range	0 °C to 55 °C horizontal installation, 0 °C to 45 °C vertical installation	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing
• Min.	0 °C	-20 °C
• max.	55 °C	60 °C
<b>Storage/transport temperature</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>		
• Storage/transport, min.	660 hPa	660 hPa
• Storage/transport, max.	1 080 hPa	1 080 hPa
<b>Relative humidity</b>		
• Permissible range (without condensation) at 25 °C	95 %	95 %
<b>Mechanics/material</b>		
Type of housing (front)		
• plastic	Yes	Yes
<b>Dimensions</b>		
Width	38 mm	38 mm
Height	62 mm	62 mm
Depth	21 mm	21 mm
<b>Weights</b>		
Weight, approx.	40 g	40 g

**Ordering data****Article No.****Article No.****SB 1222 Signal Board  
digital output modules**

4 outputs, 5 V DC, 0.1 A, 200 kHz  
4 outputs, 24 V DC, 0.1 A, 200 kHz

**6ES7222-1AD30-0XB0**  
**6ES7222-1BD30-0XB0**

**Terminal block (spare part)**

for Signal Board  
with 6 screws, gold-plated; 4 pcs.

**6ES7292-1BF30-0XA0**

## Overview



- Digital inputs and outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the relevant task
- For subsequent expansion of the system with additional inputs and outputs

## Technical specifications

Article number	6ES7223-1BH32-0XB0	6ES7223-1BL32-0XB0	6ES7223-1PH32-0XB0	6ES7223-1PL32-0XB0	6ES7223-1QH32-0XB0
	DIGITAL I/O SM 1223, 8 DI / 8 DO	DIGITAL I/O SM 1223, 16DI/16DO	DIGITAL I/O SM 1223, 8DI/8DO	DIGITAL I/O SM 1223, 16DI/16DO	DIGITAL I/O SM 1223, 8DI AC/ 8DO RLY
<b>Product type designation</b>					
<b>Supply voltage</b>					
Rated value (DC)					
• 24 V DC	Yes	Yes	Yes	Yes	Yes
permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	28.8 V	28.8 V
<b>Input current</b>					
from backplane bus 5 V DC, max.	145 mA	185 mA	145 mA	180 mA	120 mA
<b>Digital inputs</b>					
• from load voltage L+ (without load), max.	4 mA; per channel	4 mA; per channel	4 mA/input 11 mA/ relay	4 mA/input 11 mA/ relay	
<b>Output voltage</b>					
<b>Power supply to the transmitters</b>					
• present	Yes	Yes	Yes	Yes	Yes
<b>Power losses</b>					
Power loss, typ.	2.5 W	4.5 W	5.5 W	10 W	7.5 W
<b>Digital inputs</b>					
Number of digital inputs	8	16	8	16	8
• In groups of	2	2	2	2	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes	Yes
<b>Number of simultaneously controllable inputs</b>					
<b>all mounting positions</b>					
- up to 40 °C, max.	8	16	8	16	8
<b>horizontal installation</b>					
- up to 40 °C, max.	8	16	8	16	8
- up to 50 °C, max.	8	16	8	16	8
<b>vertical installation</b>					
- up to 40 °C, max.	8	16	8	16	8
<b>Input voltage</b>					
• Type of input voltage	DC	DC	DC	DC	AC
• Rated value (AC)					120/230V AC
• Rated value (DC)	24 V	24 V	24 V	24 V	
• for signal "0"	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	20 V AC at 1 mA
• for signal "1"	15 VDC at 2.5 mA	15 VDC at 2.5 mA	15 VDC at 2.5 mA	15 VDC at 2.5 mA	79 V AC at 2.5 mA

# SIMATIC S7-1200 basic controller

I/O modules

Digital modules

## SM 1223 digital input/output modules

### Technical specifications (continued)

Article number	<b>6ES7223-1BH32-0XB0</b> DIGITAL I/O SM 1223, 8 DI / 8 DO	<b>6ES7223-1BL32-0XB0</b> DIGITAL I/O SM 1223, 16DI/16DO	<b>6ES7223-1PH32-0XB0</b> DIGITAL I/O SM 1223, 8DI/8DO	<b>6ES7223-1PL32-0XB0</b> DIGITAL I/O SM 1223, 16DI/16DO	<b>6ES7223-1QH32-0XB0</b> DIGITAL I/O SM 1223, 8DI AC/ 8DO RLY
<b>Input current</b>					
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA	1 mA	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA	2.5 mA	2.5 mA	2.5 mA
• for signal "1", typ.	4 mA; Typical	4 mA; Typical	4 mA; Typical	4 mA; Typical	9 mA; Typical
<b>Input delay (for rated value of input voltage) for standard inputs</b>					
- Parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
<b>for interrupt inputs</b>					
- Parameterizable	Yes	Yes	Yes	Yes	Yes
<b>Cable length</b>					
• shielded, max.	500 m	500 m	500 m	500 m	500 m
• Unshielded, max.	300 m	300 m	300 m	300 m	300 m
<b>Digital outputs</b>					
Number of digital outputs	8	16	8	16	8
• In groups of	1	1	2	4	4
short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)			
<b>Switching capacity of the outputs</b>					
• with resistive load, max.	0.5 A	0.5 A	2 A	2 A	2 A
• on lamp load, max.	5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
<b>Output voltage</b>					
• Rated value (DC)	24 V	24 V	5 V DC to 30 V DC	5 V DC to 30 V DC	5 V DC to 30 V DC
• Rated value (AC)			5 V AC to 250 V AC	5 V AC to 250 V AC	5 V AC to 250 V AC
• for signal "0", max.	0.1 V; with 10 kOhm load	0.1 V; with 10 kOhm load			
• for signal "1", min.	20 V DC	20 V DC			
<b>Output current</b>					
• for signal "1" rated value	0.5 A	0.5 A			
• for signal "1" permissible range, max.	0.5 A	0.5 A	2 A	2 A	2 A
• for signal "0" residual current, max.	10 µA	10 µA			
<b>Output delay with resistive load</b>					
• "0" to "1", max.	50 µs	50 µs	10 ms	10 ms	10 ms
• "1" to "0", max.	200 µs	200 µs	10 ms	10 ms	10 ms
<b>Aggregate current of outputs (per group)</b>					
<b>horizontal installation</b>					
- up to 50 °C, max.	4 A; Current per mass	8 A; Current per mass	10 A; Current per mass	8 A; Current per mass	8 A; Current per mass
<b>Relay outputs</b>					
• Number of relay outputs			8	16	8
• Rated input voltage of relay coil L+ (DC)			24 V	24 V	24 V
• Number of operating cycles, max.			mechanically 10 million, at rated load voltage 100,000	mechanically 10 million, at rated load voltage 100,000	mechanically 10 million, at rated load voltage 100,000
<b>Switching capacity of contacts</b>					
- with inductive load, max.	0.5 A	0.5 A	2 A	2 A	2 A
- on lamp load, max.	5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
- with resistive load, max.	0.5 A	0.5 A	2 A	2 A	2 A

## Technical specifications (continued)

Article number	6ES7223-1BH32-0XB0 DIGITAL I/O SM 1223, 8 DI / 8 DO	6ES7223-1BL32-0XB0 DIGITAL I/O SM 1223, 16DI/16DO	6ES7223-1PH32-0XB0 DIGITAL I/O SM 1223, 8DI/8DO	6ES7223-1PL32-0XB0 DIGITAL I/O SM 1223, 16DI/16DO	6ES7223-1QH32-0XB0 DIGITAL I/O SM 1223, 8DI AC/ 8DO RLY
<b>Cable length</b>					
• shielded, max.	500 m	500 m	500 m	500 m	500 m
• Unshielded, max.	150 m	150 m	150 m	150 m	150 m
<b>Interrupts/diagnostics/ status information</b>					
<b>Alarms</b>					
• Alarms	Yes	Yes	Yes	Yes	Yes
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
<b>Diagnostic messages</b>					
• Diagnostic functions	Yes	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	Yes		Yes	Yes	
<b>Diagnostics indication LED</b>					
• for status of the inputs	Yes	Yes	Yes	Yes	Yes
• For status of the outputs	Yes	Yes	Yes	Yes	Yes
• for maintenance	Yes	Yes	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes	Yes	Yes
• Status indicator digital input (green)	Yes	Yes	Yes	Yes	Yes
<b>Galvanic isolation</b>					
<b>Galvanic isolation digital inputs</b>					
• between the channels, in groups of	2	2	2	2	2
<b>Galvanic isolation digital outputs</b>					
• between the channels			Relays	Relays	Relays
• between the channels, in groups of	1	1	2	4	2
• between the channels and the backplane bus	500 V AC	500 V AC	1500 V AC for 1 minute	1500 V AC for 1 minute	1500 V AC for 1 minute
<b>Permissible potential difference</b>					
between different circuits			750 V AC for 1 minute	750 V AC for 1 minute	750 V AC for 1 minute
<b>Degree and class of protection</b>					
Degree of protection to EN 60529					
• IP20	Yes	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>					
CE mark	Yes	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes	Yes
cULus	Yes	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes	Yes	Yes
<b>Marine approval</b>					
• Marine approval	Yes		Yes	Yes	Yes
<b>Ambient conditions</b>					
<b>Free fall</b>					
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>					
• Permissible temperature range	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing

**SIMATIC S7-1200 basic controller**

I/O modules

Digital modules

**SM 1223 digital input/output modules****Technical specifications (continued)**

Article number	<b>6ES7223-1BH32-0XB0</b> DIGITAL I/O SM 1223, 8 DI / 8 DO	<b>6ES7223-1BL32-0XB0</b> DIGITAL I/O SM 1223, 16DI/16DO	<b>6ES7223-1PH32-0XB0</b> DIGITAL I/O SM 1223, 8DI/8DO	<b>6ES7223-1PL32-0XB0</b> DIGITAL I/O SM 1223, 16DI/16DO	<b>6ES7223-1QH32-0XB0</b> DIGITAL I/O SM 1223, 8DI AC/ 8DO RLY
<b>Ambient temperature in operation (continued)</b>					
• Min.	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C	60 °C; Number of simultaneously activated outputs: 8 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 16 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated outputs: 4 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 at 55 °C horizontal or 45 °C vertical
• Permissible temperature change	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute
<b>Storage/transport temperature</b>					
• Min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>					
• Storage/transport, min.	660 hPa	660 hPa	660 hPa	660 hPa	660 hPa
• Storage/transport, max.	1 080 hPa	1 080 hPa	1 080 hPa	1 080 hPa	1 080 hPa
<b>Relative humidity</b>					
• Permissible range (without condensation) at 25 °C	95 %	95 %	95 %	95 %	95 %
<b>Connection method</b>					
required front connector	Yes	Yes	Yes	Yes	Yes
<b>Mechanics/material</b>					
Type of housing (front)					
• plastic	Yes	Yes	Yes	Yes	Yes
<b>Dimensions</b>					
Width	45 mm	70 mm	45 mm	70 mm	45 mm
Height	100 mm	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm	75 mm
<b>Weights</b>					
Weight, approx.	210 g	310 g	230 g	350 g	230 g

**Ordering data****SM 1223 digital input/output signal module**

8 inputs, 24 V DC, IEC type 1 current sinking; 8 24 V DC transistor outputs, 0.5 A, 5 W

**6ES7223-1BH32-0XB0**

16 inputs, 24 V DC, IEC type 1 current sinking; 16 24 V DC transistor outputs, 0.5 A, 5 W

**6ES7223-1BL32-0XB0**

8 inputs, 24 V DC, IEC type 1 current sinking; 8 relay outputs, 5 ... 30 V DC/ 5 ... 250 V AC, 2 A, 30 W DC/ 200 W AC

**6ES7223-1PH32-0XB0**

16 inputs, 24 V DC, IEC type 1 current sinking; 16 relay outputs, 5 ... 30 V DC/ 5 ... 250 V AC, 2 A, 30 W DC/ 200 W AC

**6ES7223-1PL32-0XB0**

8 inputs, 120/230 V AC; 8 relay outputs, 5 ... 30 V DC/ 5 ... 250 V AC, 2 A, 30 W DC/ 200 W AC

**6ES7223-1QH32-0XB0****Extension cable for two-tier configuration**

for connecting digital/analog signal modules; length 2 m

**6ES7290-6AA30-0XA0****Terminal block (spare part)**

for 8/16-channel digital signal modules with 7 screws, zinc-plated; 4 pcs.

**6ES7292-1AG30-0XA0****Front flap set (spare part)**

for 8/16-channel signal modules for 32-channel signal modules

**6ES7291-1BA30-0XA0****6ES7291-1BB30-0XA0**

**Overview**

- Digital inputs and outputs as supplement to the integral I/O of the SIMATIC S7-1200 CPUs
- Can be plugged direct into the CPU

**Technical specifications**

Article number	<b>6ES7223-0BD30-0XB0</b>	<b>6ES7223-3AD30-0XB0</b>	<b>6ES7223-3BD30-0XB0</b>
	SIGNAL BOARD SB1223, 2 DI/2 DO	SIGNAL BOARD SB 1223, 2DI/2DQ 5V 200KHZ	SIGNAL BOARD SB 1223, 2DI/2DQ 24V 200KHZ
<b>Product type designation</b>			
<b>Supply voltage</b>			
permissible range, lower limit (DC)	20.4 V		
permissible range, upper limit (DC)	28.8 V		
<b>Input current</b>			
from backplane bus 5 V DC, typ.	50 mA	50 mA	50 mA
<b>Output voltage</b>			
<b>Power supply to the transmitters</b>			
• Supply current, max.	4 mA; per channel	4 mA; per channel	4 mA; per channel
<b>Power losses</b>			
Power loss, typ.	1 W	1 W	1 W
<b>Digital inputs</b>			
Number of digital inputs	2; Current-sinking	2; Current-sourcing	2; Current-sourcing
• In groups of	1	1	1
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes
<b>Number of simultaneously controllable inputs all mounting positions</b>			
- up to 40 °C, max.	2	2	2
<b>Input voltage</b>			
• Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	5 V	24 V
• for signal "0"	0 to 5 V	0 to 1 V	0 to 5 V
• for signal "1"		2 to 6 V	
<b>Input current</b>			
• for signal "0", max. (permissible quiescent current)	1 mA	3 mA	2 mA
• for signal "1", min.		6 mA	5.8 mA
• for signal "1", typ.	0.5 A		14 mA



## SIMATIC S7-1200 basic controller

I/O modules

Digital modules

## SB 1223 digital input/output modules

## Technical specifications (continued)

Article number	6ES7223-0BD30-0XB0 SIGNAL BOARD SB1223, 2 DI/2 DO	6ES7223-3AD30-0XB0 SIGNAL BOARD SB 1223, 2DI/2DQ 5V 200KHZ	6ES7223-3BD30-0XB0 SIGNAL BOARD SB 1223, 2DI/2DQ 24V 200KHZ
<b>Input delay (for rated value of input voltage) for standard inputs</b>			
- Parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
- at "0" to "1", max.	2 µs	2 µs	2.5 µs
- at "1" to "0", max.	10 µs		
<b>for interrupt inputs</b>			
- Parameterizable	Yes	Yes	Yes
<b>for counter/technological functions</b>			
- Parameterizable	Yes	Yes	Yes
<b>Cable length</b>			
• shielded, max.	500 m	50 m	Standard input: 500 m, high-speed counters: 50 m
• Unshielded, max.	300 m		
<b>Digital outputs</b>			
Number of digital outputs	2; MOSFET, solid-state (current-sinking/current-sourcing)	2; MOSFET, solid-state (current-sinking/current-sourcing)	2; MOSFET, solid-state (current-sinking/current-sourcing)
• In groups of	1	1	1
short-circuit protection	No	No	No
<b>Switching capacity of the outputs</b>			
• with resistive load, max.	0.5 A	0.1 A	0.1 A
• on lamp load, max.	5 W		
<b>Load resistance range</b>			
• upper limit	0.6 Ω	5 Ω	10 Ω
<b>Output voltage</b>			
• Rated value (DC)	24 V	5 V	24 V
• for signal "0", max.	0.1 V; with 10 kOhm load	0.4 V	0.1 V; with 10 kOhm load
• for signal "1", min.	20 V	L+ (-0.5 V)	20 V
• for signal "1", max.		6 V	
<b>Output current</b>			
• for signal "1" rated value	0.5 A	0.1 A	0.1 A
• for signal "1" permissible range, max.		0.11 A	
• for signal "0" residual current, max.	10 µA		10 µA
<b>Cable length</b>			
• shielded, max.	500 m	50 m	50 m
• Unshielded, max.	150 m		
<b>Interrupts/diagnostics/ status information</b>			
<b>Alarms</b>			
• Alarms	Yes	Yes	Yes
<b>Diagnostic messages</b>			
• Diagnostic functions	Yes	Yes	Yes
<b>Diagnostics indication LED</b>			
• for status of the inputs	Yes	Yes	Yes
• For status of the outputs	Yes	Yes	Yes
<b>Degree and class of protection</b>			
Degree of protection to EN 60529			
• IP20	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>			
<b>Marine approval</b>			
• Germanischer Lloyd (GL)	Yes	Yes	Yes

## Technical specifications (continued)

Article number	6ES7223-0BD30-0XB0 SIGNAL BOARD SB1223, 2 DI/2 DO	6ES7223-3AD30-0XB0 SIGNAL BOARD SB 1223, 2DI/2DQ 5V 200KHZ	6ES7223-3BD30-0XB0 SIGNAL BOARD SB 1223, 2DI/2DQ 24V 200KHZ
<b>Ambient conditions</b>			
<b>Free fall</b>			
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>			
• Permissible temperature range	0 °C to 55 °C horizontal installation, 0 °C to 45 °C vertical installation	0 °C to 55 °C horizontal installation, 0 °C to 45 °C vertical installation	0 °C to 55 °C horizontal installation, 0 °C to 45 °C vertical installation
• Min.	0 °C	0 °C	0 °C
• max.	55 °C	55 °C	55 °C
<b>Storage/transport temperature</b>			
• Min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>			
• Storage/transport, min.	660 hPa	660 hPa	660 hPa
• Storage/transport, max.	1 080 hPa	1 080 hPa	1 080 hPa
<b>Relative humidity</b>			
• Permissible range (without condensation) at 25 °C	95 %	95 %	95 %
<b>Mechanics/material</b>			
Type of housing (front)			
• plastic	Yes	Yes	Yes
<b>Dimensions</b>			
Width	38 mm	38 mm	38 mm
Height	62 mm	62 mm	62 mm
Depth	21 mm	21 mm	21 mm
<b>Weights</b>			
Weight, approx.	40 g	40 g	40 g

## Ordering data

**SB 1223 digital input/output signal board**

2 inputs, 24 V DC,  
IEC type 1 current sinking;  
2 24 V DC transistor outputs,  
0.5 A, 5 W;  
can be used as HSC  
at up to 30 kHz

2 inputs, 5 V DC, 200 kHz  
2 outputs 5 V DC, 0.1 A, 200 kHz

2 inputs, 24 V DC, 200 kHz  
2 outputs 24 V DC, 0.1 A, 200 kHz

## Article No.

6ES7223-0BD30-0XB0

6ES7223-3AD30-0XB0

6ES7223-3BD30-0XB0

## Article No.

**Terminal block (spare part)**

for signal board  
with 6 screws, gold-plated; 4 pcs.

6ES7292-1BF30-0XA0

**SIMATIC S7-1200 basic controller**

I/O modules

SIPLUS digital modules

**SIPLUS SM 1221 digital input modules****Overview**

- Digital inputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	<b>6AG1221-1BF32-2XB0</b>	<b>6AG1221-1BF32-4XB0</b>	<b>6AG1221-1BH32-2XB0</b>	<b>6AG1221-1BH32-4XB0</b>
Based on	<b>6ES7221-1BF32-0XB0</b> SIPLUS S7-1200 SM 1221 8DI	<b>6ES7221-1BF32-0XB0</b> SIPLUS S7-1200 SM 1221 8DI	<b>6ES7221-1BH32-0XB0</b> SIPLUS S7-1200 SM 1221 16DI	<b>6ES7221-1BH32-0XB0</b> SIPLUS S7-1200 SM 1221 16DI
<b>Ambient conditions</b>				
<b>Free fall</b>				
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>				
• Min.	-40 °C; = Tmin; startup @ -25 °C	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-20 °C; = Tmin; startup @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated inputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
<b>Storage/transport temperature</b>				
• Min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

**Technical specifications** (continued)

Article number	<b>6AG1221-1BF32-2XB0</b>	<b>6AG1221-1BF32-4XB0</b>	<b>6AG1221-1BH32-2XB0</b>	<b>6AG1221-1BH32-4XB0</b>
Based on	<b>6ES7221-1BF32-0XB0</b>	<b>6ES7221-1BF32-0XB0</b>	<b>6ES7221-1BH32-0XB0</b>	<b>6ES7221-1BH32-0XB0</b>
	SIPLUS S7-1200 SM 1221 8DI	SIPLUS S7-1200 SM 1221 8DI	SIPLUS S7-1200 SM 1221 16DI	SIPLUS S7-1200 SM 1221 16DI
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.****Article No.**

**Digital input**  
**SIPLUS signal module SM 1221**  
 (extended temperature range and medial exposure)  
 8 inputs, 24 V DC, isolated, current sourcing/sinking

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

16 inputs, 24 V DC, isolated, current sourcing/sinking

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

**6AG1221-1BF32-4XB0****6AG1221-1BF32-2XB0****6AG1221-1BH32-4XB0****6AG1221-1BH32-2XB0****Accessories**

See SIMATIC S7-1200 SM 1221 digital input module, page 3/43

**SIMATIC S7-1200 basic controller**

I/O modules

SIPLUS digital modules

**SIPLUS SB 1221 digital input modules****Overview**

- Digital inputs as a supplement to the integral I/O of SIMATIC S7-1200 CPUs
- Can be plugged directly into the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	6AG1221-3AD30-5XB0	6AG1221-3BD30-5XB0
Based on	6ES7221-3AD30-0XB0 SIPLUS S7-1200 SB1221 4DI/5VDC	6ES7221-3BD30-0XB0 SIPLUS S7-1200 SB1221 4DI/24VDC
<b>Ambient conditions</b>		
<b>Free fall</b>		
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	55 °C; = Tmax	55 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	
<b>Relative humidity</b>		
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	

**Ordering data****SIPLUS SB 1221 Signal Board digital input module**

(extended temperature range and medial exposure)

4 inputs, 5 V DC, 200 kHz, sourcing

4 inputs, 24 V DC, 200 kHz, sourcing

**Article No.****6AG1221-3AD30-5XB0****6AG1221-3BD30-5XB0****Article No.****Accessories**

See SIMATIC S7-1200 digital input module SB 1221, page 3/45

**Overview**

- Digital outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	<b>6AG1222-1BF32-2XB0</b>	<b>6AG1222-1BF32-4XB0</b>	<b>6AG1222-1BH32-2XB0</b>	<b>6AG1222-1BH32-4XB0</b>
Based on	<b>6ES7222-1BF32-0XB0</b> SIPLUS S7-1200 SM 1222 8DQ	<b>6ES7222-1BF32-0XB0</b> SIPLUS S7-1200 SM 1222 8DQ	<b>6ES7222-1BH32-0XB0</b> SIPLUS S7-1200 SM 1222 16DQ	<b>6ES7222-1BH32-0XB0</b> SIPLUS S7-1200 SM 1222 16DQ
<b>Ambient conditions</b>				
<b>Free fall</b>				
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>				
• Min.	-40 °C; = Tmin; startup @ -25 °C	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-20 °C; = Tmin; startup @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
<b>Storage/transport temperature</b>				
• Min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

# SIMATIC S7-1200 basic controller

I/O modules

SIPLUS digital modules

## SIPLUS SM 1222 digital output modules

### Technical specifications (continued)

Article number	6AG1222-1BF32-2XB0	6AG1222-1BF32-4XB0	6AG1222-1BH32-2XB0	6AG1222-1BH32-4XB0
Based on	6ES7222-1BF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ	6ES7222-1BF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ	6ES7222-1BH32-0XB0 SIPLUS S7-1200 SM 1222 16DQ	6ES7222-1BH32-0XB0 SIPLUS S7-1200 SM 1222 16DQ
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
Article number	6AG1222-1HF32-2XB0	6AG1222-1HF32-4XB0	6AG1222-1HH32-2XB0	6AG1222-1HH32-4XB0
Based on	6ES7222-1HF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6ES7222-1HF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6ES7222-1HH32-0XB0 SIPLUS S7-1200 SM 1222 16DQ RLY	6ES7222-1HH32-0XB0 SIPLUS S7-1200 SM 1222 16DQ RLY
<b>Ambient conditions</b>				
<b>Free fall</b>				
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>				
• Min.	-40 °C; = Tmin; startup @ -25 °C	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-20 °C; = Tmin; startup @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• Permissible temperature change	5°C to 55°C, 3°C / minute			
<b>Storage/transport temperature</b>				
• Min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	-25 °C			
<b>Relative humidity</b>				
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)			
- With condensation, tested in accordance with IEC 60068-2-38, max.		100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)



## Technical specifications (continued)

Article number	6AG1222-1HF32-2XB0	6AG1222-1HF32-4XB0	6AG1222-1HH32-2XB0	6AG1222-1HH32-4XB0
Based on	6ES7222-1HF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6ES7222-1HF32-0XB0 SIPLUS S7-1200 SM 1222 8DQ RLY	6ES7222-1HH32-0XB0 SIPLUS S7-1200 SM 1222 16DQ RLY	6ES7222-1HH32-0XB0 SIPLUS S7-1200 SM 1222 16DQ RLY
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

## Ordering data

Article No.	Article No.
<p><b>Digital output SIPLUS signal module SM 1222</b></p> <p>(Extended temperature range and medial exposure)</p> <p>8 outputs, 24 V DC; 0.5 A, 5 W, isolated</p> <ul style="list-style-type: none"> <li>Suitable for areas with extraordinary medial exposure (conformal coating)</li> <li>-25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50 %</li> </ul> <p>16 outputs, 24 V DC; 0.5 A, 5 W, isolated</p> <ul style="list-style-type: none"> <li>Suitable for areas with extraordinary medial exposure (conformal coating)</li> <li>-25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50 %</li> </ul> <p>8 outputs, 5 ... 30 V DC/ 5 ... 250 V AC, relay 2 A, 30 W DC/200 W AC</p> <ul style="list-style-type: none"> <li>Suitable for areas with extraordinary medial exposure (conformal coating)</li> <li>-25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50 %</li> </ul> <p>16 outputs, 5 ... 30 V DC/ 5 ... 250 V AC, relay 2 A, 30 W DC/200 W AC</p> <ul style="list-style-type: none"> <li>Suitable for areas with extraordinary medial exposure (conformal coating)</li> <li>-25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50 %</li> </ul>	<p><b>Accessories</b></p> <p>See SIMATIC S7-1200 SM 1222 digital output module, page 3/48</p>
6AG1222-1BF32-4XB0	
6AG1222-1BF32-2XB0	
6AG1222-1BH32-4XB0	
6AG1222-1BH32-2XB0	
6AG1222-1HF32-4XB0	
6AG1222-1HF32-2XB0	
6AG1222-1HH32-4XB0	
6AG1222-1HH32-2XB0	

**SIMATIC S7-1200 basic controller**

I/O modules

SIPLUS digital modules

**SIPLUS SB 1222 digital output modules****Overview**

- Digital outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional outputs
- Can be plugged directly into the CPU
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	<b>6AG1222-1AD30-5XB0</b>	<b>6AG1222-1BD30-5XB0</b>
Based on	<b>6ES7222-1AD30-0XB0</b> SIPLUS S7-1200 SB1222 4DQ/5VDC	<b>6ES7222-1BD30-0XB0</b> SIPLUS S7-1200 SB1222 4DQ/24VDC
<b>Ambient conditions</b>		
<b>Free fall</b>		
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	55 °C; = Tmax	55 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m). For "F-Systems" applications max. +2000 m above sea level permissible
<b>Relative humidity</b>		
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	

**Ordering data****SIPLUS SB 1222 Signal Board digital output module**

(extended temperature range and medial exposure)

4 outputs, 5 V DC, 0.1 A, 200 kHz  
4 outputs, 24 V DC, 0.1 A, 200 kHz

**Article No.**

**6AG1222-1AD30-5XB0**  
**6AG1222-1BD30-5XB0**

**Article No.****Accessories**

See SIMATIC S7-1200 digital output module SB 1222, page 3/50

**Overview**

- Digital inputs and outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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**Technical specifications**

Article number	<b>6AG1223-1BH32-2XB0</b>	<b>6AG1223-1BH32-4XB0</b>	<b>6AG1223-1PH32-2XB0</b>	<b>6AG1223-1PH32-4XB0</b>
Based on	<b>6ES7223-1BH32-0XB0</b> SIPLUS S7-1200 SM 1223 8DI/8DQ	<b>6ES7223-1BH32-0XB0</b> SIPLUS S7-1200 SM 1223 8DI/8DQ	<b>6ES7223-1PH32-0XB0</b> SIPLUS S7-1200 SM 1223 8DI/8DQ RLY	<b>6ES7223-1PH32-0XB0</b> SIPLUS S7-1200 SM 1223 8DI/8DQ RLY
<b>Ambient conditions</b>				
<b>Free fall</b>				
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>				
• Min.	-40 °C; = Tmin; startup @ -25 °C	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-20 °C; = Tmin; startup @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4, inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4, inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• Permissible temperature change	5°C to 55°C, 3°C / minute			
<b>Storage/transport temperature</b>				
• Min.	-40 °C			
• max.	70 °C			
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	-25 °C			
<b>Relative humidity</b>				
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)			
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)			

**SIMATIC S7-1200 basic controller**

I/O modules

SIPLUS digital modules

**SIPLUS SM 1223 digital input/output modules****Technical specifications (continued)**

Article number	<b>6AG1223-1BH32-2XB0</b>	<b>6AG1223-1BH32-4XB0</b>	<b>6AG1223-1PH32-2XB0</b>	<b>6AG1223-1PH32-4XB0</b>
Based on	<b>6ES7223-1BH32-0XB0</b> SIPLUS S7-1200 SM 1223 8DI/8DQ	<b>6ES7223-1BH32-0XB0</b> SIPLUS S7-1200 SM 1223 8DI/8DQ	<b>6ES7223-1PH32-0XB0</b> SIPLUS S7-1200 SM 1223 8DI/8DQ RLY	<b>6ES7223-1PH32-0XB0</b> SIPLUS S7-1200 SM 1223 8DI/8DQ RLY
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
Article number	<b>6AG1223-1PL32-2XB0</b>	<b>6AG1223-1PL32-4XB0</b>	<b>6AG1223-1BL32-2XB0</b>	<b>6AG1223-1BL32-4XB0</b>
Based on	<b>6ES7223-1PL32-0XB0</b> SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	<b>6ES7223-1PL32-0XB0</b> SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	<b>6ES7223-1BL32-0XB0</b> SIPLUS S7-1200 SM 1223 16DI/16DQ	<b>6ES7223-1BL32-0XB0</b> SIPLUS S7-1200 SM 1223 16DI/16DQ
<b>Ambient conditions</b>				
<b>Free fall</b>				
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>				
• Min.	-40 °C; = Tmin; startup @ -25 °C	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-20 °C; = Tmin; s tartup @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8, inputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8, inputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
<b>Storage/transport temperature</b>				
• Min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

## Technical specifications (continued)

Article number	6AG1223-1PL32-2XB0	6AG1223-1PL32-4XB0	6AG1223-1BL32-2XB0	6AG1223-1BL32-4XB0
Based on	6ES7223-1PL32-0XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	6ES7223-1PL32-0XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	6ES7223-1BL32-0XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ	6ES7223-1BL32-0XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

## Ordering data

## SIPLUS digital input/output signal module SM 1223

(Extended temperature range and medial exposure)

8 inputs, 24 V DC,  
IEC type 1 current sinking  
8 transistor outputs, 24 V DC,  
0.5 A, 5 W

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C,  
from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

16 inputs, 24 V DC,  
IEC type 1 current sinking  
16 transistor outputs, 24 V DC,  
0.5 A, 5 W

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C,  
from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

8 inputs, 24 V DC,  
IEC type 1 current sinking  
8 relay outputs, 5 ... 30 V DC /  
5 ... 250 V AC, 2 A, 30 W DC /  
200 W AC

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C,  
from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

16 inputs, 24 V DC,  
IEC type 1 current sinking  
16 relay outputs, 5 ... 30 V DC /  
5 ... 250 V AC, 2 A, 30 W DC /  
200 W AC

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C,  
from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

## Article No.

6AG1223-1BH32-4XB0

6AG1223-1BH32-2XB0

6AG1223-1BL32-4XB0

6AG1223-1BL32-2XB0

6AG1223-1PH32-4XB0

6AG1223-1PH32-2XB0

6AG1223-1PL32-4XB0

6AG1223-1PL32-2XB0

## Article No.

## Accessories

See SIMATIC S7-1200 digital input/output SM 1223, page 3/54

**SIMATIC S7-1200 basic controller**

I/O modules

SIPLUS digital modules

**SIPLUS SB 1223 digital input/output modules****Overview**

- Digital inputs and outputs as supplement to the integral I/O of the SIPLUS S7-1200-CPU's
- Can be plugged directly into the CPU (cannot be used for +70 °C version)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	<b>6AG1223-0BD30-4XB0</b>	<b>6AG1223-0BD30-5XB0</b>	<b>6AG1223-3AD30-5XB0</b>	<b>6AG1223-3BD30-5XB0</b>
Based on	<b>6ES7223-0BD30-0XB0</b> SIPLUS S7-1200 SB1223 2DI / 2DO	<b>6ES7223-0BD30-0XB0</b> SIPLUS S7-1200 SB1223 2DI/2DO	<b>6ES7223-3AD30-0XB0</b> SIPLUS S7-1200 SB1223 2DI/2DQ, 5VDC	<b>6ES7223-3BD30-0XB0</b> SIPLUS S7-1200 SB1223 2DI/2DQ, 24VDC
<b>Ambient conditions</b>				
<b>Free fall</b>				
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>				
• Min.	0 °C	-25 °C	0 °C	-25 °C
• max.	55 °C	55 °C	55 °C	55 °C
<b>Storage/transport temperature</b>				
• Min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)			
<b>Relative humidity</b>				
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)			
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!			
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!			
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!			

Ordering data	Article No.	Accessories	Article No.
<p><b>SIPLUS digital input/output signal board SB 1223</b></p> <p>(extended temperature range and medial exposure)</p> <p>2 inputs, 24 V DC, IEC type 1 current sinking; 2 transistor outputs 24 V DC, 0.5 A, 5 W; can be used as HSC at up to 30 kHz</p> <ul style="list-style-type: none"> <li>• Suitable for areas with extraordinary medial exposure (conformal coating)</li> <li>• Ambient temperature -25 ... +55 °C</li> </ul> <p>2 inputs, 5 V DC, 200 kHz 2 outputs, 5 V DC, 0.1 A, 200 kHz</p> <p>2 inputs, 24 V DC, 200 kHz 2 outputs, 24 V DC, 0.1 A, 200 kHz</p>	<p><b>6AG1223-0BD30-4XB0</b></p> <p><b>6AG1223-0BD30-5XB0</b></p> <p><b>6ES7223-3AD30-0XB0</b></p> <p><b>6ES7223-3BD30-0XB0</b></p>	<p>See SIMATIC S7-1200 digital input/output SB 1223, page 3/57</p>	



**SIMATIC S7-1200 basic controller**

I/O modules

Analog modules

**SM 1231 analog input modules****Overview**

- Analog inputs for SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog sensors without additional amplifiers
- For solving even more complex automation tasks

**Technical specifications**

Article number	<b>6ES7231-4HD32-0XB0</b>	<b>6ES7231-4HF32-0XB0</b>	<b>6ES7231-5ND32-0XB0</b>
	ANALOG INPUT SM 1231, 4AI	ANALOG INPUT SM 1231, 8AI	ANALOG INPUT SM 1231, 4AI 16BIT
<b>Product type designation</b>			
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
<b>Input current</b>			
Current consumption, typ.	45 mA	45 mA	65 mA
from backplane bus 5 V DC, typ.	80 mA	90 mA	80 mA
<b>Power losses</b>			
Power loss, typ.	1.5 W	1.5 W	1.8 W
<b>Analog inputs</b>			
Number of analog inputs	4; Current or voltage differential inputs	8; Current or voltage differential inputs	4; Current or voltage differential inputs
permissible input frequency for current input (destruction limit), max.	± 35 V	± 35 V	± 35 V
permissible input voltage for voltage input (destruction limit), max.	35 V	35 V	35 V
permissible input current for voltage input (destruction limit), max.	40 mA	40 mA	40 mA
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA
Cycle time (all channels) max.	625 µs	625 µs	625 µs
<b>Input ranges</b>			
• Voltage	Yes; ±10V, ±5V, ±2.5V	Yes; ±10V, ±5V, ±2.5V	Yes; ±10V, ±5V, ±2.5V or ±1.25V
• Current	Yes; 4 to 20 mA, 0 to 20 mA	Yes; 4 to 20 mA, 0 to 20 mA	Yes; 4 to 20 mA, 0 to 20 mA
• Thermocouple	No	No	No
• Resistance thermometer	No	No	No
• Resistance	No	Yes	Yes
<b>Input ranges (rated values), voltages</b>			
• -1.25 V to +1.25 V			Yes
• -10 V to +10 V	Yes	Yes	Yes
• Input resistance (-10 V to +10 V)	≥9 MOhm	≥9 MOhm	≥9 MOhm
• -2.5 V to +2.5 V	Yes	Yes	Yes
• Input resistance (-2.5 V to +2.5 V)	≥9 MOhm	≥9 MOhm	≥9 MOhm
• -5 V to +5 V	Yes	Yes	Yes
• Input resistance (-5 V to +5 V)	≥9 MOhm	≥9 MOhm	≥9 MOhm

## Technical specifications (continued)

Article number	6ES7231-4HD32-0XB0 ANALOG INPUT SM 1231, 4AI	6ES7231-4HF32-0XB0 ANALOG INPUT SM 1231, 8AI	6ES7231-5ND32-0XB0 ANALOG INPUT SM 1231, 4AI 16BIT
<b>Input ranges (rated values), currents</b>			
• 0 to 20 mA	Yes	Yes	Yes
• Input resistance (0 to 20 mA)	280 Ω	280 Ω	
• 4 mA to 20 mA	Yes		Yes
<b>Thermocouple (TC)</b>			
<b>Temperature compensation</b>			
- Parameterizable		No	
<b>Analog outputs</b>			
Number of analog outputs	0	0	0
<b>Analog value creation</b>			
<b>Integration and conversion time/ resolution per channel</b>			
• Resolution with overrange (bit including sign), max.	12 bit; + sign	12 bit; + sign	15 bit; + sign
• Integration time, parameterizable	Yes	Yes	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz
<b>Smoothing of measured values</b>			
• Parameterizable	Yes	Yes	Yes
• Step: None	Yes	Yes	Yes
• Step: low	Yes	Yes	Yes
• Step: Medium	Yes	Yes	Yes
• Step: High	Yes	Yes	Yes
<b>Errors/accuracies</b>			
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1% / ±0.3% total measurement range
<b>Basic error limit (operational limit at 25 °C)</b>			
• Voltage, relative to input area, (+/-)	0.1 %	0.1 %	0.1 %
• Current, relative to input area, (+/-)	0.1 %	0.1 %	0.1 %
<b>Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency</b>			
• common mode voltage, max.	12 V	12 V	12 V
<b>Interrupts/diagnostics/ status information</b>			
<b>Alarms</b>			
• Alarms	Yes	Yes	Yes
• Diagnostic alarm	Yes	Yes	Yes
<b>Diagnostic messages</b>			
• Diagnostic functions	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	Yes	Yes	Yes
<b>Diagnostics indication LED</b>			
• for status of the inputs	Yes	Yes	Yes
• for maintenance	Yes	Yes	Yes
<b>Galvanic isolation analog outputs</b>			
• between the channels and the power supply of the electronics	No	No	No
<b>Degree and class of protection</b>			
Degree of protection to EN 60529			
• IP20	Yes	Yes	Yes

# SIMATIC S7-1200 basic controller

I/O modules

Analog modules

## SM 1231 analog input modules

### Technical specifications (continued)

Article number	6ES7231-4HD32-0XB0 ANALOG INPUT SM 1231, 4AI	6ES7231-4HF32-0XB0 ANALOG INPUT SM 1231, 8AI	6ES7231-5ND32-0XB0 ANALOG INPUT SM 1231, 4AI 16BIT
<b>Standards, approvals, certificates</b>			
CE mark	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes
<b>Marine approval</b>			
• Marine approval	Yes	Yes	Yes
<b>Highest safety class achievable in safety mode</b>			
• SIL according to IEC 61508		none	none
<b>Ambient conditions</b>			
<b>Free fall</b>			
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>			
• Permissible temperature range	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing
• Min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
<b>Storage/transport temperature</b>			
• Min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>			
• Operation, min.	795 hPa	795 hPa	795 hPa
• Operation, max.	1 080 hPa	1 080 hPa	1 080 hPa
• Storage/transport, min.	660 hPa	660 hPa	660 hPa
• Storage/transport, max.	1 080 hPa	1 080 hPa	1 080 hPa
<b>Relative humidity</b>			
• Permissible range (without condensation) at 25 °C	95 %	95 %	95 %
<b>Pollutant concentrations</b>			
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>			
required front connector	Yes	Yes	Yes
<b>Mechanics/material</b>			
Type of housing (front)			
• plastic	Yes	Yes	Yes
<b>Dimensions</b>			
Width	45 mm	45 mm	45 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weights</b>			
Weight, approx.	180 g	180 g	180 g

### Ordering data

#### SM 1231 analog input signal module

4 analog inputs, ± 10V, ± 5V, ± 2.5V, or 0 ... 20 mA, 16 bits

6ES7231-5ND32-0XB0

4 analog inputs, ± 10V, ± 5V, ± 2.5V, or 0 ... 20 mA, 12 bits + sign

6ES7231-4HD32-0XB0

8 analog inputs, ± 10V, ± 5V, ± 2.5V, or 0 ... 20 mA, 12 bits + sign

6ES7231-4HF32-0XB0

#### Extension cable for two-tier configuration

for connecting digital/analog signal modules; length 2 m

6ES7290-6AA30-0XA0

#### Terminal block (spare part)

for 8/16-channel analog signal modules

with 7 screws, gold-plated; 4 pcs.

6ES7292-1BG30-0XA0

#### Front flap set (spare part)

for 8/16-channel signal modules

6ES7291-1BA30-0XA0

**Overview**

- Analog input module for the SIMATIC S7-1200
- With extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- For the solution of more complex automation tasks as well
- Can be plugged directly into the CPU

**Technical specifications**

Article number	<b>6ES7231-4HA30-0XB0</b> SIGNAL BOARD SB 1231, 1 AI
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
<b>Input current</b>	
from backplane bus 5 V DC, typ.	55 mA
<b>Power losses</b>	
Power loss, typ.	0.4 W
<b>Analog inputs</b>	
Number of analog inputs	1; Current or voltage differential inputs
permissible input frequency for current input (destruction limit), max.	± 35 V
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for voltage input (destruction limit), max.	40 mA
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	156.25 µs; 400 Hz suppression
<b>Input ranges</b>	
• Voltage	Yes; ±10V, ±5V, ±2.5V
• Current	Yes; 0 to 20 mA
• Thermocouple	No
• Resistance thermometer	No
• Resistance	No
<b>Input ranges (rated values), voltages</b>	
• -10 V to +10 V	Yes
• Input resistance (-10 V to +10 V)	≥9 MOhm
• -2.5 V to +2.5 V	Yes
• Input resistance (-2.5 V to +2.5 V)	≥9 MOhm
• -5 V to +5 V	Yes
• Input resistance (-5 V to +5 V)	≥9 MOhm
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
• Input resistance (0 to 20 mA)	≥ 250 Ohm
<b>Analog outputs</b>	
Number of analog outputs	0

Article number	<b>6ES7231-4HA30-0XB0</b> SIGNAL BOARD SB 1231, 1 AI
<b>Analog value creation</b>	
Measurement principle	integrating
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	11 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 Hz
<b>Smoothing of measured values</b>	
• Parameterizable	Yes
• Step: None	Yes
• Step: low	Yes
• Step: Medium	Yes
• Step: High	Yes
<b>Errors/accuracies</b>	
Temperature error (relative to input range), (+/-)	25 °C ±0.3%, to 55 °C ±0.6% total measurement range
<b>Interrupts/diagnostics/ status information</b>	
<b>Alarms</b>	
• Alarms	Yes
• Diagnostic alarm	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
• Wire break	No
<b>Diagnostics indication LED</b>	
• for status of the inputs	Yes
• for maintenance	Yes
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP20	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes

**SIMATIC S7-1200 basic controller**

I/O modules

Analog modules

**SB 1231 analog input modules****Technical specifications (continued)**

Article number	<b>6ES7231-4HA30-0XB0</b> SIGNAL BOARD SB 1231, 1 AI
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>	
• Permissible temperature range	0 °C to 55 °C horizontal installation, 0 °C to 45 °C vertical installation
• Min.	0 °C
• max.	55 °C
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Operation, min.	795 hPa
• Operation, max.	1 080 hPa
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
<b>Relative humidity</b>	
• Permissible range (without condensation) at 25 °C	95 %
<b>Pollutant concentrations</b>	
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	
Type of housing (front)	
• plastic	Yes
<b>Dimensions</b>	
Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weights</b>	
Weight, approx.	35 g

**Ordering data****Article No.****SB 1231 signal board analog input module**

1 analog input, ±10 V with 12 bits or 0... 20 mA with 11 bits

**6ES7231-4HA30-0XB0****Terminal block (spare part)**

for signal board

with 6 screws, gold-plated; 4 pcs.

**6ES7292-1BF30-0XA0**

**Overview**

- Analog outputs for SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog actuators without additional amplifiers
- For solving even more complex automation tasks

**Technical specifications**

Article number	<b>6ES7232-4HB32-0XB0</b> ANALOG OUTPUT SM 1232, 2AO	<b>6ES7232-4HD32-0XB0</b> ANALOG OUTPUT SM 1232, 4AO
<b>Product type designation</b>		
<b>Supply voltage</b>		
Rated value (DC)		
• 24 V DC	Yes	Yes
<b>Input current</b>		
Current consumption, typ.	45 mA	45 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
<b>Power losses</b>		
Power loss, typ.	1.5 W	1.5 W
<b>Analog inputs</b>		
Number of analog inputs	0	0
<b>Thermocouple (TC)</b>		
<b>Temperature compensation</b>		
- Parameterizable	No	No
<b>Analog outputs</b>		
Number of analog outputs	2; Current or voltage	4; Current or voltage
<b>Output ranges, voltage</b>		
• -10 V to +10 V	Yes	Yes
<b>Output ranges, current</b>		
• 0 to 20 mA	Yes	Yes
<b>Load impedance (in rated range of output)</b>		
• with voltage outputs, min.	1 000 Ω	1 000 Ω
• with current outputs, max.	600 Ω	600 Ω
<b>Analog value creation</b>		
Measurement principle	Differential	Differential
<b>Integration and conversion time/ resolution per channel</b>		
• Resolution (incl. overrange)	Voltage: 14 bits; Current : 13 bits	Voltage: 14 bits; Current : 13 bits
• Integration time, parameterizable	Yes	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz

**SIMATIC S7-1200 basic controller**

I/O modules

Analog modules

**SM 1232 analog output modules****Technical specifications (continued)**

Article number	<b>6ES7232-4HB32-0XB0</b> ANALOG OUTPUT SM 1232, 2AO	<b>6ES7232-4HD32-0XB0</b> ANALOG OUTPUT SM 1232, 4AO
<b>Errors/accuracies</b>		
Temperature error (relative to output range), (+/-)	25 °C ±0.3%, to 55 °C ±0.6% total measurement range	25 °C ±0.3%, to 55 °C ±0.6% total measurement range
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to output area, (+/-)	0.3 %	0.3 %
• Current, relative to output area, (+/-)	0.3 %	0.3 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>		
• common mode voltage, max.	12 V	12 V
<b>Interrupts/diagnostics/status information</b>		
<b>Alarms</b>		
• Alarms	Yes	Yes
• Diagnostic alarm	Yes	Yes
<b>Diagnostic messages</b>		
• Diagnostic functions	Yes	Yes
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes	Yes
• Short circuit	Yes	Yes
<b>Diagnostics indication LED</b>		
• For status of the outputs	Yes	Yes
• for maintenance	Yes	Yes
<b>Degree and class of protection</b>		
Degree of protection to EN 60529		
• IP20	Yes	Yes
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
CSA approval	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
<b>Highest safety class achievable in safety mode</b>		
• SIL according to IEC 61508	none	none
<b>Ambient conditions</b>		
<b>Free fall</b>		
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>		
• Permissible temperature range	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing
• Min.	-20 °C	-20 °C
• max.	60 °C	60 °C
<b>Storage/transport temperature</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>		
• Operation, min.	795 hPa	795 hPa
• Operation, max.	1 080 hPa	1 080 hPa
• Storage/transport, min.	660 hPa	660 hPa
• Storage/transport, max.	1 080 hPa	1 080 hPa
<b>Relative humidity</b>		
• Permissible range (without condensation) at 25 °C	95 %	95 %
<b>Pollutant concentrations</b>		
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free



**Technical specifications** (continued)

Article number	<b>6ES7232-4HB32-0XB0</b> ANALOG OUTPUT SM 1232, 2AO	<b>6ES7232-4HD32-0XB0</b> ANALOG OUTPUT SM 1232, 4AO
<b>Connection method</b>		
required front connector	Yes	Yes
<b>Mechanics/material</b>		
Type of housing (front)		
• plastic	Yes	Yes
<b>Dimensions</b>		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
<b>Weights</b>		
Weight, approx.	180 g	180 g

**Ordering data****SM 1232 analog output signal module**2 analog outputs,  $\pm 10$  V with 14 bits  
or 0 ... 20 mA with 13 bits**6ES7232-4HB32-0XB0**4 analog outputs,  $\pm 10$  V with 14 bits  
or 0 ... 20 mA with 13 bits**6ES7232-4HD32-0XB0****Terminal block (spare part)**for 8/16-channel analog signal  
modules

with 7 screws, gold-plated; 4 units

**6ES7292-1BG30-0XA0****Extension cable  
for two-tier configuration**for connecting digital/analog signal  
modules;  
length 2 m**6ES7290-6AA30-0XA0****Front flap set (spare part)**

for 8/16-channel signal modules

**6ES7291-1BA30-0XA0**

**SIMATIC S7-1200 basic controller**

I/O modules

Analog modules

**SB 1232 analog output modules****Overview**

- Analog output for the SIMATIC S7-1200
- Can be plugged direct into the CPU

**Technical specifications**

Article number	<b>6ES7232-4HA30-0XB0</b>
	SIGNAL BOARD SB 1232, 1 AO
<b>Product type designation</b>	
<b>Input current</b>	
from backplane bus 5 V DC, typ.	15 mA
<b>Output voltage</b>	
<b>Power supply to the transmitters</b>	
• Supply current, max.	25 mA
<b>Power losses</b>	
Power loss, typ.	1.5 W
<b>Analog inputs</b>	
Number of analog inputs	0
<b>Analog outputs</b>	
Number of analog outputs	1
Cycle time (all channels) max.	Voltage: 300 $\mu$ S (R), 750 $\mu$ S (1 $\mu$ F) Current: 600 ms (1 mH); 2 ms (10 mH)
<b>Output ranges, voltage</b>	
• -10 V to +10 V	Yes
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
<b>Load impedance (in rated range of output)</b>	
• with voltage outputs, min.	1 000 $\Omega$
• with current outputs, max.	600 $\Omega$
<b>Cable length</b>	
• shielded, max.	10 m; shielded, twisted pair
<b>Analog value creation</b>	
Measurement principle	Differential
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution (incl. overrange)	V/12 bits, I/11 bits
<b>Smoothing of measured values</b>	
• Parameterizable	Yes
<b>Errors/accuracies</b>	
Temperature error (relative to output range), (+/-)	25 °C $\pm$ 0.5%, to 55 °C $\pm$ 1%

Article number	<b>6ES7232-4HA30-0XB0</b>
	SIGNAL BOARD SB 1232, 1 AO
<b>Interrupts/diagnostics/ status information</b>	
<b>Alarms</b>	
• Alarms	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
<b>Diagnostics indication LED</b>	
• For status of the outputs	Yes
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP20	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>	
• Permissible temperature range	0 °C to 55 °C horizontal installation, 0 °C to 45 °C vertical installation
• Min.	0 °C
• max.	55 °C
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
<b>Relative humidity</b>	
• Permissible range (without condensation) at 25 °C	95 %
<b>Pollutant concentrations</b>	
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free

**Technical specifications (continued)**

Article number	<b>6ES7232-4HA30-0XB0</b> SIGNAL BOARD SB 1232, 1 AO
<b>Mechanics/material</b>	
Type of housing (front)	
• plastic	Yes
<b>Dimensions</b>	
Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weights</b>	
Weight, approx.	40 g

**Ordering data****Article No.****SB 1232 analog output signal board**1 analog output,  $\pm 10$  V with 12 bits  
or 0 ... 20 mA with 11 bits**6ES7232-4HA30-0XB0****Terminal block (spare part)**for signal board  
with 6 screws, gold-plated; 4 pcs.**6ES7292-1BF30-0XA0**

**SIMATIC S7-1200 basic controller**

I/O modules

Analog modules

**SM 1234 analog input/output modules****Overview**

- Analog inputs and outputs for the SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- For solving even more complex automation tasks

**Technical specifications**

Article number	<b>6ES7234-4HE32-0XB0</b>
	ANALOG I/O SM 1234, 4AI/2AO
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
<b>Input current</b>	
Current consumption, typ.	60 mA
from backplane bus 5 V DC, typ.	80 mA
<b>Power losses</b>	
Power loss, typ.	2 W
<b>Analog inputs</b>	
Number of analog inputs	4; Current or voltage differential inputs
permissible input frequency for current input (destruction limit), max.	± 35 V
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for voltage input (destruction limit), max.	40 mA
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	625 µs
<b>Input ranges</b>	
• Voltage	Yes; ±10V, ±5V, ±2.5V
• Current	Yes; 4 to 20 mA, 0 to 20 mA
• Thermocouple	No
• Resistance thermometer	No
• Resistance	No
<b>Input ranges (rated values), voltages</b>	
• -10 V to +10 V	Yes
• Input resistance (-10 V to +10 V)	≥9 MOhm
• -2.5 V to +2.5 V	Yes
• Input resistance (-2.5 V to +2.5 V)	≥9 MOhm
• -5 V to +5 V	Yes
• Input resistance (-5 V to +5 V)	≥9 MOhm

Article number	<b>6ES7234-4HE32-0XB0</b>
	ANALOG I/O SM 1234, 4AI/2AO
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
• Input resistance (0 to 20 mA)	280 Ω
• 4 mA to 20 mA	Yes
<b>Analog outputs</b>	
Number of analog outputs	2; Current or voltage
<b>Output ranges, voltage</b>	
• -10 V to +10 V	Yes
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Load impedance (in rated range of output)</b>	
• with voltage outputs, min.	1 000 Ω
• with current outputs, max.	600 Ω
<b>Analog value creation</b>	
Measurement principle	Differential
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution (incl. overrange)	Voltage: 14 bits; Current : 13 bits
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz
<b>Smoothing of measured values</b>	
• Parameterizable	Yes
• Step: None	Yes
• Step: low	Yes
• Step: Medium	Yes
• Step: High	Yes
<b>Errors/accuracies</b>	
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Temperature error (relative to output range), (+/-)	25 °C ±0.3%, to 55 °C ±0.6% total measurement range

## Technical specifications (continued)

Article number	<b>6ES7234-4HE32-0XB0</b> ANALOG I/O SM 1234, 4AI/2AO	
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to input area, (+/-)	0.1 %	
• Current, relative to input area, (+/-)	0.1 %	
• Voltage, relative to output area, (+/-)	0.3 %	
• Current, relative to output area, (+/-)	0.3 %	
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, <math>f1 =</math> interference frequency</b>		
• common mode voltage, max.	12 V	
<b>Interrupts/diagnostics/status information</b>		
<b>Alarms</b>		
• Alarms	Yes	
• Diagnostic alarm	Yes	
<b>Diagnostic messages</b>		
• Diagnostic functions	Yes	
• Monitoring the supply voltage	Yes	
• Wire break	Yes	
• Short circuit	Yes	
<b>Diagnostics indication LED</b>		
• for status of the inputs	Yes	
• For status of the outputs	Yes	
• for maintenance	Yes	
<b>Galvanic isolation analog outputs</b>		
• between the channels and the power supply of the electronics	No	
<b>Degree and class of protection</b>		
Degree of protection to EN 60529		
• IP20	Yes	
<b>Standards, approvals, certificates</b>		
CE mark	Yes	
CSA approval	Yes	
FM approval	Yes	
RCM (formerly C-TICK)	Yes	
<b>Marine approval</b>		
• Marine approval	Yes	

Article number	<b>6ES7234-4HE32-0XB0</b> ANALOG I/O SM 1234, 4AI/2AO	
<b>Highest safety class achievable in safety mode</b>		
• SIL according to IEC 61508	none	
<b>Ambient conditions</b>		
<b>Free fall</b>		
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	
<b>Ambient temperature in operation</b>		
• Permissible temperature range	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	
• Min.	-20 °C	
• max.	60 °C	
<b>Storage/transport temperature</b>		
• Min.	-40 °C	
• max.	70 °C	
<b>Air pressure acc. to IEC 60068-2-13</b>		
• Operation, min.	795 hPa	
• Operation, max.	1 080 hPa	
• Storage/transport, min.	660 hPa	
• Storage/transport, max.	1 080 hPa	
<b>Relative humidity</b>		
• Permissible range (without condensation) at 25 °C	95 %	
<b>Pollutant concentrations</b>		
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	
<b>Connection method</b>		
required front connector	Yes	
<b>Mechanics/material</b>		
Type of housing (front)		
• plastic	Yes	
<b>Dimensions</b>		
Width	45 mm	
Height	100 mm	
Depth	75 mm	
<b>Weights</b>		
Weight, approx.	220 g	

## Ordering data

Ordering data	Article No.
<b>SM 1234 analog input/output signal module</b>	
4 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA, 12 bits + sign; 2 analog outputs, ±10 V with 14 bits or 0 ... 20 mA with 13 bits	<b>6ES7234-4HE32-0XB0</b>
<b>Terminal block (spare part)</b>	
for 8/16-channel analog signal modules with 7 screws, gold-plated; 4 pcs.	<b>6ES7292-1BG30-0XA0</b>

Ordering data	Article No.
<b>Extension cable for two-tier configuration</b>	<b>6ES7290-6AA30-0XA0</b>
for connecting digital/analog signal modules; length 2 m	
<b>Front flap set (spare part)</b>	
for 8/16-channel signal modules	<b>6ES7291-1BA30-0XA0</b>

**SIMATIC S7-1200 basic controller**

I/O modules

Analog modules

**SM 1231 thermocouple modules****Overview**

- For the convenient recording of temperatures with great accuracy
- 7 common thermocouple types can be used
- Also for the measurement of analog signals with a low level ( $\pm 80$  mV)
- Can easily be retrofitted to existing plant

**Technical specifications**

Article number	<b>6ES7231-5QD32-0XB0</b> S7-1200, ANALOG INPUT SM 1231 TC, 4 AI	<b>6ES7231-5QF32-0XB0</b> S7-1200, ANALOG INPUT SM 1231 TC, 8 AI
<b>Product type designation</b>		
<b>Supply voltage</b>		
Rated value (DC)		
• 24 V DC	Yes	Yes
<b>Input current</b>		
Current consumption, typ.	40 mA	40 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
<b>Power losses</b>		
Power loss, typ.	1.5 W	1.5 W
<b>Analog inputs</b>		
Number of analog inputs	4; Thermocouples	8; Thermocouples
permissible input frequency for current input (destruction limit), max.	$\pm 35$ V	$\pm 35$ V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
<b>Input ranges</b>		
• Thermocouple	Yes; J, K, T, E, R, S, N, C, TXK/XK(L); voltage range: $\pm 80$ mV	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: $\pm 80$ mV
• Resistance thermometer	No	No
• Resistance	No	No
<b>Input ranges (rated values), voltages</b>		
• -80 mV to +80 mV	Yes	Yes
• Input resistance (-80 mV to +80 mV)	$\geq 1$ MOhm	$\geq 1$ MOhm
<b>Input ranges (rated values), thermoelements</b>		
• Type B	Yes	Yes
• Type C	Yes	Yes
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type N	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
• Type T	Yes	Yes
• Type TXK/TXK(L) to GOST	Yes	Yes
<b>Thermocouple (TC)</b>		
• permissible input voltage for voltage input (destruction limit), max.	$\pm 35$ V	$\pm 35$ V
<b>Temperature compensation</b>		
- Parameterizable	No	No

## Technical specifications (continued)

Article number	6ES7231-5QD32-0XB0	6ES7231-5QF32-0XB0
	S7-1200, ANALOG INPUT SM 1231 TC, 4 AI	S7-1200, ANALOG INPUT SM 1231 TC, 8 AI
<b>Analog outputs</b>		
Number of analog outputs	0	0
<b>Analog value creation</b>		
Measurement principle	integrating	integrating
<b>Integration and conversion time/ resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	15 bit; + sign	15 bit; + sign
• Integration time, parameterizable	No	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 50 / 60 / 400 Hz	85 dB at 50 / 60 / 400 Hz
<b>Analog value generation (in isochronous mode)</b>		
<b>Smoothing of measured values</b>		
• Parameterizable	Yes	Yes
<b>Errors/accuracies</b>		
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.5 %	0.5 %
<b>Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency</b>		
• Common mode interference, min.	120 dB	120 dB
<b>Interrupts/diagnostics/ status information</b>		
<b>Alarms</b>		
• Alarms	Yes	Yes
• Diagnostic alarm	Yes	Yes
<b>Diagnostic messages</b>		
• Diagnostic functions	Yes; Can be read out	Yes; Can be read out
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes	Yes
<b>Diagnostics indication LED</b>		
• for status of the inputs	Yes	Yes
• for maintenance	Yes	Yes
<b>Degree and class of protection</b>		
Degree of protection to EN 60529		
• IP20	Yes	Yes
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
CSA approval	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
<b>Highest safety class achievable in safety mode</b>		
• SIL according to IEC 61508	none	none



**SIMATIC S7-1200 basic controller**

I/O modules

Analog modules

**SM 1231 thermocouple modules****Technical specifications (continued)**

Article number	<b>6ES7231-5QD32-0XB0</b> S7-1200, ANALOG INPUT SM 1231 TC, 4 AI	<b>6ES7231-5QF32-0XB0</b> S7-1200, ANALOG INPUT SM 1231 TC, 8 AI
<b>Ambient conditions</b>		
<b>Free fall</b>		
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>		
• Permissible temperature range	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing
• Min.	-20 °C	-20 °C
• max.	60 °C	60 °C
<b>Storage/transport temperature</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>		
• Operation, min.	795 hPa	795 hPa
• Operation, max.	1 080 hPa	1 080 hPa
• Storage/transport, min.	660 hPa	660 hPa
• Storage/transport, max.	1 080 hPa	1 080 hPa
<b>Relative humidity</b>		
• Permissible range (without condensation) at 25 °C	95 %	95 %
<b>Pollutant concentrations</b>		
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>		
required front connector	Yes	Yes
<b>Mechanics/material</b>		
Type of housing (front)		
• plastic	Yes	Yes
<b>Dimensions</b>		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
<b>Weights</b>		
Weight, approx.	180 g	220 g

**Ordering data****Article No.****Article No.****SM 1231 thermocouple module**

4 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, S, T, R, E, N

8 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, T, E, R, S, N, C, TXK/XK(L)

**6ES7231-5QD32-0XB0****6ES7231-5QF32-0XB0****Accessories****Terminal block (spare part)**

for 8/16-channel analog signal modules; with 7 screws, gold-plated; 4 units

**6ES7292-1BG30-0XA0**

for 32-channel analog signal modules; with 11 screws, gold-plated; 4 units

**6ES7292-1BL30-0XA0****Extension cable for two-tier configuration**

for connecting digital/analog signal modules; length 2 m

**6ES7290-6AA30-0XA0****Front flap set (spare part)**

for 8/16-channel signal modules

**6ES7291-1BA30-0XA0**

**Overview**

- For the convenient recording of temperatures with great accuracy
- 1 input with 16-bit resolution
- Common thermocouple types can be used
- Also for the measurement of analog signals with a low level ( $\pm 80$  mV)
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

**Technical specifications**

Article number	<b>6ES7231-5QA30-0XB0</b> SIGNAL BOARD SB 1231 TC, 1 AI
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
<b>Input current</b>	
Current consumption, typ.	5 mA
from backplane bus 5 V DC, typ.	20 mA
<b>Power losses</b>	
Power loss, typ.	0.5 W
<b>Analog inputs</b>	
Number of analog inputs	1; Thermocouples
permissible input frequency for current input (destruction limit), max.	$\pm 35$ V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
<b>Input ranges</b>	
• Thermocouple	Yes; J, K; voltage range $\pm 80$ MV
• Resistance thermometer	No
• Resistance	No
<b>Input ranges (rated values), voltages</b>	
• -80 mV to +80 mV	Yes
• Input resistance (-80 mV to +80 mV)	$\geq 1$ MOhm
<b>Input ranges (rated values), thermoelements</b>	
• Type J	Yes
• Input resistance (type J)	1200 °C
• Type K	Yes
• Input resistance (Type K)	1372 °C
<b>Thermocouple (TC)</b>	
• permissible input voltage for voltage input (destruction limit), max.	$\pm 35$ V
<b>Temperature compensation</b>	
- Parameterizable	No
<b>Analog outputs</b>	
Number of analog outputs	0
<b>Analog value creation</b>	
Measurement principle	integrating
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	No
• Interference voltage suppression for interference frequency $f_1$ in Hz	85 dB at 10 / 50 / 60 / 400 Hz

Article number	<b>6ES7231-5QA30-0XB0</b> SIGNAL BOARD SB 1231 TC, 1 AI
<b>Analog value generation (in isochronous mode)</b>	
<b>Smoothing of measured values</b>	
• Parameterizable	Yes
<b>Errors/accuracies</b>	
Temperature error (relative to input range), (+/-)	25 °C $\pm 0.1\%$ , to 55 °C $\pm 0.2\%$ total measurement range
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.5 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>	
• Common mode interference, min.	120 dB
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Alarms	Yes
• Diagnostic alarm	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes; Can be read out
• Wire break	Yes
<b>Diagnostics indication LED</b>	
• for status of the inputs	Yes
• for maintenance	Yes
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP20	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>	
• Permissible temperature range	0 °C to 55 °C horizontal installation, 0 °C to 45 °C vertical installation
• Min.	0 °C
• max.	55 °C
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Operation, min.	795 hPa
• Operation, max.	1 080 hPa
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa

**SIMATIC S7-1200 basic controller**

I/O modules

Analog modules

**SB 1231 thermocouple signal boards****Technical specifications** (continued)

Article number	<b>6ES7231-5QA30-0XB0</b> SIGNAL BOARD SB 1231 TC, 1 AI
<b>Relative humidity</b>	
• Permissible range (without condensation) at 25 °C	95 %
<b>Pollutant concentrations</b>	
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	
Type of housing (front)	
• plastic	Yes
<b>Dimensions</b>	
Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weights</b>	
Weight, approx.	35 g

**Ordering data****Article No.****Thermocouple signal board  
SB 1231****6ES7231-5QA30-0XB0**1 input +/- 80 mV, resolution 15 bits  
+ sign, thermocouples type J, K**Accessories****Terminal block (spare part)**

for signal board

with 6 screws, gold-plated; 4 pcs.

**6ES7292-1BF30-0XA0**

3

**Overview**

- For the convenient recording of temperatures with great accuracy
- 4 inputs
- Most popular resistance temperature detectors can be used
- Can easily be retrofitted to existing installation

**Technical specifications**

Article number	<b>6ES7231-5PD32-0XB0</b> S7-1200, ANALOG INPUT SM 1231 RTD, 4 AI	<b>6ES7231-5PF32-0XB0</b> S7-1200, ANALOG INPUT SM 1231 RTD, 8 AI
<b>Product type designation</b>		
<b>Supply voltage</b>		
Rated value (DC)		
• 24 V DC	Yes	Yes
<b>Input current</b>		
Current consumption, typ.	40 mA	40 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
<b>Power losses</b>		
Power loss, typ.	1.5 W	1.5 W
<b>Analog inputs</b>		
Number of analog inputs	4; Resistance thermometer	8; Resistance thermometer
permissible input frequency for current input (destruction limit), max.	± 35 V	± 35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
<b>Input ranges</b>		
• Thermocouple	No	No
• Resistance thermometer	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000
• Resistance	Yes; 150 Ω, 300 Ω, 600 Ω	Yes; 150 Ω, 300 Ω, 600 Ω
<b>Input ranges (rated values), resistance thermometer</b>		
• Cu 10	Yes	Yes
• Input resistance (Cu 10)	10 Ω	10 Ω
• Ni 100	Yes	Yes
• Input resistance (Ni 100)	100 Ω	100 Ω
• Ni 1000	Yes	Yes
• Input resistance (Ni 1000)	1 000 Ω	1 000 Ω
• LG-Ni 1000	Yes	Yes
• Input resistance (LG-Ni 1000)	1 000 Ω	1 000 Ω
• Ni 120	Yes	Yes
• Input resistance (Ni 120)	120 Ω	120 Ω
• Ni 200	Yes	Yes
• Input resistance (Ni 200)	200 Ω	200 Ω
• Ni 500	Yes	Yes
• Input resistance (Ni 500)	500 Ω	500 Ω
• Pt 100	Yes	Yes
• Input resistance (Pt 100)	100 Ω	100 Ω
• Pt 1000	Yes	Yes
• Input resistance (Pt 1000)	1 000 Ω	1 000 Ω
• Pt 200	Yes	Yes
• Input resistance (Pt 200)	200 Ω	200 Ω
• Pt 500	Yes	Yes
• Input resistance (Pt 500)	500 Ω	500 Ω

**SIMATIC S7-1200 basic controller**

I/O modules

Analog modules

**SM 1231 RTD signal modules****Technical specifications (continued)**

Article number	<b>6ES7231-5PD32-0XB0</b> S7-1200, ANALOG INPUT SM 1231 RTD, 4 AI	<b>6ES7231-5PF32-0XB0</b> S7-1200, ANALOG INPUT SM 1231 RTD, 8 AI
<b>Input ranges (rated values), resistors</b>		
• 0 to 150 ohms	Yes	Yes
• 0 to 300 ohms	Yes	Yes
• 0 to 600 ohms	Yes	Yes
<b>Thermocouple (TC)</b>		
<b>Temperature compensation</b>		
- Parameterizable	No	No
<b>Analog outputs</b>		
Number of analog outputs	0	0
<b>Analog value creation</b>		
Measurement principle	integrating	integrating
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	15 bit; + sign	15 bit; + sign
• Integration time, parameterizable	No	No
• Interference voltage suppression for interference frequency $f_1$ in Hz	85 dB at 50 / 60 / 400 Hz	85 dB at 50 / 60 / 400 Hz
<b>Errors/accuracies</b>		
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.05 %	0.05 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>		
• Common mode interference, min.	120 dB	120 dB
<b>Interrupts/diagnostics/status information</b>		
<b>Alarms</b>		
• Alarms	Yes	Yes
• Diagnostic alarm	Yes	Yes
<b>Diagnostic messages</b>		
• Diagnostic functions	Yes; Can be read out	Yes; Can be read out
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes	Yes
<b>Diagnostics indication LED</b>		
• for status of the inputs	Yes	Yes
• for maintenance	Yes	Yes
<b>Degree and class of protection</b>		
Degree of protection to EN 60529		
• IP20	Yes	Yes
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
CSA approval	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
<b>Highest safety class achievable in safety mode</b>		
• SIL according to IEC 61508	none	none

## Technical specifications (continued)

Article number	6ES7231-5PD32-0XB0 S7-1200, ANALOG INPUT SM 1231 RTD, 4 AI	6ES7231-5PF32-0XB0 S7-1200, ANALOG INPUT SM 1231 RTD, 8 AI
<b>Ambient conditions</b>		
<b>Free fall</b>		
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>		
• Permissible temperature range	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing
• Min.	-20 °C	-20 °C
• max.	60 °C	60 °C
<b>Storage/transport temperature</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>		
• Operation, min.	795 hPa	795 hPa
• Operation, max.	1 080 hPa	1 080 hPa
• Storage/transport, min.	660 hPa	660 hPa
• Storage/transport, max.	1 080 hPa	1 080 hPa
<b>Relative humidity</b>		
• Permissible range (without condensation) at 25 °C	95 %	95 %
<b>Pollutant concentrations</b>		
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>		
required front connector	Yes	Yes
<b>Mechanics/material</b>		
Type of housing (front)		
• plastic	Yes	Yes
<b>Dimensions</b>		
Width	45 mm	70 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
<b>Weights</b>		
Weight, approx.	220 g	220 g

## Ordering data

Ordering data	Article No.	Article No.
<b>SM 1231 RTD signal module</b> 4 inputs for resistance temperature detectors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 Ohm, resolution 15 bits + sign	6ES7231-5PD32-0XB0	
	6ES7231-5PF32-0XB0	
8 inputs for resistance temperature detectors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 Ohm, resolution 15 bits + sign		
<b>Accessories</b>		
<b>Terminal block (spare part)</b>		
for 8/16-channel analog signal modules; with 7 screws, gold-plated; 4 units		6ES7292-1BG30-0XA0
for 32-channel analog signal modules; with 11 screws, gold-plated; 4 units		6ES7292-1BL30-0XA0
<b>Extension cable for two-tier configuration</b>		
for connecting digital/analog signal modules; length 2 m		6ES7290-6AA30-0XA0
<b>Front flap set (spare part)</b>		
for 8/16-channel signal modules		6ES7291-1BA30-0XA0

**SIMATIC S7-1200 basic controller**

I/O modules

Analog modules

**SB 1231 RTD signal boards****Overview**

- For the convenient recording of temperatures with great accuracy
- 1 input with 16-bit resolution
- Common resistance-type temperature detectors can be used
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

**Technical specifications**

Article number	<b>6ES7231-5PA30-0XB0</b> SIGNAL BOARD SB 1231 RTD
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
<b>Input current</b>	
Current consumption, typ.	5 mA
from backplane bus 5 V DC, typ.	20 mA
<b>Power losses</b>	
Power loss, typ.	0.5 W
<b>Analog inputs</b>	
Number of analog inputs	1; Resistance thermometer
permissible input frequency for current input (destruction limit), max.	± 35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
<b>Input ranges</b>	
• Thermocouple	No
• Resistance thermometer	Yes; Platinum (Pt)
• Resistance	Yes; 150 Ω, 300 Ω, 600 Ω
<b>Input ranges (rated values), voltages</b>	
• Input resistance (-80 mV to +80 mV)	>= 10 MOhm
<b>Input ranges (rated values), resistance thermometer</b>	
• Pt 100	Yes
• Input resistance (Pt 100)	100 Ω
• Pt 1000	Yes
• Input resistance (Pt 1000)	1 000 Ω
• Pt 200	Yes
• Input resistance (Pt 200)	200 Ω
• Pt 500	Yes
• Input resistance (Pt 500)	500 Ω
<b>Input ranges (rated values), resistors</b>	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
<b>Thermocouple (TC)</b>	
<b>Temperature compensation</b>	
- Parameterizable	No
<b>Analog outputs</b>	
Number of analog outputs	0
<b>Analog value creation</b>	
Measurement principle	integrating

Article number	<b>6ES7231-5PA30-0XB0</b> SIGNAL BOARD SB 1231 RTD
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz
<b>Errors/accuracies</b>	
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.05 %
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, f1 = interference frequency</b>	
• Common mode interference, min.	120 dB
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Alarms	Yes
• Diagnostic alarm	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes; Can be read out
• Wire break	Yes
<b>Diagnostics indication LED</b>	
• for status of the inputs	Yes
• for maintenance	Yes
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP20	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>	
• Permissible temperature range	0 °C to 55 °C horizontal installation, 0 °C to 45 °C vertical installation
• Min.	0 °C
• max.	55 °C
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C



**Technical specifications** (continued)

Article number	<b>6ES7231-5PA30-0XB0</b> SIGNAL BOARD SB 1231 RTD
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Operation, min.	795 hPa
• Operation, max.	1 080 hPa
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
<b>Relative humidity</b>	
• Permissible range (without condensation) at 25 °C	95 %
<b>Pollutant concentrations</b>	
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	
Type of housing (front)	
• plastic	Yes
<b>Dimensions</b>	
Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weights</b>	
Weight, approx.	35 g

**Ordering data**

**RTD signal board SB 1231**  
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign

**Accessories****Terminal block (spare part)**

for signal board  
with 6 screws, gold-plated; 4 pcs.

**Article No.****6ES7231-5PA30-0XB0****6ES7292-1BF30-0XA0**

**SIMATIC S7-1200 basic controller**

I/O modules

SIPLUS analog modules

**SIPLUS SM 1231 analog input modules****Overview**

- Analog inputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- Even solves more complex automation tasks
- From +60°C to +70°C, max. 50% of the inputs can be controlled simultaneously

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	<b>6AG1231-4HD32-4XB0</b>
Based on	<b>6ES7231-4HD32-0XB0</b> SIPLUS S7-1200 SM 1231 4AI 13BIT

<b>Ambient conditions</b>	
<b>Free fall</b>	
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>	
• Min.	-20 °C; = Tmin; startup @ 0 °C
• max.	60 °C; = Tmax
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Article number	<b>6AG1231-4HD32-4XB0</b>
Based on	<b>6ES7231-4HD32-0XB0</b> SIPLUS S7-1200 SM 1231 4AI 13BIT

<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****SIPLUS SM 1231 analog input signal module**

(extended temperature range and medial exposure)

Ambient temperature range  
0 ... +55 °C4 analog inputs ±10 V, ±5 V, ±2.5 V,  
or 0 ... 20 mA; 12 bits + sign**Article No.****6AG1231-4HD32-4XB0****Article No.****Accessories**See SIMATIC S7-1200 analog input  
SM 1231, page 3/72

**Overview**

- Analog outputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators without additional amplifiers
- Even solves more complex automation tasks
- From +60 °C to +70 °C, max. 50% of the outputs can be controlled simultaneously

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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**Technical specifications**

Article number	<b>6AG1232-4HB32-4XB0</b>
Based on	<b>6ES7232-4HB32-0XB0</b> SIPLUS S7-1200 SM 1232 2AQ 13BIT
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>	
• Min.	-20 °C; = Tmin; startup @ 0 °C
• max.	60 °C; = Tmax
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Article number	<b>6AG1232-4HB32-4XB0</b>
Based on	<b>6ES7232-4HB32-0XB0</b> SIPLUS S7-1200 SM 1232 2AQ 13BIT
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.****SIPLUS SM 1232 analog output signal modules**

(extended temperature range and medial exposure)

Ambient temperature range  
0 ... +55 °C

2 analog outputs, ± 10 V with  
14 bits or 0 ... 20 mA with 13 bits

**6AG1232-4HB32-4XB0****Article No.****Accessories**

See SIMATIC S7-1200 analog output  
SM 1232, page 3/77

**SIMATIC S7-1200 basic controller**

I/O modules

SIPLUS analog modules

**SIPLUS SB 1232 analog output modules****Overview**

- Analog output for SIPLUS S7-1200
- Can be plugged directly into the CPU (cannot be used for +70 °C version)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	<b>6AG1232-4HA30-4XB0</b>	<b>6AG1232-4HA30-5XB0</b>
Based on	<b>6ES7232-4HA30-0XB0</b> SIPLUS S7-1200 SB1232 1AO	<b>6ES7232-4HA30-0XB0</b> SIPLUS S7-1200 SB1232 1AO
<b>Ambient conditions</b>		
<b>Free fall</b>		
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>		
• Min.	0 °C; = Tmin	-25 °C; = Tmin
• max.	55 °C; = Tmax	55 °C; = Tmax
<b>Storage/transport temperature</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data	Article No.	Accessories	Article No.
<p><b>SIPLUS SB 1232 analog output signal board</b></p> <p>(extended temperature range and medial exposure)</p> <p><u>Ambient temperature range</u> -25 ... +55 °C</p> <p>1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits</p> <p><u>Ambient temperature range</u> 0 ... +55 °C</p> <p>1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits</p>	<p><b>6AG1232-4HA30-5XB0</b></p> <p><b>6AG1232-4HA30-4XB0</b></p>	<p>See SIMATIC S7-1200 analog output SB 1232, page 3/79</p>	

**SIMATIC S7-1200 basic controller**

I/O modules

SIPLUS analog modules

**SIPLUS SM 1234 analog input/output modules****Overview**

- Analog inputs and outputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- Even solves more complex automation tasks
- From +60 °C to +70 °C, max. 50% of the inputs and outputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	<b>6AG1234-4HE32-2XB0</b>	<b>6AG1234-4HE32-4XB0</b>
Based on	<b>6ES7234-4HE32-0XB0</b> SIPLUS S7-1200 SM 1234 4AI/2AQ 13BIT	<b>6ES7234-4HE32-0XB0</b> SIPLUS S7-1200 SM 1234 4AI/2AQ 13BIT
<b>Ambient conditions</b>		
<b>Free fall</b>		
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>		
• Min.	-40 °C; = Tmin; startup @ -25 °C	-20 °C; = Tmin; startup @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously used outputs 1, inputs 2 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
<b>Storage/transport temperature</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.****Article No.****SIPLUS SM 1234 analog input/output signal modules**

(extended temperature range and medial exposure)

Ambient temperature range

-25 ... +70 °C,

from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%

4 analog inputs,  $\pm 10$  V,  $\pm 5$  V,  $\pm 2.5$  V, or 0 ... 20 mA, 12 bits + sign;  
2 analog outputs,  $\pm 10$  V with 14 bits or 0 ... 20 mA with 13 bits

**6AG1234-4HE32-2XB0**Ambient temperature range

0 ... +55 °C

4 analog inputs,  $\pm 10$  V,  $\pm 5$  V,  $\pm 2.5$  V, or 0 ... 20 mA, 12 bits + sign;  
2 analog outputs,  $\pm 10$  V with 14 bits or 0 ... 20 mA with 13 bits

**6AG1234-4HE32-4XB0****Accessories**

See SIMATIC S7-1200 analog input/output SM 1234, page 3/81



**SIMATIC S7-1200 basic controller**

I/O modules

SIPLUS analog modules

**SIPLUS SM 1231 thermocouple modules****Overview**

- For the convenient recording of temperatures with great accuracy
- 7 common thermocouple types can be used
- Also for the measurement of analog signals with a low level ( $\pm 80$  mV)
- Can easily be retrofitted to existing plant

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Order number	<b>6AG1231-5QF32-4XB0</b>	<b>6AG1231-5QD32-4XB0</b>
Based on	<b>6ES7231-5QF32-0XB0</b> SIPLUS S7-1200 SM 1231 8AI TC 16BIT	<b>6ES7231-5QD32-0XB0</b> SIPLUS S7-1200 SM 1231 4AI TC 16BIT
<b>Ambient conditions</b>		
<b>Free fall</b>		
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>		
• Min.	-20 °C; = Tmin; startup @ 0 °C	-20 °C; = Tmin; startup @ 0 °C
• max.	60 °C; = Tmax	60 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****SM 1231 thermocouple module**

(extended temperature range and medial exposure)

Ambient temperature range  
-40 ... +70 °C

8 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, T, E, R, S, N, C, TXK/XK(L)

4 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, T, E, R, S, N, C, TXK/XK(L)

**Article No.****6AG1231-5QF32-4XB0****6AG1231-5QD32-4XB0****Article No.****Accessories**

See SIMATIC S7-1200 thermocouple module SM 1231, page 3/84

**Overview**

- For the convenient recording of temperatures with great accuracy
- 4 inputs
- Most popular resistance temperature detectors can be used
- Can easily be retrofitted to existing plant

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	<b>6AG1231-5PD32-2XB0</b>	<b>6AG1231-5PF32-2XB0</b>
Based on	<b>6ES7231-5PD32-0XB0</b> SIPLUS S7-1200 SM1231 4AI	<b>6ES7231-5PF32-0XB0</b> SIPLUS S7-1200 SM1231 RTD 8AI
<b>Ambient conditions</b>		
<b>Free fall</b>		
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax	70 °C; = Tmax
<b>Storage/transport temperature</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****SIPLUS RTD signal module SM 1231**

(extended temperature range and medial exposure)

4 inputs for resistance temperature detectors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 Ohm, resolution 15 bits + sign

8 inputs for resistance temperature detectors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 Ohm, resolution 15 bits + sign

**Article No.****6AG1231-5PD32-2XB0****6AG1231-5PF32-2XB0****Article No.****Accessories**

See SIMATIC S7-1200 RTD signal module SM 1231, page 3/89

**SIMATIC S7-1200 basic controller**

I/O modules

Special modules

**SM 1278 4xIO-Link Master****Overview**

- Module for connecting up to 4 IO-Link devices according to IO Link Specification V1.1 The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.2 and higher

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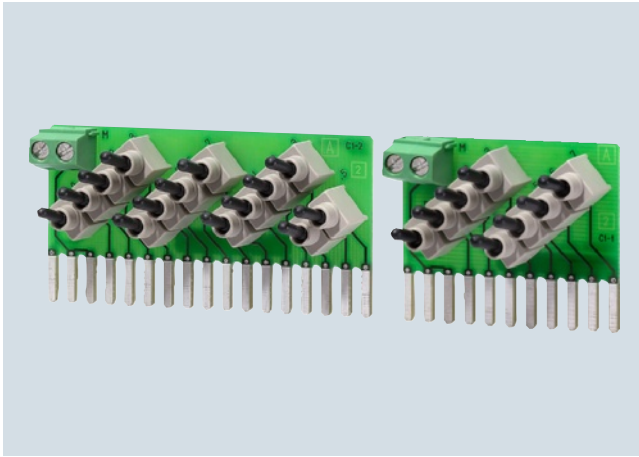
**Technical specifications**

Article number	<b>6ES7278-4BD32-0XB0</b> S7-1200, 4 X IO-LINK MASTER
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
permissible range, upper limit (DC)	28.8 V
<b>Power losses</b>	
Power loss, typ.	1 W
<b>Interrupts/diagnostics/ status information</b>	
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP20	Yes
<b>Standards, approvals, certificates</b>	
FM approval	Yes
RCM (formerly C-TICK)	Yes

Article number	<b>6ES7278-4BD32-0XB0</b> S7-1200, 4 X IO-LINK MASTER
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>	
• Permissible temperature range	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing
• Permissible temperature change	5°C to 55°C, 3°C / minute
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
<b>Relative humidity</b>	
• Permissible range (without condensation) at 25 °C	95 %
<b>Connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	
Type of housing (front)	
• plastic	Yes
<b>Dimensions</b>	
Width	45 mm
Height	100 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	150 g

**Ordering data****Article No.****SM 1278 signal module  
4xIO-Link master****6ES7278-4BD32-0XB0**

for the connection of up to  
4 IO-Link devices according to  
IO Link Specification V1.1

**Overview**

- Simulator modules for program testing during commissioning and ongoing operation
- Simulation of 8 or 14 inputs

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**Technical specifications**

Article number	<b>6ES7274-1XF30-0XA0</b> S7-1200 SIMULATOR MODULE SIM1274, 8 INP	<b>6ES7274-1XH30-0XA0</b> S7-1200 SIMULATOR MODULE SIM1274, 14 INP
<b>Product type designation</b>		
<b>Supply voltage</b>		
Rated value (DC)		
• 24 V DC	Yes	Yes
<b>Digital inputs</b>		
Number of digital inputs	8	14
<b>Digital outputs</b>		
Number of digital outputs	0	0
<b>Degree and class of protection</b>		
Degree of protection to EN 60529		
• IP20	Yes	Yes
<b>Dimensions</b>		
Width	43 mm	67 mm
Height	35 mm	35 mm
Depth	23 mm	23 mm

**Ordering data****Article No.**

<b>Digital input simulator SIM 1274 simulator module (optional)</b>	
with 8 input switches, for CPU 1211C / CPU 1212C	<b>6ES7274-1XF30-0XA0</b>
with 14 input switches, for CPU 1214C / CPU 1215C	<b>6ES7274-1XH30-0XA0</b>
with 14 input switches, for CPU 1217C	<b>6ES7274-1XK30-0XA0</b>
<b>Analog input simulator SIM 1274 simulator module (optional)</b>	
2 potentiometers	<b>6ES7274-1XA30-0XA0</b>

**SIMATIC S7-1200 basic controller**

I/O modules

Special modules

**Battery Board BB 1297****Overview**

- Battery board for extending the power reserve for the S7-1200 real-time clock

**Technical specifications**

Article number	<b>6ES7297-0AX30-0XA0</b> BATTERY BOARD BB 1297 F. CPU 12XX
<b>Product type designation</b>	
<b>Interrupts/diagnostics/ status information</b>	
<b>Alarms</b>	
• Alarms	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
<b>Diagnostics indication LED</b>	
• for maintenance	Yes; The maintenance LED (MAINT) of the PLC signals that the battery needs to be replaced.
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP20	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
<b>Marine approval</b>	
• Marine approval	Yes
• Germanischer Lloyd (GL)	Yes
• American Bureau of Shipping (ABS)	Yes
• Bureau Veritas (BV)	Yes
• Det Norske Veritas (DNV)	Yes
• Lloyds Register of Shipping (LRS)	Yes

Article number	<b>6ES7297-0AX30-0XA0</b> BATTERY BOARD BB 1297 F. CPU 12XX
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>	
• Min.	-20 °C
• max.	60 °C
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Operation, min.	795 hPa
• Operation, max.	1 080 hPa
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
<b>Relative humidity</b>	
• Permissible range (without condensation) at 25 °C	95 %
<b>Mechanics/material</b>	
Type of housing (front)	
• plastic	Yes
<b>Dimensions</b>	
Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weights</b>	
Weight, approx.	40 g

**Ordering data****Article No.**

**BB 1297 battery board**  
for long-term backup of real-time clock; can be plugged into the signal board slot of an S7-1200 CPU in FW version 3.0 or higher; battery (CR 1025) is not included

**6ES7297-0AX30-0XA0**

## Overview



SIWAREX WP241

SIWAREX WP241 is a flexible weighing module for belt scales. The compact module is easy to install in the SIMATIC S7-1200 automation system. It can also be operated as a standalone module, i.e. without a SIMATIC CPU.

## Technical specifications

SIWAREX WP241	
<b>Integration in automation systems</b>	S7-1200 • Operator Panel (not from the SIMATIC Basic series) • Automation systems from other manufacturers (possible with limitations)
<b>Communication interfaces</b>	Directly via SIMATIC bus Via Ethernet (Modbus TCP/IP) or RS 485 (Modbus RTU)
<b>Commissioning of the scale</b>	• SIMATIC S7-1200 backplane bus • RS 485 (Modbus RTU) • Ethernet (Modbus TCP/IP & SIWATOOL)
Calibration approval	PC configuration software SIWATOOL (Ethernet) or Operator Panel (Modbus / S7-1200)
Internal resolution	MID according to OIML R50 (available soon)
Number of measurements/second (internal)	up to 4 million parts
Updating time for material flow rate	100
Filter for conveyor load	100 ms
Filter for belt speed	Low-pass filter (limit frequency 0.05 ... 50 Hz)
<b>Weighing functions</b>	Low-pass filter (limit frequency 0.05 ... 50 Hz)
Readout data	• Weight • Belt load • Material flow rate • Accumulated total • Main total • Free totals 1 ... 4 • Belt speed
Limits (min/max)	• Belt load • Material flow rate • Belt speed
Zeroing function	On command or automatic set to zero
<b>Load cells</b>	Strain gauges in 4-wire or 6-wire system

SIWAREX WP241	
<b>Load cell excitation</b>	Supply voltage (regulated via feedback) 4.85 V DC
Permissible load resistance	Permissible load resistance • $R_{Lmin}$ > 40 $\Omega$ • $R_{Lmax}$ < 4100 $\Omega$
With SIWAREX IS Ex interface	• $R_{Lmin}$ > 50 $\Omega$ • $R_{Lmax}$ < 4100 $\Omega$
<b>Load cell characteristic</b>	1 ... 4 mV/V
<b>Permissible measurement signal range</b>	-21.3 ... +21.3 mV
<b>Max. distance of load cells</b>	500 m (229.66 ft)
<b>Connection to load cells in Ex zone 1</b>	Optionally via SIWAREX IS Ex interface
<b>Ex approvals</b>	• ATEX Zone 2 • UL • FM available soon
<b>Auxiliary power supply</b>	
Rated voltage	24 V DC
Max. power consumption	200 mA
Max. power consumption SIMATIC Bus	3 mA
<b>IP degree of protection to DIN EN 60529; IEC 60529</b>	IP20
<b>Climatic requirements</b> $T_{min}$ (IND) ... $T_{max}$ (IND) (operating temperature)	
Vertical installation	-10 ... +55 °C (14 ... 131 °F)
Horizontal installation	-10 ... +40 °C (14 ... 104 °F)
EMC requirements according to	EN 45501
Dimensions	70 x 75 x 100 mm (2.76 x 2.95 x 3.94 inches)

**SIMATIC S7-1200 basic controller**

I/O modules

Special modules

**SIWAREX WP241****Ordering data****Article No.**

**SIWAREX WP241**  
Electronic weighing system for scales in SIMATIC S7-1200

7MH4960-4AA01

**SIWAREX S7-1200 device manual**

Available in a range of languages

Free download on the Internet at:  
<http://www.siemens.com/weighing>**SIWAREX WP241**  
**"Ready for Use"**Complete software package for belt scales (for S7-1200 and a directly connected operator panel)  
Free download on the Internet at:  
<http://www.siemens.com/weighing>**Configuration package**  
**SIWAREX WP241 on CD-ROM**  
**for TIA Portal V12**

7MH4960-4AK01

- "Ready for Use" software for operating a scale with SIWAREX WP241 and a touch panel (in a variety of languages)
- SIWATOOL V7.0 calibration tool
- Device manuals (PDF files in a variety of languages)

**Ethernet cable patch cord 2 m**  
**(7 ft)**

6XV1850-2GH20

For connecting SIWAREX WP241 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.

**Article No.****Accessories****SIWAREX JB junction box,**  
**aluminum housing**

7MH4710-1BA

For connecting up to 4 load cells in parallel, and for connecting several junction boxes

**SIWAREX JB junction box,**  
**stainless steel housing**

7MH4710-1EA

For connecting up to 4 load cells in parallel

**Ex interface, type SIWAREX IS**With ATEX approval, but **without UL and FM approvals**, for intrinsically-safe connection of load cells, including device manual

Suitable for the SIWAREX U, CS, MS, FTA, FTC, M, CF and WP231 weighing modules

Approved for use in the EU

- Short-circuit current < 199 mA DC
- Short-circuit current < 137 mA DC

7MH4710-5BA

7MH4710-5CA

**Cables (optional)****Cable Li2Y 1 x 2 x 0.75 ST +**  
**2 x (2 x 0.34 ST) – CY,**  
**orange sheath**

7MH4702-8AG

To connect SIWAREX U, CS, MS, FTA, FTC, M, CF, WP231, WP241 and WP321 to the junction box (JB), extension box (EB) and Ex interface (Ex I) or between two JBs, for fixed laying, occasional bending permitted, approx. 10.8 mm (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-104 ... +176 °F)

**Cable Li2Y 1 x 2 x 0.75 ST +**  
**2 x (2 x 0.34 ST) – CY,**  
**blue sheath**

7MH4702-8AF

To connect SIWAREX U, CS, MS, FTA, FTC, M, CF, WP231, WP241 and WP321 to the junction box (JB), extension box (EB) and Ex interface (Ex I) or between two JBs, for fixed laying, occasional bending permitted, approx. 10.8 mm (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-104 ... +176 °F)

**Ground terminal for connecting**  
**the load cell cable shield to the**  
**grounded DIN rail**

6ES5728-8MA11

## Overview



SIWAREX WP231 is a versatile weighing module for all simple weighing and force measuring tasks. The compact module is easy to install in the SIMATIC S7-1200 automation system. It can also be operated without a SIMATIC CPU.

3

## Technical specifications

SIWAREX WP231	
<b>Integration in automation systems</b>	
S7-1200	Directly via SIMATIC bus
<ul style="list-style-type: none"> <li>Operator panel</li> <li>Automation systems from other manufacturers (possible with limitations)</li> </ul>	Via Ethernet (Modbus TCP/IP) or RS 485 (Modbus RTU)
<b>Communication interfaces</b>	
	<ul style="list-style-type: none"> <li>SIMATIC S7-1200 backplane bus</li> <li>RS 485</li> <li>Ethernet</li> </ul>
<b>Connection of remote displays (via RS 485)</b>	
	Display for weight value
<b>Adjustment of scale settings</b>	
	PC configuration software SIWATOOL (Ethernet) or directly connected operator panel (Modbus)
<b>Measuring accuracy</b>	
Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0,05 %
Internal resolution	up to ±4 million parts
<b>Number of measurements/second</b>	
	100
<b>Filters</b>	
	<ul style="list-style-type: none"> <li>Low-pass filter 0.1 ... 50 Hz</li> <li>Mean value filter</li> </ul>
<b>Weighing functions</b>	
Weight values	<ul style="list-style-type: none"> <li>Gross</li> <li>Net</li> <li>Tare</li> </ul>
Limit values	<ul style="list-style-type: none"> <li>Min/max</li> <li>Empty</li> </ul>
Zero-setting function	Per command
Tare function	Per command
Tare specification	Per command
<b>Load cells</b>	
	Strain gages in 4-wire or 6-wire system

SIWAREX WP231	
<b>Load cell powering</b>	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load impedance	
<ul style="list-style-type: none"> <li><math>R_{Lmin}</math></li> <li><math>R_{Lmax}</math></li> </ul>	<ul style="list-style-type: none"> <li>&gt; 40 <math>\Omega</math></li> <li>&lt; 4 100 <math>\Omega</math></li> </ul>
With SIWAREX IS Ex interface	
<ul style="list-style-type: none"> <li><math>R_{Lmin}</math></li> <li><math>R_{Lmax}</math></li> </ul>	<ul style="list-style-type: none"> <li>&gt; 50 <math>\Omega</math></li> <li>&lt; 4 100 <math>\Omega</math></li> </ul>
<b>Load cell characteristic</b>	1 ... 4 mV/V
<b>Permissible range of the measurement signal (with 4 mV/V sensors)</b>	-21.3 ... +21.3 mV
<b>Max. distance of load cells</b>	500 m (229.66 ft)
<b>Connection to load cells in Ex zone 1</b>	Optionally via SIWAREX IS Ex interface
<b>Ex approvals</b>	
	<ul style="list-style-type: none"> <li>ATEX Zone 2</li> <li>UL</li> <li>FM available soon</li> </ul>
<b>Auxiliary power supply</b>	
Rated voltage	24 V DC
Max. current consumption	200 mA
Max. power consumption SIMATIC Bus	3 mA
<b>IP degree of protection to DIN EN 60529; IEC 60529</b>	
	IP20
<b>Climatic requirements</b>	
$T_{min} (IND) \dots T_{max} (IND)$ (operating temperature)	
Vertical installation	-10 ... +55 °C (14 ... 131 °F)
Horizontal installation	-10 ... +40 °C (14 ... 104 °F)
EMC requirements according to	EN 45501
Dimensions	70 x 75 x 100 mm (2.76 x 2.95 x 3.94 inches)



**SIMATIC S7-1200 basic controller**

I/O modules

Special modules

**SIWAREX WP231****Ordering data****Article No.****SIWAREX WP231**  
**Weighing electronics for scales**  
**in SIMATIC S7-1200****7MH4960-2AA01****SIWAREX S7-1200 device manual**

Available in a range of languages

Free download from the Internet at:  
<http://www.siemens.com/weighing>**SIWAREX WP231 "Ready for Use"**

Complete software package for non-automatic scale (for S7-1200 and a directly connected operator panel)

Free download from the Internet at:  
<http://www.siemens.com/weighing>**Configuration package**  
**SIWAREX WP231 on CD-ROM**  
**for TIA Portal V11****7MH4960-2AK01**

- "Ready for use" software for operating a scale with SIWAREX WP231 and a touch panel (in a variety of languages)
- SIWATOOL V7.0 calibration tool

- Device manuals (PDF files in a variety of languages)

**Ethernet cable patch cord 2 m (7 ft)****6XV1850-2GH20**

For connecting SIWAREX WP231 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.

**Remote display (optional)**

The digital remote displays can be connected directly to the SIWAREX WP231 via the RS 485 interface.

Suitable remote display:

S102

Siebert Industrieelektronik GmbH  
Postfach 1180

D-66565 Eppelborn, Germany

Tel.: +49 6806/980-0

Fax: +49 6806/980-999

Internet: [www.siebert-group.com/en](http://www.siebert-group.com/en)

Detailed information is available from the manufacturer.

**Article No.****Accessories****SIWAREX JB junction box,**  
**aluminum housing****7MH4710-1BA**

For connecting up to 4 load cells in parallel, and for connecting several junction boxes

**SIWAREX JB junction box,**  
**stainless steel housing****7MH4710-1EA**

For connecting up to 4 load cells in parallel

**SIWAREX JB junction box,**  
**stainless steel housing (ATEX)****7MH4710-1EA01**

For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate)

**Ex interface, type SIWAREX IS**With ATEX approval, but **without UL and FM approvals**, for intrinsically-safe connection of load cells, including device manual

Suitable for the SIWAREX U, CS, MS, FTA, FTC, M, CF and WP231 weighing modules

Approved for use in the EU

- Short-circuit current < 199 mA DC
- Short-circuit current < 137 mA DC

**7MH4710-5BA**  
**7MH4710-5CA****Cables (optional)****Cable Li2Y 1 x 2 x 0.75 ST +**  
**2 x (2 x 0.34 ST) – CY,**  
**orange sheath****7MH4702-8AG**

To connect SIWAREX U, CS, MS, FTA, FTC, M, CF, WP231, WP241 and WP321 to the junction box (JB), extension box (EB) and Ex interface (Ex I) or between two JBs, for fixed laying, occasional bending permitted, approx. 10.8 mm (0.43 inch) outer diameter, for ambient temperature

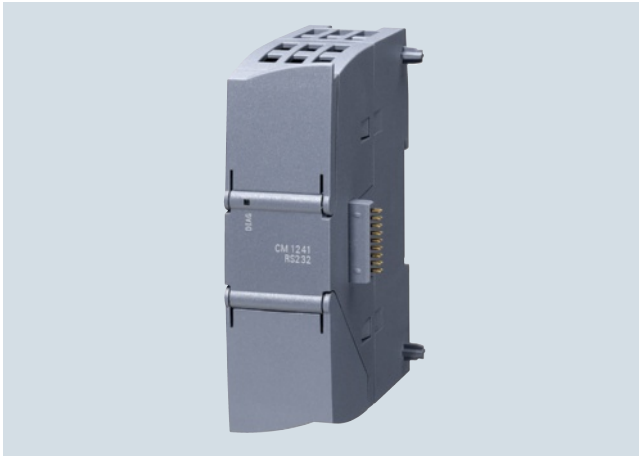
-40 ... +80 °C (-104 ... +176 °F)

**Cable Li2Y 1 x 2 x 0.75 ST +**  
**2 x (2 x 0.34 ST) – CY,**  
**blue sheath****7MH4702-8AF**

To connect SIWAREX U, CS, MS, FTA, FTC, M, CF, WP231, WP241 and WP321 to the junction box (JB), extension box (EB) and Ex interface (Ex I) or between two JBs, for fixed laying, occasional bending permitted, approx. 10.8 mm (0.43 inch) outer diameter, for ambient temperature

-40 ... +80 °C (-104 ... +176 °F)

**Ground terminal for connecting**  
**the load cell cable shield to the**  
**grounded DIN rail****6ES5728-8MA11**

**Overview**

- For quick, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can also be loaded
- Simple parameterization with STEP 7 Basic

**Technical specifications**

Article number	<b>6ES7241-1CH32-0XB0</b>	<b>6ES7241-1AH32-0XB0</b>
	COMMUNICATION MODULE CM 1241, RS422/485	COMMUNICATION MODULE CM 1241, RS 232
<b>Product type designation</b>		
<b>Supply voltage</b>		
Rated value (DC)		
• 24 V DC	Yes	Yes
permissible range, lower limit (DC)	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V
<b>Input current</b>		
Current consumption, max.		220 mA; From L5+; logic
<b>Power losses</b>		
Power loss, typ.	1.2 W	1.1 W
<b>Interfaces</b>		
Number of interfaces	1	1
Interface physics, RS 232C (V.24)		Yes
Interface physics, RS 422/RS 485 (X.27)	Yes	
<b>Point-to-point</b>		
• Cable length, max.	1 000 m	10 m
<b>Integrated protocol driver</b>		
- ASCII	Yes; Available as library function	
- USS	Yes; Available as library function	
<b>Ambient conditions</b>		
<b>Free fall</b>		
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>		
• Permissible temperature range	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing
• Permissible temperature change	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute
<b>Storage/transport temperature</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C

**SIMATIC S7-1200 basic controller**

I/O modules

Communication

**CM 1241 communication modules****Technical specifications (continued)**

Article number	<b>6ES7241-1CH32-0XB0</b> COMMUNICATION MODULE CM 1241, RS422/485	<b>6ES7241-1AH32-0XB0</b> COMMUNICATION MODULE CM 1241, RS 232
<b>Air pressure acc. to IEC 60068-2-13</b>		
• Operation, min.	795 hPa	795 hPa
• Operation, max.	1 080 hPa	1 080 hPa
• Storage/transport, min.	660 hPa	660 hPa
• Storage/transport, max.	1 080 hPa	1 080 hPa
<b>Relative humidity</b>		
• Permissible range (without condensation) at 25 °C	95 %	95 %
<b>Software</b>		
<b>Runtime software</b>		
<b>Target system</b>		
- S7-1200	Yes	Yes
<b>Dimensions</b>		
Width	30 mm	30 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
<b>Weights</b>		
Weight, approx.	155 g	150 g

**Ordering data****Article No.****Article No.****CM 1241 communication module**

Communication module  
for point-to-point connection,  
with one RS422/485 interface

**6ES7241-1CH32-0XB0**

Communication module  
for point-to-point connection,  
with one RS 232 interface

**6ES7241-1AH32-0XB0****Accessories****Front flap set (spare part)**

for communication modules

**6ES7291-1CC30-0XA0**

### Overview

- For fast, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can be loaded later
- Simple parameterization with STEP 7 Basic
- Can be plugged directly into the CPU

### Technical specifications

Article number	<b>6ES7241-1CH30-1XB0</b> COMMUNICATION BOARD CB 1241, RS 485
<b>Product type designation</b>	
<b>Input current</b>	
from backplane bus 5 V DC, typ.	50 mA
<b>Power losses</b>	
Power loss, typ.	1.5 W
<b>Interrupts/diagnostics/status information</b>	
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
<b>Diagnostics indication LED</b>	
• For status of the outputs	Yes
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP20	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes

Article number	<b>6ES7241-1CH30-1XB0</b> COMMUNICATION BOARD CB 1241, RS 485
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>	
• Permissible temperature range	0 °C to 55 °C horizontal installation, 0 °C to 45 °C vertical installation
• Permissible temperature change	5°C to 55°C, 3°C / minute
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Operation, min.	795 hPa
• Operation, max.	1 080 hPa
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
<b>Relative humidity</b>	
• Permissible range (without condensation) at 25 °C	95 %
<b>Pollutant concentrations</b>	
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Mechanics/material</b>	
Type of housing (front)	
• plastic	Yes
<b>Dimensions</b>	
Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weights</b>	
Weight, approx.	40 g

### Ordering data

**Communication board  
CB 1241 RS 485**  
for point-to-point connection,  
with 1 RS 485 interface

**Article No.**  
**6ES7241-1CH30-1XB0**

### Article No.

#### Accessories

##### Terminal block (spare part)

for signal board  
with 6 screws, gold-plated; 4 pcs.

**6ES7292-1BF30-0XA0**

**SIMATIC S7-1200 basic controller**

I/O modules

Communication

**CM 1242-5****Overview**

The CM 1242-5 communication module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP slave and has the following characteristics:

- PROFIBUS DPV1 slave in accordance with IEC 61158
- Module replacement without PG supported
- Power is supplied via the backplane bus so that no extra cabling is required
- Support of all standard baud rates from 9.6 Kbit/s to 12 Mbit/s
- Compact industry-standard enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1242-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the S7-1200 for optimal production.

DP-M	DP-S	FMS	PG/OP	S7
	●			

**Technical specifications**

Article number	<b>6GK7242-5DX30-0XE0</b>
Product type designation	CM 1242-5
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
• for power supply	0
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS 485)
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Consumed current	
• from backplane bus for DC at 5 V typical	0.15 A
Active power loss	0.75 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operation	0 ... 45 °C
• for horizontally arranged busbars during operation	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20

Article number	<b>6GK7242-5DX30-0XE0</b>
Product type designation	CM 1242-5
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-1200 single width
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.115 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	3
<b>Performance data PROFIBUS DP</b>	
Service as DP slave	
• DPV0	Yes
• DPV1	Yes
Amount of data	
• of the address area of the inputs as DP slave total	240 byte
• of the address area of the outputs as DP slave total	240 byte
<b>Performance data telecontrol</b>	
Protocol is supported	
• TCP/IP	No
<b>Product functions management, configuration</b>	
Configuration software	
• required	STEP 7 Basic/Professional V11 (TIA Portal) or higher

Ordering data	Article No.
<b>SIPLUS CM 1242-5 communication module</b> Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 master	<b>6AG1242-5DX30-2XE0</b>
<b>Accessories</b>	
<b>PROFIBUS FastConnect connection plug RS 485</b> With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s <ul style="list-style-type: none"> <li>• Without PG interface</li> <li>• With PG interface</li> </ul>	<b>6ES7972-0BA52-0XA0</b> <b>6ES7972-0BB52-0XA0</b>
<b>PROFIBUS FC Standard Cable</b> 2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order 20 m, sold by the meter	<b>6XV1830-0EH10</b>
<b>PROFIBUS FastConnect Stripping Tool</b> Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	<b>6GK1905-6AA00</b>
<b>PROFIBUS bus terminal 12M</b> Bus terminal for connection of PROFIBUS nodes up to 12 Mbps with connecting cable	<b>6GK1500-0AA10</b>

Note:

You can find order information for software in the IK PI catalog.

## SIMATIC S7-1200 basic controller

I/O modules

Communication

### CM 1243-2

#### Overview



CM 1243-2 communication module for S7-1200

The CM 1243-2 communication module is the AS-Interface master for the SIMATIC S7-1200 and has the following features:

- As many as 62 AS-Interface slaves can be connected
- Integrated analog value transmission
- Supports all AS-Interface master functions in accordance with the AS-Interface specification V3.0
- Indication of the operating state on the front of the device displayed via LED
- Display of operating mode, AS-Interface voltage faults, configuration faults and peripheral faults via LED behind the front panel
- Compact enclosure in the design of the SIMATIC S7-1200
- Suitable for AS-i Power24V: In combination with the optional DCM 1271 data decoupling module, a standard 24 V power supply unit can be used
- Configuration and diagnostics via the TIA portal

#### Design

The CM 1243-2 communication module is positioned to the left of the S7-1200 CPU and linked to the S7-1200 via lateral contacts.

It has:

- Terminals for two AS-i cables (internally jumpered) via two screw terminals each
- One terminal for connection to the functional ground
- LEDs for indication of the operating state and fault statuses of the connected slaves

The screw terminals (included in scope of supply) can be removed to facilitate installation.

#### Function

The CM 1243-2 supports all specified functions of the AS-Interface Specification V3.0.

The values of the digital AS-i slaves can be activated via the process image of the S7-1200. During configuration of the slaves in the TIA Portal, the values of the analog AS-i slaves are also accessible via process image transfer.

It is also possible to exchange all data of the AS-i master and the connected AS-i slaves with the S7-1200 via the data record interface.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the control panel of the CM 1243-2 in the TIA Portal.

The optional DCM 1271 data decoupling module (see [Accessories and Catalog IC 10](#)) has an integrated detection unit for detecting ground faults on the AS-Interface cable. The integrated overload protection also disconnects the AS-Interface cable if the drive current required exceeds 4 A.

#### Security information

The use of this product requires suitable protective measures (including network segmentation for IT security) in order to ensure safe plant operation; see <http://www.siemens.com/industrialsecurity>.

#### Configuration

Configuration of the CM 1243-2 requires STEP 7 version V11+SP2 and/or STEP 7 V12 or higher.

For STEP 7 V11+ SP2 or higher, the additional Hardware Support Package for CM 1243-2 is required. This is available via the Industry Online Support Portal, see <http://support.automation.siemens.com/WW/view/en/54164095>.

The software enables user-friendly configuration and diagnostics of the AS-i master and any connected slaves.

Alternatively, you can also apply the AS-Interface ACTUAL configuration at the "touch of a button" via the control panel integrated in the TIA portal/STEP7.

When operated on a S7-1200 CPU with firmware version V4.0 or higher, the firmware version V1.1 (or higher) is required for the CM 1243-2.

Ordering data	Article No.
<b>CM 1243-2 communication module</b> <ul style="list-style-type: none"> <li>• AS-Interface master for SIMATIC S7-1200</li> <li>• Corresponds to AS-Interface Specification V3.0</li> <li>• With screw terminals, removable terminals (included in the scope of supply)</li> <li>• Dimensions (W x H x D / mm): 30 x 100 x 75</li> </ul>	<b>3RK7243-2AA30-0XB0</b>
<b>Accessories</b>	
<b>DCM 1271 data decoupling module</b> <ul style="list-style-type: none"> <li>• With screw terminals</li> <li>• Removable terminals</li> <li>• Dimensions (W x H x D / mm): 30 x 100 x 75</li> </ul>	<b>3RK7271-1AA30-0AA0</b>
<b>5-pin screw terminal (spare part)</b> <p>For AS-i master CM 1243-2 and AS-i data decoupling unit DCM 1271</p> <ul style="list-style-type: none"> <li>• With screw terminals</li> </ul>	<b>3RK1901-3MA00</b>
<b>3-pin screw terminal (spare part)</b> <p>for AS-i DCM 1271 data decoupling module for connecting the power supply unit</p> <ul style="list-style-type: none"> <li>• With screw terminals</li> </ul>	<b>3RK1901-3MB00</b>
<b>Manuals</b> <p>Manual AS-i master CM 1243-2 and AS-i DCM 1271 data decoupling module for SIMATIC S7-1200</p> <p>See <a href="https://support.industry.siemens.com/cs/ww/en/ps/15805/man">https://support.industry.siemens.com/cs/ww/en/ps/15805/man</a></p>	

## Overview



DP-M	DP-S	FMS	PG/OP	S7
●			●	●

The CM 1243-5 communication module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP master and has the following characteristics:

- PROFIBUS DPV1 master in accordance with IEC 61158
- Support of up to 16 PROFIBUS DP slaves
- Communication with other S7 controllers based on S7 communication
- Allows the connection of programming devices and operator panels with a PROFIBUS interface to the S7-1200
- Module replacement without PG supported
- Support of all standard baud rates from 9.6 Kbit/s to 12 Mbit/s
- Compact industry-standard enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1243-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the S7-1200 for optimal production.

## Technical specifications

Article number	<b>6GK7243-5DX30-0XE0</b>
Product type designation	CM 1243-5
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS 485)
• for power supply	3-pole terminal block
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage external	24 V
Relative positive tolerance for DC at 24 V	20 %
Relative negative tolerance for DC at 24 V	20 %
Consumed current	
• from external supply voltage for DC at 24 V typical	0.1 A
Active power loss	2.4 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operation	0 ... 45 °C
• for horizontally arranged busbars during operation	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20

Article number	<b>6GK7243-5DX30-0XE0</b>
Product type designation	CM 1243-5
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-1200 single width
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.134 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	3
<b>Performance data PROFIBUS DP</b>	
Service as DP master	
• DPV1	Yes
Number of DP slaves on DP master usable	16
Amount of data	
• of the address area of the inputs as DP master total	512 byte
• of the address area of the outputs as DP master total	512 byte
• of the address area of the inputs per DP slave	244 byte
• of the address area of the outputs per DP slave	244 byte
• of the address area of the diagnostic data per DP slave	240 byte
Service as DP slave	
• DPV0	No
• DPV1	No



**SIMATIC S7-1200 basic controller**

I/O modules

Communication

**CM 1243-5****Technical specifications (continued)**

Article number	<b>6GK7243-5DX30-0XE0</b>
Product type designation	CM 1243-5
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	8
• with PG connections maximum	1
• with PG/OP connections maximum	3
• Note	max. 4 connections to other S7 stations
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	
• without DP maximum	8
• with DP maximum	8
<b>Performance data telecontrol</b>	
Protocol is supported	
• TCP/IP	No
<b>Product functions management, configuration</b>	
Configuration software	
• required	STEP 7 Basic/Professional V11 (TIA Portal) or higher

**Ordering data****Article No.****CM 1243-5 communication module**

Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 master

**6GK7243-5DX30-0XE0****Accessories****PROFIBUS FastConnect connection plug RS 485**

With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s

- Without PG interface
- With PG interface

**6ES7972-0BA52-0XA0**  
**6ES7972-0BB52-0XA0****PROFIBUS FC Standard Cable**

2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order 20 m, sold by the meter

**6XV1830-0EH10****PROFIBUS FastConnect Stripping Tool**

Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable

**6GK1905-6AA00****PROFIBUS bus terminal 12M**

Bus terminal for connection of PROFIBUS nodes up to 12 Mbps with connecting cable

**6GK1500-0AA10**Note:

You can find order information for software in the IK PI catalog.

## Overview



- Unmanaged switch for connecting a SIMATIC S7-1200 to an Industrial Ethernet network with a line, tree or star topology
- Multiplication of Ethernet interfaces on a SIMATIC S7-1200 for additional connection of up to three programming devices, operator controls, and further Ethernet nodes
- Simple, space-saving mounting on the SIMATIC S7-1200 mounting rail
- Low-cost solution for implementing small, local Ethernet networks
- Connection without any problems using RJ45 standard connectors
- Simple and fast status display via LEDs on the device
- Integral autocrossover function permits use of uncrossed connecting cables

3

## Technical specifications

Article number	<b>6GK7277-1AA10-0AA0</b>
Product type designation	CSM 1277
<b>Transmission rate</b>	
Transfer rate	10 Mbit/s, 100 Mbit/s
<b>Interfaces</b>	
No. of electrical/optical connections	4
• for network components or terminal equipment maximum	
Number of electrical connections	4
• for network components or terminal equipment	
Type of electrical connection	RJ45 port
• for network components or terminal equipment	
<b>Interfaces others</b>	
Number of electrical connections	1
• for power supply	
Type of electrical connection	3-pole terminal block
• for power supply	
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage	
• external	24 V
• external	19.2 ... 28.8 V
Product component fusing at power supply input	Yes
Fuse protection type at input for supply voltage	0.5 A / 60 V
Consumed current maximum	0.07 A
Active power loss	
• for DC at 24 V	1.6 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity	
• at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20

Article number	<b>6GK7277-1AA10-0AA0</b>
Product type designation	CSM 1277
<b>Design, dimensions and weight</b>	
Design	SIMATIC S7-1200 device design
Width	45 mm
Height	100 mm
Depth	75 mm
Net weight	0.15 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• wall mounting	Yes
• S7-300 rail mounting	No
• S7-1500 rail mounting	No
<b>Product functions management, configuration</b>	
Product function	
• multiport mirroring	No
• switch-managed	No
<b>Standards, specifications, approvals</b>	
Standard	
• for FM	FM3611: Class 1, Division 2, Group A, B, C, D / T..., CL.1, Zone 2, GP. IIC, T. Ta
• for hazardous zone	EN 600079-15:2005, EN 600079-0:2006, II 3 G Ex nA II T4, KEMA 08 ATEX 0003 X
• for safety from CSA and UL	UL 508, CSA C22.2 No. 142
• for emitted interference	EN 61000-6-4 (Class A)
• for interference immunity	EN 61000-6-2
Certificate of suitability	EN 61000-6-2, EN 61000-6-4
• CE marking	Yes
• C-Tick	Yes
• KC approval	No
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• Bureau Veritas (BV)	No
• Det Norske Veritas (DNV)	No
• Germanische Lloyd (GL)	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
MTBF at 40 °C	273 y

**SIMATIC S7-1200 basic controller**

I/O modules

Communication

**CSM 1277 unmanaged****Ordering data****Article No.****Article No.****CSM 1277 compact switch module**

Unmanaged switch for connecting a SIMATIC S7-1200 and up to three further nodes to Industrial Ethernet with 10/100 Mbit/s;  
4 x RJ45 ports; external 24 V DC power supply, diagnostics on LEDs, S7-1200 module including electronic manual on CD-ROM

**6GK7277-1AA10-0AA0****Accessories****IE FC TP Trailing Cable 2 x 2 (Type C)**

4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval;  
sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

**6XV1840-3AH10****IE FC RJ45 Plug 180 2 x 2**

RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB10-2AA0**  
**6GK1901-1BB10-2AB0**  
**6GK1901-1BB10-2AE0**

**IE FC Outlet RJ45**

For connecting Industrial Ethernet FC cables and TP cords; graduated prices for 10 and 50 units or more

**6GK1901-1FC000AA0****IE TP Cord RJ45/RJ45**

- TP cord preassembled with 2 RJ45 connectors; length: 0.5 m
- TP cable 4 x 2 with 2 RJ45 connectors; length: 0.5 m

**6XV1850-2GE50****6XV1870-3QE50**

## Overview



The CP 1243-1 communications processor is used for connecting a SIMATIC S7-1200 to the TeleControl Server Basic control center software via Ethernet, and for safe communication via IP-based networks.

The CP has the following features:

- Ethernet-based connection to TeleControl Server basic, e.g. via Internet
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Automatic sending of alert emails
- Data buffering of up to 64,000 values ensures a secure database even with temporary connection failures
- Secure communication via VPN connections based on IPSec
- Access protection via Stateful Inspection Firewall
- Clearly laid out LED signaling for fast and easy diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7

## Technical specifications

Article number	<b>6GK7243-1BX30-0XE0</b>
Product type designation	CP 1243-1
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
• for power supply	0
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Consumed current	
• from backplane bus for DC at 5 V typical	0.25 A
Active power loss	1.25 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operation	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-1200 single width
Width	30 mm
Height	110 mm
Depth	75 mm
Net weight	0.122 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• wall mounting	Yes
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	3
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• Note	like CPU

# SIMATIC S7-1200 basic controller

I/O modules

Communication

CP 1243-1

## Technical specifications (continued)

Article number	<b>6GK7243-1BX30-0XE0</b>
Product type designation	CP 1243-1
<b>Performance data telecontrol</b>	
Suitability for use	
• Node station	No
• substation	Yes
• TIM control center	No
Control center connection	to be used with Telecontrol Server Basic
Control center connection by means of a permanent connection	supported
Control center connection Note	Connection to Scada system via Telecontrol Server Basic
Protocol is supported	
• DNP3	No
• IEC 60870-5	No
Product function data buffering if connection is aborted	Yes
• Note	64,000 values
Number of data points per station maximum	200
<b>Performance data Teleservice</b>	
Diagnostics function online diagnostics with SIMATIC STEP 7	Yes
Product function	
• program download with SIMATIC STEP 7	Yes
• Remote firmware update	Yes
<b>Product functions management, configuration</b>	
Configuration software	
• required	STEP 7 Basic/Professional V13 Update 2 + HSP (TIA Portal) or higher
<b>Product functions Security</b>	
Firewall version	stateful inspection
Product function with VPN connection	IPSec
Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168
Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
Type of hashing algorithms with VPN connection	MD5, SHA-1
Number of possible connections with VPN connection	8
Product function	
• password protection for Web applications	No
• password protection for teleservice access	No
• encrypted data transmission	Yes
• ACL - IP-based	No
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	No
• log file for unauthorized access	No
<b>Product functions Time</b>	
Protocol is supported NTP time synchronization	Yes
• from control station	Yes

## Ordering data

## Article No.

### Communication processor CP 1243-1

Communications processor for connection of SIMATIC S7-1200 to TeleControl Server Basic or for secure connection via IP-based networks

**6GK7243-1BX30-0XE0**

### Accessories

#### TeleControl Server Basic V3.0

Software for 8 to 5000 stations; Single License for one installation; OPC (UA) server for GPRS and Ethernet/Internet communication with SIMATIC S7-1200 and SIMATIC S7-200 (GPRS only); connection management to remote stations; routing for connections between S7 stations; German and English operator interface; for Windows 7 Professional 32/64-bit + Service Pack 1 Windows 7 Enterprise 32/64-bit + Service Pack 1 Windows 7 Ultimate 32/64-bit + Service Pack 1 Windows Server 2008 32-bit + Service Pack 2 Windows Server 2008 R2 Standard 64-bit Service Pack 1

• **TeleControl Server Basic 8 V3**  
Connection management for 8 SIMATIC S7-1200 or S7-200 stations

**6NH9910-0AA21-0AA0**

• **TeleControl Server Basic 32 V3**  
Connection management for 32 SIMATIC S7-1200 or S7-200 stations

**6NH9910-0AA21-0AF0**

• **TeleControl Server Basic 64 V3**  
Connection management for 64 SIMATIC S7-1200 or S7-200 stations

**6NH9910-0AA21-0AB0**

• **TeleControl Server Basic 256 V3**  
Connection management for 256 SIMATIC S7-1200 or S7-200 stations

**6NH9910-0AA21-0AC0**

• **TeleControl Server Basic 1000 V3**

Connection management for 1000 SIMATIC S7-1200 or S7-200 stations

**6NH9910-0AA21-0AD0**

• **TeleControl Server Basic 5000 V3**

Connection management for 5000 SIMATIC S7-1200 or S7-200 stations

**6NH9910-0AA21-0AE0**

• **TeleControl Server Basic UPGR V3**

Upgrade package from Version V2.x to V3 for all license sizes

**6NH9910-0AA21-0GA0**

Ordering data	Article No.		Article No.
<b>Compact Switch Module CSM 1277</b>	See page 3/115	<b>IE FC TP Standard Cable GP 2 x 2 (Type A)</b>	
<b>IE FC RJ45 Plugs</b> RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE F RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter max. length 1000 m, minimum order quantity 20 m	<b>6XV1840-2AH10</b>
<b>IE FC RJ45 Plug 180</b> 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface		<b>IE FC Stripping Tool</b> Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>
<ul style="list-style-type: none"> <li>• 1 pack = 1 unit</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>	<b>STEP7 Basic Engineering Software V13 SP1 (TIA Portal)</b>	See Chapter 11, page 11/6

**SIMATIC S7-1200 basic controller**

I/O modules

Communication

**CP 1242-7 V2 GPRS modules****Overview**

The CP 1242-7 GPRS V2 communications processor is used to connect a SIMATIC S7-1200 to the globally available GSM/GPRS mobile radio network and has the following characteristics:

- Worldwide wireless exchange of data between S7-1200 controllers and/or between S7-1200 controllers and control centers with an Internet connection
- Communication based on the GPRS (**G**eneral **P**acket **R**adio **S**ervice) mobile wireless service with data transmission speeds of up to 86 Kbit/s in the downlink and 43 Kbit/s in the uplink
- GPRS mode with fixed IP addresses and dynamic IP addresses with standard mobile phone contract
- Time synchronization on the basis of NTP (**N**etwork **T**ime **P**rotocol)
- Sending and receiving of text messages
- LED signaling for fast diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7

In conjunction with the TeleControl Server Basic software, the CP 1242-7 forms a telecontrol system with additional properties:

- Connection of up to 5000 telecontrol stations to the control center via an OPC interface
- Data buffering in the substations in the event of connection failures
- Central status monitoring of the substations
- No special provider services required for fixed IP addresses
- Teleservice access with STEP 7 to the substations via the Internet

The CP 1242-7 V2 is a new product version of the CP 1242-7. The concept for process data transmission has been expanded with a simple data point configuration, which enables substantially easier commissioning without high programming overhead and minimizes susceptibility to errors during the projects implementation phase. CP 1242-7 has also been equipped with new functions, such as access to the internal Web server of the S7-1200. This opens up numerous new application areas.

**Technical specifications**

Article number	<b>6GK7242-7KX31-0XE0</b>
Product type designation	CP 1242-7 V2
<b>Transmission rate</b>	
Transfer rate	
• for GPRS transmission with downlink maximum	86 kbit/s
• for GPRS transmission with uplink maximum	43 kbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• for external antenna(s)	1
• for power supply	1
Number of slots	
• for SIM cards	1
Type of electrical connection	
• for external antenna(s)	SMA socket (50 ohms)
• for power supply	3-pole terminal block
Slot version	
• for SIM card	Standard
<b>Wireless technology</b>	
Type of mobile wireless service	
• is supported	SMS, GPRS
• Note	GPRS (Multislot Class 10)
Type of mobile network is supported	GSM
Operating frequency	850 MHz, 900 MHz, 1800 MHz, 1900 MHz
Transmit power	
• at operating frequency 900 MHz	2 W
• at operating frequency 1800 MHz	1 W
• at operating frequency 1900 MHz	1 W
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage external	24 V
Relative positive tolerance for DC at 24 V	20 %
Relative negative tolerance for DC at 24 V	20 %
Consumed current	
• from external supply voltage for DC at 24 V typical	0.1 A
• from external supply voltage for DC at 24 V maximum	0.22 A
Active power loss	2.4 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operation	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20

**Technical specifications (continued)**

Article number	<b>6GK7242-7KX31-0XE0</b>
Product type designation	CP 1242-7 V2
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-1200 single width
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.133 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	3
<b>Performance data</b>	
Number of users/telephone numbers definable maximum	10
<b>Performance data open communication</b>	
Number of possible connections for open communication	
• by means of T blocks maximum	like CPU
<b>Performance data IT functions</b>	
Number of possible connections	
• as e-mail client maximum	1
<b>Performance data telecontrol</b>	
Control center connection	Telecontrol Server Basic supported
Control center connection by means of a permanent connection	supported
Control center connection by means of demand-oriented connection	supported
Control center connection Note	Connection to Scada system using OPC interface
Protocol is supported	
• DNP3	No
• IEC 60870-5	No
Product function data buffering if connection is aborted	Yes
• Note	64,000 values
<b>Performance data Teleservice</b>	
Diagnostics function online diagnostics with SIMATIC STEP 7	Yes
Product function	
• program download with SIMATIC STEP 7	Yes
• Remote firmware update	Yes
<b>Product functions management, configuration</b>	
Configuration software	
• required	STEP 7 Basic/Professional V13 SP1 or higher
<b>Product functions Security</b>	
Product function	
• password protection for teleservice access	Yes
• encrypted data transmission	Yes
<b>Product functions Time</b>	
Protocol is supported NTP time synchronization	Yes
• from control station	Yes

**Ordering data****Article No.****Communications processor CP 1242-7 V2<sup>1)</sup>**

Communication processor CP 1242-7 GPRS V2 for connecting SIMATIC S7-1200 to TeleControl Server Basic via GSM/GPRS mobile radio network

**6GK7242-7KX31-0XE0****Accessories****TeleControl Server Basic V3.0**

Software for 8 to 5000 stations; Single License for one installation; OPC (UA) server for GPRS and Ethernet/Internet communication with SIMATIC S7-1200 and SIMATIC S7-200 (GPRS only); connection management to remote stations; routing for connections between S7 stations; German and English operator interface; for Windows 7 Professional 32/64-bit + Service Pack 1  
Windows 7 Enterprise 32/64-bit + Service Pack 1  
Windows 7 Ultimate 32/64-bit + Service Pack 1  
Windows Server 2008 32-bit + Service Pack 2  
Windows Server 2008 R2 Standard 64-bit Service Pack 1

**• TeleControl Server Basic 8 V3**

Connection management for 8 SIMATIC S7-1200 or S7-200 stations

**6NH9910-0AA21-0AA0****• TeleControl Server Basic 32 V3**

Connection management for 32 SIMATIC S7-1200 or S7-200 stations

**6NH9910-0AA21-0AF0****• TeleControl Server Basic 64 V3**

Connection management for 64 SIMATIC S7-1200 or S7-200 stations

**6NH9910-0AA21-0AB0****• TeleControl Server Basic 256 V3**

Connection management for 256 SIMATIC S7-1200 or S7-200 stations

**6NH9910-0AA21-0AC0****• TeleControl Server Basic 1000 V3**

Connection management for 1000 SIMATIC S7-1200 or S7-200 stations

**6NH9910-0AA21-0AD0****• TeleControl Server Basic 5000 V3**

Connection management for 5000 SIMATIC S7-1200 or S7-200 stations

**6NH9910-0AA21-0AE0****• TeleControl Server Basic UPGR V3**

Upgrade package from Version V2.x to V3 for all license sizes

**6NH9910-0AA21-0GA0**

<sup>1)</sup> Note national approvals under <http://www.siemens.com/mobilenetwork-approvals>



**SIMATIC S7-1200 basic controller**

I/O modules

Communication

**CP 1242-7 V2 GPRS modules****Ordering data****Article No.****Article No.****ANT794-4MR antenna**

Omnidirectional antenna for GSM (2G), UMTS (3G) and LTE (4G) networks; weather-resistant for indoor and outdoor use; 5 m cable with fixed connection to antenna; SMA connector; including mounting bracket, screws, wall plugs

**6NH9860-1AA00****ANT794-3M antenna**

Flat panel antenna for GSM (2G) networks, for triband with 900/1800/1900 MHz; weather-resistant for indoor/outdoor use, 1.2 m cable with fixed connection to antenna; SMA connector, incl. assembly adhesive tape

**6NH9870-1AA00****STEP 7 Basic Engineering Software V13 SP1 (TIA Portal)****Target system:**

SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC

**Requirement:**

Windows 7 Professional (64 bit),  
Windows 7 Enterprise (64 bit),  
Windows 7 Ultimate SP1 (64 bit),  
Windows 8.1 (64 bit),  
Windows 8.1 Professional (64 bit),  
Windows 8.1 Enterprise (64 bit),  
Windows Server 2008 R2 StdE (full installation),  
Windows Server 2012 StdE (full installation)

**Form of delivery:**

German, English, Chinese, Italian, French, Spanish

- STEP 7 Basic V13, Floating License
- STEP 7 Basic V13, Trial License
- Upgrade STEP 7 Basic V12 to STEP 7 Professional Basic V13, Floating License

**6ES7822-0AA03-0YA5****6ES7822-0AA03-0YA7****6ES7822-0AA03-0YE5****Software Update Service**

For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and service packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 12 weeks prior to expiration. Requires the current software version.

- STEP 7 Basic V1x, Software Update Service Standard, 1 year
- STEP 7 Basic V1x, Software Update Service Compact, 1 year;

**6ES7822-0AA00-0YLO****6ES7822-0AA00-0YMO**

## Overview



CP 1243-7 LTE is used to connect the S7-1200 to a mobile wireless network of the 4th Generation LTE (Long Term Evolution). The increased data rates compared to GPRS and widespread introduction of LTE open up new areas of application. The CP1243-7 is characterized by the following properties:

- 1 connection to LTE (4G) mobile wireless network (various versions for EU and North America)
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Operation with fixed IP addresses and dynamic IP addresses with standard cellular phone contract
- Time synchronization based on NTP (Network Time Protocol)
- On-demand connection buildup via voice call or text message
- Sending and receiving of text messages
- TeleService access with STEP 7 to substations via mobile wireless networks
- Compact industrial enclosure in S7-1200 design for mounting on a standard mounting rail
- Temperature range in operation: -20°C to +70°C
- Installation on standard mounting rails
- Diagnostics LEDs (overall status and details)
- Integrated security functions (VPN and firewall)
- Access to the CPU Web server
- Fast commissioning due to simplified configuration with STEP 7
- Data buffering of up to 64,000 values ensures a secure database even with temporary connection failures

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## Technical specifications

Article number	6GK7243-7KX30-0XE0	6GK7243-7SX30-0XE0
Product type designation	CP 1243-7 LTE EU	CP 1243-7 LTE US
<b>Transmission rate</b>		
Transfer rate		
• for LTE transmission with downlink maximum	42 Mbit/s	42 Mbit/s
• for LTE transmission with uplink maximum	5.76 Mbit/s	5.76 Mbit/s
<b>Interfaces</b>		
Number of interfaces acc. to Industrial Ethernet	0	0
Number of electrical connections		
• for external antenna(s)	1	1
• for power supply	1	1
Number of slots		
• for SIM cards	1	1
Type of electrical connection		
• for external antenna(s)	SMA socket (50 ohms)	SMA socket (50 ohms)
• for power supply	3-pole terminal block	3-pole terminal block
Slot version		
• for SIM card	Standard	Standard
<b>Wireless technology</b>		
Type of mobile wireless service		
• is supported	SMS, GPRS	SMS, GPRS
• Note	GPRS (Multislot Class 10)	GPRS (Multislot Class 10)
Type of mobile network is supported	GSM, UMTS, LTE	GSM, UMTS, LTE
Operating frequency		
• for LTE transmission	800 MHz, 1800 MHz, 2600 MHz	700 MHz, 1700 MHz

Article number	6GK7243-7KX30-0XE0	6GK7243-7SX30-0XE0
Product type designation	CP 1243-7 LTE EU	CP 1243-7 LTE US
<b>Supply voltage, current consumption, power loss</b>		
Type of voltage of the supply voltage	DC	DC
Supply voltage external	24 V	24 V
Relative positive tolerance for DC at 24 V	20 %	20 %
Relative negative tolerance for DC at 24 V	20 %	20 %
<b>Permitted ambient conditions</b>		
Ambient temperature		
• for vertical installation during operation	-20 ... +60 °C	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C	-20 ... +70 °C
• during storage	-40 ... +70 °C	-40 ... +70 °C
• during transport	-40 ... +70 °C	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %	95 %
Protection class IP	IP20	IP20
<b>Design, dimensions and weight</b>		
Module format	Compact module S7-1200 single width	Compact module S7-1200 single width
Width	30 mm	30 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Net weight	0.133 kg	0.133 kg
Mounting type		
• 35 mm DIN rail mounting	Yes	Yes
• S7-300 rail mounting	No	No
• wall mounting	Yes	Yes

# SIMATIC S7-1200 basic controller

I/O modules

Communication

## CP 1243-7 LTE modules

### Technical specifications (continued)

Article number	6GK7243-7KX30-0XE0	6GK7243-7SX30-0XE0
Product type designation	CP 1243-7 LTE EU	CP 1243-7 LTE US
<b>Product properties, functions, components general</b>		
Number of units		
• per CPU maximum	3	3
<b>Performance data</b>		
Number of users/telephone numbers definable maximum	10	10
<b>Performance data open communication</b>		
Number of possible connections for open communication		
• by means of T blocks maximum	like CPU	like CPU
<b>Performance data IT functions</b>		
Number of possible connections		
• as e-mail client maximum	1	1
<b>Performance data telecontrol</b>		
Suitability for use		
• substation	Yes	Yes
Control center connection	Telecontrol Server Basic	Telecontrol Server Basic
Control center connection by means of a permanent connection	supported	supported
Control center connection by means of demand-oriented connection	supported	supported
Control center connection Note	Connection to Scada system using OPC interface	Connection to Scada system using OPC interface
Protocol is supported		
• DNP3	No	No
• IEC 60870-5	No	No
Product function data buffering if connection is aborted	Yes	Yes
• Note	64,000 values	64,000 values
<b>Performance data Teleservice</b>		
Diagnostics function online diagnostics with SIMATIC STEP 7	Yes	Yes
Product function		
• program download with SIMATIC STEP 7	Yes	Yes
• Remote firmware update	Yes	Yes
<b>Product functions management, configuration</b>		
Configuration software		
• required	STEP 7 Basic/ Professional V13 SP1 or higher	STEP 7 Basic/ Professional V13 SP1 + HSP or higher

Article number	6GK7243-7KX30-0XE0	6GK7243-7SX30-0XE0
Product type designation	CP 1243-7 LTE EU	CP 1243-7 LTE US
<b>Product functions Security</b>		
Firewall version	stateful inspection	stateful inspection
Product function with VPN connection	IPSec	IPSec
Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56	AES-256, AES-192, AES-128, 3DES-168, DES-56
Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates	Preshared key (PSK), X.509v3 certificates
Type of hashing algorithms with VPN connection	MD5, SHA-1	MD5, SHA-1
Number of possible connections with VPN connection	1	1
Product function		
• password protection for teleservice access	Yes	Yes
• encrypted data transmission	Yes	Yes
<b>Product functions Time</b>		
Protocol is supported NTP time synchronization	Yes	Yes
• from control station	Yes	Yes

Ordering data	Article No.	Article No.
<p><i>Communication processor</i> <i>CP 1243-7 LTE</i></p> <p>Communication processor for connecting SIMATIC S7-1200 to the TeleControl Server Basic via the LTE mobile wireless network</p> <ul style="list-style-type: none"> <li>• <b>CP 1243-7 LTE EU</b> Frequencies in European band: 700, 1700 MHz</li> </ul> <p>Frequencies in European band: 700, 1700 MHz</p> <ul style="list-style-type: none"> <li>• <b>CP 1243-7 LTE US</b> Frequencies in North American band: 800, 1800, 2600 MHz</li> </ul>	<p><b>6GK7243-7KX30-0XE0</b></p> <p><b>6GK7243-7SX30-0XE0</b></p>	<p><i>Accessories</i></p> <p><i>TeleControl Server Basic V3.0</i></p> <p>Software for 8 to 5000 stations; Single License for one installation; OPC (UA) server for GPRS and Ethernet/Internet communication with SIMATIC S7-1200 and SIMATIC S7-200 (GPRS only); connection management to remote stations; routing for connections between S7 stations; German and English operator interface; for Windows 7 Professional 32/64-bit + Service Pack 1 Windows 7 Enterprise 32/64-bit + Service Pack 1 Windows 7 Ultimate 32/64-bit + Service Pack 1 Windows Server 2008 32-bit + Service Pack 2 Windows Server 2008 R2 Standard 64-bit Service Pack 1</p> <ul style="list-style-type: none"> <li>• <b>TeleControl Server Basic 8 V3</b> Connection management for 8 SIMATIC S7-1200 or S7-200 stations</li> <li>• <b>TeleControl Server Basic 32 V3</b> Connection management for 32 SIMATIC S7-1200 or S7-200 stations</li> <li>• <b>TeleControl Server Basic 64 V3</b> Connection management for 64 SIMATIC S7-1200 or S7-200 stations</li> <li>• <b>TeleControl Server Basic 256 V3</b> Connection management for 256 SIMATIC S7-1200 or S7-200 stations</li> <li>• <b>TeleControl Server Basic 1000 V3</b> Connection management for 1000 SIMATIC S7-1200 or S7-200 stations</li> <li>• <b>TeleControl Server Basic 5000 V3</b> Connection management for 5000 SIMATIC S7-1200 or S7-200 stations</li> <li>• <b>TeleControl Server Basic UPGR V3</b> Upgrade package from Version V2.x to V3 for all license sizes</li> </ul>
		<p><b>6NH9910-0AA21-0AA0</b></p> <p><b>6NH9910-0AA21-0AF0</b></p> <p><b>6NH9910-0AA21-0AB0</b></p> <p><b>6NH9910-0AA21-0AC0</b></p> <p><b>6NH9910-0AA21-0AD0</b></p> <p><b>6NH9910-0AA21-0AE0</b></p> <p><b>6NH9910-0AA21-0GA0</b></p>

**SIMATIC S7-1200 basic controller**

I/O modules

Communication

**CP 1243-1 DNP3****Overview**

The CP 1243-1 DNP3 communications processor is used to connect a SIMATIC S7-1200 to a control center system via the DNP3 protocol and has the following characteristics:

- Support for the established DNP3 telecontrol protocol for standardized linking of the SIMATIC S7-1200 to WinCC, PCS 7, or other commercially available control center systems
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Automatic sending of alert emails
- Clearly laid out LED signaling for fast and easy diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7
- Data buffering of up to 64,000 values ensures a secure database even with temporary connection failures

**Technical specifications**

Article number	<b>6GK7243-1JX30-0XE0</b>
Product type designation	CP 1243-1 DNP3
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
• for power supply	0
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Consumed current	
• from backplane bus for DC at 5 V typical	0.25 A
Active power loss	1.25 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operation	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-1200 single width
Width	30 mm
Height	110 mm
Depth	75 mm
Net weight	0.122 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• wall mounting	Yes
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	3
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• Note	like CPU
<b>Performance data IT functions</b>	
Number of possible connections	
• as e-mail client maximum	1

**Technical specifications (continued)**

Article number	<b>6GK7243-1JX30-0XE0</b>
Product type designation	CP 1243-1 DNP3
<b>Performance data telecontrol</b>	
Suitability for use	
• Node station	No
• substation	Yes
• TIM control center	No
Control center connection	control center with DNP3 function supported
Control center connection by means of a permanent connection	supported
Control center connection Note	Connection to Scada system using DNP3 services
Protocol is supported	
• DNP3	Yes
• IEC 60870-5	No
Product function data buffering if connection is aborted	Yes
• Note	64,000 values
Number of data points per station maximum	200
<b>Performance data Teleservice</b>	
Diagnostics function online diagnostics with SIMATIC STEP 7	Yes
Product function	
• program download with SIMATIC STEP 7	Yes
• Remote firmware update	Yes
<b>Product functions management, configuration</b>	
Configuration software	
• required	STEP 7 Basic/Professional V12 SP1 (TIA Portal) or higher
<b>Product functions Time</b>	
Protocol is supported NTP time synchronization	No
• from control station	Yes

**Ordering data****Article No.****CP 1243-1 DNP3 communications processor**

Communications processor for connecting SIMATIC S7-1200 to a control center via the DNP3 protocol

**6GK7243-1JX30-0XE0****Accessories****Compact Switch Module CSM 1277**

See page 3/115

**IE FC RJ45 Plugs**

RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables

180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB10-2AA0**  
**6GK1901-1BB10-2AB0**  
**6GK1901-1BB10-2AE0**

**IE FC TP Standard Cable GP 2 x 2 (Type A)**

4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE F RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter  
max. length 1000 m,  
minimum order quantity 20 m

**6XV1840-2AH10****IE FC Stripping Tool**

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

**6GK1901-1GA00****STEP 7 Basic Engineering Software V13 SP1 (TIA Portal)**

See Chapter 11, page 11/6

**SIMATIC S7-1200 basic controller**

I/O modules

Communication

**CP 1243-1 IEC****Overview**

The CP 1243-1 IEC communications processor is used to connect a SIMATIC S7-1200 to a control center system via the IEC 60870 protocol and has the following characteristics:

- Support for the established communication standard in accordance with IEC 60870-5-104 for standardized linking of the SIMATIC S7-1200 to WinCC, PCS 7, or other commercially available control center systems
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Automatic sending of alert emails
- Clearly laid out LED signaling for fast and easy diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7
- Data buffering of up to 64,000 values ensures a secure database even with temporary connection failures

**Technical specifications**

Article number	<b>6GK7243-1PX30-0XE0</b>
Product type designation	CP 1243-1 IEC
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
• for power supply	0
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Consumed current	
• from backplane bus for DC at 5 V typical	0.25 A
Active power loss	1.25 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operation	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-1200 single width
Width	30 mm
Height	110 mm
Depth	75 mm
Net weight	0.122 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• wall mounting	Yes
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	3
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• Note	like CPU
<b>Performance data IT functions</b>	
Number of possible connections	
• as e-mail client maximum	1

Technical specifications (continued)		Ordering data	Article No.
Article number	<b>6GK7243-1PX30-0XE0</b>	<b>CP 1243-1 IEC communications processor</b>	<b>6GK7243-1PX30-0XE0</b>
Product type designation	CP 1243-1 IEC	Communications processor for connecting SIMATIC S7-1200 to a control center via the IEC 60870-5-104 protocol	
<b>Performance data telecontrol</b>		<i>Accessories</i>	
Suitability for use		<b>CSM 1277 compact switch module</b>	See page 3/115
• Node station	No	<i>IE FC RJ45 plugs</i>	
• substation	Yes	RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables;	
• TIM control center	No	180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
Control center connection	control center with IEC 60870-5 function	<ul style="list-style-type: none"> <li>• 1 pack = 1 unit</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>
Control center connection by means of a permanent connection	supported	<b>IE FC TP Standard Cable GP 2 x 2 (Type A)</b>	<b>6XV1840-2AH10</b>
Control center connection Note	Connection to Scada system using IEC 60870-5	4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE F RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1 000 m, minimum order quantity 20 m	
Protocol is supported		<b>IE FC Stripping Tool</b>	<b>6GK1901-1GA00</b>
• DNP3	No	Pre-adjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
• IEC 60870-5	Yes	<b>STEP 7 Basic Engineering Software V13 (TIA Portal)</b>	See Chapter 11, page 11/6
Product function data buffering if connection is aborted	Yes		
• Note	64,000 values		
Number of data points per station maximum	200		
<b>Performance data Teleservice</b>			
Diagnostics function online diagnostics with SIMATIC STEP 7	Yes		
Product function			
• program download with SIMATIC STEP 7	Yes		
• Remote firmware update	Yes		
<b>Product functions management, configuration</b>			
Configuration software			
• required	STEP 7 Basic/Professional V13 (TIA Portal) or higher		
<b>Product functions Time</b>			
Protocol is supported NTP time synchronization	No		
• from control station	Yes		



**SIMATIC S7-1200 basic controller**

I/O modules

Communication

**SIMATIC RF120C****Overview**

SIMATIC RF120C communication module

The SIMATIC RF120C is a communication module for direct connection of SIMATIC identification systems to the SIMATIC S7-1200. The readers of all RFID systems as well as the MV400 code reading systems can be operated on the SIMATIC RF120C.

Integration into the TIA Portal and the uniform plug-in connection systems permit fast and simple commissioning.

**Technical specifications**

Article number	<b>6GT2002-0LA00</b>
Product type designation	RF120C communication module
Suitability for operation	SIMATIC S7-1200 together with RF200/300/600, MOBY D/U, MV
<b>Transmission rate</b>	
Transfer rate at the point-to-point connection serial maximum	115.2 kbit/s
<b>Interfaces</b>	
Design of the interface for point-to-point connection	RS422
Number of readers connectable	1
Type of electrical connection	
• of the backplane bus	S7-1200 backplane bus
• for supply voltage	Screw terminals
Design of the interface to the reader for communication	D-sub, 9-pin, socket
<b>Mechanical data</b>	
Material	Xantar MX 1094
Color	Ti-grey 24L01
Tightening torque of the screw for securing the equipment maximum	0.45 N·m
<b>Supply voltage, current consumption, power loss</b>	
Supply voltage	
• for DC Rated value	24 V
• for DC	20 ... 30 V
Consumed current for DC at 24 V	
• without connected devices typical	0.03 A
• with connected devices maximum	1 A

Article number	<b>6GT2002-0LA00</b>
Product type designation	RF120C communication module
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Protection class IP	IP20
Shock resistance	According to IEC 61131-2
Shock acceleration	300 m/s <sup>2</sup>
Resistance against vibration	100 m/s <sup>2</sup>
<b>Design, dimensions and weight</b>	
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.15 kg
Mounting type	S7-1200 rack
Cable length for RS 422 interface maximum	1 000 m
<b>Product properties, functions, components general</b>	
Display version	4 LEDs for reader connection, 1 LED for device status
Product function transponder file handler can be addressed	No
Protocol is supported	
• S7 communication	Yes
Type of parameterization	HSP
Type of programming	Library with functions
Type of computer-mediated communication	acyclic communication
<b>Standards, specifications, approvals</b>	
Certificate of suitability	CE, FCC, cULus, KCC, C-Tick
MTBF	196 y

Ordering data	Article No.		Article No.
<b>SIMATIC RF120C communications module</b>	<b>6GT2002-0LA00</b>	<b>Accessories for extended use</b>	
Integrated in the S7-1200 controller for connection of a reader		<b>Extension cable for all readers</b>	
<b>Accessories for all readers</b>		PUR material, CMG approval, suitable for cable carriers, straight reader connector	
<b>Reader cable for SIMATIC RF200 / RF300 / RF600 / MV400</b>		2 m	<b>6GT2891-4FH20</b>
PUR material, CMG approval, suitable for cable carriers, straight reader connector		5 m	<b>6GT2891-4FH50</b>
2 m	<b>6GT2091-4LH20</b>	10 m	<b>6GT2891-4FN10</b>
5 m	<b>6GT2091-4LH50</b>	20 m	<b>6GT2891-4FN20</b>
10 m	<b>6GT2091-4LN10</b>	50 m	<b>6GT2891-4FN50</b>
		2 m, plug angled at reader	<b>6GT2891-4JH20</b>
		5 m, plug angled at reader	<b>6GT2891-4JH50</b>
		10 m, plug angled at reader	<b>6GT2891-4JN10</b>
		<b>Reader adapter cable for MOBY D</b>	<b>6GT2691-4FH20</b>
		Material PUR, CMG approval, suitable for cable carriers, 2 m. A cable of the type 6GT2091-4L... is also required.	
		<b>DVD "RFID Systems Software &amp; Documentation"</b>	<b>6GT2080-2AA20</b>

**SIMATIC S7-1200 basic controller**

I/O modules

SIPLUS communication

**SIPLUS CM 1241 communication modules****Overview**

- For fast, high-performance serial data exchange via point-to-point coupling
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can also be loaded
- Simple parameterization with STEP 7 Basic

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	<b>6AG1241-1AH32-2XB0</b>
Based on	<b>6ES7241-1AH32-0XB0</b> SIPLUS S7-1200 CM1241 RS 232
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>	
• Min.	-40 °C; = Tmin; startup @ -25 °C
• max.	70 °C; = Tmax
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)

Article number	<b>6AG1241-1AH32-2XB0</b>
Based on	<b>6ES7241-1AH32-0XB0</b> SIPLUS S7-1200 CM1241 RS 232
<b>Relative humidity</b>	
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.****SIPLUS CM 1241 communication module**

(extended temperature range and medial exposure)

Ambient temperature -25 ... +70° C

Communication module for point-to-point connection, with one RS 485 interface

**6AG1241-1CH32-2XB0**

Communication module for point-to-point connection, with one RS 232 interface

**6AG1241-1AH32-2XB0**

Suitable for areas with extraordinary medial exposure (conformal coating)

Communication module for point-to-point connection, with one RS 485 interface

**6AG1241-1CH32-4XB0****Accessories****Article No.**

See SIMATIC S7-1200 communication module CM 1241, page 3/108

**Overview**

- For fast, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can be loaded later
- Simple parameterization with STEP 7 Basic
- Can be plugged directly into the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****SIPLUS CB 1241 RS 485 communication board**

for point-to-point connection,  
with 1 RS 485 interface

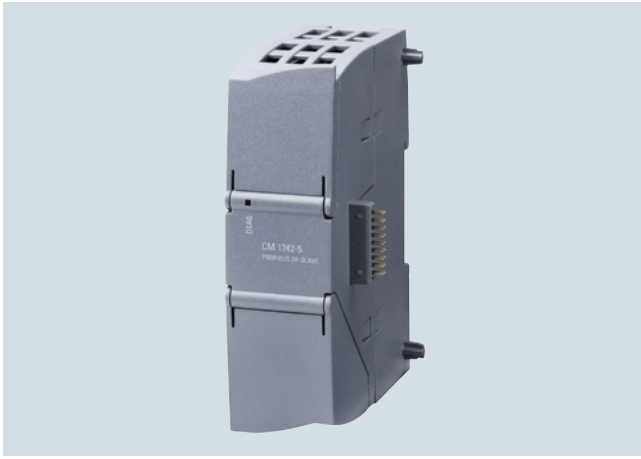
**Accessories****Article No.****6AG1241-1CH30-5XB1**

See SIMATIC CB 1241 RS 485  
communication board, page 3/109

**SIMATIC S7-1200 basic controller**

I/O modules

SIPLUS communication

**SIPLUS CM 1242-5 communication modules****Overview**

DP-M	DP-S	FMS	PG/OP	S7
	●			

The SIPLUS CM 1242-5 communication module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP slave and has the following characteristics:

- PROFIBUS DPV1 slave in accordance with IEC 61158
- Module replacement without PG supported
- Power is supplied via the backplane bus so that no extra cabling is required
- Support of all standard baud rates from 9.6 Kbit/s to 12 Mbit/s
- Compact industry-standard enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1242-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the S7-1200 for optimal production.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**SIPLUS S7-1200 CM 1242-5**

<b>Article No.</b>	<b>6AG1 242-5DX30-2XE0</b>
<b>Article No. based on</b>	<b>6GK7 242-5DX30-0XE0</b>
Ambient temperature range	-25 ... +55 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere).
Technical data	The technical data of the standard product applies except for the ambient conditions.
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

**Ordering data****Article No.****SIPLUS CM 1242-5 communication module**

(extended temperature range and medial exposure)

Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 slave

**6AG1242-5DX30-2XE0****Accessories**

See SIMATIC S7-1200 communication module CM 1242-5, page 3/111

## Overview



DP-M	DP-S	FMS	PG/OP	S7
●			●	●

The CM 1243-5 communication module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP master and has the following characteristics:

- PROFIBUS DPV1 master in accordance with IEC 61158
- Support of up to 16 PROFIBUS DP slaves
- Communication with other S7 controllers based on S7 communication
- Allows the connection of programming devices and operator panels with a PROFIBUS interface to the S7-1200
- Module replacement without PG supported
- Support of all standard baud rates from 9.6 Kbit/s to 12 Mbit/s
- Compact industry-standard enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1243-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the S7-1200 for optimal production.

### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

### SIPLUS S7-1200 CM 1243-5

<b>Article number</b>	<b>6AG1 243-5DX30-2XE0</b>
<b>Article number based on</b>	<b>6GK7 243-5DX30-0XE0</b>
Ambient temperature range	-25 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere).
Technical data	The technical data of the standard product applies except for the ambient conditions.
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

### Ordering data

### Article No.

#### SIPLUS CM 1243-5 communication module

(extended temperature range and medial exposure)

Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 master

**6AG1243-5DX30-2XE0**

#### Accessories

See SIMATIC S7-1200 CM 1243-5 communication module, page 3/114

**SIMATIC S7-1200 basic controller**

I/O modules

SIPLUS communication

**SIPLUS NET CSM 1277****Overview**

- Unmanaged switch for connection of SIPLUS S7-1200 to an Industrial Ethernet network with a line, tree or star topology
- Multiplication of Ethernet interfaces on a SIPLUS S7-1200 for additional connection of up to three programming devices, operator controls, and further Ethernet nodes
- Simple, space-saving mounting on the SIPLUS S7-1200 rail
- Low-cost solution for implementing small, local Ethernet networks
- Problem-free connection using RJ45 standard connectors
- Simple and fast status display via LEDs on the device
- Integral autocrossover function permits use of uncrossed connecting cables

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

<b>SIPLUS NET CSM 1277</b>	
<b>Article number</b>	<b>6AG1 277-1AA10-4AA0</b>
<b>Article number based on</b>	<b>6GK7 277-1AA10-0AA0</b>
Ambient temperature range	0 ... +60 °C

**Technical specifications**

<b>Article number</b>	<b>6AG1277-1AA10-4AA0</b>
<b>Based on</b>	<b>6GK7277-1AA10-0AA0</b>
<b>Product-type designation</b>	SIPLUS CSM 1277
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operating	0 °C
	60 °C
• during storage	-40 °C
	70 °C
• during transport	-40 °C
	70 °C
Ambient condition relating to ambient temperature - air pressure - installation altitude	0 ... +60°C at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // 0 ... +50°C at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // 0 ... +40°C at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Resistance to biologically active substances conformity in accordance with EN 60721-3-3	Compliant with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.
Resistance to chemically active substances conformity in accordance with EN 60721-3-3	Compliant with EN 60721-3-3, Class 3C4 incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.
Resistance to mechanically active substances conformity in accordance with EN 60721-3-3 note	Compliant with EN 60721-3-3, Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on the unused interfaces during operation.

**Ordering data****Article No.****SIPLUS NET CSM 1277 compact switch module**

(extended temperature range and medial exposure)

Unmanaged switch for connection of SIPLUS S7-1200 and up to three further nodes to Industrial Ethernet with 10/100 Mbit/s;  
4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic Manual on CD-ROM

**6AG1 277-1AA10-4AA0****Accessories**

See CSM 1277 unmanaged, page 3/116

**Overview**

- Digital inputs as supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- Operable exclusively in the central system

**Technical specifications**

Article number	<b>6ES7226-6BA32-0XB0</b> DIGITAL INPUT SM 1226, F-DI 16X 24VDC
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	Yes
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Input current</b>	
from backplane bus 5 V DC, max.	155 mA
<b>Digital inputs</b>	
• from load voltage L+ (without load), max.	130 mA
<b>Power losses</b>	
Power loss, typ.	7 W
<b>Digital inputs</b>	
Number of digital inputs	16
<b>horizontal installation</b>	
- up to 50 °C, max.	16
<b>vertical installation</b>	
- up to 40 °C, max.	16
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	0.5 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
- Parameterizable	Yes
<b>Cable length</b>	
• shielded, max.	200 m
• Unshielded, max.	200 m
<b>Diagnostics indication LED</b>	
• for status of the inputs	Yes

Article number	<b>6ES7226-6BA32-0XB0</b> DIGITAL INPUT SM 1226, F-DI 16X 24VDC
<b>Standards, approvals, certificates</b>	
CE mark	Yes
cULus	Yes
FM approval	Yes
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>	
• Min.	0 °C
• max.	55 °C
• Permissible temperature change	5°C to 55°C, 3°C / minute
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
<b>Relative humidity</b>	
• Permissible range (without condensation) at 25 °C	95 %
<b>Mechanics/material</b>	
Type of housing (front)	
• plastic	Yes
<b>Dimensions</b>	
Width	70 mm
Height	100 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	250 g



**SIMATIC S7-1200 basic controller**

I/O modules

Fail-safe I/O modules

**SM 1226 fail-safe digital input****Ordering data****Article No.****Article No.****SM 1226 fail-safe digital input signal modules****6ES7 226-6BA32-0XB0**

16 inputs, 24 V DC (SIL 2/category 3/PL d) or 8 inputs 24 V DC (SIL 3/category 3 or category 4/PL e) or a combination of both

**Accessories****STEP 7 Safety Basic V13 SP1****Task:**

Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC

**Requirement:**

STEP 7 Basic V13 SP1 and higher

Floating license for 1 user, software and documentation on DVD, license key on USB stick

**6ES7833-1FB13-0YA5**

Floating license for 1 user, software, documentation and license key for download<sup>1)</sup>; email address required for delivery

**6ES7833-1FB13-0YH5****STEP 7 Safety Advanced V13 SP1****Task:**

Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco

**Requirement:**

STEP 7 Professional V13 SP1

Floating license for 1 user, software and documentation on DVD, license key on USB stick

**6ES7833-1FA13-0YA5**

Floating license for 1 user, software, documentation and license key for download<sup>1)</sup>; email address required for delivery

**6ES7833-1FA13-0YH5**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

**Overview**

- Digital outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

**Technical specifications**

Article number	<b>6ES7226-6DA32-0XB0</b> DIGITAL OUTPUT SM 1226, F-DQ 4X 24VDC
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	Yes
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Input current</b>	
from backplane bus 5 V DC, max.	125 mA
<b>Digital inputs</b>	
• from load voltage L+ (without load), max.	170 mA
<b>Power losses</b>	
Power loss, typ.	8 W
<b>Digital outputs</b>	
Number of digital outputs	4
• In groups of	1
short-circuit protection	Yes
<b>Output voltage</b>	
• Rated value (DC)	24 V
<b>Output current</b>	
• for signal *I* rated value	2 A
<b>Cable length</b>	
• shielded, max.	200 m
• Unshielded, max.	200 m
<b>Diagnostics indication LED</b>	
• For status of the outputs	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
cULus	Yes
FM approval	Yes

Article number	<b>6ES7226-6DA32-0XB0</b> DIGITAL OUTPUT SM 1226, F-DQ 4X 24VDC
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>	
• Min.	0 °C
• max.	55 °C
• Permissible temperature change	5°C to 55°C, 3°C / minute
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
<b>Relative humidity</b>	
• Permissible range (without condensation) at 25 °C	95 %
<b>Mechanics/material</b>	
Type of housing (front)	
• plastic	Yes
<b>Dimensions</b>	
Width	70 mm
Height	100 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	270 g

**Ordering data****SM 1226 fail-safe digital output signal module**

4 outputs; 24 V DC, current sourcing/sinking

**Article No.**

**6ES7226-6DA32-0XB0**

**Article No.****Accessories****STEP 7 Safety Basic V13 SP1**

See Fail-safe digital input, page 3/138

**STEP 7 Safety Advanced V13 SP1**

See Fail-safe digital input, page 3/138

**SIMATIC S7-1200 basic controller**

I/O modules

Fail-safe I/O modules

**SM 1226 fail-safe relay output****Overview**

- Relay outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

**Technical specifications**

Article number	<b>6ES7226-6RA32-0XB0</b> DIGITAL OUTPUT SM 1226, F-DQ 2X RELAY
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	Yes
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Input current</b>	
from backplane bus 5 V DC, max.	120 mA
<b>Digital inputs</b>	
• from load voltage L+ (without load), max.	300 mA
<b>Power losses</b>	
Power loss, typ.	10 W
<b>Output voltage</b>	
• Rated value (DC)	5 V DC to 30 V DC
• Rated value (AC)	5 V AC to 250 V AC
<b>Relay outputs</b>	
• Number of relay outputs	2
<b>Cable length</b>	
• shielded, max.	200 m
• Unshielded, max.	200 m
<b>Diagnostics indication LED</b>	
• For status of the outputs	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
cULus	Yes
FM approval	Yes

Article number	<b>6ES7226-6RA32-0XB0</b> DIGITAL OUTPUT SM 1226, F-DQ 2X RELAY
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>	
• Min.	0 °C
• max.	55 °C
• Permissible temperature change	5°C to 55°C, 3°C / minute
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
<b>Relative humidity</b>	
• Permissible range (without condensation) at 25 °C	95 %
<b>Mechanics/material</b>	
Type of housing (front)	
• plastic	Yes
<b>Dimensions</b>	
Width	70 mm
Height	100 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	300 g

**Ordering data****SM 1226 fail-safe relay output signal module**

2 relay outputs

**Article No.****6ES7226-6RA32-0XB0****Article No.****Accessories****STEP 7 Safety Basic V13 SP1**

See Fail-safe digital input, page 3/138

**STEP 7 Safety Advanced V13 SP1**

See Fail-safe digital input, page 3/138

**Overview**


In terms of design and functionality, the SIMATIC PM 1207 single-phase load power supply (PM = power module) with automatic range selection of the input voltage is an optimal match to the SIMATIC S7-1200 PLC. It provides the supply to CPUs with 24 V input as well as to signal modules, and to 24 V loads connected to the modules. Comprehensive certifications, such as UL, ATEX and GL facilitate universal use.

3

**Technical specifications**

Article number	<b>6EP1332-1SH71</b>
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
<b>Input</b>	
Input	1-phase AC
Supply voltage	
• 1 with AC Rated value	120 V
• 2 with AC Rated value	230 V
• Note	Automatic range selection
Input voltage	
• 1 with AC	85 ... 132 V
• 2 with AC	176 ... 264 V
Wide-range input	No
Overvoltage resistance	$2.3 \times V_{in}$ rated, 1.3 ms
Mains buffering at Iout rated, min.	20 ms; at $V_{in} = 93/187$ V
Rated line frequency	50 ... 60 Hz
Rated line range	47 ... 63 Hz
Input current	
• at rated input voltage 120 V	1.2 A
• at rated input voltage 230 V	0.67 A
Switch-on current limiting (+25 °C), max.	13 A
Duration of inrush current limiting at 25 °C	
• maximum	3 ms
$I^2t$ , max.	0.5 A <sup>2</sup> ·s
Built-in incoming fuse	T 3, 15 A/250 V (not accessible)
Protection in the mains power input (IEC 60898)	Recommended miniature circuit breaker: 16 A characteristic B or 10 A characteristic C

Article number	<b>6EP1332-1SH71</b>
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
<b>Output</b>	
Output	Controlled, isolated DC voltage
Rated voltage Vout DC	24 V
Total tolerance, static ±	3 %
Static mains compensation, approx.	0.1 %
Static load balancing, approx.	0.2 %
Residual ripple peak-peak, max.	150 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	240 mV
Product function Output voltage adjustable	No
Output voltage setting	-
Status display	Green LED for 24 V OK
On/off behavior	No overshoot of Vout (soft start)
Startup delay, max.	6 s; 2 s at 230 V, 6 s at 120 V
Voltage rise, typ.	10 ms
Rated current value Iout rated	2.5 A
Current range	0 ... 2.5 A
Active power supplied typical	60 W
Short-term overload current	
• on short-circuiting during the start-up typical	6 A
• at short-circuit during operation typical	6 A
Duration of overloading capability for excess current	
• on short-circuiting during the start-up	100 ms
• at short-circuit during operation	100 ms
Parallel switching for enhanced performance	Yes
Numbers of parallel switchable units for enhanced performance	2

# SIMATIC S7-1200 basic controller

## Power supplies

### 1-phase, 24 V DC (for S7-1200)

#### Technical specifications (continued)

Article number	<b>6EP1332-1SH71</b>
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
<b>Efficiency</b>	
Efficiency at $V_{out}$ rated, $I_{out}$ rated, approx.	83 %
Power loss at $V_{out}$ rated, $I_{out}$ rated, approx.	12 W
<b>Closed-loop control</b>	
Dynamic mains compensation ( $V_{in}$ rated $\pm 15$ %), max.	0.3 %
Dynamic load smoothing ( $I_{out}$ : 50/100/50 %), $U_{out} \pm$ typ.	3 %
Load step setting time 50 to 100%, typ.	5 ms
Load step setting time 100 to 50%, typ.	5 ms
Setting time maximum	5 ms
<b>Protection and monitoring</b>	
Output overvoltage protection	< 33 V
Current limitation, typ.	2.65 A
Property of the output Short-circuit proof	Yes
Short-circuit protection	Constant current characteristic
Enduring short circuit current RMS value	
• typical	2.7 A
Overload/short-circuit indicator	-
<b>Safety</b>	
Primary/secondary isolation	Yes
Galvanic isolation	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178
Protection class	Class I
Leakage current	
• maximum	3.5 mA
CE mark	Yes
UL/CSA approval	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950-1, CSA C22.2 No. 60950-1) File E151273
Explosion protection	ATEX (EX) II 3G Ex nA II T4; cULus (ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455
Certificate of suitability IECEx	No
Certificate of suitability NEC Class 2	No
FM approval	Class I, Div. 2, Group ABCD, T4
CB approval	Yes
Marine approval	GL, ABS, BV, DNV, LRS, NK
Degree of protection (EN 60529)	IP20

Article number	<b>6EP1332-1SH71</b>
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
<b>EMC</b>	
Emitted interference	EN 55022 Class B
Supply harmonics limitation	not applicable
Noise immunity	EN 61000-6-2
<b>Operating data</b>	
Ambient temperature	
• during operation	0 ... 60 °C
- Note	with natural convection
• during transport	-40 ... +85 °C
• during storage	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation
<b>Mechanics</b>	
Connection technology	screw-type terminals
Connections	
• Supply input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>
• Output	L+, M: 2 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>
• Auxiliary	-
Width of the enclosure	70 mm
Height of the enclosure	100 mm
Depth of the enclosure	75 mm
Weight, approx.	0.3 kg
Product property of the enclosure housing for side-by-side mounting	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15, wall mounting
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

#### Ordering data

#### Article No.

**SIMATIC S7-1200 PM 1207**

Input 120/230 V AC,  
output 24 V DC/2.5 A

**6EP1332-1SH71**

**Overview**


- Stabilized power supply for SIPLUS S7-1200
- In the S7-1200 design
- Input 120/230 V AC, output 24 V DC, 2.5 A (derating: 1.5 A from 60 °C)

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**SIPLUS power supply PM 1207**

Article number	6AG1332-1SH71-4AA0	6AG1332-1SH71-7AA0
Article number based on	6EP1332-1SH71	
Ambient temperature range	0 ... +60° C	-25 ... +70° C
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
<b>Ambient conditions</b>		
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.	
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold spores, fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!	
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!	
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!	
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K	

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

**SIMATIC S7-1200 basic controller**

## Power supplies

**SIPLUS PM 1207 power supplies****Technical specifications**

Article No.	<b>SIPLUS PM 1207</b> <b>6AG1332-1SH71-7AA0</b> <b>6AG1332-1SH71-4AA0</b>
Article No. based on	<b>6EP1332-1SH71</b>
Input voltage, nominal value	120/230 V AC (auto-switching)
• Range	85...132 V / 176...264 V AC
Mains buffering	> 20 ms (at 93/187 V)
Line frequency, nominal	50/60 Hz
• Range	47 ... 63 Hz
Input current, nominal value	1.2/0.67 A
• Inrush current (25 °C)	<13 A
• Recommended circuit-breaker	16 A Charact. B, 10 A Charact. C
Output voltage, nominal value	24 V DC
• Tolerance	± 3%
• Residual ripple	< 150 mVpp
• Adjustment	No
Output current, nominal value	2.5 A (derating: 1.5 A from 60 °C)
Efficiency at nominal values, approx.	83%
Parallel operation	Yes, 2 units
Electronic short-circuit protection	Yes, automatic restart
Radio interference suppression (EN 55022)	Class B
Operating display	Green LED for "24 V o.k."
Supply-harmonics limitation (EN 61000-3-2)	Not applicable
Degree of protection (EN 60529)	IP20
Protection class	Class 1
Electric isolation	SELV acc. to EN 60950 and EN 50178
Ambient temperature	0 ... +60 °C -25 ... 70 °C
Transport and storage temperature	-25 ... +85 °C
Installation	Standard rail EN 60715 35x7.5/15
Dimensions (W x H x D) in mm	70 x 100 x 75
Weight, approx.	0.3 kg
Certifications	CE

**Ordering data****Article No.****SIPLUS PM 1207 power supply**

(extended temperature range and medial exposure)

Input 120/230 V AC, output 24 V DC, 2.5 A;  
derating from + 55 °C to + 70 °C at 1.2 A output current

Ambient temperature -25 ... +70 °C

Ambient temperature 0 ... +60 °C

**6AG1332-1SH71-7AA0****6AG1332-1SH71-4AA0**

# SIMATIC S7-1200 basic controller

## Operator control and monitoring

### SIMATIC HMI Basic Panels (2nd Generation)

#### Overview



SIMATIC HMI Basic Panels, 2nd generation

With their fully developed HMI basic functions, 2<sup>nd</sup> generation SIMATIC HMI Basic Panels are the ideal entry level series for simple HMI applications.

The device family offers panels with 4", 7", 9" and 12" widescreen displays, as well as combined key and touch operation.

The innovative high-resolution widescreen displays with 64 000 colors are also suitable for upright installation, and they can be dimmed down to 100 %. The innovative operator interface with improved usability opens up a diverse range of options thanks to new controls and graphics. The new USB interface enables the connection of keyboard, mouse or barcode scanner, and supports the simple archiving of data on a USB stick.

The integrated Ethernet or RS 485/422 interface (version-specific) enables simple connection to the controller.

For further information, refer to:  
[www.siemens.com/basic-panels](http://www.siemens.com/basic-panels)

#### Note:

For selected SIMATIC HMI Basic Panels, it is possible to customize the appearance of the panel using the customer name or customer logo, as well as to change the membrane color scheme in accordance with the customer's corporate design. This is even possible for small quantities.

#### Ordering data

#### Article No.

<b>SIMATIC HMI Basic Panels, Key and Touch</b>	
<b>SIMATIC HMI KTP400 Basic</b>	<b>6AV2123-2DB03-0AX0</b>
<b>SIMATIC HMI KTP700 Basic</b>	<b>6AV2123-2GB03-0AX0</b>
<b>SIMATIC HMI KTP700 Basic DP</b>	<b>6AV2123-2GA03-0AX0</b>
<b>SIMATIC HMI KTP900 Basic</b>	<b>6AV2123-2JB03-0AX0</b>
<b>SIMATIC HMI KTP1200 Basic</b>	<b>6AV2123-2MB03-0AX0</b>
<b>SIMATIC HMI KTP1200 Basic DP</b>	<b>6AV2123-2MA03-0AX0</b>
<b>Starter kits</b>	
<b>Starter kit SIMATIC S7-1200 + KP300 Basic mono PN</b>	<b>6AV6651-7HA01-3AA4</b>
<b>Starter Kit SIMATIC S7-1200 + KTP400 Basic</b>	<b>6AV6651-7KA01-3AA4</b>
<b>Starter Kit SIMATIC S7-1200 + KTP700 Basic</b>	<b>6AV6651-7DA01-3AA4</b>
Starter kits with an S7-1200 consist of:	
<ul style="list-style-type: none"> <li>the respective SIMATIC HMI Basic Panel</li> <li>SIMATIC HMI KP300 Basic mono PN</li> <li>SIMATIC HMI KTP400 Basic</li> <li>SIMATIC HMI KTP700 Basic</li> </ul>	
<ul style="list-style-type: none"> <li>SIMATIC S7-1200 CPU 1212C AC/DC/Rly</li> <li>SIMATIC S7-1200 Simulator Module SIM 12</li> <li>SIMATIC STEP 7 BASIC CD</li> <li>SIMATIC S7-1200 HMI Manual Collection CD</li> <li>Ethernet CAT5 cable, 2 m</li> </ul>	
<b>Starter kit LOGO! + KP300 Basic mono PN</b>	<b>6AV2132-0HA00-0AA1</b>
<b>Starter kit LOGO! + KTP400 Basic</b>	<b>6AV2132-0KA00-0AA1</b>
<b>Starter kit LOGO! + KTP700 Basic</b>	<b>6AV2132-3GB00-0AA1</b>
Starter kits with a LOGO! consist of:	
<ul style="list-style-type: none"> <li>the respective SIMATIC HMI Basic Panel</li> <li>SIMATIC HMI KP300 Basic mono PN</li> <li>SIMATIC HMI KTP400 Basic</li> <li>SIMATIC HMI KTP700 Basic</li> </ul>	
<ul style="list-style-type: none"> <li>LOGO! 12/24 RCE</li> <li>LOGO! POWER 24 V 1.3 A</li> <li>LOGO! SOFT COMFORT V7</li> <li>WINCC BASIC (TIA Portal)</li> <li>Ethernet CAT5 cable, 2 m</li> </ul>	
<b>Documentation</b>	
You can find the manual for the Basic Panels on the Internet at:	<a href="http://support.automation.siemens.com">http://support.automation.siemens.com</a>
<b>Accessories</b>	See Catalog ST 80 / ST PC or Industry Mall

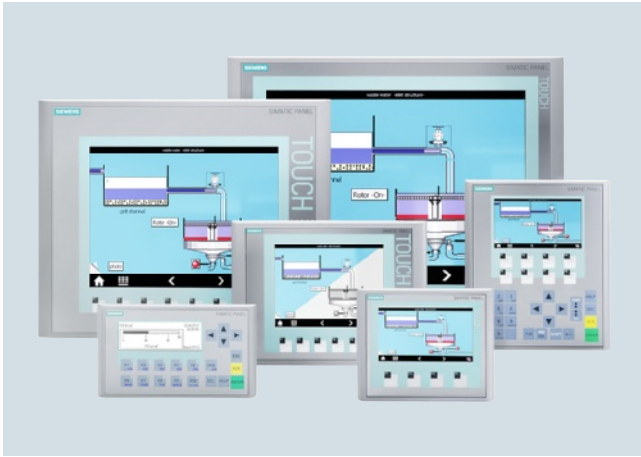


## SIMATIC S7-1200 basic controller

Operator control and monitoring

### SIMATIC HMI Basic Panels (1st Generation)

#### Overview



- Ideal entry-level series from 3" to 15" for operating and monitoring compact machines and systems
- Clear process representation thanks to use of pixel-graphics displays
- Intuitive operation using Touch and tactile function keys
- Equipped with all the necessary basic functions such as alarm logging, recipe management, plots, vector graphics, and language switching
- Simple connection to the controller via integral Ethernet interface or separate version with RS 485/422
- Faster commissioning thanks to integrated diagnostics viewer and IP setting for SIMATIC S7-1200 and S7-1500 PLCs

#### Ordering data

#### Article No.

##### SIMATIC HMI Basic Panels (1<sup>st</sup> Generation)

##### SIMATIC HMI Basic Panels, Key and Touch

- SIMATIC HMI KTP400 Basic mono PN
- SIMATIC HMI KTP400 Basic color PN
- SIMATIC HMI KTP600 Basic mono PN
- SIMATIC HMI KTP600 Basic color DP
- SIMATIC HMI KTP600 Basic color PN
- SIMATIC HMI KTP1000 Basic color DP
- SIMATIC HMI KTP1000 Basic color PN

6AV6647-0AA11-3AX0

6AV6647-0AK11-3AX0

6AV6647-0AB11-3AX0

6AV6647-0AC11-3AX0

6AV6647-0AD11-3AX0

6AV6647-0AE11-3AX0

6AV6647-0AF11-3AX0

##### SIMATIC HMI Basic Panels, Key

- SIMATIC HMI KP300 Basic mono PN
- SIMATIC HMI KP400 Basic color PN

6AV6647-0AH11-3AX0

6AV6647-0AJ11-3AX0

##### SIMATIC HMI Basic Panels, Touch

- SIMATIC HMI TP1500 Basic color PN

6AV6647-0AG11-3AX0

##### Documentation

You can find the manual for the Basic Panels on the Internet at:

<http://support.automation.siemens.com>

##### Accessories

See Catalog ST 80 / ST PC or Industry Mall

# SIMATIC S7-1200 basic controller

## Operator control and monitoring

### SIPLUS Basic Panels (2nd generation)

#### Overview



With their fully developed HMI basic functions, 2<sup>nd</sup> generation SIPLUS Basic Panels are the ideal entry level series for simple HMI applications.

The device family offers panels with 4", 7", 9" and 12" displays, as well as combined key and touch operation.

The innovative high-resolution widescreen displays with 64 000 colors are also suitable for upright installation, and they can be dimmed down to 100 %. The innovative operator interface with improved usability opens up a diverse range of options thanks to new controls and graphics. The new USB interface enables the connection of keyboard, mouse or barcode scanner, and supports the simple archiving of data on a USB stick.

The integrated Ethernet or RS 485/422 interface (version-specific) enables simple connection to the controller.

#### Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see: <http://www.siemens.com/siplus-extreme>

#### Technical specifications

Article number	6AG1123-2DB03-2AX0	6AG1123-2GB03-2AX0	6AG1123-2JB03-2AX0
Based on	6AV2123-2DB03-0AX0 SIPLUS HMI KTP400 BASIC	6AV2123-2GB03-0AX0 SIPLUS HMI KTP700 BASIC	6AV2123-2JB03-0AX0 SIPLUS HMI KTP900 BASIC
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Operation (vertical installation)			
- For vertical installation, min.	-20 °C	-20 °C	-20 °C
- For vertical installation, max.	50 °C	50 °C	50 °C
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>			
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-1200 basic controller**

Operator control and monitoring

**SIPLUS Basic Panels (2nd generation)****Ordering data****Article No.****SIMATIC HMI Basic Panels,  
Key and Touch****SIMATIC HMI KTP400 Basic**

For areas subject to exceptional  
medial exposure (conformal  
coating); ambient temperature  
-25 ... +50 °C

**6AG1123-2DB03-2AX0****SIMATIC HMI KTP700 Basic**

For areas subject to exceptional  
medial exposure (conformal  
coating); ambient temperature  
-25 ... +50 °C

**6AG1123-2GB03-2AX0****SIMATIC HMI KTP900 Basic**

For areas subject to exceptional  
medial exposure (conformal  
coating); ambient temperature  
-25 ... +50 °C

**6AG1123-2JB03-2AX0****Accessories****Article No.**

See Catalog ST 80 / ST PC  
or Industry Mall

3

#### Overview



- Ideal entry-level series of 3.8 inches to 15 inches for operating and monitoring compact machines and systems
- Clear process representation through the use of full-graphic displays
- Intuitive operation via touch and tactile function keys
- Equipped with all the necessary basic functions such as reporting, recipe management, curve representation, vector graphics, and language selection
- Easy connection to the controller via integrated Ethernet interface or a separate version with RS 485/422

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

#### Technical specifications

Article number	6AG1647-0AH11-2AX0	6AG1647-0AA11-2AX0	6AG1647-0AD11-2AX0
Based on	6AV6647-0AH11-3AX0	6AV6647-0AA11-3AX0	6AV6647-0AD11-3AX0
	SIPLUS HMI KP300 BASIC MONO PN 3,6"	SIPLUS KTP400 BASIC MONO PN 3,8"	SIPLUS KTP600 BASIC COLOR PN
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Operation (vertical installation)			
- For vertical installation, min.	-25 °C	-10 °C	-25 °C
- For vertical installation, max.	60 °C	50 °C	60 °C
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>			
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

# SIMATIC S7-1200 basic controller

## Operator control and monitoring

### SIPLUS Basic Panels (1st Generation)

#### Technical specifications (continued)

Article number	<b>6AG1647-0AE11-4AX0</b>	<b>6AG1647-0AF11-4AX0</b>	<b>6AG1647-0AG11-4AX0</b>
Based on	<b>6AV6647-0AE11-3AX0</b> SIPLUS HMI KTP1000 BASIC COLOR DP 10,4"	<b>6AV6647-0AF11-3AX0</b> SIPL6AV6647-0AF11-3AX0US KTP1000 BASIC COLOR DP 10,4"	<b>6AV6647-0AG11-3AX0</b> SIPLUS HMI TP1500 BASIC COLOR PN 15"
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Operation (vertical installation)	0 °C to +50 °C	0 °C to +50 °C	0 °C to +50 °C
- For vertical installation, min.	0 °C	0 °C	0 °C
- For vertical installation, max.	50 °C	50 °C	50 °C
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>			
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

#### Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>SIPLUS HMI KP300 Basic mono PN</b> For areas with extreme medial exposure (conformal coating); ambient temperature -25 ... +60 °C	<b>6AG1647-0AH11-2AX0</b>	<b>SIPLUS HMI KTP1000 Basic color DP</b> For areas with extreme medial exposure (conformal coating); ambient temperature 0 ... +50 °C	<b>6AG1647-0AE11-4AX0</b>
<b>SIPLUS HMI KTP400 Basic mono PN</b> For areas with extreme medial exposure (conformal coating); ambient temperature -10 ... +60 °C	<b>6AG1647-0AA11-2AX0</b>	<b>SIPLUS HMI KTP1000 Basic color PN</b> For areas with extreme medial exposure (conformal coating); ambient temperature 0 ... +50 °C	<b>6AG1647-0AF11-4AX0</b>
<b>SIPLUS HMI KTP600 Basic color PN</b> For areas with extreme medial exposure (conformal coating); ambient temperature -25 ... +60 °C	<b>6AG1647-0AD11-2AX0</b>	<b>SIPLUS HMI TP1500 Basic color PN</b> For areas with extreme medial exposure (conformal coating); ambient temperature 0 ... +50 °C	<b>6AG1647-0AG11-4AX0</b>
		<b>Accessories</b>	See Catalog ST 80 / ST PC or Industry Mall

### Overview



SIMATIC HMI Comfort Panels

- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player and Web Server
- Dimmable displays from 0 to 100% via PROFlenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Optimal selection option: seven touch and five key versions are available
- Data security in the event of a power failure for the device and for the SIMATIC HMI Memory Card
- Innovative service and commissioning concept through second SD card (automatic backup)
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22 and marine approvals
- Wide range of communication options: PROFIBUS and PROFINET onboard; 2 x PROFINET with integrated switch for 7" models or larger; plus 1 x PROFINET with Gigabit support for 15" models or larger
- All versions can be used as an OPC UA client or as an OPC DA server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal

#### Customized device designs:

For selected SIMATIC HMI Basic Panels, it is possible to customize the appearance of the panel using the customer name or customer logo, as well as to change the membrane color scheme in accordance with the customer's corporate design. This is even possible for small quantities.

### Ordering data

### Article No.

<b>SIMATIC HMI Comfort Panels, Key and Touch</b>	
<b>SIMATIC HMI KTP400 Comfort</b>	<b>6AV2124-2DC01-0AX0</b>
<b>SIMATIC HMI Comfort Panels, Touch</b>	
<b>SIMATIC HMI TP700 Comfort</b>	<b>6AV2124-0GC01-0AX0</b>
<b>SIMATIC HMI TP900 Comfort</b>	<b>6AV2124-0JC01-0AX0</b>
<b>SIMATIC HMI TP1200 Comfort</b>	<b>6AV2124-0MC01-0AX0</b>
<b>SIMATIC HMI TP1500 Comfort</b>	<b>6AV2124-0QC02-0AX0</b>
<b>SIMATIC HMI TP1900 Comfort</b>	<b>6AV2124-0UC02-0AX0</b>
<b>SIMATIC HMI TP2200 Comfort</b>	<b>6AV2124-0XC02-0AX0</b>
<b>SIMATIC HMI Comfort Panels, Key</b>	
<b>SIMATIC HMI KP400 Comfort</b>	<b>6AV2124-1DC01-0AX0</b>
<b>SIMATIC HMI KP700 Comfort</b>	<b>6AV2124-1GC01-0AX0</b>
<b>SIMATIC HMI KP900 Comfort</b>	<b>6AV2124-1JC01-0AX0</b>
<b>SIMATIC HMI KP1200 Comfort</b>	<b>6AV2124-1MC01-0AX0</b>
<b>SIMATIC HMI KP1500 Comfort</b>	<b>6AV2124-1QC02-0AX0</b>
<b>Starter kits for SIMATIC HMI Comfort Panels</b>	
Consisting of: the respective SIMATIC HMI Comfort Panel, SIMATIC WinCC Comfort, Ethernet cable, 2 m SIMATIC HMI memory card 2 GB 10 protective films for touch screen devices	
<b>Starter kit for SIMATIC HMI KTP400 Comfort, Key and Touch</b>	<b>6AV2181-4DB20-0AX0</b>
<b>Starter kit for SIMATIC HMI TP700 Comfort, Touch</b>	<b>6AV2181-4GB00-0AX0</b>
<b>Starter kit for SIMATIC HMI TP900 Comfort, Touch</b>	<b>6AV2181-4JB00-0AX0</b>
<b>Starter kit for SIMATIC HMI TP1200 Comfort, Touch</b>	<b>6AV2181-4MB00-0AX0</b>
<b>Starter kit for SIMATIC HMI TP1500 Comfort, Touch</b>	<b>6AV2181-4QB00-0AX0</b>
<b>Starter kit for SIMATIC HMI TP1900 Comfort, Touch</b>	<b>6AV2181-4UB00-0AX0</b>
<b>Starter kit for SIMATIC HMI TP2200 Comfort, Touch</b>	<b>6AV2181-4XB00-0AX0</b>
<b>Starter kit for SIMATIC HMI KP400 Comfort, Key</b>	<b>6AV2181-4DB10-0AX0</b>
<b>Starter kit for SIMATIC HMI KP700 Comfort, Key</b>	<b>6AV2181-4GB10-0AX0</b>
<b>Starter kit for SIMATIC HMI KP900 Comfort, Key</b>	<b>6AV2181-4JB10-0AX0</b>
<b>Starter kit for SIMATIC HMI KP1200 Comfort, Key</b>	<b>6AV2181-4MB10-0AX0</b>
<b>Starter kit for SIMATIC HMI KP1500 Comfort, Key</b>	<b>6AV2181-4QB10-0AX0</b>
<b>Accessories</b>	See Catalog ST 80 / ST PC or Industry Mall



## SIMATIC S7-1200 basic controller

Operator control and monitoring

### SIPLUS Comfort Panels

#### Overview



- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player
- Dimmable displays from 0 to 100% via PROFlenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Optimal selection option: seven touch and five key versions are available
- Data security in the event of a power failure for the device and for the SIMATIC HMI Memory Card
- Innovative service and commissioning concept through second SD card (automatic backup)
- Easy project transfer via standard cable (standard Ethernet cable, standard USB cable)
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22

- Wide range of communication options: PROFIBUS and PROFINET onboard; 2x PROFINET with integrated switch for 7" models or larger; plus 1 additional PROFINET with Gigabit support for 15" models or larger
- All variants can be used as an OPC UA client or as an OPC DA server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- Key-operated devices with stamped keys for optimum tactile feedback
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Technical specifications

Article number	6AG1124-2DC01-4AX0	6AG1124-0GC01-4AX0	6AG1124-0JC01-4AX0	6AG1124-0MC01-4AX0
Based on	6AV2124-2DC01-0AX0 SIPLUS HMI KTP400 COMFORT	6AV2124-0GC01-0AX0 SIPLUS HMI TP700 COMFORT	6AV2124-0JC01-0AX0 SIPLUS HMI TP900 COMFORT	6AV2124-0MC01-0AX0 SIPLUS HMI TP1200 COMFORT
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Operation (vertical installation)				
- For vertical installation, min.	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin
- For vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!



# SIMATIC S7-1200 basic controller

## Operator control and monitoring

### SIPLUS Comfort Panels

#### Technical specifications (continued)

Article number	6AG1124-1DC01-4AX0	6AG1124-1GC01-4AX0	6AG1124-1JC01-4AX0	6AG1124-1MC01-4AX0	6AG1124-1QC02-4AX0
Based on	6AV2124-1DC01-0AX0 SIPLUS HMI KP400 COMFORT	6AV2124-1GC01-0AX0 SIPLUS HMI KP700 COMFORT	6AV2124-1JC01-0AX0 SIPLUS HMI KP900 COMFORT	6AV2124-1MC01-0AX0 SIPLUS HMI KP1200 COMFORT	6AV2124-1QC02-0AX0 SIPLUS HMI KP1500 COMFORT
<b>Ambient conditions</b>					
<b>Ambient temperature in operation</b>					
• Operation (vertical installation)					
- For vertical installation, min.	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin
- For vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
<b>Extended ambient conditions</b>					
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>					
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>					
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

### Technical specifications (continued)

Article number	6AG1124-0QC02-4AX0	6AG1124-0UC02-4AX0	6AG1124-0XC02-4AX0
Based on	6AV2124-0QC02-0AX0	6AV2124-0UC02-0AX0	6AV2124-0XC02-0AX0
	SIPLUS HMI TP1500 COMFORT	SIPLUS HMI TP1900 COMFORT	SIPLUS HMI TP2200 COMFORT
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Operation (vertical installation)			
- For vertical installation, min.	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin
- For vertical installation, max.	50 °C; = Tmax	45 °C; = Tmax	45 °C; = Tmax
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>			
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

### Ordering data

Ordering data	Article No.	Ordering data	Article No.
SIPLUS HMI Comfort Panels, Keys and Touch		SIPLUS HMI Comfort Panels, Keys	
SIPLUS HMI KP400 Comfort	6AG1124-2DC01-4AX0	SIPLUS HMI KP400 Comfort	6AG1124-1DC01-4AX0
SIPLUS HMI Comfort Panels, Touch		SIPLUS HMI KP700 Comfort	6AG1124-1GC01-4AX0
SIPLUS HMI TP700 Comfort	6AG1124-0GC01-4AX0	SIPLUS HMI KP900 Comfort	6AG1124-1JC01-4AX0
SIPLUS HMI TP900 Comfort	6AG1124-0JC01-4AX0	SIPLUS HMI KP1200 Comfort	6AG1124-1MC01-4AX0
SIPLUS HMI TP1200 Comfort	6AG1124-0MC01-4AX0	SIPLUS HMI KP1500 Comfort	6AG1124-1QC02-4AX0
SIPLUS HMI TP1500 Comfort	6AG1124-0QC02-4AX0	<b>Accessories</b>	See Catalog ST 80 / ST PC or Industry Mall
SIPLUS HMI TP1900 Comfort	6AG1124-0UC02-4AX0		
SIPLUS HMI TP2200 Comfort	6AG1124-0XC02-4AX0		

## SIMATIC S7-1200 basic controller

Add-on products from third-party manufacturers

### SIMATIC S7-1200 CM CANopen

#### Overview



#### Overview

For connecting CANopen components to the SIMATIC S7-1200, the CM CANopen communication module from the HMS Industrial Networks AB company is available for use together with system and IO components of the S7-1200 automation system

#### Note:

The CM CANopen module is an HMS product and can only be obtained through HMS.

#### Application

CANopen is a widely used industrial bus system and can be used for a variety of different applications. The module allows simple and cost-effective connection of CANopen applications to SIMATIC.

- Control of hydraulic valves/axes in vehicles
- Control of motors in packaging machines or conveyors
- Capturing of angular encoder positions in wind turbines
- Capturing of control devices on machines, e.g. joysticks
- Capturing the measured data of path encoders, inclinometers or angular encoders, e.g. for tower cranes and gantry cranes

The CM CANopen module has the following properties:

- Interface module for CANopen (master/slave) for SIMATIC S7-1200
- Connection of up to 16 CANopen slave stations in the master mode
- 256 bytes of input data and 256 bytes of output data per module
- Connection of up to 3 modules per CPU
- 3 LEDs for module, network and I/O status diagnostics
- Possible integration of the module into the hardware catalog of the TIA Portal configuration suite
- Supports Transparent CAN 2.0A for processing customer-specific protocols
- CANopen implementation according to communication profiles CiA 301 Rev. 4.2 and CiA 302 Rev. 4.1 (Master)

#### More information

The CANopen bus can be configured via any commercially available CANopen configuration tool. The HMS company also supplies suitable "CM CANopen Configuration Studio" software with the product. The configuration is saved directly on the module by means of a USB connection. Routing via PROFIBUS/PROFINET is not possible.

Preprogrammed function blocks are available for easier PLC programming in the TIA Portal.

For further information, please contact HMS directly:

<http://www.hms-networks.com/can-for-s7-1200>

#### Ordering and Support

Please note that ordering and support for the module are exclusively carried out via HMS. Please contact HMS directly should you have any questions concerning this module. The relevant contact details can be found on the Internet at

<http://www.hms-networks.com/can-for-s7-1200>

#### Exemption from liability/Use of hyperlinks

Siemens has prepared this description with great care. It is not possible, however, for Siemens to verify that the data supplied by external companies is complete, correct or up to date. The possibility that individual items of information might be incorrect, incomplete, or not up-to-date cannot therefore be ruled out. Unless compulsory by law, Siemens accepts no liability for the usability of the data or of the product for the user per se.

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## SIMATIC S7-1500 advanced controller



<b>4/2</b>	<b>Introduction</b>
4/2	SIMATIC S7-1500/S7-1500F, SIPLUS S7-1500
<b>4/5</b>	<b>Central processing units</b>
4/5	Standard CPUs
4/15	SIPLUS Standard CPUs
4/19	Fail-safe CPUs
<b>4/28</b>	<b>I/O modules</b>
4/28	<u>Digital modules</u>
4/28	SM 521 digital input modules
4/33	SM 522 digital output modules
4/39	SM 523 digital input/output modules
4/41	SIPLUS SM 521 digital modules
4/43	SIPLUS SM 522 digital modules
4/45	<u>Analog modules</u>
4/45	SM 531 analog input modules
4/50	SM 532 analog output modules
4/53	SM 534 analog input/output modules
4/56	SIPLUS SM 531 analog modules
4/57	SIPLUS SM 532 analog modules
4/58	<u>Technology modules</u>
4/58	TM PosInput 2 position detection modules
4/61	TM Count 2x24V counter modules
4/64	TM Timer DIDQ 16x24V time-based IO modules
4/67	SIPLUS TM Count 2x24V counter modules
4/68	<u>Communication</u>
4/68	CM PtP
4/71	CM 1542-5
4/73	CP 1542-5
4/75	CM 1542-1
4/77	CP 1543-1
4/80	SCALANCE W774 RJ45 for use in the control cabinet
4/83	SCALANCE W734 RJ45 for use in the control cabinet
4/86	SIPLUS CM PtP
4/88	SIPLUS CM 1542-5
<b>4/89</b>	<b>Connection system</b>
4/89	Front connectors
4/90	<u>SIMATIC TOP connect system cabling for SIMATIC S7-1500 and ET 200MP</u>
4/91	Fully modular connection
4/95	Front connectors with single cores

<b>4/96</b>	<b>Power supplies</b>
4/96	1-phase, 24 V DC (for S7-1500 and ET 200MP)
4/99	System power supplies
<b>4/101</b>	<b>SIPLUS power supplies</b>
4/101	Single-phase, 24 V DC/3 A (SIPLUS PM 1507)
4/102	Single-phase, 24 V DC/8 A (SIPLUS PM 1507)
4/103	SIPLUS system power supplies
<b>4/105</b>	<b>Operator control and monitoring</b>
4/105	SIMATIC HMI Basic Panels and Comfort Panels
4/106	SIPLUS Basic Panels and Comfort Panels
<b>4/107</b>	<b>Accessories</b>
4/107	Mounting rails
4/108	Spare parts

**Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

[www.siemens.com/simatic/printmaterial](http://www.siemens.com/simatic/printmaterial)

## SIMATIC S7-1500 advanced controller

### Introduction

#### SIMATIC S7-1500/S7-1500F, SIPLUS S7-1500

#### Overview



Modular, scalable, and universally usable system in IP20 level of protection:

- The system solution for a variety of automation applications in discrete automation
- Highest performance with excellent usability
- Configurable exclusively in the Totally Integrated Automation Portal with STEP 7 Professional V12 or higher

#### Performance

- Increase in performance through:
  - Faster command execution
  - Language extensions
  - New data types
  - Faster backplane bus
  - Optimized code generation
- Powerful communication:
  - PROFINET IO (2-port switch) as standard interface; from CPU 1515-2 PN, one or more additional integrated PROFINET interfaces, e.g. for network separation
  - Expandable with communication modules for bus systems and point-to-point connection

#### Integrated technology

- Motion Control integrated without additional modules:
  - Standardized blocks (PLCopen) for connection of analog and PROFIdrive-capable drives
  - The Motion Control functionality supports speed-controlled and positioning axes as well as external encoders
  - Positionally precise gearing between axes
- Comprehensive trace functions for all CPU tags for real-time diagnosis and sporadic error detection; for effective commissioning and quick optimization of drives and controls
- Comprehensive control functionalities:
  - E.g. easily configurable blocks for automatic optimization of the control parameters for optimum control quality
- Additional functions through available technology modules:
  - E.g. high-speed counting, position detection, or measurement functions for signals up to 1 MHz

#### Safety Integrated

Protection of personnel and machinery – within the framework of an integrated complete system

- Failsafe SIMATIC S7-1500F controllers for processing standard and safety programs on the same controller. Generation of the failsafe and standard user program is carried out in the TIA Portal with the same editors; this enables failsafe data to be evaluated like standard data in the standard user program, for example. Due to this integration the system benefits and the comprehensive functionality of SIMATIC are also available for failsafe applications.

#### Security Integrated

- Password-based know-how protection against unauthorized reading and modification of program blocks
- Copy protection for greater protection against unauthorized copying of program blocks:
  - With copy protection, individual blocks on the SIMATIC Memory Card can be tied to its serial number so that the block can only be run if the configured memory card is inserted into the CPU.
- Rights concept with four different authorization levels:
  - Different access rights can be assigned to various user groups. The new protection level 4 makes it possible to also restrict communication to HMI devices.
- Improved manipulation protection:
  - Changed or unauthorized transfers of engineering data are detected by the controller.
- For use of an Ethernet CP (CP 1543-1):
  - Additional access protection by means of a firewall
  - Setup of secure VPN connections (V12 SP1 or higher)

#### Design and handling

- CPUs with display for plain text information:
  - Information about article numbers, firmware version, and the serial number of all connected modules can be displayed
  - Setting the IP address of the CPU and additional network settings directly on site, without programming device
  - Display of occurring error messages directly as plain text message, meaning reduction in downtime
- Uniform front connectors for all modules and integrated potential bridges for flexible potential group formation simplify stock keeping and reduce wiring costs
- Integrated DIN rail in the S7-1500 mounting rail:
  - Quick and easy installation of additional components such as miniature circuit breakers, relays, etc.
- Central expansion with signal modules:
  - For flexible adaptation to any application
- System cabling for digital signal modules:
  - For fast and clearly arranged connecting to sensors and actuators in the field and simple wiring inside the control cabinet
- Power supply:
  - Load power supply modules (PMs) for supplying the module with 24 V
  - Power supply modules to supply power to the internal module electronics via the backplane bus
- Distributed expansion:
  - Use of up to 30 signal modules, communication modules, and technology modules via the PROFINET interface module IM 155-5 for the ET 200MP I/O system
  - No difference in terms of handling and system functions in central and distributed operation

**Overview** (continued)**Integrated system diagnostics**

- Integrated system diagnostics for CPUs, activated by default:
  - Consistent plain text display of system diagnostic information in the display, TIA Portal, HMI, and web server, even for drive messages. Messages are updated even if the CPU is in STOP state.
  - System diagnostics integrated in the CPU firmware. Configuration by user not required. The diagnostics is automatically updated on configuration changes.

**Datalog (archives) and recipes**

- SIMATIC Memory Card:
  - Plug-in load memory
  - Permits firmware updates
  - Storage option for STEP 7 projects (including comments and symbols), additional documentation, or csv files (for recipes and archives)
  - Easy access to plant-relevant operating data and configuration data with Office tools via the SD Card reader (two-way data exchange from and to the controller)
- Integrated web server:
  - Easy access to plant-relevant operating data and configuration data via a Web browser

**Approvals**

The SIMATIC S7-1500 complies with the following national and international standards:

- cULus approval
- cULus HazLoc approval
- FM approval
- ATEX approval (only for 24 V; not for 230 V)
- CE
- C-TICK
- KCC
- IECEx (24 V only; not for 230 V)
- EN 61000-6-4
- EN 60068-2-1/ -2/ -6/ -14/ -27/ -30/ -32
- EN 61131-2

You can find the marine approvals available for the S7-1500 on the Internet (SIMATIC Customer Support):  
<http://www.siemens.com/automation/support>

**Technical specifications**

General technical specifications SIMATIC S7-1500	
Degree of protection	IP20 acc. to IEC 60 529
Ambient temperature	
• Horizontal installation	0...60 °C (display: at an operating temperature of typ. 50 °C, the display is switched off.)
• Vertical installation	0... 40 °C (display: at an operating temperature of typ. 40 °C, the display is switched off.)
Relative humidity	5%...95%, no condensation
Atmospheric pressure	From 1080 to 795 hPa (corresponds to an altitude of -1000 to +2000 m)
Insulation	
• < 50 V	707 V DC test voltage (type test)
• < 150 V	2200 V DC test voltage
• < 250 V	2500 V DC test voltage
Electromagnetic compatibility	Requirements of the EMC directive; interference immunity according to IEC 61000-6-2
• Pulse-shaped disturbance variables	Test according to: Electrostatic discharge according to IEC 61000-4-2, burst pulses according to IEC 61000-4-4, energy single pulse (surge) according to IEC 61000-4-5,
• Sinusoidal disturbance variables	Test according to: HF irradiation according to IEC 61000-4-3, HF decoupling according to IEC 61000-4-6
• Emission of radio frequency interference	Requirements of the EMC directive; interference emission according to EN 61000-6-4 Interference emission according to 61000-6-4 Interference emission of electromagnetic fields according to EN 61000-6-4

General technical specifications SIMATIC S7-1500	
Mechanical stress	
• Vibrations	Testing according to EN 60068-2-6 Tested with: 5 Hz ≤ f ≤ 8.4 Hz, constant amplitude 7 mm; 9 Hz ≤ f ≤ 150 Hz, constant acceleration 2 g; duration of vibration: 10 frequency passes per axis in each direction of the 3 mutually perpendicular axes
• Shock	Testing according to EN 60068-2-27 Tested with: Half-wave: strength of shock 15 g peak value, 11 ms duration; shock direction: 3 shocks each in ± direction in each of the 3 mutually vertical axes



# SIMATIC S7-1500 advanced controller

## Introduction

### SIMATIC S7-1500/S7-1500F, SIPLUS S7-1500

#### Technical specifications (continued)

General technical specifications of the SIPLUS S7-1500	
Ambient temperature range	-40/-25/-20 ... +55/+60/+70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.

General technical specifications of the SIPLUS S7-1500	
<b>Ambient conditions</b>	
Extended ambient conditions	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
<ul style="list-style-type: none"> <li>• against biologically active substances / conformity with EN 60721-3-3</li> <li>• against chemically active substances / conformity with EN 60721-3-3</li> <li>• against mechanically active substances / conformity with EN 60721-3-3</li> </ul>	<ul style="list-style-type: none"> <li>• With condensation, tested in accordance with IEC 60068-2-38, max.</li> <li>Yes; Class 3C4 (RH &lt; 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!</li> <li>Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!</li> </ul>

## SIMATIC S7-1500 advanced controller

### Central processing units

#### Standard CPUs

#### Overview CPU 1511-1 PN



- Entry-level CPU in the S7-1500 controller product range
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

#### Overview CPU 1515-2 PN



- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

#### Overview CPU 1513-1 PN



- The CPU for applications with medium requirements for program/data storage in the S7-1500 controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch



## SIMATIC S7-1500 advanced controller

### Central processing units

#### Standard CPUs

##### Overview CPU 1516-3 PN/DP



- The CPU with a large program and data memory in the S7-1500 controller product range for applications with high requirements regarding program scope and networking
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

##### Overview CPU 1517-3 PN/DP



- The CPU with a large program and data memory in the S7-1500 controller product range for applications with high requirements regarding program scope and networking
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, positionally precise gearing between axes
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

## SIMATIC S7-1500 advanced controller

### Central processing units

#### Standard CPUs

#### Overview CPU 1518-4 PN/DP



- The CPU with a very large program and data memory in the S7-1500 controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking

- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Two additional PROFINET interfaces with separate IP address; the PROFINET interface X3 also offers the option of transferring data at a rate of 1 Gbit/s
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

#### Note:

SIMATIC Memory Card required for operation of the CPU

#### Technical specifications

Article number	6ES7511-1AK00-0AB0	6ES7513-1AL00-0AB0	6ES7515-2AM00-0AB0
	CPU 1511-1PN, 150KB PROGRAM, 1MB DATA	CPU 1513-1 PN, 300KB PROGRAM, 1,5MB DATA	CPU 1515-2 PN, 500KB PROGRAM, 3MB DATA
<b>Product type designation</b>			
<b>General information</b>			
<b>Engineering with</b>			
• STEP 7 TIA Portal can be configured/integrated as of version	V13 SP1	V13 SP1	V13 SP1
<b>Display</b>			
Screen diagonal (cm)	3.45 cm	3.45 cm	6.1 cm
<b>Supply voltage</b>			
Type of supply voltage	24 V DC	24 V DC	24 V DC
<b>Power losses</b>			
Power loss, typ.	5.7 W	5.7 W	6.3 W
<b>Memory</b>			
<b>Work memory</b>			
• integrated (for program)	150 kbyte	300 kbyte	500 kbyte
• integrated (for data)	1 Mbyte	1.5 Mbyte	3 Mbyte
<b>Load memory</b>			
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte
<b>CPU processing times</b>			
for bit operations, typ.	60 ns	40 ns	30 ns
for word operations, typ.	72 ns	48 ns	36 ns
for fixed point arithmetic, typ.	96 ns	64 ns	48 ns
for floating point arithmetic, typ.	384 ns	256 ns	192 ns
<b>Counters, timers and their retentivity</b>			
<b>S7 counter</b>			
• Number	2 048	2 048	2 048
<b>IEC counter</b>			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>S7 times</b>			
• Number	2 048	2 048	2 048
<b>IEC timer</b>			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)

# SIMATIC S7-1500 advanced controller

## Central processing units

### Standard CPUs

#### Technical specifications (continued)

Article number	<b>6ES7511-1AK00-0AB0</b> CPU 1511-1PN, 150KB PROGRAM, 1MB DATA	<b>6ES7513-1AL00-0AB0</b> CPU 1513-1 PN, 300KB PROGRAM, 1,5MB DATA	<b>6ES7515-2AM00-0AB0</b> CPU 1515-2 PN, 500KB PROGRAM, 3MB DATA
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Number, max.	16 kbyte	16 kbyte	16 kbyte
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
<b>Time of day</b>			
<b>Clock</b>			
• Type	Hardware clock	Hardware clock	Hardware clock
<b>Interfaces</b>			
<b>1st interface</b>			
<b>Interface types</b>			
- Number of ports	2	2	2
- Integrated switch	Yes	Yes	Yes
- RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1
<b>Protocols</b>			
- PROFINET IO Controller	Yes	Yes	Yes
- PROFINET IO Device	Yes	Yes	Yes
- SIMATIC communication	Yes	Yes	Yes
- Open IE communication	Yes	Yes	Yes
- Web server	Yes	Yes	Yes
- Media redundancy	Yes	Yes	Yes
<b>2nd interface</b>			
<b>Interface types</b>			
- Number of ports			1
- Integrated switch			No
- RJ 45 (Ethernet)			Yes; X2
<b>Protocols</b>			
- PROFINET IO Controller			No
- PROFINET IO Device			No
- SIMATIC communication			Yes
- Open IE communication			Yes
- Web server			Yes
<b>Protocols</b>			
<b>Number of connections</b>			
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs
<b>PROFINET IO Controller</b>			
<b>Services</b>			
- Number of connectable IO devices, max.	128; In total, up to 256 distributed I/O devices can be connected via PROFIBUS or PROFINET	128; In total, up to 256 distributed I/O devices can be connected via PROFIBUS or PROFINET	256; In total, up to 512 distributed I/O devices can be connected via PROFIBUS or PROFINET
- Of which IO devices with IRT and "high performance" option, max.	64	64	64
- Max. number of connectable IO devices for RT	128	128	256
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)	Yes; With minimum OB 6x cycle of 625 µs	Yes; With minimum OB 6x cycle of 500 µs	Yes; With minimum OB 6x cycle of 500 µs

### Technical specifications (continued)

Article number	<b>6ES7511-1AK00-0AB0</b> CPU 1511-1PN, 150KB PROGRAM, 1MB DATA	<b>6ES7513-1AL00-0AB0</b> CPU 1513-1 PN, 300KB PROGRAM, 1,5MB DATA	<b>6ES7515-2AM00-0AB0</b> CPU 1515-2 PN, 500KB PROGRAM, 3MB DATA
<b>supported technology objects</b>			
Motion	Yes	Yes	Yes
• Speed-controlled axis	6; Requirement: There must be no other motion technology objects created	6; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created
- Number of speed-controlled axes, max.			
• Positioning axis	6; Requirement: There must be no other motion technology objects created	6; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created
- Number of positioning axes, max.			
• Synchronized axes (relative gear synchronization)	3; Requirement: There must be no other motion technology objects created	3; Requirement: There must be no other motion technology objects created	15; Requirement: There must be no other motion technology objects created
- Number of axes, max.			
• External encoders	6; Requirement: There must be no other motion technology objects created	6; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created
- Number of external encoders, max.			
Controller			
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring			
• High-speed counter	Yes	Yes	Yes
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• horizontal installation, min.	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
<b>Configuration programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
<b>Know-how protection</b>			
• User program protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
<b>Access protection</b>			
• Password for display	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
<b>Dimensions</b>			
Width	35 mm	35 mm	70 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
<b>Weights</b>			
Weight, approx.	430 g	430 g	830 g

# SIMATIC S7-1500 advanced controller

## Central processing units

### Standard CPUs

#### Technical specifications (continued)

Article number	<b>6ES7516-3AN00-0AB0</b> CPU 1516-3 PN/DP, 1MB PROG., 5MB DATA	<b>6ES7517-3AP00-0AB0</b> CPU 1517-3 PN/DP, 2MB PROG./ 8MB DATA	<b>6ES7518-4AP00-0AB0</b> CPU 1518-4 PN/DP, 4MB PROG., 20MB DATA
<b>Product type designation</b>			
<b>General information</b>			
<b>Engineering with</b>			
• STEP 7 TIA Portal can be configured/integrated as of version	V13 SP1	V13 SP1	V13 SP1
<b>Display</b>			
Screen diagonal (cm)	6.1 cm	6.1 cm	6.1 cm
<b>Supply voltage</b>			
Type of supply voltage	24 V DC	24 V DC	24 V DC
<b>Power losses</b>			
Power loss, typ.	7 W	24 W	24 W
<b>Memory</b>			
<b>Work memory</b>			
• integrated (for program)	1 Mbyte	2 Mbyte	4 Mbyte
• integrated (for data)	5 Mbyte	8 Mbyte	20 Mbyte
<b>Load memory</b>			
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte
<b>CPU processing times</b>			
for bit operations, typ.	10 ns	2 ns	1 ns
for word operations, typ.	12 ns	3 ns	2 ns
for fixed point arithmetic, typ.	16 ns	3 ns	2 ns
for floating point arithmetic, typ.	64 ns	12 ns	6 ns
<b>Counters, timers and their retentivity</b>			
<b>S7 counter</b>			
• Number	2 048	2 048	2 048
<b>IEC counter</b>			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>S7 times</b>			
• Number	2 048	2 048	2 048
<b>IEC timer</b>			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Number, max.	16 kbyte	16 kbyte	16 kbyte
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
<b>Time of day</b>			
<b>Clock</b>			
• Type	Hardware clock	Hardware clock	Hardware clock
<b>Interfaces</b>			
<b>1st interface</b>			
<b>Interface types</b>			
- Number of ports	2	2	2
- Integrated switch	Yes	Yes	Yes
- RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1
<b>Protocols</b>			
- PROFINET IO Controller	Yes	Yes	Yes
- PROFINET IO Device	Yes	Yes	Yes
- SIMATIC communication	Yes	Yes	Yes
- Open IE communication	Yes	Yes	Yes
- Web server	Yes	Yes	Yes
- Media redundancy	Yes	Yes	Yes

### Technical specifications (continued)

Article number	<b>6ES7516-3AN00-0AB0</b> CPU 1516-3 PN/DP, 1MB PROG., 5MB DATA	<b>6ES7517-3AP00-0AB0</b> CPU 1517-3 PN/DP, 2MB PROG./ 8MB DATA	<b>6ES7518-4AP00-0AB0</b> CPU 1518-4 PN/DP, 4MB PROG., 20MB DATA
<b>2nd interface</b>			
<b>Interface types</b>			
- Number of ports	1	1	1
- Integrated switch	No	No	No
- RJ 45 (Ethernet)	Yes; X2	Yes; X2	Yes; X2
<b>Protocols</b>			
- PROFINET IO Controller	No	No	No
- PROFINET IO Device	No	No	No
- SIMATIC communication	Yes	Yes	Yes
- Open IE communication	Yes	Yes	Yes
- Web server	Yes	Yes	Yes
<b>3rd interface</b>			
<b>Interface types</b>			
- Number of ports	1	1	1
- Integrated switch			No
- RJ 45 (Ethernet)			Yes; X3
- RS 485	Yes	Yes	
<b>Protocols</b>			
- PROFINET IO Controller			No
- PROFINET IO Device			No
- SIMATIC communication	Yes	Yes	Yes
- Open IE communication			Yes
- Web server			Yes
- PROFIBUS DP master	Yes	Yes	
- PROFIBUS DP slave	No	No	
<b>4th interface</b>			
<b>Interface types</b>			
- Number of ports			1
- RS 485			Yes
<b>Protocols</b>			
- SIMATIC communication			Yes
- PROFIBUS DP master			Yes
- PROFIBUS DP slave			No
<b>Protocols</b>			
<b>Number of connections</b>			
• Number of connections, max.	256; via integrated interfaces of the CPU and connected CPs / CMs	320; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs
<b>PROFINET IO Controller</b>			
<b>Services</b>			
- Number of connectable IO devices, max.	256; In total, up to 768 distributed I/O devices can be connected via PROFIBUS or PROFINET	512; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET	512; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET
- Of which IO devices with IRT and "high performance" option, max.	64	64	64
- Max. number of connectable IO devices for RT	256	512	512
<b>PROFIBUS DP master</b>			
<b>Services</b>			
- Number of DP slaves	125; In total, up to 768 distributed I/O devices can be connected via PROFIBUS or PROFINET	125; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET	125; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)	Yes; With minimum OB 6x cycle of 375 µs	Yes; With minimum OB 6x cycle of 375 µs	Yes; With minimum OB 6x cycle of 250 µs

# SIMATIC S7-1500 advanced controller

## Central processing units

### Standard CPUs

#### Technical specifications (continued)

Article number	<b>6ES7516-3AN00-0AB0</b> CPU 1516-3 PN/DP, 1MB PROG., 5MB DATA	<b>6ES7517-3AP00-0AB0</b> CPU 1517-3 PN/DP, 2MB PROG./ 8MB DATA	<b>6ES7518-4AP00-0AB0</b> CPU 1518-4 PN/DP, 4MB PROG., 20MB DATA
<b>supported technology objects</b>			
Motion	Yes	Yes	Yes
<ul style="list-style-type: none"> <li>Speed-controlled axis               <ul style="list-style-type: none"> <li>Number of speed-controlled axes, max.</li> </ul> </li> <li>Positioning axis               <ul style="list-style-type: none"> <li>Number of positioning axes, max.</li> </ul> </li> <li>Synchronized axes (relative gear synchronization)               <ul style="list-style-type: none"> <li>Number of axes, max.</li> </ul> </li> <li>External encoders               <ul style="list-style-type: none"> <li>Number of external encoders, max.</li> </ul> </li> </ul>	30; Requirement: There must be no other motion technology objects created  30; Requirement: There must be no other motion technology objects created  15; Requirement: There must be no other motion technology objects created  30; Requirement: There must be no other motion technology objects created	96; Requirement: There must be no other motion technology objects created  96; Requirement: There must be no other motion technology objects created  48; Requirement: There must be no other motion technology objects created  96; Requirement: There must be no other motion technology objects created	128; Requirement: There must be no other motion technology objects created  128; Requirement: There must be no other motion technology objects created  64; Requirement: There must be no other motion technology objects created  128; Requirement: There must be no other motion technology objects created
Controller			
<ul style="list-style-type: none"> <li>PID_Compact</li> <li>PID_3Step</li> <li>PID-Temp</li> </ul>	Yes; Universal PID controller with integrated optimization  Yes; PID controller with integrated optimization for valves  Yes; PID controller with integrated optimization for temperature	Yes; Universal PID controller with integrated optimization  Yes; PID controller with integrated optimization for valves  Yes; PID controller with integrated optimization for temperature	Yes; Universal PID controller with integrated optimization  Yes; PID controller with integrated optimization for valves  Yes; PID controller with integrated optimization for temperature
Counting and measuring			
<ul style="list-style-type: none"> <li>High-speed counter</li> </ul>	Yes	Yes	Yes
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
<ul style="list-style-type: none"> <li>horizontal installation, min.</li> <li>horizontal installation, max.</li> <li>vertical installation, min.</li> <li>vertical installation, max.</li> </ul>	0 °C  60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off  0 °C  40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	0 °C  60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off  0 °C  40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	0 °C  60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off  0 °C  40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
<b>Configuration programming</b>			
<b>Programming language</b>			
<ul style="list-style-type: none"> <li>LAD</li> <li>FBD</li> <li>STL</li> <li>SCL</li> <li>GRAPH</li> </ul>	Yes	Yes	Yes
<b>Know-how protection</b>			
<ul style="list-style-type: none"> <li>User program protection</li> <li>Copy protection</li> <li>Block protection</li> </ul>	Yes	Yes	Yes
<b>Access protection</b>			
<ul style="list-style-type: none"> <li>Password for display</li> <li>Protection level: Write protection</li> <li>Protection level: Read/write protection</li> <li>Protection level: Complete protection</li> </ul>	Yes	Yes	Yes
<b>Dimensions</b>			
Width	70 mm	175 mm	175 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
<b>Weights</b>			
Weight, approx.	845 g	1 978 g	1 988 g

# SIMATIC S7-1500 advanced controller

## Central processing units

### Standard CPUs

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Ordering data	Article No.	Article No.
<b>CPU 1511-1 PN</b> Work memory 150 KB for program, 1 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required	6ES7511-1AK00-0AB0	
<b>CPU 1513-1 PN</b> Work memory 300 KB for program, 1.5 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required	6ES7513-1AL00-0AB0	
<b>CPU 1515-2 PN</b> 500 KB RAM for program, 3 MB for data, PROFINET IO IRT interface, PROFINET interface; SIMATIC Memory Card required	6ES7515-2AM00-0AB0	
<b>CPU 1516-3 PN/DP</b> 1 MB RAM for program, 5 MB for data, PROFINET IO IRT interface, PROFINET/PROFIBUS interface; SIMATIC Memory Card required	6ES7516-3AN00-0AB0	
<b>CPU 1517-3 PN/DP</b> 2 MB RAM for program, 8 MB for data, PROFINET IO IRT interface, PROFINET/PROFIBUS interface; SIMATIC Memory Card required	6ES7517-3AP00-0AB0	
<b>CPU 1518-4 PN/DP</b> Work memory 4 MB for program, 20 MB for data, PROFINET IO IRT interface, 2 PROFIBUS/PROFIBUS interfaces; SIMATIC Memory Card required	6ES7518-4AP00-0AB0	
<b>Accessories</b>		
<b>SIMATIC Memory Card</b>		
4 MB	6ES7954-8LC02-0AA0	
12 MB	6ES7954-8LE02-0AA0	
24 MB	6ES7954-8LF02-0AA0	
256 MB	6ES7954-8LL02-0AA0	
2 GB	6ES7954-8LP01-0AA0	
<b>SIMATIC S7-1500 mounting rail</b> Fixed lengths, with grounding elements <ul style="list-style-type: none"> <li>• 160 mm</li> <li>• 245 mm</li> <li>• 482 mm</li> <li>• 530 mm</li> <li>• 830 mm</li> </ul> For cutting to length by customer, without drill holes; grounding elements must be ordered separately <ul style="list-style-type: none"> <li>• 2000 mm</li> </ul>	6ES7590-1AB60-0AA0 6ES7590-1AC40-0AA0 6ES7590-1AE80-0AA0 6ES7590-1AF30-0AA0 6ES7590-1AJ30-0AA0  6ES7590-1BC00-0AA0	
<b>PE connection element for mounting rail 2000 mm</b> 20 units	6ES7590-5AA00-0AA0	
		<b>Power supply</b> For supplying the backplane bus of the S7-1500 24 V DC input voltage, power 25 W 24/48/60 V DC input voltage, power 60 W 120/230 V AC input voltage, power 60 W
		6ES7505-0KA00-0AB0 6ES7505-0RA00-0AB0 6ES7507-0RA00-0AB0
		<b>Power connector</b> With coding element for power supply module; spare part, 10 units
		6ES7590-8AA00-0AA0
		<b>Load power supply</b> 24 V DC/3A 24 V DC/8A
		6EP1332-4BA00 6EP1333-4BA00
		<b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage <ul style="list-style-type: none"> <li>• with push-in terminals</li> </ul>
		6ES7193-4JB00-0AA0
		<b>PROFIBUS FastConnect RS 485 bus connector with 90° cable outlet</b> With insulation displacement, max. transmission rate 12 Mbps Without programming device interface, grounding via control cabinet contact surface; 1 unit With programming device interface, grounding via control cabinet contact surface; 1 unit
		6ES7972-0BA70-0XA0 6ES7972-0BB70-0XA0
		<b>PROFIBUS FC Standard Cable GP</b> Standard type with special design for fast mounting, 2-wire, shielded; Sold by the meter, max. length 1000 m, minimum order quantity 20 m
		6XV1830-0EH10
		<b>PROFIBUS FC Robust Cable</b> 2-wire, shielded; Sold by the meter, max. length 1000 m, minimum order quantity 20 m
		6XV1830-0JH10
		<b>PROFIBUS FC Flexible Cable</b> 2-wire, shielded; Sold by the meter, max. length 1000 m, minimum order quantity 20 m
		6XV1831-2K
		<b>PROFIBUS FC Trailing Cable</b> 2-wire, shielded; Sold by the meter, max. length 1000 m, minimum order quantity 20 m Sheath color: Petrol Sheath color: Violet
		6XV1830-3EH10 6XV1831-2L



# SIMATIC S7-1500 advanced controller

## Central processing units

### Standard CPUs

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Ordering data	Article No.	Ordering data	Article No.
<b>PROFIBUS FC Food Cable</b> 2-wire, shielded; Sold by the meter, max. length 1000 m, minimum order quantity 20 m	6XV1830-0GH10	<b>IE FC stripping tool</b> Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00
<b>PROFIBUS FC Ground Cable</b> 2-wire, shielded; Sold by the meter, max. length 1000 m, minimum order quantity 20 m	6XV1830-3FH10	<b>Display</b> for CPU 1511-1 PN and CPU 1513-1 PN; spare part  for CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1517-3 PN/DP and CPU 1518-4 PN/DP; spare part	6ES7591-1AA00-0AA0  6ES7591-1BA00-0AA0
<b>PROFIBUS FC FRNC Cable GP</b> 2-wire, shielded, flame-retardant, with copolymer outer sheath FRNC; Sold by the meter, max. length 1000 m, minimum order quantity 20 m	6XV1830-0LH10	<b>Front cover for PROFIBUS DP interface</b> for CPU 1517-3 PN/DP and CPU 1518-4 PN/DP; spare part	6ES7591-8AA00-0AA0
<b>PROFIBUS FastConnect stripping tool</b> Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	6GK1905-6AA00	<b>SIMATIC S7-1500 Starter Kit</b> Comprising: CPU 1511-1 PN, SIMATIC Memory Card 4 MB, digital input DI 16 x 24 V DC HF, digital output DO 16 x 24 V DC/0.5 A ST, 160 mm mounting rail, front connector, STEP 7 Professional V12, 365-day license, power supply 60 W AC 120/230 V, Standard Ethernet CAT 5 cable (2 m), screwdriver, documentation	6ES7511-1AK01-4YB5
<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		<b>STEP 7 Professional V13 SP1</b> Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Professional SP1 (64-bit), Windows 7 Enterprise SP1 (64-bit), Windows 7 Ultimate SP1 (64-bit), Windows 8.1 (64-bit), Windows 8.1 Professional (64-bit), Windows 8.1 Enterprise (64-bit), Windows Server 2008 R2 StdE (full installation), Windows Server 2012 StdE (full installation) Available in: German, English, Chinese, Italian, French, Spanish	
<b>IE FC RJ45 Plug 180</b> 180° cable outlet  1 unit 10 units 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	STEP 7 Professional V13 SP1, floating license  STEP 7 Professional V13 SP1, floating license, software download incl. license key <sup>1)</sup>  Email address required for delivery	6ES7822-1AA03-0YA5  6ES7822-1AE03-0YA5
<b>IE FC TP Standard Cable GP 2 x 2</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-2AH10		
<b>IE FC TP Trailing Cable 2 x 2 (Type C)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-3AH10		
<b>IE FC TP Marine Cable 2 x 2 (Type B)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 with marine approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-4AH10		

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

## SIMATIC S7-1500 advanced controller

### Central processing units

#### SIPLUS Standard CPUs

#### Overview SIPLUS CPU 1511-1 PN



- Entry-level CPU in the S7-1500 controller product range
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode
- SIMATIC Memory Card required for operation of the CPU

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Overview SIPLUS CPU 1513-1 PN



- The CPU for applications with medium/high requirements for program/data storage in the S7-1500 controller product range
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch

- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode
- SIMATIC Memory Card required for operation of the CPU

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Overview SIPLUS CPU 1516-3 PN/DP



- The CPU with large program and data memory in the S7-1500 controller product range for applications with high program scope requirements.
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- SIMATIC Memory Card required for operation of the CPU

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## SIMATIC S7-1500 advanced controller

Central processing units

### SIPLUS Standard CPUs

#### Overview SIPLUS CPU 1518-4 PN/DP



- The CPU with a very large program and data memory in the S7-1500 controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking

- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Two additional PROFINET interfaces with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

SIMATIC Memory Card required for operating the CPU

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information has been added.

#### Technical specifications

Article number	6AG1511-1AK00-2AB0	6AG1511-1AK00-7AB0	6AG1513-1AL00-2AB0	6AG1513-1AL00-7AB0
Based on	6ES7511-1AK00-0AB0 SIPLUS S7-1500 CPU 1511-1 PN	6ES7511-1AK00-0AB0 SIPLUS S7-1500 CPU 1511-1 PN	6ES7513-1AL00-0AB0 SIPLUS S7-1500 CPU 1513-1 PN	6ES7513-1AL00-0AB0 SIPLUS S7-1500 CPU 1513-1 PN
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• horizontal installation, min.	-40 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-40 °C; = Tmin; Startup @ -20 °C	-40 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-40 °C; = Tmin; Startup @ -20 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	70 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	70 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-40 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-40 °C; = Tmin; Startup @ -20 °C	-40 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-40 °C; = Tmin; Startup @ -20 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

### Technical specifications (continued)

Article number	6AG1511-1AK00-2AB0	6AG1511-1AK00-7AB0	6AG1513-1AL00-2AB0	6AG1513-1AL00-7AB0
Based on	6ES7511-1AK00-0AB0 SIPLUS S7-1500 CPU 1511-1 PN	6ES7511-1AK00-0AB0 SIPLUS S7-1500 CPU 1511-1 PN	6ES7513-1AL00-0AB0 SIPLUS S7-1500 CPU 1513-1 PN	6ES7513-1AL00-0AB0 SIPLUS S7-1500 CPU 1513-1 PN
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
Article number	6AG1516-3AN00-2AB0	6AG1516-3AN00-7AB0	6AG1518-4AP00-4AB0	
Based on	6ES7516-3AN00-0AB0 SIPLUS S7-1500 CPU 1516-3 PN/DP	6ES7516-3AN00-0AB0 SIPLUS S7-1500 CPU 1516-3 PN/DP	6ES7518-4AP00-0AB0 SIPLUS S7-1500 CPU 1518-4 PN/DP	
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• horizontal installation, min.	-40 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-40 °C; = Tmin; Startup @ -20 °C	0 °C	
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	70 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	
• vertical installation, min.	-40 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-40 °C; = Tmin; Startup @ -20 °C	0 °C	
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Available soon	
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Available soon	
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Available soon	

**SIMATIC S7-1500 advanced controller**

## Central processing units

**SIPLUS Standard CPUs****Ordering data****Article No.****Article No.****SIPLUS CPU 1511-1 PN**

(extended temperature range and medial exposure)

Work memory 150 KB for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required

Temperature range -40 ... +60 °C

Temperature range -40 ... +70 °C

**6AG1511-1AK00-2AB0****6AG1511-1AK00-7AB0****SIPLUS CPU 1513-1 PN**

(extended temperature range and medial exposure)

Work memory 300 KB for program, 1.5 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required

Temperature range -40 ... +60 °C

Temperature range -40 ... +70 °C

**6AG1513-1AL00-2AB0****6AG1513-1AL00-7AB0****SIPLUS CPU 1516-3 PN/DP**

(extended temperature range and medial exposure)

1 MB RAM for program, 5 MB for data, PROFINET IO IRT interface, PROFINET/PROFIBUS interface; SIMATIC Memory Card required

Temperature range -40 ... +60 °C

Temperature range -40 ... +70 °C

**6AG1516-3AN00-2AB0****6AG1516-3AN00-7AB0****SIPLUS CPU 1518-4 PN/DP**

(medial exposure)

Work memory 3 MB for program, 10 MB for data, PROFINET IO IRT interface, 2 PROFINET/PROFIBUS interfaces; SIMATIC Memory Card required

**6AG1518-4AP00-4AB0****Power supply**

(extended temperature range and medial exposure)

24 V DC input voltage, power 25 W

24/48/60 V DC input voltage, power 60 W

120/230 V AC input voltage, power 60 W

**6AG1505-0KA00-7AB0****6AG1505-0RA00-7AB0****6AG1507-0RA00-7AB0****Load power supply**

(extended temperature range and medial exposure)

24 V DC/3A

24 V DC/8A

**6AG1332-4BA00-7AA0****6AG1333-4BA00-7AA0****Display**

(extended temperature range and medial exposure)

For SIPLUS CPU 1511-1 PN and CPU 1513-1 PN; spare part

For SIPLUS CPU 1516-3 PN/DP and SIPLUS CPU 1518-4 PN/DP; spare part

**6AG1591-1AA00-2AA0****6AG1591-1BA00-2AA0****Further accessories**

See SIMATIC S7-1500, Standard CPUs, page 4/13

### Overview CPU 1511F-1 PN

- Entry-level CPU in the S7-1500F Controller product range
- Suitable for standard and fail-safe applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode

Note:

SIMATIC Memory Card required for operation of the CPU

### Overview CPU 1513F-1 PN

- The CPU for standard and fail-safe applications with medium/high requirements for program/data storage in the S7-1500 controller product range
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode

Note:

SIMATIC Memory Card required for operation of the CPU

### Overview CPU 1515F-2 PN



- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 controller product range
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLE according to ISO 13849.
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU



## SIMATIC S7-1500 advanced controller

### Central processing units

#### Fail-safe CPUs

##### Overview CPU 1516F-3 PN/DP



- The CPU with a large program and data memory in the S7-1500 controller product range for failsafe applications with high requirements regarding program scope and networking.
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Additional PROFINET interface with separate IP address.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders.
- Integrated Web server with the option of creating user-defined Web pages.

Note:

SIMATIC Memory Card required for operation of the CPU

##### Overview CPU 1517F-3 PN/DP



- The CPU with a very large program and data memory in the S7-1500 controller product range for failsafe applications with high requirements regarding program scope and networking.
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, positionally precise gearing between axes
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU

### Overview CPU 1518-4 PN/DP



- The CPU with a very large program and data memory in the S7-1500 controller product range for failsafe applications with highest requirements regarding program scope and networking.
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- Extremely high processing speed for binary and floating-point arithmetic.
- For cross-industry automation tasks in series machine, special machine and plant construction.

- Used as central controller in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Two additional PROFINET interfaces with separate IP addresses.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated Web server with the option of creating user-defined Web pages.

#### Note:

SIMATIC Memory Card required for operation of the CPU

### Technical specifications

Article number	6ES7511-1FK00-0A00	6ES7513-1FL00-0A00	6ES7515-2FM00-0A00	6ES7516-3FN00-0A00	6ES7517-3FP00-0A00	6ES7518-4FP00-0A00
	CPU 1511F-1PN, 225KB PROG, 1MB DATA	CPU 1513F-1 PN, 450KB PROG, 1,5MB DATA	CPU 1515F-2 PN, 750KB PROG., 3MB DATA	CPU 1516F-3 PN/DP, 1,5MB PROG, 5MB DATA	CPU 1517F-3 PN/DP, 3MB PROG., 8MB DATA	CPU 1518F-4 PN/DP, 6MB PROG, 20MB DATA
<b>Product type designation</b>						
<b>General information</b>						
<b>Engineering with</b>						
• STEP 7 TIA Portal can be configured/integrated as of version	V13 SP1	V13 SP1	V13 SP1	V13 SP1	V13 SP1	V13 SP1
<b>Display</b>						
Screen diagonal (cm)	3.45 cm	3.45 cm	6.1 cm	6.1 cm	6.1 cm	6.1 cm
<b>Supply voltage</b>						
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
<b>Power losses</b>						
Power loss, typ.	5.7 W	5.7 W	6.3 W	7 W	24 W	24 W
<b>Memory</b>						
<b>Work memory</b>						
• integrated (for program)	225 kbyte	450 kbyte	750 kbyte	1.5 Mbyte	3 Mbyte	6 Mbyte
• integrated (for data)	1 Mbyte	1.5 Mbyte	3 Mbyte	5 Mbyte	8 Mbyte	20 Mbyte
<b>Load memory</b>						
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte
<b>CPU processing times</b>						
for bit operations, typ.	60 ns	40 ns	30 ns	10 ns	2 ns	1 ns
for word operations, typ.	72 ns	48 ns	36 ns	12 ns	3 ns	2 ns
for fixed point arithmetic, typ.	96 ns	64 ns	48 ns	16 ns	3 ns	2 ns
for floating point arithmetic, typ.	384 ns	256 ns	192 ns	64 ns	12 ns	6 ns



# SIMATIC S7-1500 advanced controller

## Central processing units

### Fail-safe CPUs

#### Technical specifications (continued)

Article number	<b>6ES7511-1FK00-0AB0</b> CPU 1511F-1PN, 225KB PROG, 1MB DATA	<b>6ES7513-1FL00-0AB0</b> CPU 1513F-1 PN, 450KB PROG, 1,5MB DATA	<b>6ES7515-2FM00-0AB0</b> CPU 1515F-2 PN, 750KB PROG.,3MB DATA	<b>6ES7516-3FN00-0AB0</b> CPU 1516F-3 PN/DP, 1,5MB PROG, 5MB DATA	<b>6ES7517-3FP00-0AB0</b> CPU 1517F-3 PN/DP, 3MB PROG., 8MB DATA	<b>6ES7518-4FP00-0AB0</b> CPU 1518F-4 PN/DP, 6MB PROG, 20MB DATA
<b>Counters, timers and their retentivity</b>						
<b>S7 counter</b>						
• Number	2 048	2 048	2 048	2 048	2 048	2 048
<b>IEC counter</b>						
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>S7 times</b>						
• Number	2 048	2 048	2 048	2 048	2 048	2 048
<b>IEC timer</b>						
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>						
<b>Flag</b>						
• Number, max.	16 kbyte	16 kbyte	16 kbyte	16 kbyte	16 kbyte	16 kbyte
<b>Address area</b>						
<b>I/O address area</b>						
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
<b>Time of day</b>						
<b>Clock</b>						
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock	Hardware clock	Hardware clock
<b>Interfaces</b>						
<b>1st interface</b>						
<b>Interface types</b>						
- Number of ports	2	2	2	2	2	2
- Integrated switch	Yes	Yes	Yes	Yes	Yes	Yes
- RJ 45 (Ethernet)	Yes	Yes; X1	Yes; X1	Yes; X1	Yes; X1	Yes; X1
<b>Protocols</b>						
- PROFINET IO Controller	Yes	Yes	Yes	Yes	Yes	Yes
- PROFINET IO Device	Yes	Yes	Yes	Yes	Yes	Yes
- SIMATIC communication	Yes	Yes	Yes	Yes	Yes	Yes
- Open IE communication	Yes	Yes	Yes	Yes	Yes	Yes
- Web server	Yes	Yes	Yes	Yes	Yes	Yes
- Media redundancy	Yes	Yes	Yes	Yes	Yes	Yes
<b>2nd interface</b>						
<b>Interface types</b>						
- Number of ports			1	1	1	1
- Integrated switch			No	No	No	No
- RJ 45 (Ethernet)			Yes; X2	Yes; X2	Yes; X2	Yes; X2
<b>Protocols</b>						
- PROFINET IO Controller			No	No	No	No
- PROFINET IO Device			No	No	No	No
- SIMATIC communication			Yes	Yes	Yes	Yes
- Open IE communication			Yes	Yes	Yes	Yes
- Web server			Yes	Yes	Yes	Yes

# SIMATIC S7-1500 advanced controller

## Central processing units

### Fail-safe CPUs

#### Technical specifications (continued)

Article number	6ES7511-1FK00-0AB0	6ES7513-1FL00-0AB0	6ES7515-2FM00-0AB0	6ES7516-3FN00-0AB0	6ES7517-3FP00-0AB0	6ES7518-4FP00-0AB0
	CPU 1511F-1PN, 225KB PROG, 1MB DATA	CPU 1513F-1 PN, 450KB PROG, 1,5MB DATA	CPU 1515F-2 PN, 750KB PROG., 3MB DATA	CPU 1516F-3 PN/DP, 1,5MB PROG, 5MB DATA	CPU 1517F-3 PN/DP, 3MB PROG., 8MB DATA	CPU 1518F-4 PN/DP, 6MB PROG, 20MB DATA
<b>3rd interface</b>						
<b>Interface types</b>						
- Number of ports				1	1	1
- Integrated switch						No
- RJ 45 (Ethernet)						Yes; X3
- RS 485				Yes	Yes	
<b>Protocols</b>						
- PROFINET IO Controller						No
- PROFINET IO Device						No
- SIMATIC communication				Yes	Yes	Yes
- Open IE communication						Yes
- Web server						Yes
- PROFIBUS DP master				Yes	Yes	
- PROFIBUS DP slave				No	No	
<b>4th interface</b>						
<b>Interface types</b>						
- Number of ports						1
- RS 485						Yes
<b>Protocols</b>						
- SIMATIC communication						Yes
- PROFIBUS DP master						Yes
- PROFIBUS DP slave						No
<b>Protocols</b>						
<b>Number of connections</b>						
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs	320; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs
<b>PROFINET IO Controller</b>						
<b>Services</b>						
- Number of connectable IO devices, max.	128; In total, up to 256 distributed I/O devices can be connected via PROFIBUS or PROFINET	128; In total, up to 256 distributed I/O devices can be connected via CPs/CMs via PROFIBUS or PROFINET.	256; In total, up to 512 distributed I/O devices can be connected via PROFIBUS or PROFINET	256; In total, up to 768 distributed I/O devices can be connected via PROFIBUS or PROFINET	512; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET	512; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET
- Of which IO devices with IRT and "high performance" option, max.	64	64	64	64	64	64
- Max. number of connectable IO devices for RT	128	128	256	256	512	512
<b>PROFIBUS DP master</b>						
<b>Services</b>						
- Number of DP slaves				125; In total, up to 768 distributed I/O devices can be connected via PROFIBUS or PROFINET	125; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET	125; In total, up to 1000 distributed I/O devices can be connected via PROFIBUS or PROFINET
<b>Isochronous mode</b>						
Isochronous operation (application synchronized up to terminal)	Yes; With minimum OB 6x cycle of 625 µs	Yes; With minimum OB 6x cycle of 500 µs	Yes; With minimum OB 6x cycle of 500 µs	Yes; With minimum OB 6x cycle of 375 µs	Yes; With minimum OB 6x cycle of 375 µs	Yes; With minimum OB 6x cycle of 250 µs

# SIMATIC S7-1500 advanced controller

## Central processing units

### Fail-safe CPUs

#### Technical specifications (continued)

Article number	<b>6ES7511-1FK00-0AB0</b>	<b>6ES7513-1FL00-0AB0</b>	<b>6ES7515-2FM00-0AB0</b>	<b>6ES7516-3FN00-0AB0</b>	<b>6ES7517-3FP00-0AB0</b>	<b>6ES7518-4FP00-0AB0</b>
	CPU 1511F-1PN, 225KB PROG, 1MB DATA	CPU 1513F-1 PN, 450KB PROG, 1,5MB DATA	CPU 1515F-2 PN, 750KB PROG., 3MB DATA	CPU 1516F-3 PN/DP, 1,5MB PROG, 5MB DATA	CPU 1517F-3 PN/DP, 3MB PROG., 8MB DATA	CPU 1518F-4 PN/DP, 6MB PROG, 20MB DATA
<b>supported technology objects</b>						
Motion	Yes	Yes	Yes	Yes	Yes	Yes
• Speed-controlled axis						
- Number of speed-controlled axes, max.	6; Max. number of speed-controlled axes (requirement: there must be no other motion technology objects created)	6; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created	96; Requirement: There must be no other motion technology objects created	128; Requirement: There must be no other motion technology objects created
• Positioning axis						
- Number of positioning axes, max.	6; Max. number of positioning axes (requirement: there must be no other motion technology objects created)	6; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created	96; Requirement: There must be no other motion technology objects created	128; Requirement: There must be no other motion technology objects created
• Synchronized axes (relative gear synchronization)						
- Number of axes, max.	3; Max. number of synchronous axes (requirement: there must be no other motion technology objects created)	3; Requirement: There must be no other motion technology objects created	15; Requirement: There must be no other motion technology objects created	15; Requirement: There must be no other motion technology objects created	48; Requirement: There must be no other motion technology objects created	64; Requirement: There must be no other motion technology objects created
• External encoders						
- Number of external encoders, max.	6; Max. number of external encoders (requirement: there must be no other motion technology objects created)	6; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created	30; Requirement: There must be no other motion technology objects created	96; Requirement: There must be no other motion technology objects created	128; Requirement: There must be no other motion technology objects created
Controller						
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring						
• High-speed counter	Yes	Yes	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>						
<b>Highest safety class achievable in safety mode</b>						
• Low demand mode: PFDavg	< 2.00E-05	< 2.00E-05	< 2.00E-05	< 2.00E-05	< 2.00E-05	< 2.00E-05
• High demand/continuous mode: PFH	< 1.00E-09	< 1.00E-09	< 1.00E-09	< 1.00E-09	< 1.00E-09	< 1.00E-09

# SIMATIC S7-1500 advanced controller

## Central processing units

### Fail-safe CPUs

#### Technical specifications (continued)

Article number	<b>6ES7511-1FK00-0AB0</b> CPU 1511F-1PN, 225KB PROG, 1MB DATA	<b>6ES7513-1FL00-0AB0</b> CPU 1513F-1 PN, 450KB PROG, 1,5MB DATA	<b>6ES7515-2FM00-0AB0</b> CPU 1515F-2 PN, 750KB PROG.,3MB DATA	<b>6ES7516-3FN00-0AB0</b> CPU 1516F-3 PN/DP, 1,5MB PROG, 5MB DATA	<b>6ES7517-3FP00-0AB0</b> CPU 1517F-3 PN/DP, 3MB PROG., 8MB DATA	<b>6ES7518-4FP00-0AB0</b> CPU 1518F-4 PN/DP, 6MB PROG, 20MB DATA
<b>Ambient conditions</b>						
<b>Ambient temperature in operation</b>						
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temper- ature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temper- ature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temper- ature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temper- ature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temper- ature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temper- ature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temper- ature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temper- ature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temper- ature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temper- ature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temper- ature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temper- ature of typically 40 °C, the display is switched off
<b>Configuration</b>						
<b>programming</b>						
<b>Programming language</b>						
- LAD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- FBD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- STL	Yes	Yes	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes	Yes	Yes
<b>Know-how protection</b>						
• User program protection	Yes	Yes	Yes	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes	Yes	Yes	Yes
<b>Access protection</b>						
• Password for display	Yes	Yes	Yes	Yes	Yes	Yes
• Protection level: Write protection	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe
• Protection level: Read/write protection	Yes	Yes	Yes	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes	Yes	Yes	Yes
<b>Dimensions</b>						
Width	35 mm	35 mm	70 mm	70 mm	175 mm	175 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm	129 mm
<b>Weights</b>						
Weight, approx.	430 g	430 g	830 g	845 g	1 978 g	1 988 g

# SIMATIC S7-1500 advanced controller

## Central processing units

### Fail-safe CPUs

Ordering data	Article No.	Article No.
<b>CPU 1511F-1 PN</b> Fail-safe CPU, 230 KB RAM for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required	6ES7511-1FK00-0AB0	
<b>CPU 1513F-1 PN</b> Fail-safe CPU, 450 KB RAM for program, 1.5 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required	6ES7513-1FL00-0AB0	
<b>CPU 1515F-2 PN</b> Work memory 750 KB for program, 3 MB for data, PROFINET IO IRT interface, PROFINET interface; SIMATIC Memory Card required	6ES7515-2FM00-0AB0	
<b>CPU 1516F-3 PN/DP</b> Fail-safe CPU, 1.5 MB RAM for program, 5 MB for data, PROFINET IO IRT interface, PROFINET/PROFIBUS interface; SIMATIC Memory Card required	6ES7516-3FN00-0AB0	
<b>CPU 1517F-3 PN/DP</b> Failsafe CPU, 3 MB RAM for program, 8 MB for data, PROFINET IO IRT interface, PROFINET/PROFIBUS interface; SIMATIC Memory Card required	6ES7517-3FP00-0AB0	
<b>CPU 1518F-4 PN/DP</b> Fail-safe CPU, work memory 6 MB for program, 20 MB for data, PROFINET IO IRT interface, 2 PROFINET interfaces, PROFIBUS interface; SIMATIC Memory Card required	6ES7518-4FP00-0AB0	
<b>Accessories</b>		
<b>SIMATIC Memory Card</b>		
4 MB	6ES7954-8LC02-0AA0	
12 MB	6ES7954-8LE02-0AA0	
24 MB	6ES7954-8LF02-0AA0	
256 MB	6ES7954-8LL02-0AA0	
2 GB	6ES7954-8LP01-0AA0	
<b>SIMATIC S7-1500 mounting rail</b> Fixed lengths, with grounding elements <ul style="list-style-type: none"> <li>• 160 mm</li> <li>• 245 mm</li> <li>• 482 mm</li> <li>• 530 mm</li> <li>• 830 mm</li> </ul> For cutting to length by customer, without drill holes; grounding elements must be ordered separately <ul style="list-style-type: none"> <li>• 2000 mm</li> </ul>	6ES7590-1AB60-0AA0 6ES7590-1AC40-0AA0 6ES7590-1AE80-0AA0 6ES7590-1AF30-0AA0 6ES7590-1AJ30-0AA0  6ES7590-1BC00-0AA0	
<b>PE connection element for mounting rail 2000 mm</b> 20 units	6ES7590-5AA00-0AA0	
		<b>Power supply</b> For supplying the backplane bus of the S7-1500 24 V DC input voltage, power 25 W 24/48/60 V DC input voltage, power 60 W 120/230 V AC input voltage, power 60 W
		6ES7505-0KA00-0AB0 6ES7505-0RA00-0AB0 6ES7507-0RA00-0AB0
		<b>Power connector</b> With coding element for power supply module; spare part, 10 units
		6ES7590-8AA00-0AA0
		<b>Load power supply</b> 24 V DC/3A 24 V DC/8A
		6EP1332-4BA00 6EP1333-4BA00
		<b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage <ul style="list-style-type: none"> <li>• With push-in terminals</li> </ul>
		6ES7193-4JB00-0AA0
		<b>PROFIBUS FastConnect RS 485 bus connector with 90° cable outlet</b> With insulation displacement, max. transmission rate 12 Mbps Without programming device interface, grounding via control cabinet contact surface; 1 unit With programming device interface, grounding via control cabinet contact surface; 1 unit
		6ES7972-0BA70-0XA0 6ES7972-0BB70-0XA0
		<b>PROFIBUS FC Standard Cable GP</b> Standard type with special design for fast mounting, 2-core, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m
		6XV1830-0EH10
		<b>PROFIBUS FC Robust Cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m
		6XV1830-0JH10
		<b>PROFIBUS FC Flexible Cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m
		6XV1831-2K
		<b>PROFIBUS FC Trailing Cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m Sheath color: Petrol Sheath color: Violet
		6XV1830-3EH10 6XV1831-2L
		<b>PROFIBUS FC Food Cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m
		6XV1830-0GH10

Ordering data	Article No.	Article No.	
<b>PROFIBUS FC Ground Cable</b> 2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1830-3FH10	<b>IE FC stripping tool</b> Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00
<b>PROFIBUS FC FRNC Cable GP</b> 2-wire, shielded, flame-retardant, with copolymer outer sheath FRNC; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1830-0LH10	<b>Display</b> for CPU 1511-1 PN and CPU 1513-1 PN; spare part  for CPU 1515-2 PN, CPU 1515F-2 PN, CPU 1516-3 PN/DP, CPU 1516F-3 PN/DP, CPU 1517-3 PN/DP, CPU 1517F-3 PN/DP, CPU 1518-4 PN/DP and CPU 1518F-4 PN/DP; spare part	6ES7591-1AA00-0AA0  6ES7591-1BA00-0AA0
<b>PROFIBUS FastConnect stripping tool</b> Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	6GK1905-6AA00	<b>STEP 7 Professional V13 SP1</b> Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Professional SP1 (64-bit), Windows 7 Enterprise SP1 (64-bit), Windows 7 Ultimate SP1 (64-bit), Windows 8.1 (64-bit), Windows 8.1 Professional (64-bit), Windows 8.1 Enterprise (64-bit), Windows Server 2008 R2 StdE (full installation), Windows Server 2012 StdE (full installation) Available in: German, English, Chinese, Italian, French, Spanish	
<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		STEP 7 Professional V13 SP1, floating license  STEP 7 Professional V13 SP1, floating license, software download incl. license key <sup>1)</sup> Email address required for delivery	6ES7822-1AA03-0YA5  6ES7822-1AE03-0YA5
<b>IE FC RJ45 Plug 180</b> 180° cable outlet  1 unit 10 units 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	<b>STEP 7 Safety Advanced V13 SP1</b> Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1  Floating license for 1 user  Floating license for 1 user, license key download without software or documentation <sup>1)</sup> Email address required for delivery	6ES7833-1FA13-0YA5 6ES7833-1FA13-0YH5
<b>IE FC TP Standard Cable GP 2 x 2</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-2AH10		
<b>IE FC TP Trailing Cable 2 x 2 (Type C)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-3AH10		
<b>IE FC TP Marine Cable 2 x 2 (Type B)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 with marine approval, sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-4AH10		

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

**SIMATIC S7-1500 advanced controller**

I/O modules

Digital modules

**SM 521 digital input modules****Overview**

- 16 and 32-channel digital input modules
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- 35 mm wide modules with parameters and diagnostic functions
- 25 mm wide modules for use in tight spaces: particularly economical, without parameters or diagnostic functions

4

**Technical specifications**

Article number	<b>6ES7521-1BH0-0AB0</b>	<b>6ES7521-1BL00-0AB0</b>	<b>6ES7521-1BH50-0AA0</b>	<b>6ES7521-1FH00-0AA0</b>
	DI 16X24VDC HF	DI 32X24VDC HF	DI 16X24VDC SRC BA	DI 16X230VAC BA
<b>Product type designation</b>				
<b>General information</b>				
<b>Product function</b>				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
<b>Engineering with</b>				
• STEP 7 TIA Portal can be configured/integrated as of version			V12 / V12	V12 / V12
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
<b>Operating mode</b>				
• DI		Yes		
• Counter	Yes	Yes		
• MSI	Yes	Yes	Yes	Yes
<b>Supply voltage</b>				
Type of supply voltage	DC	DC		
Rated value (DC)	24 V	24 V		
Reverse polarity protection	Yes	Yes		
<b>Digital inputs</b>				
Number of digital inputs	16	32	16	16
Digital inputs, configurable m/p-reading	Yes p-reading	Yes p-reading	m-reading	p-reading Yes
Input characteristic curve in accordance with IEC 61131, type 1				
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes	
<b>Input voltage</b>				
• Type of input voltage	DC	DC	DC	AC
• Rated value (AC)				230 V
• Rated value (DC)	24 V	24 V	24 V	
• for signal "0"	-30 to +5V	-30 to +5V		0V AC to 40V AC
• for signal "1"	+11 to +30V	+11 to +30V	-11 to -30V	79 to 264 V AC
<b>Input current</b>				
• for signal "1", typ.	2.5 mA	2.5 mA	4.5 mA	11 mA; At 230 V AC and 5.5 mA at 120 V AC

## Technical specifications (continued)

Article number	6ES7521-1BH00-0AB0 DI 16X24VDC HF	6ES7521-1BL00-0AB0 DI 32X24VDC HF	6ES7521-1BH50-0AA0 DI 16X24VDC SRC BA	6ES7521-1FH00-0AA0 DI 16X230VAC BA
<b>Input delay (for rated value of input voltage) for standard inputs</b>				
- Parameterizable	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	No	No
<b>for interrupt inputs</b>				
- Parameterizable	Yes	Yes	No	No
<b>for counter/technological functions</b>				
- Parameterizable	Yes			
<b>Cable length</b>				
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m
<b>Encoder</b>				
<b>Connectable encoders</b>				
• 2-wire sensor	Yes	Yes	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA	2 mA
<b>Isochronous mode</b>				
Isochronous operation (application synchronized up to terminal)	Yes	Yes	No	No
Filtering and processing time (TCI), min.	80 µs; At 50 µs filter time	80 µs; At 50 µs filter time		
Bus cycle time (TDP), min.	250 µs	250 µs		
<b>Interrupts/diagnostics/ status information</b>				
<b>Alarms</b>				
• Diagnostic alarm	Yes	Yes	No	No
• Hardware interrupt	Yes	Yes	No	No
<b>Diagnostic messages</b>				
• Diagnostics	Yes	Yes	No	
• Monitoring the supply voltage	Yes	Yes	No	No
• Wire break	Yes; to I < 350 µA	Yes; to I < 350 µA	No	No
• Short circuit	No	No	No	No
• Fuse blown	No	No	No	No
<b>Diagnostics indication LED</b>				
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	No	No
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	Yes; Red LED	No	No
• for module diagnostics	Yes; Red LED	Yes; Red LED	No	Yes; Red LED
<b>Galvanic isolation</b>				
<b>Electrical isolation channels</b>				
• between the channels and the backplane bus	Yes	Yes	Yes	Yes
<b>Isolation</b>				
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	2500 V DC
<b>Decentralized operation</b>				
Fast Startup supported	Yes; 500 ms	Yes; 500 ms		
Prioritized startup	Yes	Yes	Yes	Yes
<b>Dimensions</b>				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
<b>Weights</b>				
Weight, approx.	240 g	260 g	230 g	300 g



**SIMATIC S7-1500 advanced controller**

I/O modules

Digital modules

**SM 521 digital input modules****Technical specifications (continued)**

Article number	<b>6ES7521-1BH10-0AA0</b> DI 16X24VDC BA	<b>6ES7521-1BL10-0AA0</b> DI 32X24VDC BA
<b>Product type designation</b>		
<b>General information</b>		
<b>Product function</b>		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
<b>Engineering with</b>		
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -
<b>Operating mode</b>		
• MSI	Yes	Yes
<b>Supply voltage</b>		
Type of supply voltage	DC	DC
Rated value (DC)	24 V	24 V
<b>Digital inputs</b>		
Number of digital inputs	16	32
m/p-reading	p-reading	p-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
<b>Input voltage</b>		
• Type of input voltage	DC	DC
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5V	-30 to +5V
• for signal "1"	+11 to +30V	+11 to +30V
<b>Input current</b>		
• for signal "1", typ.	2.7 mA	2.7 mA
<b>Input delay (for rated value of input voltage)</b>		
<b>for standard inputs</b>		
- Parameterizable	No	No
<b>for interrupt inputs</b>		
- Parameterizable	No	No
<b>Cable length</b>		
• shielded, max.	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m
<b>Encoder</b>		
<b>Connectable encoders</b>		
• 2-wire sensor	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
<b>Isochronous mode</b>		
Isochronous operation (application synchronized up to terminal)	No	No

## Technical specifications (continued)

Article number	6ES7521-1BH10-0AA0 DI 16X24VDC BA	6ES7521-1BL10-0AA0 DI 32X24VDC BA
<b>Interrupts/diagnostics/ status information</b>		
<b>Alarms</b>		
• Diagnostic alarm	No	No
• Hardware interrupt	No	No
<b>Diagnostic messages</b>		
• Diagnostics	No	No
• Monitoring the supply voltage	No	No
• Wire break	No	No
• Short circuit	No	No
• Fuse blown	No	No
<b>Diagnostics indication LED</b>		
• RUN LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED
• MAINT LED	No	No
• Monitoring of the supply voltage (PWR-LED)	No	No
• Channel status display	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No	No
• for module diagnostics	No	No
<b>Galvanic isolation</b>		
<b>Electrical isolation channels</b>		
• between the channels and the backplane bus	Yes	Yes
<b>Isolation</b>		
Isolation checked with	707 V DC (type test)	707 V DC (type test)
<b>Decentralized operation</b>		
Prioritized startup	Yes	Yes
<b>Dimensions</b>		
Width	25 mm	25 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
<b>Weights</b>		
Weight, approx.	230 g	260 g
<b>other</b>		
Note:	Supplied incl. 40-pole push-in front connectors	Supplied incl. 40-pole push-in front connectors

**SIMATIC S7-1500 advanced controller**

I/O modules

Digital modules

**SM 521 digital input modules****Ordering data****Article No.****Article No.****SM 521 digital input modules**

Module width 35 mm;  
with parameters and  
diagnostic functions

16 inputs, 24 V DC, isolated,  
parameterizable diagnostics and  
hardware interrupts

**6ES7521-1BH00-0AB0**

32 inputs, 24 V DC, isolated,  
parameterizable diagnostics and  
hardware interrupts

**6ES7521-1BL00-0AB0**

16 inputs, 24 V DC, isolated,  
input delay 3.2 ms

**6ES7521-1BH50-0AA0**

16 inputs, 230 V AC, isolated,  
input delay 20 ms

**6ES7521-1FH00-0AA0**

Module width 25 mm;  
without parameters or  
diagnostic functions;  
front connector (push-in)  
included in delivery package

16 inputs, 24 V DC, isolated

**6ES7521-1BH10-0AA0**

32 inputs, 24 V DC, isolated

**6ES7521-1BL10-0AA0****Accessories****Front connectors**

For 35 mm modules;  
including four potential bridges,  
cable ties and individual labeling  
strips, 40-pin

- Screw terminals
- Push-in

**6ES7592-1AM00-0XB0****6ES7592-1BM00-0XB0****6ES7592-1BM00-0XA0**

For 25 mm modules;  
including cable ties and individual  
labeling strips; push-in terminal  
40-pin;  
Spare part

**Potential bridges  
for front connectors****6ES7592-3AA00-0AA0**

For 35 mm modules;  
20 units; spare part

**DIN A4 labeling sheets**

For 35 mm modules;  
10 sheets with 10 labeling strips  
each for I/O modules; perforated,  
Al gray

**6ES7592-2AX00-0AA0**

For 25 mm modules;  
10 sheets with 20 labeling strips  
each for I/O modules; perforated,  
Al gray

**6ES7592-1AX00-0AA0****U connector****6ES7590-0AA00-0AA0**

5 units; spare part

**Universal front door  
for I/O modules**

For 35 mm modules;  
5 front doors; with 5 labeling strips  
(front) and 5 cabling diagrams per  
front door; spare part

**6ES7528-0AA00-7AA0**

For 25 mm modules;  
5 front doors; with 5 labeling strips  
(front) and 5 cabling diagrams per  
front door; spare part

**6ES7528-0AA00-0AA0**

## Overview



- 8, 16 and 32-channel digital output modules
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- 35 mm wide modules with parameters and diagnostic functions
- 25 mm wide modules for use in tight spaces: particularly economical, without parameters or diagnostic functions

## Technical specifications

Article number	6ES7522-1BH00-0AB0	6ES7522-1BL00-0AB0	6ES7522-1BF00-0AB0	6ES7522-5HF00-0AB0	6ES7522-5FF00-0AB0
	DQ 16X24VDC/ 0.5A ST	DQ 32X24VDC/ 0.5A ST	DQ 8X24VDC/2A HF	DQ 8X230VAC/5A ST (RELAY)	DQ 8X230VAC/2A ST (TRIAC)
<b>Product type designation</b>					
<b>General information</b>					
<b>Product function</b>					
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
<b>Engineering with</b>					
• STEP 7 TIA Portal can be configured/integrated as of version	V12 / V12	V12 / V12	V12 / V12	V12 / V12	V12 / V12
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
<b>Operating mode</b>					
• MSO	Yes	Yes	Yes	Yes	Yes
<b>Supply voltage</b>					
Type of supply voltage	DC	DC	DC	DC	
Rated value (DC)	24 V	24 V	24 V	24 V	
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; through internal protection with 7 A per group	Yes; through internal protection with 10 A per group	Yes	
<b>Digital outputs</b>					
Type of digital output	Transistor	Transistor	Transistor	Relays	Triac
Number of digital outputs	16	32	8	8	8
Current-sinking				Yes	
Current-sourcing	Yes	Yes	Yes	Yes	Yes
Digital outputs, configurable	Yes	Yes	Yes	Yes	Yes
short-circuit protection	Yes; Clocked electronically	Yes; Clocked electronically	Yes; Clocked electronically	No	No
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)	-17 V		
Controlling a digital input	Yes	Yes	Yes	possible	
<b>Switching capacity of the outputs</b>					
• with resistive load, max.	0.5 A	0.5 A	2 A		2 A
• on lamp load, max.	5 W	5 W	10 W	1 500 W; 10,000 operating cycles	50 W
• Low energy/fluorescent lamps with electronic control gear				10 X 58 W (25,000 operating cycles)	
• Fluorescent tubes, conventionally compensated				1 X 58 W (25,000 operating cycles)	
• Fluorescent tubes, uncompensated				10 X 58 W (25,000 operating cycles)	

## SIMATIC S7-1500 advanced controller

I/O modules

Digital modules

## SM 522 digital output modules

## Technical specifications (continued)

Article number	6ES7522-1BH00-0AB0 DQ 16X24VDC/ 0.5A ST	6ES7522-1BL00-0AB0 DQ 32X24VDC/ 0.5A ST	6ES7522-1BF00-0AB0 DQ 8X24VDC/2A HF	6ES7522-5HF00-0AB0 DQ 8X230VAC/5A ST (RELAY)	6ES7522-5FF00-0AB0 DQ 8X230VAC/2A ST (TRIAC)
<b>Load resistance range</b>					
• lower limit	48 Ω	48 Ω	12 Ω		
• upper limit	12 kΩ	12 kΩ	4 kΩ		
<b>Output voltage</b>					
• Type of output voltage	DC	DC	DC		AC
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)		L1 (-1.5 V) at maximum output current; L1 (-8.5 V) at minimum output current
<b>Output current</b>					
• for signal "1" rated value	0.5 A	0.5 A	2 A	5 A	2 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	0 A	2 mA
<b>Output delay with resistive load</b>					
• "0" to "1", max.	100 μs	100 μs	100 μs		1 AC cycle
• "1" to "0", max.	500 μs	500 μs	500 μs		1 AC cycle
<b>Parallel switching of 2 outputs</b>					
• for logic links	Yes	Yes	Yes	Yes	No
• for increased power	No	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes	Yes
<b>Switching frequency</b>					
• with resistive load, max.	100 Hz	100 Hz	100 Hz	2 Hz	10 Hz
• with inductive load, max.	0.5 Hz; to IEC 947-5-1, DC-13	0.5 Hz; to IEC 947-5-1, DC-13	0.5 Hz; to IEC 947-5-1, DC-13	0.5 Hz	0.5 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	2 Hz	1 Hz
<b>Aggregate current of the outputs</b>					
• Current per channel, max.	0.5 A; see additional description in the manual	0.5 A; see additional description in the manual	2 A; see additional description in the manual	8 A; see additional description in the manual	2 A; see additional description in the manual
• Current per group, max.	4 A; see additional description in the manual	4 A; see additional description in the manual	8 A; see additional description in the manual	8 A; see additional description in the manual	2 A; see additional description in the manual
• Current per module, max.	8 A; see additional description in the manual	16 A; see additional description in the manual	16 A; see additional description in the manual	64 A; see additional description in the manual	10 A; see additional description in the manual
<b>Relay outputs</b>					
• Number of relay outputs				8	
• Rated input voltage of relay coil L+ (DC)				24 V	
• Current consumption of relays (coil current of all relays), max.				80 mA	
• external protection for relay outputs				With miniature circuit breaker with characteristic B for: $\cos \varphi 1.0$ : 600 A $\cos \varphi 0.5 \dots 0.7$ : 900 A with 8 A Diazed fuse: 1000 A	
• Contact connection (internal)				No	
• Size of motor starters according to NEMA, max.				5	
• Number of operating cycles, max.				4 000 000; see additional description in the manual	
• Relay approved acc. to UL 508				Yes; 250 V AC/5 A g.p.; 120 V AC TV-4 tungsten; A300, R300	

## Technical specifications (continued)

Article number	6ES7522-1BH00-0AB0 DQ 16X24VDC/ 0.5A ST	6ES7522-1BL00-0AB0 DQ 32X24VDC/ 0.5A ST	6ES7522-1BF00-0AB0 DQ 8X24VDC/2A HF	6ES7522-5HF00-0AB0 DQ 8X230VAC/5A ST (RELAY)	6ES7522-5FF00-0AB0 DQ 8X230VAC/2A ST (TRIAC)
<b>Switching capacity of contacts</b>					
- with inductive load, max.				see additional description in the manual	
- with resistive load, max.				see additional description in the manual	
<b>Triac outputs</b>					
• Size of motor starters according to NEMA, max.					5
<b>Cable length</b>					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m
<b>Isochronous mode</b>					
Isochronous operation (application synchronized up to terminal)	Yes	Yes	No	No	No
Execution and activation time (TCO), min.	70 µs	70 µs			
Bus cycle time (TDP), min.	250 µs	250 µs			
<b>Interrupts/diagnostics/status information</b>					
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
<b>Alarms</b>					
• Diagnostic alarm	Yes	Yes	Yes	Yes	No
<b>Diagnostic messages</b>					
• Diagnostics	Yes	Yes	Yes	Yes	No
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	No
• Wire break	No	No	No	No	No
• Short circuit	Yes	Yes	Yes	No	No
• Fuse blown	No	No	No	No	No
<b>Diagnostics indication LED</b>					
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	No
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No	No	Yes; Red LED	No	No
• for module diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
<b>Galvanic isolation</b>					
<b>Electrical isolation channels</b>					
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes
<b>Isolation</b>					
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	Between the channels: 2500 V DC; between the channels and backplane bus: 2500 V DC; between L+ backplane bus 707 V DC (type test)	2500 V DC
<b>Decentralized operation</b>					
Prioritized startup	Yes	Yes	Yes	Yes	Yes
<b>Dimensions</b>					
Width	35 mm	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm
<b>Weights</b>					
Weight, approx.	230 g	280 g	240 g	350 g	290 g

**SIMATIC S7-1500 advanced controller**

I/O modules

Digital modules

**SM 522 digital output modules****Technical specifications (continued)**

Article number	<b>6ES7522-1BH10-0AA0</b> DQ 16X24VDC/0.5A BA	<b>6ES7522-1BL10-0AA0</b> DQ 32X24VDC/0.5A BA
<b>Product type designation</b>		
<b>General information</b>		
<b>Product function</b>		
• I&M data	Yes	Yes
<b>Engineering with</b>		
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -
<b>Operating mode</b>		
• MSO	Yes	Yes
<b>Supply voltage</b>		
Type of supply voltage	DC	DC
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; through internal protection with 7 A per group
<b>Digital outputs</b>		
Type of digital output	Transistor	Transistor
Number of digital outputs	16	32
Current-sourcing	Yes	Yes
Digital outputs, configurable	No	No
short-circuit protection	Yes	Yes
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)
Controlling a digital input	Yes	Yes
<b>Switching capacity of the outputs</b>		
• with resistive load, max.	0.5 A	0.5 A
• on lamp load, max.	5 W	5 W
<b>Load resistance range</b>		
• lower limit	48 Ω	48 Ω
• upper limit	12 kΩ	12 kΩ
<b>Output voltage</b>		
• Type of output voltage	DC	DC
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)
<b>Output current</b>		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
<b>Output delay with resistive load</b>		
• "0" to "1", max.	100 μs	100 μs
• "1" to "0", max.	500 μs	500 μs
<b>Parallel switching of 2 outputs</b>		
• for logic links	Yes	Yes
• for increased power	No	No
• for redundant control of a load	Yes	Yes
<b>Switching frequency</b>		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz; to IEC 947-5-1, DC-13	0.5 Hz; to IEC 947-5-1, DC-13
• on lamp load, max.	10 Hz	10 Hz
<b>Aggregate current of the outputs</b>		
• Current per channel, max.	0.5 A; see additional description in the manual	0.5 A; see additional description in the manual
• Current per group, max.	4 A; see additional description in the manual	4 A; see additional description in the manual
• Current per module, max.	8 A; see additional description in the manual	16 A; see additional description in the manual
<b>Cable length</b>		
• shielded, max.	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m

## Technical specifications (continued)

Article number	6ES7522-1BH10-0AA0 DQ 16X24VDC/0.5A BA	6ES7522-1BL10-0AA0 DQ 32X24VDC/0.5A BA
<b>Interrupts/diagnostics/ status information</b>		
Substitute values connectable	No	No
<b>Alarms</b>		
• Diagnostic alarm	No	No
<b>Diagnostic messages</b>		
• Diagnostics	No	No
<b>Diagnostics indication LED</b>		
• RUN LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED
• MAINT LED	No	No
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED
• Channel status display	Yes; Green LED	Yes; Green LED
<b>Galvanic isolation</b>		
<b>Electrical isolation channels</b>		
• between the channels and the backplane bus	Yes	Yes
<b>Isolation</b>		
Isolation checked with	707 V DC (type test)	707 V DC (type test)
<b>Decentralized operation</b>		
Prioritized startup	Yes	Yes
<b>Dimensions</b>		
Width	25 mm	25 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
<b>Weights</b>		
Weight, approx.	230 g	280 g
<b>other</b>		
Note:	Supplied incl. 40-pole push-in front connectors	Supplied incl. 40-pole push-in front connectors



**SIMATIC S7-1500 advanced controller**

I/O modules

Digital modules

**SM 522 digital output modules****Ordering data****Article No.****Article No.****SM 522 digital output modules**

Module width 35 mm;  
with parameters and  
diagnostic functions

8 outputs, 24 V DC; 2 A, isolated

**6ES7522-1BF00-0AB0**

16 outputs, 24 V DC; 0.5 A, isolated

**6ES7522-1BH00-0AB0**

32 outputs, 24 V DC; 0.5 A, isolated

**6ES7522-1BL00-0AB0**

8 relay outputs, 230 V AC, 5 A

**6ES7522-5HF00-0AB0**

8 outputs (triac), 230 V AC, 2 A

**6ES7522-5FF00-0AB0**

Module width 25 mm;  
without parameters or  
diagnostic functions;  
front connector (push-in)  
included in delivery package

16 outputs, 24 V DC; 0.5 A, isolated

**6ES7 522-1BH10-0AA0**

32 outputs, 24 V DC; 0.5 A, isolated

**6ES7 522-1BL10-0AA0****Accessories****Front connectors**

For 35 mm modules;  
including four potential bridges,  
cable ties and individual labeling  
strips, 40-pin

- Screw terminals
- Push-in

**6ES7592-1AM00-0XB0****6ES7592-1BM00-0XB0**

For 25 mm modules;  
including cable ties and individual  
labeling strips; push-in terminal  
40-pin;  
Spare part

**6ES7592-1BM00-0XA0****Potential bridges  
for front connectors****6ES7592-3AA00-0AA0**

For 35 mm modules;  
20 units; spare part

**DIN A4 labeling sheets**

For 35 mm modules;  
10 sheets with 10 labeling strips  
each for I/O modules; perforated,  
Al gray

**6ES7592-2AX00-0AA0**

For 25 mm modules;  
10 sheets with 20 labeling strips  
each for I/O modules; perforated,  
Al gray

**6ES7592-1AX00-0AA0****U connector****6ES7590-0AA00-0AA0**

5 units; spare part

**Universal front door  
for I/O modules**

For 35 mm modules;  
5 front doors; with 5 labeling strips  
(front) and 5 cabling diagrams per  
front door; spare part

**6ES7528-0AA00-7AA0**

For 25 mm modules;  
5 front doors; with 5 labeling strips  
(front) and 5 cabling diagrams per  
front door; spare part

**6ES7528-0AA00-0AA0**

## Overview



- 16 digital inputs and 16 digital outputs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- For use in the tightest spaces: particularly economical, without parameters or diagnostic functions

## Technical specifications

Article number	<b>6ES7523-1BL00-0AA0</b> DI/DQ 16X24CDV/16X24VDC/ 0.5A BA
<b>Product type designation</b>	
<b>General information</b>	
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -
<b>Operating mode</b>	
• MSI	Yes
• MSO	Yes
<b>Supply voltage</b>	
Type of supply voltage	DC
Rated value (DC)	24 V
Reverse polarity protection	Yes; through internal protection with 7 A per group
<b>Digital inputs</b>	
Number of digital inputs	16
m/p-reading	p-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "1", typ.	2.7 mA

Article number	<b>6ES7523-1BL00-0AA0</b> DI/DQ 16X24CDV/16X24VDC/ 0.5A BA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- Parameterizable	No
<b>for interrupt inputs</b>	
- Parameterizable	No
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
<b>Digital outputs</b>	
Type of digital output	transistor
Number of digital outputs	16
Current-sourcing	Yes
short-circuit protection	Yes
Limitation of inductive shutdown voltage to	L+ (-53 V)
Controlling a digital input	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A
• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	48 Ω
• upper limit	12 kΩ
<b>Output voltage</b>	
• Type of output voltage	DC
• for signal "1", min.	L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	100 μs
• "1" to "0", max.	500 μs
<b>Parallel switching of 2 outputs</b>	
• for logic links	Yes
• for increased power	No
• for redundant control of a load	Yes

**SIMATIC S7-1500 advanced controller**

I/O modules

Digital modules

**SM 523 digital input/output modules****Technical specifications (continued)**

Article number	<b>6ES7523-1BL00-0AA0</b> DI/DQ 16X24CDV/16X24VDC/ 0.5A BA
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	10 Hz
<b>Aggregate current of the outputs</b>	
• Current per channel, max.	0.5 A; see additional description in the manual
• Current per group, max.	4 A; see additional description in the manual
• Current per module, max.	8 A; see additional description in the manual
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
<b>Encoder</b>	
<b>Connectable encoders</b>	
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	No
<b>Interrupts/diagnostics/ status information</b>	
Substitute values connectable	No
<b>Alarms</b>	
• Diagnostic alarm	No
• Hardware interrupt	No
<b>Diagnostic messages</b>	
• Diagnostics	No
• Monitoring the supply voltage	No
• Wire break	No
• Short circuit	No
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	No
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	No
• for module diagnostics	No
<b>Electrical isolation channels</b>	
• between the channels and the backplane bus	Yes
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	No
<b>Decentralized operation</b>	
Prioritized startup	Yes
<b>Dimensions</b>	
Width	25 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	280 g
<b>other</b>	
Note:	Supplied incl. 40-pole push-in front connectors

**Ordering data****Article No.****SM 523 digital input/output  
module**

Module width 25 mm;  
without parameters or  
diagnostic functions;  
front connector (push-in)  
included in delivery package

16 inputs, 24 V DC, isolated;  
16 outputs, 24 V DC; 0.5 A, isolated

**6ES7523-1BL00-0AA0****Accessories****Front connectors**

For 25 mm modules;  
including cable ties and individual  
labeling strips; push-in terminal  
40-pin;  
Spare part

**6ES7592-1BM00-0XA0****DIN A4 labeling sheets**

For 25 mm modules;  
10 sheets with 20 labeling strips  
each for I/O modules; perforated,  
Al gray

**6ES7592-1AX00-0AA0****U connector**

5 units; spare part

**6ES7590-0AA00-0AA0****Universal front door  
for I/O modules**

For 25 mm modules;  
5 front doors; with 5 labeling strips  
(front) and 5 cabling diagrams per  
front door; spare part

**6ES7528-0AA00-0AA0**

**Overview**

- 16 and 32-channel digital input modules
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	<b>6AG1521-1BH00-7AB0</b>	<b>6AG1521-1BL00-7AB0</b>	<b>6AG1521-1BH50-7AA0</b>	<b>6AG1521-1FH00-7AA0</b>
Based on	<b>6ES7521-1BH00-0AB0</b> SIPLUS S7-1500 DI 16X24VDC HF	<b>6ES7521-1BL00-0AB0</b> SIPLUS S7-1500 DI 32X24VDC HF	<b>6ES7521-1BH50-0AA0</b> SIPLUS S7-1500 DI 16X24VDC SRC BA	<b>6ES7521-1FH00-0AA0</b> SIPLUS S7-1500 DI 16X230VAC BA
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• horizontal installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 16	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 8	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 8
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-1500 advanced controller**

I/O modules

SIPLUS digital modules

**SIPLUS SM 521 digital modules****Ordering data****Article No.****SIPLUS SM 521 digital input modules**

(extended temperature range and media exposure)

16 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts

**6AG1521-1BH00-7AB0**

32 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts

**6AG1521-1BL00-7AB0**

16 inputs, 24 V DC, isolated, input delay 3.2 ms

**6AG1521-1BH50-7AA0**

16 inputs, 230 V AC, isolated, input delay 20 ms

**6AG1521-1FH00-7AA0****Accessories****Article No.**

See SIMATIC S7-1500 SM 521 digital input modules, page 4/32

**Overview**

- 8, 16 and 32-channel digital output modules
- For flexible adaptation of the controller to the task in hand
- For subsequent expansion of the system with additional outputs

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information has been added.

**Technical specifications**

Article number	<b>6AG1522-1BF00-7AB0</b>	<b>6AG1522-1BH00-7AB0</b>	<b>6AG1522-1BL00-7AB0</b>	<b>6AG1522-5HF00-2AB0</b>	<b>6AG1522-5FF00-7AB0</b>
Based on	<b>6ES7522-1BF00-0AB0</b> SIPLUS S7-1500 DQ 8X24VDC/2A HF	<b>6ES7522-1BH00-0AB0</b> SIPLUS S7-1500 DQ 16X24VDC/0.5A ST	<b>6ES7522-1BL00-0AB0</b> SIPLUS S7-1500 DQ 32X24VDC/0.5A ST	<b>6ES7522-5HF00-0AB0</b> SIPLUS S7-1500 DO 8X230VAC/5A ST	<b>6ES7522-5FF00-0AB0</b> SIPLUS S7-1500 DO 8X230VAC/2A ST (TRIAC)
<b>Ambient conditions</b>					
<b>Ambient temperature in operation</b>					
• horizontal installation, min.	-40 °C; = Tmin	-25 °C; = Tmin	-40 °C; = Tmin	-25 °C; = Tmin	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax; > +60 °C Number of simultaneously control- lable outputs max. 8x 0.5 A, max. total current per group 2 A	70 °C; = Tmax; > +60 °C Number of simultaneously control- lable outputs max. 8x 0.5 A, max. total current per group 2 A	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously control- lable outputs max. 8x 0.25 A, max. total current 2 A
• vertical installation, min.	-40 °C; = Tmin	-25 °C; = Tmin	-40 °C; = Tmin	-25 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax	50 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax
<b>Extended ambient conditions</b>					
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>					
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation condi- tions)	100 %; RH incl. condensation/frost (no commissioning under condensation condi- tions)	100 %; RH incl. condensation/frost (no commissioning under condensation condi- tions)	100 %; RH incl. condensation/frost (no commissioning under condensation condi- tions)	100 %; RH incl. condensation/frost (no commissioning under condensation condi- tions)

**SIMATIC S7-1500 advanced controller**

I/O modules

SIPLUS digital modules

**SIPLUS SM 522 digital modules****Technical specifications (continued)**

Article number	<b>6AG1522-1BF00-7AB0</b>	<b>6AG1522-1BH00-7AB0</b>	<b>6AG1522-1BL00-7AB0</b>	<b>6AG1522-5HF00-2AB0</b>	<b>6AG1522-5FF00-7AB0</b>
Based on	<b>6ES7522-1BF00-0AB0</b> SIPLUS S7-1500 DQ 8X24VDC/2A HF	<b>6ES7522-1BH00-0AB0</b> SIPLUS S7-1500 DQ 16X24VDC/0.5A ST	<b>6ES7522-1BL00-0AB0</b> SIPLUS S7-1500 DQ 32X24VDC/0.5A ST	<b>6ES7522-5HF00-0AB0</b> SIPLUS S7-1500 DO 8X230VAC/5A ST	<b>6ES7522-5FF00-0AB0</b> SIPLUS S7-1500 DO 8X230VAC/2A ST (TRIAC)
<b>Resistance</b>					
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****SIPLUS SM 522 digital output modules**

(extended temperature range and medial exposure)

- 8 outputs, 24 V DC; 2 A, isolated
- 16 outputs, 24 V DC; 0.5 A, isolated
- 32 outputs, 24 V DC; 0.5 A, isolated
- 8 relay outputs, 230 V AC, 5 A
- 8 outputs (triac), 230 V AC, 2 A

**Article No.**

- 6AG1522-1BF00-7AB0**
- 6AG1522-1BH00-7AB0**
- 6AG1522-1BL00-7AB0**
- 6AG1522-5HF00-2AB0**
- 6AG1522-5FF00-7AB0**

**Article No.****Accessories**

See SIMATIC S7-1500 SM 522 digital output modules, page 4/38

**Overview**

- 4 or 8-channel analog input modules
- Optionally with extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- Even solves more complex automation tasks

**Technical specifications**

Article number	<b>6ES7531-7QD00-0AB0</b> AI 4XU//RTD/TC ST	<b>6ES7531-7KF00-0AB0</b> AI 8XU//RTD/TC ST	<b>6ES7531-7NF10-0AB0</b> AI 8XU/I HS
<b>Product type designation</b>			
<b>General information</b>			
<b>Product function</b>			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
<b>Engineering with</b>			
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13.0.2	V12 / V12	V12 / V12
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -
<b>Operating mode</b>			
• MSI	Yes	Yes	Yes
<b>CiR - Configuration in RUN</b>			
Reparameterization possible in RUN	Yes	Yes	
Calibration possible in RUN	Yes	Yes	
<b>Supply voltage</b>			
Type of supply voltage	DC	DC	DC
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
<b>Analog inputs</b>			
Number of analog inputs	4	8	8
• For current measurement	4	8	8
• For voltage measurement	4	8	8
• For resistance/resistance thermometer measurement	2	4	
• For thermocouple measurement	4	8	
permissible input voltage for voltage input (destruction limit), max.	28.8 V	28.8 V	28.8 V
Technical unit for temperature measurement adjustable	Yes	Yes	



**SIMATIC S7-1500 advanced controller**

I/O modules

Analog modules

**SM 531 analog input modules****Technical specifications (continued)**

Article number	<b>6ES7531-7QD00-0AB0</b> AI 4XU/I/RTD/TC ST	<b>6ES7531-7KF00-0AB0</b> AI 8XU/I/RTD/TC ST	<b>6ES7531-7NF10-0AB0</b> AI 8XU/I HS
<b>Input ranges (rated values), voltages</b>			
• 1 V to 5 V	Yes	Yes	Yes
• -1 V to +1 V	Yes	Yes	
• -10 V to +10 V	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes	Yes	
• -250 mV to +250 mV	Yes	Yes	
• -5 V to +5 V	Yes	Yes	Yes
• -50 mV to +50 mV	Yes	Yes	
• -500 mV to +500 mV	Yes	Yes	
• -80 mV to +80 mV	Yes	Yes	
<b>Input ranges (rated values), currents</b>			
• 0 to 20 mA	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes
<b>Input ranges (rated values), thermoelements</b>			
• Type B	Yes	Yes	
• Type E	Yes	Yes	
• Type J	Yes	Yes	
• Type K	Yes	Yes	
• Type N	Yes	Yes	
• Type R	Yes	Yes	
• Type S	Yes	Yes	
• Type T	Yes	Yes	
<b>Input ranges (rated values), resistance thermometer</b>			
• Ni 100	Yes; Standard/climate	Yes; Standard/climate	
• Ni 1000	Yes; Standard/climate	Yes; Standard/climate	
• LG-Ni 1000	Yes; Standard/climate	Yes; Standard/climate	
• Pt 100	Yes; Standard/climate	Yes; Standard/climate	
• Pt 1000	Yes; Standard/climate	Yes; Standard/climate	
• Pt 200	Yes; Standard/climate	Yes; Standard/climate	
• Pt 500	Yes; Standard/climate	Yes; Standard/climate	
<b>Input ranges (rated values), resistors</b>			
• 0 to 150 ohms	Yes	Yes	
• 0 to 300 ohms	Yes	Yes	
• 0 to 600 ohms	Yes	Yes	
• 0 to 6000 ohms	Yes	Yes	
• PTC	Yes	Yes	
<b>Thermocouple (TC)</b>			
• Technical unit for temperature measurement	°C/°F/K	°C/°F/K	
<b>Temperature compensation</b>			
- Parameterizable	Yes	Yes	
<b>Resistance thermometer (RTD)</b>			
• Technical unit for temperature measurement	°C/°F/K	°C/°F/K	
<b>Cable length</b>			
• shielded, max.	800 m; for U/I, 200 m for R/RTD, 50 m for TC	800 m; for U/I, 200 m for R/RTD, 50 m for TC	800 m

## Technical specifications (continued)

Article number	6ES7531-7QD00-0AB0 AI 4XU/I/RTD/TC ST	6ES7531-7KF00-0AB0 AI 8XU/I/RTD/TC ST	6ES7531-7NF10-0AB0 AI 8XU/I HS
<b>Analog value generation for the inputs</b>			
<b>Integration and conversion time/resolution per channel</b>			
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	
• Integration time (ms)	2,5 / 16,67 / 20 / 100 ms	2,5 / 16,67 / 20 / 100 ms	
• Basic conversion time, including integration time (ms)	9 / 23 / 27 / 107 ms	9 / 23 / 27 / 107 ms	
- additional conversion time for wire break monitoring	9 ms	9 ms	
- additional conversion time for resistance measurement	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms	
• Basic execution time of the module (all channels released)			62.5 µs; independent of number of activated channels
<b>Smoothing of measured values</b>			
• Parameterizable	Yes	Yes	Yes
<b>Encoder</b>			
<b>Connection of signal encoders</b>			
• for voltage measurement	Yes	Yes	Yes
• for current measurement as 2-wire transducer	Yes	Yes	Yes
- Burden of 2-wire transmitter, max.	820 Ω	820 Ω	820 Ω
• for current measurement as 4-wire transducer	Yes	Yes	Yes
• for resistance measurement with two-wire connection	Yes; Only for PTC	Yes; Only for PTC	
• for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC	Yes; All measuring ranges except PTC	
<b>Errors/accuracies</b>			
<b>Basic error limit (operational limit at 25 °C)</b>			
• Voltage, relative to input area, (+/-)	0.1 %	0.1 %	0.2 %
• Current, relative to input area, (+/-)	0.1 %	0.1 %	0.2 %
• Resistance, relative to input area, (+/-)	0.1 %	0.1 %	
• Resistance thermometer, relative to input area, (+/-)	0.1 %; Pt xxx standard: ±0.7 K, Pt xxx climate: ±0.2 K, Ni xxx standard: ±0.3 K, Ni xxx climate: ±0.15 K	Pt xxx standard: ±0.7 K, Pt xxx climate: ±0.2 K, Ni xxx standard: ±0.3 K, Ni xxx climate: ±0.15 K	
• Thermocouple, relative to input area, (+/-)	0.1 %; Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K	Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K	
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>			
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB	
• common mode voltage, max.	10 V	10 V	10 V
• Common mode interference, min.	60 dB	60 dB	60 dB; at 400 Hz: 50 dB

**SIMATIC S7-1500 advanced controller**

I/O modules

Analog modules

**SM 531 analog input modules****Technical specifications (continued)**

Article number	<b>6ES7531-7QD00-0AB0</b> AI 4XU/I/RTD/TC ST	<b>6ES7531-7KF00-0AB0</b> AI 8XU/I/RTD/TC ST	<b>6ES7531-7NF10-0AB0</b> AI 8XU/I HS
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)			Yes
Filtering and processing time (TCI), min.			80 µs
Bus cycle time (TDP), min.			250 µs
<b>Interrupts/diagnostics/status information</b>			
<b>Alarms</b>			
• Diagnostic alarm	Yes	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
<b>Diagnostic messages</b>			
• Diagnostics	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD	Yes; only for 1 ... 5 V and 4 ... 20 mA
• Overflow/underflow	Yes	Yes	Yes
<b>Diagnostics indication LED</b>			
• RUN LED	Yes; Green LED	Yes; Green LED	
• ERROR LED	Yes; Red LED	Yes; Red LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	Yes; Green LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED
<b>Electrical isolation channels</b>			
• between the channels and the backplane bus	Yes	Yes	Yes
<b>Isolation</b>			
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• horizontal installation, min.			0 °C
• horizontal installation, max.			60 °C
• vertical installation, min.			0 °C
• vertical installation, max.			40 °C
<b>Decentralized operation</b>			
Prioritized startup	No	No	No
<b>Dimensions</b>			
Width	25 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
<b>Weights</b>			
Weight, approx.	210 g	310 g	200 g
<b>Other</b>			
Note:	Supplied incl. 40-pole push-in front connectors. Additional basic error and noise for integration time = 2.5 ms: Voltage: ±250 mV (±0.02%), ±80 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 Ohms (±0.02%); resistance thermometer: Pt100 climate: ±0.08 K, Ni100 climate: ±0.08 K; thermocouple: Type B, R, S: ±3 K, type E, J, K, N, T: ±1 K	Additional basic error and noise for integration time = 2.5 ms: Voltage: ±250 mV (±0.02%), ±80 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 ohms ±0.02%; resistance thermometer: Pt100 climate: ±0.08 K, Ni100 climate: ±0.08 K; thermocouple: Type B, R, S: ±3 K, type E, J, K, N, T: ±1 K	

Ordering data	Article No.	Accessories	Article No.
<b>SM 531 analog input modules</b> <u>Module width: 25 mm</u> 4 analog inputs $\pm 10$ V, $\pm 5$ V, $\pm 2.5$ V, $\pm 1$ V, $\pm 500$ mV, $\pm 250$ mV, $\pm 80$ mV, $\pm 50$ mV, 1 ... 5 V, 0/4 ... 20 mA, $\pm 20$ mA, thermocouples type B, E, J, K, N, R, S, T, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt 100, Pt 1000, Pt 250, Pt 500, resistors 0...150/300/600/ 6000 ohms, 16 bit; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door	<b>6ES7531-7QD00-0AB0</b>	<b>Front connectors</b> For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin <ul style="list-style-type: none"> <li>Screw terminals</li> <li>Push-in</li> </ul> For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; Spare part	<b>6ES7592-1AM00-0XB0</b> <b>6ES7592-1BM00-0XB0</b> <b>6ES7592-1BM00-0XA0</b>
<u>Module width: 35 mm</u> 8 analog inputs, $\pm 10$ V, $\pm 5$ V, 1 ... 5 V or 0/4 ... 20 mA, $\pm 20$ mA, 16 bit + sign; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door	<b>6ES7531-7NF10-0AB0</b>	<b>DIN A4 labeling sheets</b> For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray  For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	<b>6ES7592-2AX00-0AA0</b>  <b>6ES7592-1AX00-0AA0</b>
8 analog inputs $\pm 10$ V, $\pm 5$ V, $\pm 2.5$ V, $\pm 1$ V, $\pm 500$ mV, $\pm 250$ mV, $\pm 80$ mV, $\pm 50$ mV, 1 ... 5 V, 0/4 ... 20 mA, $\pm 20$ mA, thermocouples type B, E, J, K, N, R, S, T, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt 100, Pt 1000, Pt 250, Pt 500, resistors 0...150/300/600/ 6000 ohms, 16 bit; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door	<b>6ES7531-7KF00-0AB0</b>	<b>U connector</b> 5 units; spare part	<b>6ES7590-0AA00-0AA0</b>
		<b>Universal front door for I/O modules</b> For 35 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part  For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	<b>6ES7528-0AA00-7AA0</b>  <b>6ES7528-0AA00-0AA0</b>
		<b>Shielding set I/O</b> For 35 mm modules; Infeed element, shield clamp, and shield terminal; 5 units, spare part (one shield set supplied with the module).  For 25 mm modules; Infeed element, shield clamp, and shield terminal; 4 units, spare part (one shield set supplied with the module).	<b>6ES7590-5CA00-0AA0</b>  <b>6ES7590-5CA10-0XA0</b>
		<b>Shield terminal element</b> 10 units; spare part	<b>6ES7590-5BA00-0AA0</b>

**SIMATIC S7-1500 advanced controller**

I/O modules

Analog modules

**SM 532 analog output modules****Overview**

- 2, 4 and 8-channel analog output modules
- Optionally with extremely short conversion times
- For connecting analog actuators without additional amplifiers
- Even solves more complex automation tasks

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**Technical specifications**

Article number	<b>6ES7532-5NB00-0AB0</b> AQ 2XU/I ST	<b>6ES7532-5HD00-0AB0</b> AQ 4XU/I ST	<b>6ES7532-5HF00-0AB0</b> AQ 8XU/I HS
<b>Product type designation</b>			
<b>General information</b>			
<b>Product function</b>			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
<b>Engineering with</b>			
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13.0.2	V12 / V12	V12 / V12
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -
<b>Operating mode</b>			
• MSO	Yes	Yes	Yes
<b>CiR - Configuration in RUN</b>			
Reparameterization possible in RUN	Yes	Yes	Yes
Calibration possible in RUN	Yes	Yes	Yes
<b>Supply voltage</b>			
Type of supply voltage	DC	DC	DC
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
<b>Analog outputs</b>			
Number of analog outputs	2	4	8
Cycle time (all channels), min.	3.2 ms; independent of number of activated channels	3.2 ms; independent of number of activated channels	125 µs; independent of number of activated channels
<b>Output ranges, voltage</b>			
• 0 to 10 V	Yes	Yes	Yes
• 1 V to 5 V	Yes	Yes	Yes
• -10 V to +10 V	Yes	Yes	Yes
<b>Output ranges, current</b>			
• 0 to 20 mA	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes
<b>Connection of actuators</b>			
• for voltage output two-wire connection	Yes	Yes	Yes
• for voltage output four-wire connection	Yes	Yes	Yes
• for current output two-wire connection	Yes	Yes	Yes

## Technical specifications (continued)

Article number	6ES7532-5NB00-0AB0 AQ 2XU/I ST	6ES7532-5HD00-0AB0 AQ 4XU/I ST	6ES7532-5HF00-0AB0 AQ 8XU/I HS
<b>Load impedance (in rated range of output)</b>			
• with voltage outputs, min.	1 k $\Omega$ ; 0.5 k $\Omega$ hm at 1 to 5 V	1 k $\Omega$ ; 0.5 k $\Omega$ hm at 1 to 5 V	1 k $\Omega$
• with voltage outputs, capacitive load, max.	1 $\mu$ F	1 $\mu$ F	100 nF
• with current outputs, max.	750 $\Omega$	750 $\Omega$	500 $\Omega$
• with current outputs, inductive load, max.	10 mH	10 mH	1 mH
<b>Cable length</b>			
• shielded, max.	800 m; for current, 200 m for voltage	800 m; for current, 200 m for voltage	200 m
<b>Analog value generation for the outputs</b>			
<b>Integration and conversion time/ resolution per channel</b>			
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit
• Conversion time (per channel)	0.5 ms	0.5 ms	50 $\mu$ s
<b>Settling time</b>			
• for resistive load	1.5 ms	1.5 ms	30 $\mu$ s; see additional description in the manual
• for capacitive load	2.5 ms	2.5 ms	100 $\mu$ s; see additional description in the manual
• for inductive load	2.5 ms	2.5 ms	100 $\mu$ s; see additional description in the manual
<b>Errors/accuracies</b>			
<b>Basic error limit (operational limit at 25 °C)</b>			
• Voltage, relative to output area, (+/-)	0.2 %	0.2 %	0.2 %
• Current, relative to output area, (+/-)	0.2 %	0.2 %	0.2 %
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)	No		Yes
Execution and activation time (TCO), min.			100 $\mu$ s
Bus cycle time (TDP), min.			250 $\mu$ s
<b>Interrupts/diagnostics/ status information</b>			
Substitute values connectable	Yes	Yes	Yes
<b>Alarms</b>			
• Diagnostic alarm	Yes	Yes	Yes
<b>Diagnostic messages</b>			
• Diagnostics	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	Yes; Only for output type "current"	Yes; Only for output type "current"	Yes; Only for output type "current"
• Short circuit	Yes; Only for output type "voltage"	Yes; Only for output type "voltage"	Yes; Only for output type "voltage"
• Overflow/underflow	Yes	Yes	Yes
<b>Diagnostics indication LED</b>			
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	Yes; Green LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED
<b>Electrical isolation channels</b>			
• between the channels and the backplane bus	Yes	Yes	Yes

**SIMATIC S7-1500 advanced controller**

I/O modules

Analog modules

**SM 532 analog output modules****Technical specifications** (continued)

Article number	<b>6ES7532-5NB00-0AB0</b> AQ 2XU/I ST	<b>6ES7532-5HD00-0AB0</b> AQ 4XU/I ST	<b>6ES7532-5HF00-0AB0</b> AQ 8XU/I HS
<b>Isolation</b>			
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
<b>Decentralized operation</b>			
Prioritized startup	No	No	No
<b>Dimensions</b>			
Width	25 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
<b>Weights</b>			
Weight, approx.	200 g	310 g	325 g
<b>other</b>			
Note:	Supplied incl. 40-pole push-in front connectors		

**Ordering data****Article No.****Article No.****SM 532 analog output modules**Module width 25 mm

2 analog outputs,  $\pm 10$  V, 1 ... 5 V, 0 ... 10 V or  $\pm 20$  mA, 0/4 ... 20 mA, 16 bit;  
incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door

**6ES7532-5NB00-0AB0**Module width 35 mm

4 analog outputs,  $\pm 10$  V, 1 ... 5 V, 0 ... 10 V or  $\pm 20$  mA, 0/4 ... 20 mA, 16 bit;  
incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door

**6ES7532-5HD00-0AB0**

8 analog outputs,  $\pm 10$  V, 1 ... 5 V, 0 ... 10 V or  $\pm 20$  mA, 0/4 ... 20 mA, 16 bit;  
incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door

**6ES7532-5HF00-0AB0****Accessories****Front connectors**

For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin

- Screw terminals
- Push-in

**6ES7592-1AM00-0XB0****6ES7592-1BM00-0XB0****6ES7592-1BM00-0XA0**

For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; Spare part

**DIN A4 labeling sheets**

For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray

**6ES7592-2AX00-0AA0**

For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray

**6ES7592-1AX00-0AA0****U connector**

5 units; spare part

**6ES7590-0AA00-0AA0****Universal front door for I/O modules**

For 35 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part

**6ES7528-0AA00-7AA0**

For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part

**6ES7528-0AA00-0AA0****Shielding set I/O**

For 35 mm modules; Infeed element, shield clamp, and shield terminal; 5 units, spare part (one shield set supplied with the module).

**6ES7590-5CA00-0AA0**

For 25 mm modules; Infeed element, shield clamp, and shield terminal; 4 units, spare part (one shield set supplied with the module).

**6ES7590-5CA10-0XA0****Shield connection clamp**

10 units; spare part

**6ES7590-5BA00-0AA0**

## Overview



- 4 analog inputs/ 2 analog outputs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- For use in the tightest spaces

## Technical specifications

Article number	<b>6ES7534-7QE00-0AB0</b> AI/AQ 4XU/I/RTD/TC; 2XU, I ST
<b>Product type designation</b>	
<b>General information</b>	
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13.0.2
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1
• PROFINET as of GSD version/GSD revision	V2.3 / -
<b>Operating mode</b>	
• MSI	Yes
• MSO	Yes
<b>CiR - Configuration in RUN</b>	
Reparameterization possible in RUN	Yes
Calibration possible in RUN	Yes
<b>Supply voltage</b>	
Type of supply voltage	DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Analog inputs</b>	
Number of analog inputs	4
• For current measurement	4
• For voltage measurement	4
• For resistance/resistance thermometer measurement	2
• For thermocouple measurement	4
permissible input voltage for voltage input (destruction limit), max.	28.8 V
Technical unit for temperature measurement adjustable	Yes

Article number	<b>6ES7534-7QE00-0AB0</b> AI/AQ 4XU/I/RTD/TC; 2XU, I ST
<b>Input ranges (rated values), voltages</b>	
• 1 V to 5 V	Yes
• -1 V to +1 V	Yes
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -250 mV to +250 mV	Yes
• -5 V to +5 V	Yes
• -50 mV to +50 mV	Yes
• -500 mV to +500 mV	Yes
• -80 mV to +80 mV	Yes
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Input ranges (rated values), thermoelements</b>	
• Type B	Yes
• Type E	Yes
• Type J	Yes
• Type K	Yes
• Type N	Yes
• Type R	Yes
• Type S	Yes
• Type T	Yes
<b>Input ranges (rated values), resistance thermometer</b>	
• Ni 100	Yes; Standard/climate
• Ni 1000	Yes; Standard/climate
• LG-Ni 1000	Yes; Standard/climate
• Pt 100	Yes; Standard/climate
• Pt 1000	Yes; Standard/climate
• Pt 200	Yes; Standard/climate
• Pt 500	Yes; Standard/climate
<b>Input ranges (rated values), resistors</b>	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
• 0 to 6000 ohms	Yes
• PTC	Yes



## SIMATIC S7-1500 advanced controller

I/O modules

Analog modules

## SM 534 analog input/output modules

## Technical specifications (continued)

Article number	<b>6ES7534-7QE00-0AB0</b> AI/AQ 4XU/I/RTD/TC; 2XU, I ST
<b>Thermocouple (TC)</b>	
• Technical unit for temperature measurement	°C/°F/K
<b>Temperature compensation</b>	
- Parameterizable	Yes
<b>Resistance thermometer (RTD)</b>	
• Technical unit for temperature measurement	°C/°F/K
<b>Cable length</b>	
• shielded, max.	800 m; for U/I, 200 m for R/RTD, 50 m for TC
<b>Analog outputs</b>	
Number of analog outputs	2
Cycle time (all channels), min.	3.2 ms; ±0.5 ms, regardless of the number of activated channels
<b>Output ranges, voltage</b>	
• 0 to 10 V	Yes
• 1 V to 5 V	Yes
• -10 V to +10 V	Yes
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Connection of actuators</b>	
• for voltage output two-wire connection	Yes
• for voltage output four-wire connection	Yes
• for current output two-wire connection	Yes
<b>Load impedance (in rated range of output)</b>	
• with voltage outputs, min.	1 kΩ; 0.5 kΩ at 1 to 5 V
• with voltage outputs, capacitive load, max.	1 μF
• with current outputs, max.	750 Ω
• with current outputs, inductive load, max.	10 mH
<b>Cable length</b>	
• shielded, max.	800 m; for current, 200 m for voltage
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Integration time (ms)	2.5 / 16.67 / 20 / 100
• Basic conversion time, including integration time (ms)	9 / 23 / 27 / 107 ms
- additional conversion time for wire break monitoring	9 ms
- additional conversion time for resistance measurement	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10
<b>Smoothering of measured values</b>	
• Parameterizable	Yes

Article number	<b>6ES7534-7QE00-0AB0</b> AI/AQ 4XU/I/RTD/TC; 2XU, I ST
<b>Analog value generation for the outputs</b>	
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit
• Conversion time (per channel)	0.5 ms
<b>Settling time</b>	
• for resistive load	1.5 ms
• for capacitive load	2.5 ms
• for inductive load	2.5 ms
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	Yes
- Burden of 2-wire transmitter, max.	820 Ω
• for current measurement as 4-wire transducer	Yes
• for resistance measurement with two-wire connection	Yes; Only for PTC
• for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC
<b>Errors/accuracies</b>	
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to input area, (+/-)	0.1 %
• Current, relative to input area, (+/-)	0.1 %
• Resistance, relative to input area, (+/-)	0.1 %
• Resistance thermometer, relative to input area, (+/-)	0.1 %; Pt xxx standard: ±0.7 K, Pt xxx climate: ±0.2 K, Ni xxx standard: ±0.3 K, Ni xxx climate: ±0.15 K
• Thermocouple, relative to input area, (+/-)	0.1 %; Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K
• Voltage, relative to output area, (+/-)	0.2 %
• Current, relative to output area, (+/-)	0.2 %
<b>Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency</b>	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB
• common mode voltage, max.	10 V
• Common mode interference, min.	60 dB
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	No

## Technical specifications (continued)

Article number	<b>6ES7534-7QE00-0AB0</b> AI/AQ 4XU/I/RTD/TC; 2XU, I ST
<b>Interrupts/diagnostics/ status information</b>	
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
<b>Diagnostic messages</b>	
• Diagnostics	Yes
• Monitoring the supply voltage	Yes
• Wire break	Yes; only for input type 1 ... 5 V, 4 ... 20 mA, TC, R, RTD and output type current
• Short circuit	Yes; Only for output type "voltage"
• Overflow/underflow	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; Red LED
<b>Galvanic isolation</b>	
<b>Galvanic isolation analog inputs</b>	
• between the channels and the backplane bus	Yes
<b>Galvanic isolation analog outputs</b>	
• between the channels and the backplane bus	Yes
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Decentralized operation</b>	
Prioritized startup	No
<b>Dimensions</b>	
Width	25 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	250 g
<b>other</b>	
Note:	Supplied incl. 40-pole push-in front connectors. Additional basic error and noise for integration time = 2.5 ms: Voltage: $\pm 250$ mV ( $\pm 0.02\%$ ), $\pm 80$ mV ( $\pm 0.05\%$ ), $\pm 50$ mV ( $\pm 0.05\%$ ); resistance: 150 Ohms ( $\pm 0.02\%$ ); resistance thermometer: Pt100 climate: $\pm 0.08$ K, Ni100 climate: $\pm 0.08$ K; thermoelement: Type B, R, S: $\pm 3$ K, type E, J, K, N, T: $\pm 1$ K

## Ordering data

## Article No.

**SM 534 analog input/output module**

## Module width 25 mm

4 analog inputs  $\pm 10$  V,  $\pm 5$  V,  $\pm 2.5$  V,  $\pm 1$  V,  $\pm 500$  mV,  $\pm 250$  mV,  $\pm 80$  mV,  $\pm 50$  mV, 1 ... 5 V, 0/4 ... 20 mA,  $\pm 20$  mA, thermocouples type B, E, J, K, N, R, S, T, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt 100, Pt 1000, Pt 250, Pt 500, resistors 0...150/300/600/6000 Ohm, 16 bit; 2 analog outputs,  $\pm 10$  V, 1 ... 5 V, 0 ... 10 V or  $\pm 20$  mA, 0/4 ... 20 mA, 16 bit; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door

**6ES7534-7QE00-0AB0****Accessories****Front connectors**

For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; Spare part

**6ES7592-1BM00-0XA0****DIN A4 labeling sheets**

For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray

**6ES7592-1AX00-0AA0****U connector**

5 units; spare part

**6ES7590-0AA00-0AA0****Universal front door for I/O modules**

For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part

**6ES7528-0AA00-0AA0****Shielding set I/O**

For 25 mm modules; Infeed element, shield clamp, and shield terminal; 4 units, spare part (one shield set supplied with the module).

**6ES7590-5CA10-0XA0****Shield terminal element**

10 units; spare part

**6ES7590-5BA00-0AA0**

**SIMATIC S7-1500 advanced controller**

I/O modules

SIPLUS analog modules

**SIPLUS SM 531 analog modules****Overview**

- 8-channel analog input modules
- Optionally with extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- Even solves more complex automation tasks

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	<b>6AG1531-7NF10-7AB0</b>	<b>6AG1531-7KF00-7AB0</b>
Based on	<b>6ES7531-7NF10-0AB0</b> SIPLUS S7-1500 AI 8XU/I HS	<b>6AG1531-7KF00-7AB0</b> SIPLUS S7-1500 AI 8XU/I/RTD/TC ST
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• horizontal installation, min.	-40 °C; = Tmin; startup @ -25 °C	-25 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax; > +60 °C max. 4x ±20 mA or 4x ±10 V permissible	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin; startup @ -25 °C	-25 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax	50 °C; = Tmax
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****SIPLUS SM 531 analog input modules**

(extended temperature range and medial exposure)

8 analog inputs, ±10 V, ±5 V, 1 ... 5 V or 0/4 ... 20 mA, ±20 mA, 16 bit + sign; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door

**Article No.****6AG1531-7NF10-7AB0****Article No.****6AG1531-7KF00-7AB0**

8 analog inputs  
±10 V, ±5 V, ±2.5 V, ±1 V, ±500 mV, ±250 mV, ±80 mV, ±50 mV, 1 ... 5 V, 0/4 ... 20 mA, ±20 mA, thermocouples type B, E, J, K, N, R, S, T, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt 100, Pt 1000, Pt 250, Pt 500, resistors 0...150/300/600/6000 Ohm, 16 bit

**Accessories**

See SIMATIC S7-1500 SM 531 analog input modules, page 4/49

**Overview**

- 4 and 8-channel analog output modules
- Optionally with extremely short conversion times
- For connecting analog actuators without additional amplifiers
- Even solves more complex automation tasks

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	<b>6AG1532-5HD00-7AB0</b>	<b>6AG1532-5HF00-7AB0</b>
Based on	<b>6ES7532-5HD00-0AB0</b> SIPLUS S7-1500 AO 4XU/I ST	<b>6ES7532-5HF00-0AB0</b> SIPLUS S7-1500 AO 8XU/I HS
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• horizontal installation, min.	-25 °C; = Tmin	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	70 °C; = Tmax; > +60 °C max. 4x ±10 V permissible	70 °C; = Tmax; > +60 °C max. 4x ±10 V permissible
• vertical installation, min.	-25 °C; = Tmin	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****SIPLUS SM 532 analog output modules**

(extended temperature range and medial exposure)

4 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16 bit

8 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16 bit; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door

**Article No.****6AG1532-5HD00-7AB0****6AG1532-5HF00-7AB0****Article No.****Accessories**

See SIMATIC S7-1500 SM 532 analog output modules, page 4/52

**SIMATIC S7-1500 advanced controller**

I/O modules

Technology modules

**TM PosInput 2 position detection modules****Overview**

- 2-channel counting and position detection module with RS 422 interface
- Extensive parameterization options for optimum task-specific adaptation
- Reduces load on controller due to preprocessing on the module
- Position detection with incremental and SSI absolute encoders
- Speed and time period measuring
- Storage and comparison functions
- Connection of encoders with RS 422 signals or 5V-TTL signals

**Technical specifications**

Article number	<b>6ES7551-1AB00-0AB0</b> S7-1500, TM POSINPUT 2
<b>Product type designation</b>	
<b>General information</b>	
<b>Product function</b>	
• I&M data	Yes; I&M 0
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	V12 SP1 / V12 SP1
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -
• PROFINET as of GSD version/GSD revision	V2.3 / -
<b>Installation type/mounting</b>	
Type of fitting, rail mounting	Yes; S7-1500 mounting rail
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes
<b>Input current</b>	
Current consumption, max.	75 mA; without load
<b>Encoder supply</b>	
Number of outputs	4; One 5 V and 24 V encoder supply per channel
<b>5 V encoder supply</b>	
• 5 V	Yes; 5.2 V +/-2%
• short-circuit protection	Yes
• Output current, max.	300 mA; Per channel
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	300 mA; Per channel
<b>Power</b>	
Power available from the backplane bus	1.3 W
<b>Power losses</b>	
Power loss, typ.	5.5 W

Article number	<b>6ES7551-1AB00-0AB0</b> S7-1500, TM POSINPUT 2
<b>Digital inputs</b>	
Number of digital inputs	4; 2 per channel
Digital inputs, configurable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Digital input functions, parameterizable</b>	
• Gate start/stop	Yes; only for pulse and incremental encoders
• Capture	Yes
• Synchronization	Yes; only for pulse and incremental encoders
• Freely usable digital input	Yes
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V
• permissible voltage at input, max.	30 V
<b>Input current</b>	
• for signal "1", typ.	2.5 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
<b>for counter/technological functions</b>	
- Parameterizable	Yes
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	600 m

## Technical specifications (continued)

Article number	6ES7551-1AB00-0AB0 S7-1500, TM POSINPUT 2	Article number	6ES7551-1AB00-0AB0 S7-1500, TM POSINPUT 2
<b>Digital outputs</b>		<b>Encoder signals, incremental encoder (asymmetrical)</b>	
Type of digital output	Transistor	• Input voltage	5 V TTL (push-pull encoders only)
Number of digital outputs	4; 2 per channel	• Input frequency, max.	1 MHz
Digital outputs, configurable short-circuit protection	Yes	• Counting frequency, max.	4 MHz; with quadruple evaluation
Limitation of inductive shutdown voltage to	Yes; electronic/thermal	• Signal filter, can be parameterized	Yes
Controlling a digital input	L+ (-33 V)	• Incremental encoder with A/B tracks, 90° out of phase	Yes
	Yes	• Incremental encoder with A/B tracks, 90° out of phase and zero track	Yes
<b>Digital output functions, parameterizable</b>		• Pulse encoder	Yes
• Switching tripped by comparison values	Yes	• Pulse encoder with direction	Yes
• Freely usable digital output	Yes	• Pulse encoder with one impulse signal per count direction	Yes
<b>Switching capacity of the outputs</b>		<b>Encoder signals, absolute encoder (SSI)</b>	
• with resistive load, max.	0.5 A; Per digital output	• Input signal	to RS-422
• on lamp load, max.	5 W	• Message frame length, parameterizable	10 ... 40 bit
<b>Load resistance range</b>		• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• lower limit	48 Ω	• Binary code	Yes
• upper limit	12 kΩ	• Gray code	Yes
<b>Output voltage</b>		• Cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max.; 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.
• Type of output voltage	DC	• Parity bit, parameterizable	Yes
• for signal "1", min.	23.2 V; L+ (-0.8 V)	• Monoflop time	16, 32, 48, 64 μs & automatic
<b>Output current</b>		• Multiturn	Yes
• for signal "1" rated value	0.5 A; Per digital output	• Singleturn	Yes
• for signal "0" residual current, max.	0.5 mA	<b>Interface types</b>	
<b>Output delay with resistive load</b>		• RS422	Yes
• "0" to "1", max.	50 μs	• TTL 5 V	Yes; push-pull encoders only
• "1" to "0", max.	50 μs	<b>Isochronous mode</b>	
<b>Switching frequency</b>		Isochronous operation (application synchronized up to terminal)	Yes
• with resistive load, max.	10 kHz	Filtering and processing time (TCI), min.	130 μs; only for pulse and incremental encoders
• with inductive load, max.	0.5 Hz; Acc. to IEC 947-5-1, DC-13; observe derating curve	Bus cycle time (TDP), min.	250 μs
• on lamp load, max.	10 Hz	<b>Interrupts/diagnostics/status information</b>	
<b>Aggregate current of the outputs</b>		<b>Alarms</b>	
• Current per module, max.	2 A	• Diagnostic alarm	Yes
<b>Cable length</b>		• Hardware interrupt	Yes
• shielded, max.	1 000 m	<b>Diagnostic messages</b>	
• Unshielded, max.	600 m	• Monitoring the supply voltage	Yes
<b>Encoder signals, incremental encoder (symmetrical)</b>		• Wire break	Yes
• Input voltage	RS 422	• Short circuit	Yes
• Input frequency, max.	1 MHz	• A/B transition error at incremental encoder	Yes
• Counting frequency, max.	4 MHz; with quadruple evaluation	• Frame error at SSI encoder	Yes
• Signal filter, can be parameterized	Yes	<b>Diagnostics indication LED</b>	
• Cable length, shielded, max.	32 m; at 1 MHz	• RUN LED	Yes; Green LED
• Incremental encoder with A/B tracks, 90° out of phase	Yes	• ERROR LED	Yes; Red LED
• Incremental encoder with A/B tracks, 90° out of phase and zero track	Yes	• MAINT LED	Yes; yellow LED
• Pulse encoder	Yes	• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Pulse encoder with direction	Yes	• Channel status display	Yes; Green LED
• Pulse encoder with one impulse signal per count direction	Yes	• for channel diagnostics	Yes; Red LED

**SIMATIC S7-1500 advanced controller**

I/O modules

Technology modules

**TM PosInput 2 position detection modules****Technical specifications (continued)**

Article number	<b>6ES7551-1AB00-0AB0</b> S7-1500, TM POSINPUT 2
<b>Integrated Functions</b>	
Number of counters	2
Counter frequency (counter) max.	4 MHz; with quadruple evaluation
<b>Counting functions</b>	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response can be parameterized	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
<b>Comparator</b>	
- Number of comparators	2; Per channel
- Direction dependency	Yes
- Can be changed from user program	Yes
<b>Position detection</b>	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
<b>Measuring functions</b>	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
<b>Measuring range</b>	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	4 MHz
- Period measurement, min.	0.25 µs
- Period measurement, max.	25 s
<b>Accuracy</b>	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Speed measurement	100 ppm; depending on measuring interval and signal evaluation

Article number	<b>6ES7551-1AB00-0AB0</b> S7-1500, TM POSINPUT 2
<b>Electrical isolation channels</b>	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	No
<b>Permissible potential difference</b>	
between different circuits	75 V DC/60 V AC (base isolation)
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Please note derating for inductive loads
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
<b>Decentralized operation</b>	
To SIMATIC S7-1500	Yes
To standard PROFINET controller	Yes
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	325 g

**Ordering data****Counter and positioning module TM PosInput 2**

with 2 channels, max. 1 MHz counting frequency; for SSI encoders and incremental encoders with RS 422 or 5V TTL interface

**Accessories****Front connectors**

For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin

- Screw terminals
- Push-in

**DIN A4 labeling sheets**

10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey

**Article No.****6ES7551-1AB00-0AB0****6ES7592-1AM00-0XB0****6ES7592-1BM00-0XB0****6ES7592-2AX00-0AA0****Article No.****U connector**

5 units; spare part

**Universal front door for I/O modules**

5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part

**Shielding set I/O**

Infeed element, shield clamp, and shield terminal; 5 units; spare part

**Shield terminal element**

10 units; spare part

**6ES7590-0AA00-0AA0****6ES7528-0AA00-7AA0****6ES7590-5CA00-0AA0****6ES7590-5BA00-0AA0**



## Overview



- 2-channel high-speed counter module
- With comprehensive parameterization options for an optimum adaptation to the task and reduction of control load
- Speed and time period measuring
- Storage and comparison functions
- Connection of 24 V encoders

## Technical specifications

Article number	<b>6ES7550-1AA00-0AB0</b> S7-1500, TM COUNT 2X24V
<b>Product type designation</b>	
<b>General information</b>	
<b>Product function</b>	
• I&M data	Yes; I&M 0
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	V12 / V12
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -
• PROFINET as of GSD version/GSD revision	V2.3 / -
<b>Installation type/mounting</b>	
Type of fitting, rail mounting	Yes; S7-1500 mounting rail
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes
<b>Input current</b>	
Current consumption, max.	75 mA; without load
<b>Encoder supply</b>	
Number of outputs	1; A common 24 V encoder supply for both channels
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	1 A; total current of all encoders/channels
<b>Power</b>	
Power available from the backplane bus	1.3 W
<b>Power losses</b>	
Power loss, typ.	4 W

Article number	<b>6ES7550-1AA00-0AB0</b> S7-1500, TM COUNT 2X24V
<b>Digital inputs</b>	
Number of digital inputs	6; 3 per channel
Digital inputs, configurable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Digital input functions, parameterizable</b>	
• Gate start/stop	Yes
• Capture	Yes
• Synchronization	Yes
• Freely usable digital input	Yes
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V
• permissible voltage at input, max.	30 V
<b>Input current</b>	
• for signal "1", typ.	2.5 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
<b>for counter/technological functions</b>	
- Parameterizable	Yes
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	600 m



# SIMATIC S7-1500 advanced controller

I/O modules

Technology modules

## TM Count 2x24V counter modules

### Technical specifications (continued)

Article number	<b>6ES7550-1AA00-0AB0</b> S7-1500, TM COUNT 2X24V
<b>Digital outputs</b>	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, configurable	Yes
short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
<b>Digital output functions, parameterizable</b>	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	48 Ω
• upper limit	12 kΩ
<b>Output voltage</b>	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	50 μs
• "1" to "0", max.	50 μs
<b>Switching frequency</b>	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
<b>Aggregate current of the outputs</b>	
• Current per module, max.	2 A
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
<b>Encoder</b>	
<b>Connectable encoders</b>	
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Signal filter, can be parameterized	Yes
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Incremental encoder with A/B tracks, 90° out of phase	Yes
• Incremental encoder with A/B tracks, 90° out of phase and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes

Article number	<b>6ES7550-1AA00-0AB0</b> S7-1500, TM COUNT 2X24V
<b>Encoder signal 24 V</b>	
- Permissible voltage at input, min.	-30 V
- Permissible voltage at input, max.	30 V
<b>Interface types</b>	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
• m/p-reading	Yes
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes
Filtering and processing time (TCI), min.	130 μs
Bus cycle time (TDP), min.	250 μs
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
<b>Diagnostic messages</b>	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• Short circuit	Yes
• A/B transition error at incremental encoder	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• Status indicator backward counting (green)	Yes
• Status indicator forward counting (green)	Yes
<b>Integrated Functions</b>	
Number of counters	2
Counter frequency (counter) max.	800 kHz; with quadruple evaluation
<b>Counting functions</b>	
• Continuous counting	Yes
• Counter response can be parameterized	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
<b>Comparator</b>	
- Number of comparators	2; Per channel
- Direction dependency	Yes
- Can be changed from user program	Yes
<b>Position detection</b>	
• Incremental acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes

**Technical specifications (continued)**

Article number	<b>6ES7550-1AA00-0AB0</b> S7-1500, TM COUNT 2X24V
<b>Measuring functions</b>	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
<b>Measuring range</b>	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz
- Period measurement, min.	1.25 µs
- Period measurement, max.	25 s
<b>Accuracy</b>	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Speed measurement	100 ppm; depending on measuring interval and signal evaluation
<b>Electrical isolation channels</b>	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	No
<b>Permissible potential difference</b>	
between different circuits	75 V DC/60 V AC (base isolation)
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Please note derating for inductive loads
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
<b>Decentralized operation</b>	
To SIMATIC S7-1500	Yes
To standard PROFINET controller	Yes
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	250 g

**Ordering data****Article No.**

<b>TM Count 2x24V counter module</b>	<b>6ES7550-1AA00-0AB0</b>
With 2 channels, max. 200 kHz; for 24 V encoder	
<b>Accessories</b>	
<b>Front connectors</b>	
For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	<b>6ES7592-1AM00-0XB0</b>
• Push-in	<b>6ES7592-1BM00-0XB0</b>
<b>DIN A4 labeling sheets</b>	<b>6ES7592-2AX00-0AA0</b>
10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey	
<b>U connector</b>	<b>6ES7590-0AA00-0AA0</b>
5 units; spare part	
<b>Universal front door for I/O modules</b>	<b>6ES7528-0AA00-7AA0</b>
5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	
<b>Shielding set I/O</b>	<b>6ES7590-5CA00-0AA0</b>
Infed element, shield clamp, and shield terminal; 5 units, spare part	
<b>Shield terminal element</b>	<b>6ES7590-5BA00-0AA0</b>
10 units; spare part	

**SIMATIC S7-1500 advanced controller**

I/O modules

Technology modules

**TM Timer DIDQ 16x24V time-based IO modules****Overview**

- 8 digital inputs, 16 digital outputs, of which up to 16 can be used in different configurations as technological, time-controlled channels
- Inputs for detecting the input edges with  $\mu\text{s}$  accuracy
- Outputs for outputting switching signals with  $\mu\text{s}$  accuracy
- 32x oversampling
- PWM output
- Counter function
- Outputs can be switched between 0.5 A standard and especially fast 0.1 A high-speed operation

**Technical specifications**

Article number	<b>6ES7552-1AA00-0AB0</b> S7-1500, TM TIMER DIDQ 16X24V
<b>Product type designation</b>	
<b>General information</b>	
<b>Product function</b>	
• I&M data	Yes; I&M 0
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	V13 Update 3
<b>Installation type/mounting</b>	
Type of fitting, rail mounting	Yes; S7-1500 mounting rail
<b>Load voltage 1L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes; against destruction
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes; against destruction
<b>Input current</b>	
from load voltage 1L+ (without load), max.	40 mA; without load
from load voltage 2L+ (without load), max.	30 mA; without load
<b>Encoder supply</b>	
Number of outputs	8; max. depending on parameterization
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	1.2 A; Total current of all encoders / channels, max. 0.5 A per output
<b>Power</b>	
Power available from the backplane bus	1.3 W
<b>Power losses</b>	
Power loss, typ.	5 W

Article number	<b>6ES7552-1AA00-0AB0</b> S7-1500, TM TIMER DIDQ 16X24V
<b>Digital inputs</b>	
Number of digital inputs	8; max. depending on parameterization
• In groups of	8
Digital inputs, configurable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Digital input functions, parameterizable</b>	
• Digital input with time stamp	Yes
- Number, max.	8
• Counter	Yes
- Number, max.	4
• Counter for incremental encoder	Yes
- Number, max.	4
• Digital input with oversampling	Yes
- Number, max.	8
• HW enable for digital input	Yes
- Number, max.	4
• HW enable for digital output	Yes
- Number, max.	4
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V
• permissible voltage at input, max.	30 V
<b>Input current</b>	
• for signal "1", typ.	2.5 mA
<b>Input delay (for rated value of input voltage)</b>	
• Minimum pulse width for program reactions	3 $\mu\text{s}$ for parameterization "none"
<b>for standard inputs</b>	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms
- at "0" to "1", min.	4 $\mu\text{s}$ ; for parameterization "none"
- at "1" to "0", min.	4 $\mu\text{s}$ ; for parameterization "none"
<b>Cable length</b>	
• shielded, max.	1 000 m; Depending on sensor, cable quality and rate of change
• Unshielded, max.	600 m; Depending on sensor, cable quality and rate of change

## Technical specifications (continued)

Article number	<b>6ES7552-1AA00-0AB0</b> S7-1500, TM TIMER DIDQ 16X24V
<b>Digital outputs</b>	
Type of digital output	Transistor
Number of digital outputs	16; max. depending on parameterization
• In groups of	8
Current-sinking	Yes; With High Speed output
Current-sourcing	Yes
Digital outputs, configurable	Yes
short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V
Controlling a digital input	Yes
<b>Digital output functions, parameterizable</b>	
• Digital output with time stamp	Yes
- Number, max.	16
• PWM output	Yes
- Number, max.	16
• Digital output with oversampling	Yes
- Number, max.	16
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A; 0.1 A with High Speed output
• on lamp load, max.	5 W; 1 W with High Speed output
<b>Load resistance range</b>	
• lower limit	48 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
<b>Output voltage</b>	
• Type of output voltage	DC
• for signal "0", max.	1 V; With High Speed output
• for signal "1", min.	23.2 V; L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A; 0.1 A with High Speed output, observe derating
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	1 μs; With High Speed output, 5 μs with Standard output
• "1" to "0", max.	1 μs; With High Speed output, 6 μs with Standard output
<b>Switching frequency</b>	
• with resistive load, max.	10 kHz
• on lamp load, max.	10 Hz
<b>Aggregate current of the outputs</b>	
• Current per group, max.	4 A
• Current per module, max.	8 A; Observe derating
<b>Cable length</b>	
• shielded, max.	1 000 m; Depending on load and cable quality
• Unshielded, max.	600 m; Depending on load and cable quality

Article number	<b>6ES7552-1AA00-0AB0</b> S7-1500, TM TIMER DIDQ 16X24V
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Input voltage	24 V
• Input frequency, max.	50 kHz
• Counting frequency, max.	200 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz
• Incremental encoder with A/B tracks, 90° out of phase	Yes
• Pulse encoder	Yes
<b>Encoder signal 24 V</b>	
- Permissible voltage at input, min.	-30 V
- Permissible voltage at input, max.	30 V
<b>Interface types</b>	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes
Bus cycle time (TDP), min.	250 μs
<b>Interrupts/diagnostics/status information</b>	
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnostic messages</b>	
• Diagnostics	Yes
• Monitoring the supply voltage	Yes
• Short circuit	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
<b>Integrated Functions</b>	
Number of counters	4
Counter frequency (counter) max.	200 kHz; with quadruple evaluation
<b>Counting functions</b>	
• Continuous counting	Yes
<b>Electrical isolation channels</b>	
• between the channels and the backplane bus	Yes

**SIMATIC S7-1500 advanced controller**

I/O modules

Technology modules

**TM Timer DIDQ 16x24V time-based IO modules****Technical specifications (continued)**

Article number	<b>6ES7552-1AA00-0AB0</b> S7-1500, TM TIMER DIDQ 16X24V
<b>Permissible potential difference</b> between different circuits	75 V DC/60 V AC (base isolation)
<b>Isolation</b> Isolation checked with	707 V DC (type test)
<b>Ambient conditions</b> <b>Ambient temperature in operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Observe derating
<b>Decentralized operation</b> To SIMATIC S7-1500	Yes
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b> Weight, approx.	320 g

**Ordering data****Article No.**

<b>Time-based IO module</b> <b>TM Timer DIDQ 16x24V</b>	<b>6ES7552-1AA00-0AB0</b>
Max. 16 time-controlled inputs or outputs	
<b>Accessories</b>	
<b>Front connector</b>	
For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	<b>6ES7592-1AM00-0XB0</b>
• Push-in	<b>6ES7592-1BM00-0XB0</b>
<b>DIN A4 labeling sheets</b>	<b>6ES7592-2AX00-0AA0</b>
10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey	
<b>U connector</b>	<b>6ES7590-0AA00-0AA0</b>
5 units; spare part	
<b>Universal front door for I/O modules</b>	<b>6ES7528-0AA00-7AA0</b>
5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	
<b>Shielding set I/O</b>	<b>6ES7590-5CA00-0AA0</b>
Infeed element, shield clamp, and shield terminal; 5 units, spare part: Note: Only shield clamps and shield terminal are required for the TM Timer DIDQ 16x24V	
<b>Shield terminal element</b>	<b>6ES7590-5BA00-0AA0</b>
10 units; spare part	

**Overview**

- 2-channel high-speed counter module
- With comprehensive parameterization options for an optimum adaptation to the task and reduction of control load
- Speed and time period measuring
- Storage and comparison functions
- Connection of 24 V encoders

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	<b>6AG1550-1AA00-7AB0</b>
Based on	<b>6ES7550-1AA00-0AB0</b> SIPLUS S7-1500 TM COUNT 2X24V
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
<ul style="list-style-type: none"> <li>• horizontal installation, min.</li> <li>• horizontal installation, max.</li> </ul>	-40 °C; = Tmin; startup @ -25 °C 70 °C; = Tmax; note derating for inductive loads; > +60 °C total current of the encoder supply max. 0.5 A, total current of the outputs max. 1 A
<ul style="list-style-type: none"> <li>• vertical installation, min.</li> <li>• vertical installation, max.</li> </ul>	-40 °C; = Tmin; startup @ -25 °C 40 °C; Please note derating for inductive loads
<b>Extended ambient conditions</b>	
<ul style="list-style-type: none"> <li>• Relative to ambient temperature-atmospheric pressure-installation altitude</li> </ul>	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
<ul style="list-style-type: none"> <li>- With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<ul style="list-style-type: none"> <li>- against biologically active substances / conformity with EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
<ul style="list-style-type: none"> <li>- against chemically active substances / conformity with EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
<ul style="list-style-type: none"> <li>- against mechanically active substances / conformity with EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.**

<b>SIPLUS TM Count 2x24V counter modules</b> (extended temperature range and medial exposure) With 2 channels, max. 200 kHz; for 24 V encoder	<b>6AG1550-1AA00-7AB0</b>
<b>Accessories</b>	See SIMATIC S7-1500, TM Count 2x24V counter module, page 4/63

**SIMATIC S7-1500 advanced controller**

I/O modules

Communication

**CM PtP****Overview**

- Modules for serial communication connections, scaled according to interface types, protocols, and performance
- 4 versions with different physical transmission characteristics:
  - RS 232C, max. 19.2 Kbit/s
  - RS 232C, max. 115.2 Kbit/s
  - RS 422/RS 485, max. 19.2 Kbit/s
  - RS 422/RS 485, max. 115.2 Kbit/s
- Protocols supported
  - Freepoint: User-parameterizable telegram format for universal communication
  - 3964(R) for improved transmission reliability
  - Modbus RTU Master
  - Modbus RTU Slave
  - USS, implemented through instructions

**Technical specifications**

Article number	<b>6ES7540-1AD00-0AA0</b>	<b>6ES7541-1AD00-0AB0</b>	<b>6ES7540-1AB00-0AA0</b>	<b>6ES7541-1AB00-0AB0</b>
	CM PTP RS 232 BA	CM PTP RS 232 HF	CM PTP RS 422/485 BA	CM PTP RS 422/485 HF
<b>Product type designation</b>				
<b>General information</b>				
<b>Product function</b>				
• I&M data	Yes; I&M 0	Yes; I&M 0	Yes; I&M 0	Yes; I&M 0
<b>Engineering with</b>				
• STEP 7 TIA Portal can be configured/integrated as of version	V12 / V12	V12 / V12	V12 / V12	V12 / V12
• STEP 7 can be configured/integrated as of version	V5.5 SP2 with GSD file	V5.5 SP2 with GSD file	V5.5 SP2 with GSD file	V5.5 SP2 with GSD file
• PROFIBUS as of GSD version/GSD revision	- / -	- / -	- / -	- / -
• PROFINET as of GSD version/GSD revision	V2.3	V2.3 / -	V2.3	V2.3 / -
<b>Installation type/mounting</b>				
Type of fitting, rail mounting	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail
<b>Supply voltage</b>				
Type of supply voltage	system power supply	system power supply	system power supply	system power supply
<b>Input current</b>				
Current consumption (rated value)	35 mA; From the backplane bus	35 mA; From the backplane bus	33 mA; From the backplane bus	33 mA; From the backplane bus
<b>Power</b>				
Power available from the backplane bus	0.65 W	0.65 W	0.65 W	0.65 W
<b>Power losses</b>				
Power loss, typ.	0.6 W	0.6 W	0.6 W	0.6 W
<b>Interfaces</b>				
<b>1st interface</b>				
<b>Interface types</b>				
- RS 232	Yes	Yes	Yes	Yes
- RS 422			Yes	Yes
- RS 485			Yes	Yes
<b>RS 232</b>				
• Transmission rate, max.	19.2 kbit/s	115.2 kbit/s		
• Cable length, max.	15 m	15 m		
• RS-232 accompanying signals	RTS, CTS, DTR, DSR, RI, DCD	RTS, CTS, DTR, DSR, RI, DCD		
<b>RS 485</b>				
• Transmission rate, max.			19.2 kbit/s	115.2 kbit/s
• Cable length, max.			1 200 m	1 200 m

**Technical specifications (continued)**

Article number	<b>6ES7540-1AD00-0AA0</b> CM PTP RS 232 BA	<b>6ES7541-1AD00-0AB0</b> CM PTP RS 232 HF	<b>6ES7540-1AB00-0AA0</b> CM PTP RS 422/485 BA	<b>6ES7541-1AB00-0AB0</b> CM PTP RS 422/485 HF
<b>RS 422</b>				
• Transmission rate, max.			19.2 kbit/s	115.2 kbit/s
• Cable length, max.			1 200 m	1 200 m
• 4-wire full duplex connection			Yes	Yes
• 4-wire multipoint connection			No	No
<b>Integrated protocols</b>				
<b>Freepoint</b>				
- Telegram length, max.	1 kbyte	4 kbyte	1 kbyte	4 kbyte
- Bits per character	7 or 8	7 or 8	7 or 8	7 or 8
- Number of stop bits	1 or 2 bit	1 or 2 bit	1 or 2 bit	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any
<b>3964 (R)</b>				
- Telegram length, max.	1 kbyte	4 kbyte	1 kbyte	4 kbyte
- Bits per character	7 or 8	7 or 8	7 or 8	7 or 8
- Number of stop bits	1 or 2 bit	1 or 2 bit	1 or 2 bit	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any
<b>Modbus RTU master</b>				
- Address area		1 to 247, extended 1 to 65535		1 to 247, extended 1 to 65535
- Number of slaves, max.		1		32
<b>MODBUS RTU slave</b>				
- Address area		1 to 247, extended 1 to 65535		1 to 247, extended 1 to 65535
<b>Frame buffer</b>				
• Buffer memory for message frames	2 kbyte	8 kbyte	2 kbyte	8 kbyte
• Number of message frames which can be buffered	255	255	255	255
<b>Interrupts/diagnostics/status information</b>				
<b>Alarms</b>				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Hardware interrupt	No	No	No	No
<b>Diagnostic messages</b>				
• Diagnostics	Yes	Yes	Yes	Yes
• Wire break	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>				
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• Receive RxD	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED
• Send TxD	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED
<b>Galvanic isolation</b>				
between the backplane bus and interface	Yes	Yes	Yes	Yes
<b>Isolation</b>				
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C



**SIMATIC S7-1500 advanced controller**

I/O modules

Communication

**CM PtP****Technical specifications** (continued)

Article number	<b>6ES7540-1AD00-0AA0</b> CM PTP RS 232 BA	<b>6ES7541-1AD00-0AB0</b> CM PTP RS 232 HF	<b>6ES7540-1AB00-0AA0</b> CM PTP RS 422/485 BA	<b>6ES7541-1AB00-0AB0</b> CM PTP RS 422/485 HF
<b>Decentralized operation</b>				
To SIMATIC S7-300	Yes	Yes	Yes	Yes
To SIMATIC S7-400	Yes	Yes	Yes	Yes
To SIMATIC S7-1500	Yes	Yes	Yes	Yes
To standard PROFINET controller	Yes	Yes	Yes	Yes
Fast Startup supported	Yes	Yes	Yes	Yes
<b>Dimensions</b>				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	127 mm	127 mm	127 mm	127 mm
<b>Weights</b>				
Weight, approx.	0.22 kg	0.22 kg	0.22 kg	0.22 kg

**Ordering data****Article No.****Article No.**

<b>CM PtP RS 232 BA communication modules</b> Basic communication module with 1 interface RS 232, Freepport, 3964(R) and USS protocols, 9-pin sub D connector, max. 19.2 Kbit/s	<b>6ES7540-1AD00-0AA0</b>	<b>Accessories</b>	
<b>CM PtP RS 232 HF communication modules</b> High Feature communication module with 1 interface RS 232, Freepport, 3964(R), USS and Modbus RTU protocols, 9-pin sub D connector, max. 115.2 Kbit/s	<b>6ES7541-1AD00-0AB0</b>	<b>RS 232 connecting cables</b> For linking to SIMATIC S7	
<b>CM PtP RS 422/485 BA communication modules</b> Basic communication module with 1 interface RS 422/485, Freepport, 3964(R) and USS protocols, 15-pin sub D socket, max. 19.2 Kbit/s	<b>6ES7540-1AB00-0AA0</b>	5 m	<b>6ES7902-1AB00-0AA0</b>
<b>CM PtP RS 422/485 HF communication modules</b> High Feature communication module with 1 interface RS 422/485, Freepport, 3964(R), USS and Modbus RTU protocols, 15-pin sub D socket, max. 115.2 Kbit/s	<b>6ES7541-1AB00-0AB0</b>	10 m	<b>6ES7902-1AC00-0AA0</b>
		15 m	<b>6ES7902-1AD00-0AA0</b>
		<b>RS 422/485 connecting cables</b> For linking to SIMATIC S7	
		5 m	<b>6ES7902-3AB00-0AA0</b>
		10 m	<b>6ES7902-3AC00-0AA0</b>
		50 m	<b>6ES7902-3AG00-0AA0</b>

## Overview



DP-M	DP-S	FMS	PG/OP	S7	
●	●		●	●	

The CM 1542-5 communication module expands the SIMATIC S7-1500 controller with an additional PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbps. The module also allows the implementation of separate PROFIBUS lines; in other words, the control of multiple field devices via several PROFIBUS segments. The CM 1542-5 assumes all communication tasks, thus reducing the CPU workload.

The CM 1542-5 is suitable for S7 communication as well as for conventional PROFIBUS communication. This makes it possible to establish communication between the S7-1500 controller and other devices, for example those from the SIMATIC S7-300/400 range.

- PROFIBUS DP master or DP slave with electrical interface for connecting the SIMATIC S7-1500 to PROFIBUS at up to 12 Mbit/s (including 45.45 Kbit/s)
- Communication services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Module replacement without a PG
- Data record routing (PROFIBUS DP)
- Adding or modifying distributed I/O during operation

## Technical specifications

Article number	<b>6GK7542-5DX00-0XE0</b>
Product type designation	CM 1542-5
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	15 V
Relative symmetrical tolerance for DC	
• at 15 V	3 %
Consumed current	
• from backplane bus for DC at 15 V typical	0.2 A
Active power loss	3 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-1500 single width
Width	35 mm
Height	142 mm
Depth	129 mm
Net weight	0.4 kg
Mounting type	
• S7-1500 rail mounting	Yes
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	8
• Note	depending on CPU type

**SIMATIC S7-1500 advanced controller**

I/O modules

Communication

**CM 1542-5****Technical specifications (continued)**

Article number	<b>6GK7542-5DX00-0XE0</b>
Product type designation	CM 1542-5
<b>Performance data PROFIBUS DP</b>	
Service as DP master	
• DPV1	Yes
Number of DP slaves on DP master usable	125
Amount of data	
• of the address area of the inputs as DP master total	8 192 byte
• of the address area of the outputs as DP master total	8 192 byte
• of the address area of the inputs per DP slave	244 byte
• of the address area of the outputs per DP slave	244 byte
Service as DP slave	
• DPV0	Yes
• DPV1	Yes
Amount of data	
• of the address area of the inputs as DP slave total	240 byte
• of the address area of the outputs as DP slave total	240 byte
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	40
• Note	depending on the system upper limit
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	40
<b>Performance data telecontrol</b>	
Protocol is supported	
• TCP/IP	No
<b>Product functions management, configuration</b>	
Configuration software	
• required	STEP 7 Professional V12 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
<b>Product functions Diagnosis</b>	
Product function Web-based diagnostics	Yes; yes, via S7-1500 CPU
<b>Product functions Time</b>	
Product function pass on time synchronization	Yes

**Ordering data****Article No.****CM 1542-5 communication modules**

Communication module for electrical connection of SIMATIC S7-1500 to PROFIBUS as a DP master or DP slave

**6GK7542-5DX00-0XE0****Accessories****PROFIBUS RS 485 FastConnect connector**

With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbps

- Without PG interface
- with PG interface

**6ES7972-0BA52-0XA0**  
**6ES7972-0BB52-0XA0****PROFIBUS FC standard cable**

2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order 20 m, sold by the meter

**6XV1830-0EH10****PROFIBUS FastConnect stripping tool**

Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable

**6GK1905-6AA00****PROFIBUS bus terminal 12M**

Bus terminal for connection of PROFIBUS nodes up to 12 Mbps with connecting cable

**6GK1500-0AA10**Note:

You can find order information for software for communication with PC systems in the IK PI catalog.

## Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●		

The CP 1542-5 communications processor expands the SIMATIC S7-1500 controller with an additional PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbit/s. The processor also allows the implementation of separate PROFIBUS lines; in other words, the control of multiple field devices via several PROFIBUS segments. The CP 1542-5 handles all communication tasks, thus reducing the CPU load.

- PROFIBUS DP master or DP slave with electrical interface for connecting the SIMATIC S7-1500 to PROFIBUS at up to 12 Mbit/s (including 45.45 Kbit/s)

Communication services:

- PROFIBUS DP
- PG/OP communication
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Module replacement without a PG

## Technical specifications

Article number	<b>6GK7542-5FX00-0XE0</b>
Product type designation	CP 1542-5
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	15 V
Relative symmetrical tolerance for DC	
• at 15 V	3 %
Consumed current	
• from backplane bus for DC at 15 V typical	0.1 A
Active power loss	1.5 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-1500 single width
Width	35 mm
Height	142 mm
Depth	129 mm
Net weight	0.27 kg
Mounting type	
• S7-1500 rail mounting	Yes
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	8
• Note	depending on CPU type

## SIMATIC S7-1500 advanced controller

I/O modules

Communication

## CP 1542-5

## Technical specifications (continued)

Article number	<b>6GK7542-5FX00-0XE0</b>
Product type designation	CP 1542-5
<b>Performance data PROFIBUS DP</b>	
Service as DP master	
• DPV1	Yes
Number of DP slaves on DP master usable	32
Amount of data	
• of the address area of the inputs as DP master total	2 048 byte
• of the address area of the outputs as DP master total	2 048 byte
• of the address area of the inputs per DP slave	244 byte
• of the address area of the outputs per DP slave	244 byte
Service as DP slave	
• DPV0	Yes
• DPV1	Yes
Amount of data	
• of the address area of the inputs as DP slave total	240 byte
• of the address area of the outputs as DP slave total	240 byte
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	16
• Note	depending on the system upper limit
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	16
<b>Performance data telecontrol</b>	
Protocol is supported	
• TCP/IP	No
<b>Product functions management, configuration</b>	
Configuration software	
• required	STEP 7 Professional V12 SP1 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
<b>Product functions Diagnosis</b>	
Product function Web-based diagnostics	Yes; yes, via S7-1500 CPU
<b>Product functions Time</b>	
Product function pass on time synchronization	Yes

## Ordering data

## Article No.

**CP 1542-5****communications processors**

Communication module for electrical connection of SIMATIC S7-1500 to PROFIBUS as DP master or DP slave; PG/OP communication, time synchronization, diagnostics

**6GK7542-5FX00-0XE0****Accessories****PROFIBUS FastConnect connection plugs**

With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s

• without programming device interface

**6ES7972-0BA52-0XA0**

• with programming device interface

**6ES7972-0BB52-0XA0****PROFIBUS FC standard cable**

2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order 20 m, sold by the meter

**6XV1830-0EH10****PROFIBUS FastConnect stripping tool**

Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable

**6GK1905-6AA00****PROFIBUS bus terminal 12M**

Bus terminal for connection of PROFIBUS stations for up to 12 Mbps with connecting cable

**6GK1500-0AA10**Note:

You can find order information for software for communication with PC systems in the IK PI catalog.

## Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
	●	●	●	●		●	●

Communication module for connecting a SIMATIC S7-1500 to PROFINET networks as PROFINET IO controller.

The CM 1542-1 supports the following communication services:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication
- IT communication;  
web diagnose by means of access to the Web server of the S7-1500 system

## Technical specifications

Article number	<b>6GK7542-1AX00-0XE0</b>
Product type designation	CM 1542-1
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	15 V
Relative symmetrical tolerance for DC	
• at 15 V	3 %
Consumed current	
• from backplane bus for DC at 15 V typical	0.22 A
Active power loss	3.3 W

Article number	<b>6GK7542-1AX00-0XE0</b>
Product type designation	CM 1542-1
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-1500 single width
Width	35 mm
Height	142 mm
Depth	129 mm
Net weight	0.4 kg
Mounting type	
• S7-1500 rail mounting	Yes
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	8
• Note	depending on CPU type
<b>Performance data open communication</b>	
Number of possible connections for open communication	
• by means of T blocks maximum	64; depending on the system upper limit
Amount of data	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
Number of Multicast stations	6
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	64
• Note	depending on the system upper limit
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	64
<b>Performance data PROFINET communication as PN IO-Controller</b>	
Product function PROFINET IO controller	Yes
Number of PN IO devices on PROFINET IO controller usable total	128
Number of PN IO IRT devices on PROFINET IO controller usable	64
Number of external PN IO lines with PROFINET per rack	10

# SIMATIC S7-1500 advanced controller

## I/O modules

### Communication

#### CM 1542-1

#### Technical specifications (continued)

Article number	<b>6GK7542-1AX00-0XE0</b>
Product type designation	CM 1542-1
Amount of data	
• as user data for input variables as PROFINET IO controller maximum	8 Kibyte
• as user data for input variables as PROFINET IO controller maximum	8 Kibyte
• as user data for input variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for output variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for input variables per PN IO device for each sub-module as PROFINET IO controller maximum	256 byte
• as user data for output variables per PN IO device for each sub-module as PROFINET IO controller maximum	256 byte
<b>Performance data telecontrol</b>	
Protocol is supported	
• TCP/IP	Yes
<b>Product functions management, configuration</b>	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 Professional V13 (TIA Portal) or higher
Identification & maintenance function	
• I&MO - device-specific information	Yes
• I&M1 – higher-level designation/location designation	Yes
<b>Product functions Diagnosis</b>	
Product function Web-based diagnostics	Yes; yes, via S7-1500 CPU
<b>Product functions switch</b>	
Product feature Switch	Yes
Product function	
• switch-managed	No
• with IRT PROFINET IO switch	Yes
• Configuration with STEP 7	Yes
<b>Product functions Redundancy</b>	
Product function	
• Ring redundancy	Yes
• Redundancy manager	Yes
Protocol is supported Media Redundancy Protocol (MRP)	Yes
<b>Product functions Security</b>	
Product function	
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	No
• log file for unauthorized access	No
<b>Product functions Time</b>	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported NTP	Yes

#### Ordering data

#### Article No.

**CM 1542-1 communication module** **6GK7542-1AX00-0XE0**

for connection of SIMATIC S7-1500 to PROFINET IO via TCP/IP, ISO-on-TCP, UDP S7 communication, IP broadcast/multicast, SNMPV1, time synchronization via NTP; 1 x RJ45 interface with 10/100 Mbit/s;

#### Accessories

#### IE FC RJ45 Plug 4 x 2

RJ45 plug connector for Industrial Ethernet (10/100/1000 Mbit/s) with a sturdy metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPU's with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB11-2AA0**  
**6GK1901-1BB11-2AB0**  
**6GK1901-1BB11-2AE0**

#### IE FC TP Standard Cable GP 4 x 2

8-core, shielded TP installation cable for connection to IE FC RJ45 Modular Outlet for universal applications; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m

- AWG22, for connection to IE FC RJ45 Modular Outlet
- AWG24, for connection to IE FC RJ45 Plug 4 x 2

**6XV1870-2E**

**6XV1878-2A**

#### SCALANCE X204-2 Industrial Ethernet Switch

Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports

**6GK5204-2BB10-2AA3**

#### Industrial Ethernet Switch SCALANCE X308-2

2 x 1000 Mbit/s multimode fiber-optic cable ports (SC sockets), 1 x 10/100/1000 Mbit/s RJ45 port, 7 x 10/100 Mbit/s RJ45 ports; for glass fiber-optic cable (multimode) up to max. 750 m

**6GK5308-2FL00-2AA3**

## Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●			●		●	●

The SIMATIC CP 1543-1 communications processor securely connects the new SIMATIC S7-1500 controller to Industrial Ethernet networks. By combining a variety of security features such as an SPI (Stateful Packet Inspection) firewall, VPN and data encryption protocols such as FTPS and SNMPv3, the communications processor protects individual S7-1500 stations or even entire automation cells against unauthorized access.

The CP can also be used for linking the S7-1500 station into an IPv6-based network. All functions are configured by means of STEP 7 Professional V12 (TIA Portal) or higher.

The CP 1543-1 supports the following communications services:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE, FETCH/WRITE)
- IT communication
  - FTP functions (File Transfer Protocol FTP/FTPS) for file management and access to data blocks in the CPU (client and server function)
  - Sending e-mails via SMTP or ESMTP with "SMTP-Auth" for authentication on an e-mail server (also with IPv6)
- Security functions
  - Stateful Packet Inspection (layers 3 and 4) firewall
  - Secure communication via VPN (IPsec)
  - Secure access to the Web server of the CPU via the HTTPS protocol
  - Secure file transfer using FTPS
  - Secure transfer of the time of day (NTP)
  - SNMPv3 for tap-proof transfer of network analysis information
- Integration of the S7-1500 into IPv6-based networks; An IPv6-compliant IP address can be used for the following communication services:
  - FETCH/WRITE access (CP as server)
  - FTP server mode
  - FTP client mode with addressing by program block
  - E-mail transfer with addressing by program block

## Technical specifications

Article number	<b>6GK7543-1AX00-0XE0</b>
Product type designation	CP 1543-1
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	15 V
Relative symmetrical tolerance for DC	
• at 15 V	3 %
Consumed current	
• from backplane bus for DC at 15 V typical	0.35 A
Active power loss	5.3 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-1500 single width
Width	35 mm
Height	142 mm
Depth	129 mm
Net weight	0.35 kg
Mounting type	
• S7-1500 rail mounting	Yes
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	8
• Note	depending on CPU type
<b>Performance data open communication</b>	
Number of possible connections for open communication	
• by means of T blocks maximum	118; depending on the system upper limit
Amount of data	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
Number of Multicast stations	118



**SIMATIC S7-1500 advanced controller**

I/O modules

Communication

**CP 1543-1****Technical specifications (continued)**

Article number	<b>6GK7543-1AX00-0XE0</b>
Product type designation	CP 1543-1
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	118
• Note	depending on the system upper limit
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	118
<b>Performance data IT functions</b>	
Number of possible connections	
• as client by means of FTP maximum	32
• as server by means of FTP maximum	16
• as server by means of HTTP maximum	4
• as e-mail client maximum	1
Amount of data as user data for email maximum	64 Kibyte
<b>Performance data telecontrol</b>	
Protocol is supported	
• TCP/IP	Yes
<b>Product functions management, configuration</b>	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	No
Configuration software	
• required	STEP 7 Professional V12 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/location designation	Yes

Article number	<b>6GK7543-1AX00-0XE0</b>
Product type designation	CP 1543-1
<b>Product functions Diagnosis</b>	
Product function Web-based diagnostics	Yes; yes, via S7-1500 CPU
<b>Product functions Security</b>	
Firewall version	stateful inspection
Product function with VPN connection	IPSec
Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
Type of hashing algorithms with VPN connection	MD5, SHA-1
Number of possible connections with VPN connection	16
Product function	
• password protection for Web applications	No
• ACL - IP-based	No
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	No
• log file for unauthorized access	Yes
<b>Product functions Time</b>	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported NTP	Yes

Ordering data	Article No.		Article No.
<b>CP 1543-1 communications processor</b> for connection of SIMATIC S7-1500 to Industrial Ethernet via TCP/IP, ISO and UDP and Security functions; 1 x RJ45 interface with 10/100/1000 Mbit/s; electronic manual on DVD	<b>6GK7543-1AX00-0XE0</b>		
<b>Accessories</b>			
<b>IE FC RJ45 Plug 180 2 x 2</b> RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface <ul style="list-style-type: none"> <li>• 1 pack = 1 unit</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>	<b>IE FC TP Standard Cable GP 2 x 2 (Type A)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m	<b>6XV1840-2AH10</b>
<b>IE FC RJ45 Plug 4 x 2</b> RJ45 plug connector for Industrial Ethernet (10/100/1000 Mbit/s) with a sturdy metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface <ul style="list-style-type: none"> <li>• 1 pack = 1 unit</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	<b>6GK1901-1BB11-2AA0</b> <b>6GK1901-1BB11-2AB0</b> <b>6GK1901-1BB11-2AE0</b>	<b>IE FC TP Standard Cable GP 4 x 2</b> 8-core, shielded TP installation cable for connection to IE FC RJ45 Modular Outlet for universal applications; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m <ul style="list-style-type: none"> <li>• AWG22, for connection to IE FC RJ45 Modular Outlet</li> <li>• AWG24, for connection to IE FC RJ45 Plug 4 x 2</li> </ul>	<b>6XV1870-2E</b> <b>6XV1878-2A</b>
		<b>IE FC stripping tool</b> Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>
		<b>Industrial Ethernet Switch SCALANCE X204-2</b> Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports	<b>6GK5204-2BB10-2AA3</b>
		<b>Industrial Ethernet Switch SCALANCE X308-2</b> 2 x 1000 Mbit/s multimode fiber-optic cable ports (SC sockets), 1 x 10/100/1000 Mbit/s RJ45 port, 7 x 10/100 Mbit/s RJ45 ports; for glass fiber-optic cable (multimode) up to max. 750 m	<b>6GK5308-2FL00-2AA3</b>

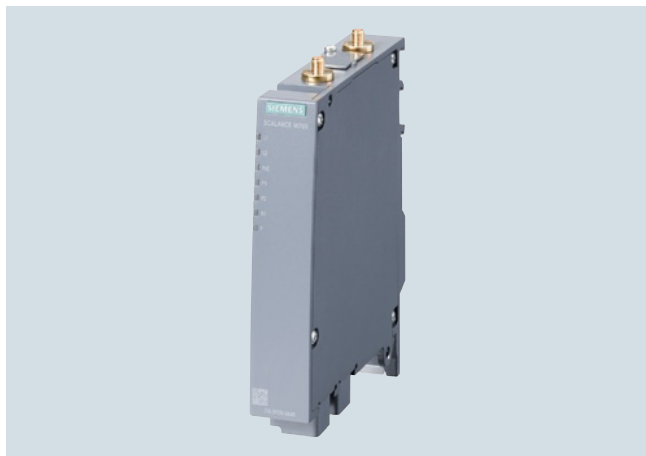
Note:

You can find order information for software for communication with PC systems in the IK PI catalog.

**SIMATIC S7-1500 advanced controller**

I/O modules

Communication

**SCALANCE W774 RJ45 for use in the control cabinet****Overview**

- Access points in SIMATIC design suitable for applications where the device is to be mounted in the control cabinet

**Product versions**

SCALANCE W774-1 RJ45

- A radio card is permanently installed; functional scope can be expanded by using a KEY-PLUG W780 IFeatures

**Technical specifications**

Article number	<b>6GK5774-1FX00-0AA0</b> <b>6GK5774-1FX00-0AB0</b> <sup>1)</sup>
Product type designation	<b>SCALANCE W774-1 RJ45</b>
<b>Transmission rate</b>	
Transfer rate	
• with WLAN maximum	300 Mbit/s
• 1 for Industrial Ethernet	10 Mbit/s
• 2 for Industrial Ethernet	100 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
<b>Interfaces</b>	
Number of electrical connections	
• for network components or terminal equipment	2
• for power supply	1
• for redundant voltage supply	1
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	4-pole screw terminal, PoE
design of the removable storage	
• C-PLUG	Yes
• KEY-PLUG	Yes
<b>Interfaces wireless</b>	
Number of radio cards permanently installed	1
Transmission mode for multiple input multiple output (MIMO)	2x2
Number of spatial streams	2
Number of electrical connections for external antenna(s)	2
Type of electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes

Article number	<b>6GK5774-1FX00-0AA0</b> <b>6GK5774-1FX00-0AB0</b> <sup>1)</sup>
Product type designation	<b>SCALANCE W774-1 RJ45</b>
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Supply voltage	
• from Power-over-Ethernet acc. to IEEE802.3at for type 1 and IEEE802.3af	48 V
Consumed current	
• for DC at 24 V typical	0.25 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.125 A
Active power loss	
• for DC at 24 V typical	6 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	6 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	-20 ... +60 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	97 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W774-1 RJ45 or W734-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP30

<sup>1)</sup> Wireless approval in the USA

## Technical specifications (continued)

Article number	<b>6GK5774-1FX00-0AA0</b> <b>6GK5774-1FX00-0AB0</b> <sup>1)</sup>
Product type designation	<b>SCALANCE W774-1 RJ45</b>
<b>Design, dimensions and weight</b>	
Width	26 mm
Height	156 mm
Depth	127 mm
Width of the enclosure w/o antenna	26 mm
Height of the enclosure w/o antenna	147 mm
Depth of the enclosure w/o antenna	127 mm
Net weight	0.52 kg
Mounting type	wall mounting only if flat mounted
• S7-300 rail mounting	Yes
• S7-1500 rail mounting	Yes
• wall mounting	Yes
<b>Wireless frequencies</b>	
Operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz
<b>Product properties, functions, components general</b>	
Product function Access Point Mode	Yes
Product function Client Mode	Yes
Number of SSIDs	4
Product function	
• Dual Client	No
• iPCF Access Point	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures'
• iPCF client	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'
• iPCF-MC Access Point	No
• iPCF-MC client	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'
Number of iPCF-capable radio modules	1
Product function iREF	No
Number of iREF-capable radio modules	0
<b>Product functions management, configuration</b>	
No. of manageable IP addr. in client	8
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	No
• configuration with STEP 7 in the TIA Portal	No
• forced roaming with IWLAN	No
• WDS	Yes
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	Yes
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher-level designation/location designation	Yes

Article number	<b>6GK5774-1FX00-0AA0</b> <b>6GK5774-1FX00-0AB0</b> <sup>1)</sup>
Product type designation	<b>SCALANCE W774-1 RJ45</b>
<b>Product functions Diagnosis</b>	
Product function	
• PROFINET IO diagnosis	No
• Link Check	No
• connection monitoring IP-Alive	No
• localization via Aeroscout	No
• SysLog	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
<b>Product functions VLAN</b>	
Product function	
• function VLAN with IWLAN	Yes
<b>Product functions DHCP</b>	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
<b>Product functions Redundancy</b>	
Protocol is supported	
• STP/RSTP	Yes
<b>Product functions Security</b>	
Product function	
• ACL - MAC-based	No
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported	
• SSH	Yes
<b>Product functions Time</b>	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes

<sup>1)</sup> Wireless approval in the USA

# SIMATIC S7-1500 advanced controller

I/O modules

Communication

## SCALANCE W774 RJ45 for use in the control cabinet

### Technical specifications (continued)

Article number	<b>6GK5774-1FX00-0AA0</b> <b>6GK5774-1FX00-0AB0</b> <sup>1)</sup>
Product type designation	<b>SCALANCE W774-1 RJ45</b>
<b>Standards, specifications, approvals</b>	
Standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety from CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
• for hazardous zone from CSA and UL	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, CL. 1, Div. 2, GP. A,B,C,D, T4 / CL. 1, Zone 2, GP IIC
Certificate of suitability	
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• CCC	No
• E1 approval	No
• Railway application in accordance with EN 50155	No
• Fire protection in accordance with EN 45545-2	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: <a href="http://www.siemens.com/wireless-approvals">www.siemens.com/wireless-approvals</a>
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• Bureau Veritas (BV)	No
• Det Norske Veritas (DNV)	No
• Germanische Lloyd (GL)	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
<b>Accessories</b>	
accessories	24 V DC screw terminal included in scope of delivery

<sup>1)</sup> Wireless approval in the USA

### Ordering data

### Article No.

#### SCALANCE W774 access points

IWLAN access points with built-in wireless interface for establishing wireless connections with iFeatures; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 300 Mbit/s; WPA2/AES; integrated 2-port switch; Power over Ethernet (PoE), IP30 degree of protection (-20 °C to +60°C); scope of delivery: Mounting hardware, 4-pin screw terminal for 24V DC; manual on CD-ROM; German/English

#### SCALANCE W774-1 RJ45

IWLAN Access Point with one built-in wireless interface

- National approvals for operation outside the USA
- National approvals for operation within the USA <sup>2)</sup>

**6GK5774-1FX00-0AA0**

**6GK5774-1FX00-0AB0**

#### Accessories

#### KEY-PLUG W780 iFeatures

Swap medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; can be used in SCALANCE W access points with PLUG compartment

**6GK5907-8PA00**

#### C-PLUG

Swap medium for simple replacement of devices if a fault occurs; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment

**6GK1900-0AB00**

#### IE FC RJ45 Plug 180 2 x 2

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB10-2AA0**

**6GK1901-1BB10-2AB0**

**6GK1901-1BB10-2AE0**

#### IE FC Standard Cable GP 2 x 2

4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m

**6XV1840-2AH10**

#### IE FC stripping tool

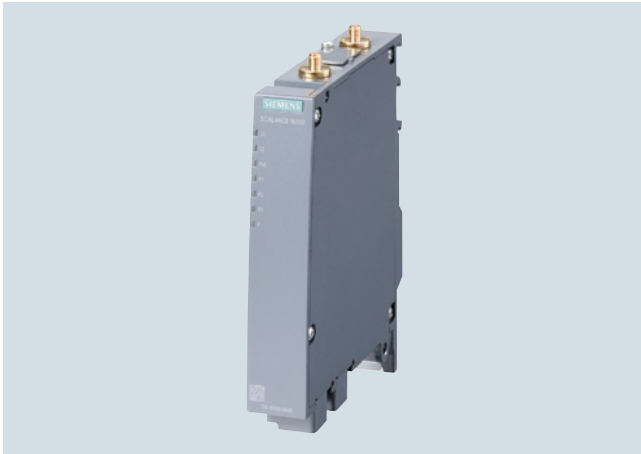
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

**6GK1901-1GA00**

#### Antennas and miscellaneous IWLAN accessories

See Catalog IK PI, Industrial Wireless LAN/ accessories

<sup>2)</sup> Please note national approvals under <http://www.siemens.com/wireless-approvals>

**Overview**

- Client modules in SIMATIC design suitable for applications where the device is to be mounted in the control cabinet



ET 200MP station with SCALANCE W734 RJ45

*SCALANCE W734-1 RJ45*

- A radio card is permanently installed; functional scope can be expanded by using a KEY-PLUG W740 iFeatures

**Technical specifications**

Article number	<b>6GK5734-1FX00-0AA0</b> <b>6GK5734-1FX00-0AB0</b> <sup>1)</sup>
Product type designation	SCALANCE W734-1 RJ45
<b>Transmission rate</b>	
Transfer rate	
• with WLAN maximum	300 Mbit/s
• 1 for Industrial Ethernet	10 Mbit/s
• 2 for Industrial Ethernet	100 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
<b>Interfaces</b>	
Number of electrical connections	
• for network components or terminal equipment	2
• for power supply	1
• for redundant voltage supply	1
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	4-pole screw terminal, PoE
design of the removable storage	
• C-PLUG	Yes
• KEY-PLUG	Yes
<b>Interfaces wireless</b>	
Number of radio cards permanently installed	1
Transmission mode for multiple input multiple output (MIMO)	2x2
Number of spatial streams	2
Number of electrical connections for external antenna(s)	2
Type of electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Supply voltage	
• from Power-over-Ethernet acc. to IEEE802.3at for type 1 and IEEE802.3af	48 V
Consumed current	
• for DC at 24 V typical	0.25 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.125 A
Active power loss	
• for DC at 24 V typical	6 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	6 W

1) Wireless approval in the USA

**SIMATIC S7-1500 advanced controller**

I/O modules

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**SCALANCE W734 RJ45 for use in the control cabinet****Technical specifications (continued)**

Article number	<b>6GK5734-1FX00-0AA0</b> <b>6GK5734-1FX00-0AB0</b> <sup>1)</sup>
Product type designation	SCALANCE W734-1 RJ45
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	-20 ... +60 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	97 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W774-1 RJ45 or W734-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP30
<b>Design, dimensions and weight</b>	
Width	26 mm
Height	156 mm
Depth	127 mm
Width of the enclosure without antenna	26 mm
Height of the enclosure without antenna	147 mm
Depth of the enclosure without antenna	127 mm
Net weight	0.52 kg
Mounting type	wall mounting only if flat mounted
• S7-300 rail mounting	Yes
• S7-1500 rail mounting	Yes
• wall mounting	Yes
<b>Wireless frequencies</b>	
Operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz
<b>Product properties, functions, components general</b>	
Product function Access Point Mode	No
Product function Client Mode	Yes
Product function	
• Dual Client	No
• iPCF client	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'
• iPCF-MC Access Point	No
• iPCF-MC client	Yes; Only in combination with 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'
Number of iPCF-capable radio modules	1

Article number	<b>6GK5734-1FX00-0AA0</b> <b>6GK5734-1FX00-0AB0</b> <sup>1)</sup>
Product type designation	SCALANCE W734-1 RJ45
<b>Product functions management, configuration</b>	
Number of manageable IP addresses in client	8
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	No
• configuration with STEP 7 in the TIA Portal	No
• forced roaming with IWLAN	No
• WDS	No
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	No
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher-level designation/ location designation	Yes
<b>Product functions Diagnosis</b>	
Product function	
• PROFINET IO diagnosis	No
• Link Check	No
• connection monitoring IP-Alive	No
• localization via Aeroscout	No
• SysLog	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
<b>Product functions VLAN</b>	
Product function	
• function VLAN with IWLAN	No
<b>Product functions DHCP</b>	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
<b>Product functions Security</b>	
Product function	
• ACL - MAC-based	No
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported	
• SSH	Yes

1) Wireless approval in the USA



## Technical specifications (continued)

Article number	<b>6GK5734-1FX00-0AA0</b> <b>6GK5734-1FX00-0AB0</b> <sup>1)</sup>
Product type designation	SCALANCE W734-1 RJ45
<b>Product functions Time</b>	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes
<b>Standards, specifications, approvals</b>	
Standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety from CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
• for hazardous zone from CSA and UL	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, CL. 1, Div. 2, GP. A,B,C,D, T4 / CL. 1, Zone 2, GP IIC
Certificate of suitability	
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• CCC	No
• E1 approval	No
• Railway application in accordance with EN 50155	No
• Fire protection in accordance with EN 45545-2	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: <a href="http://www.siemens.com/wireless-approvals">www.siemens.com/wireless-approvals</a>
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• Bureau Veritas (BV)	No
• Det Norske Veritas (DNV)	No
• Germanische Lloyd (GL)	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
<b>Accessories</b>	
accessories	24 V DC screw terminal included in scope of delivery

<sup>1)</sup> Wireless approval in the USA

## Ordering data

## Article No.

### SCALANCE W734 Client Modules

IWLAN Ethernet client modules with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 300 Mbit/s; WPA2/AES; integrated 2-port switch; Power over Ethernet (PoE), IP30 degree of protection (-20°C to +60°C); scope of delivery: Mounting hardware, 4-pin screw terminal for 24V DC; manual on CD-ROM; German/English

### SCALANCE W734-1 RJ45

for managing the wireless connection of up to eight linked devices with Industrial Ethernet connection

- National approvals for operation outside the USA
- National approvals for operation within the USA <sup>2)</sup>

**6GK5734-1FX00-0AA0**

**6GK5734-1FX00-0AB0**

### Accessories

#### KEY-PLUG W740 iFeatures

Swap medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; can be used in SCALANCE W client modules with PLUG compartment

**6GK5907-4PA00**

#### C-PLUG

Swap medium for simple replacement of devices if a fault occurs; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment

**6GK1900-0AB00**

#### IE FC RJ45 Plug 180 2 x 2

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/ CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB10-2AA0**

**6GK1901-1BB10-2AB0**

**6GK1901-1BB10-2AE0**

#### IE FC Standard Cable GP 2 x 2

4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval  
Sold by the meter  
max. quantity 1000 m  
minimum order 20 m

**6XV1840-2AH10**

#### IE FC stripping tool

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

**6GK1901-1GA00**

### Antennas and miscellaneous IWLAN accessories

See Catalog IK PI, Industrial Wireless LAN/ accessories

<sup>2)</sup> Please note national approvals under <http://www.siemens.com/wireless-approvals>



**SIMATIC S7-1500 advanced controller**

I/O modules

SIPLUS Communication

**SIPLUS CM PTP****Overview**

- Modules for serial communication connections, scaled according to interface types, protocols, and performance
- 4 versions with different physical transmission characteristics:
  - RS 232C, max. 19.2 Kbit/s
  - RS 232C, max. 115.2 Kbit/s
  - RS 422/RS 485, max. 19.2 Kbit/s
  - RS 422/RS 485, max. 115.2 Kbit/s
- Protocols supported
  - Freepoint: User-parameterizable telegram format for universal communication
  - 3964(R) for improved transmission reliability
  - Modbus RTU Master
  - Modbus RTU Slave
  - USS, implemented through instructions

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	<b>6AG1540-1AD00-7AA0</b>	<b>6AG1541-1AD00-7AB0</b>	<b>6AG1540-1AB00-7AA0</b>	<b>6AG1541-1AB00-7AB0</b>
Based on	<b>6ES7540-1AD00-0AA0</b> SIPLUS S7-1500 CM PTP RS 232 BA	<b>6ES7541-1AD00-0AB0</b> SIPLUS S7-1500 CM PTP RS 232 HF	<b>6ES7540-1AB00-0AA0</b> SIPLUS S7-1500 CM PTP RS 422/485 BA	<b>6ES7541-1AB00-0AB0</b> SIPLUS S7-1500 CM PTP RS 422/485 HF
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• horizontal installation, min.	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data	Article No.	Accessories	Article No.
<p><b>SIPLUS CM PtP RS 232 BA communication modules</b></p> <p>(extended temperature range and medial exposure)</p> <p>Basic communication module with 1 interface RS 232, Freeport, 3964(R) and USS protocols, 9-pin sub D connector, max. 19.2 Kbit/s</p>	6AG1540-1AD00-7AA0	See SIMATIC S7-1500, CM PtP communication module, page 4/70	
<p><b>SIPLUS CM PtP RS 232 HF communication modules</b></p> <p>(extended temperature range and medial exposure)</p> <p>High Feature communication module with 1 interface RS 232, Freeport, 3964(R), USS and Modbus RTU protocols, 9-pin sub D connector, max. 115.2 Kbit/s</p>	6AG1541-1AD00-7AB0		
<p><b>SIPLUS CM PtP RS 422/485 BA communication modules</b></p> <p>(extended temperature range and medial exposure)</p> <p>Basic communication module with 1 interface RS 422/485, Freeport, 3964(R) and USS protocols, 15-pin sub D socket, max. 19.2 Kbit/s</p>	6AG1540-1AB00-7AA0		
<p><b>SIPLUS CM PtP RS 422/485 HF communication modules</b></p> <p>(extended temperature range and medial exposure)</p> <p>High Feature communication module with 1 interface RS 422/485, Freeport, 3964(R), USS and Modbus RTU protocols, 15-pin sub D socket, max. 115.2 Kbit/s</p>	6AG1541-1AB00-7AB0		

**SIMATIC S7-1500 advanced controller**

I/O modules

SIPLUS communication

**SIPLUS CM 1542-5****Overview**

DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●	●	●

The CM 1542-5 communication module expands the SIMATIC S7-1500 controller with an additional PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbps. The module also allows the implementation of separate PROFIBUS lines; in other words, the control of multiple field devices via several PROFIBUS segments. The CM 1542-5 handles all communication tasks, thus reducing the CPU load.

Apart from classic PROFIBUS communication; the CM 1542-5 is also suitable for S7 communication. This makes it possible to establish communication between the S7-1500 controller and other devices, for example those from the SIMATIC S7-300/400 range.

- PROFIBUS DP master or DP slave with electrical interface for connecting the SIMATIC S7-1500 to PROFIBUS at up to 12 Mbit/s (including 45.45 Kbit/s)
- Communication services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Module replacement without a PG
- Data record routing (PROFIBUS DP)
- Adding or modifying distributed I/O during operation

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****Article No.****SIPLUS CM 1542-5 communication modules**

(extended temperature range and medial exposure)

Communication module for electrical connection of SIMATIC S7-1500 to PROFIBUS as a DP master or DP slave

**6AG1542-5DX00-7XE0****Accessories**

See SIMATIC S7-1500, CM 1542-5 communication module, page 4/72

### Overview



- Uniform, 40-pin front connector, suitable for SIMATIC S7-1500 I/O modules
- Versions for 25 mm wide or 35 mm wide modules
- With screw-type or push-in terminals
- Connectable core cross-sections: 0.25 mm<sup>2</sup> to 1.5 mm<sup>2</sup> (AWG 24 to 16)
- Front connector for 35 mm modules to be ordered separately; front connector for 25 mm modules included in scope of supply of modules

### Ordering data

### Article No.

#### Front connectors

For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin

- Screw terminals
- Push-in

**6ES7592-1AM00-0XB0**

**6ES7592-1BM00-0XB0**

**6ES7592-1BM00-0XA0**

For 25 mm modules; including cable ties and individual labeling strips; push-in, 40-pin; Spare part

#### Potential bridges for front connectors

**6ES7592-3AA00-0AA0**

For 35 mm modules; 20 units; spare part

## SIMATIC S7-1500 advanced controller

Connection system - SIMATIC TOP connect system cabling for SIMATIC S7-1500 and ET 200MP

### Introduction

#### Overview



With two cabling systems, SIMATIC TOP connect ensures efficient wiring of the input and output module of the SIMATIC S7-1500: Fully modular connection for fast and clearly arranged connecting to sensors and actuators in the field, and flexible connection for simple wiring inside the control cabinet.

With the TIA Selection Tool, you can select suitable system cabling for the individual I/O modules with a simple mouse click. Suitable components for the respective I/O module are always offered. These can be transferred to the order list and then ordered in the Industry Mall.

Further information can be found on the Internet at <http://www.siemens.com/tia-selection-tool>

#### Design

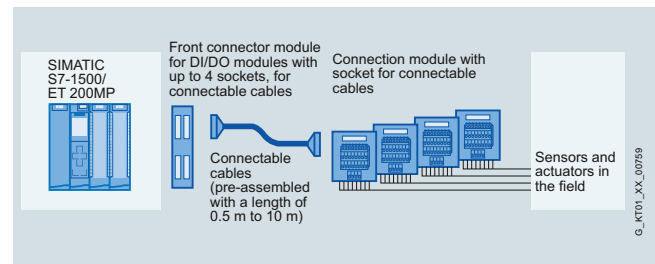
Two cabling variants are available for a wide range of control cabinet concepts:

##### Fully modular connection

The system consists of:

- Front connector module
- Connecting cable
- Terminal modules in the following versions: Basic module, signal module and function module

Connection errors are thus practically excluded and installation overhead is significantly reduced. Systematic connection of the SIMATIC system. The assembly overhead for the connecting cables is drastically reduced thanks to the use of pre-assembled or easily assembled cables sold by the meter.



SIMATIC TOP connect for S7-1500/ ET200 MP, fully modular connection

##### Flexible connection

Flexible connection with front connectors is available with 20 (Pin1 – 20) or 40 wired single cores.

These are available in lengths from 2.5 m to 10.0 m.

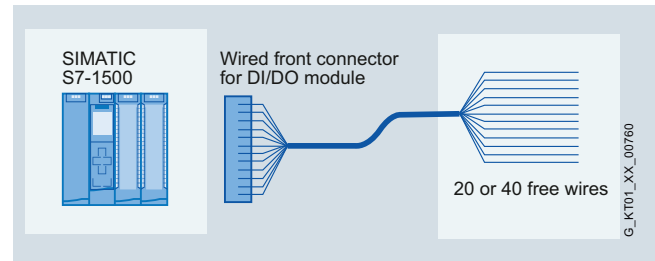
The single cores are available in different versions:

- Core type H05V-K is used for industrial applications
- The UL/CSA-approved core is available for export to North America
- The halogen-free version is used where low smoke gas density in the event of fire is required, e.g. in building automation

The blue wires are numbered sequentially and can be routed direct to each element in the control cabinet. The numbering of the single cores corresponds to the coding of the front connector contacts.

In comparison to conventional single wiring, there is a cost saving of 50 % for assembly, since the single cores that have already been checked on the connector are fixed.

Thus no complex pre-assembly of up to two times 20 single cores per module is necessary.



SIMATIC TOP connect for S7-1500/ ET200 MP, flexible connection

**Overview**

The fully modular connection for connecting to the digital I/O modules of the SIMATIC S7-1500 or ET 200MP consists of modified front connectors, called front connector modules, pre-assembled connecting cables of various lengths, and terminal modules. Suitable components can be selected for the application in question and joined by means of simple plug-in connections. The terminal modules are used instead of conventional terminal blocks and act as the interface to the sensors and actuators.

**Benefits**

- Easy plugging in of front connector module, connecting cable and terminal module
- Fast and low-cost wiring
- In the case of digital signals, the supply voltage can be connected to the front connector module or the terminal module
- Reduction in wiring errors, clear control cabinet wiring
- Byte-by-byte, or four-byte distribution of the signals in the case of digital signals
- Each component can be replaced individually
- Every cable length can be configured without cutting, or pre-assembled cables can be used

**Design****Front connector module**

Modified front connectors, called front connector modules, are available for connecting to the I/O modules. These are plugged into the I/O module to be wired instead of the front connector. The front connector modules are available in many different versions for digital I/O modules, analog I/O modules and for the 24 V, 2-ampère module. The connecting cables are plugged into these front connector modules.

**Connecting cable**

The connecting cable is available in two different versions.

As a pre-assembled 16-pole or 50-pole round cable (shielded or unshielded) up to a length of 10 m, or as a 16-pole round-sheath ribbon cable (with or without shield), which can be easily assembled by the user; or as 2 x 16-pole round-sheath ribbon cables (without shield).

When assembled, there are one or two insulation displacement connectors (female ribbon connectors) at both ends of the cable.

The round-sheath ribbon cable is assembled by the user with the aid of pliers (can be ordered separately). The cable transmits 8 or 2 x 8 channels over a distance of up to 30 m.

The connecting cable connects the front connector module with the terminal module.

**Connection module**

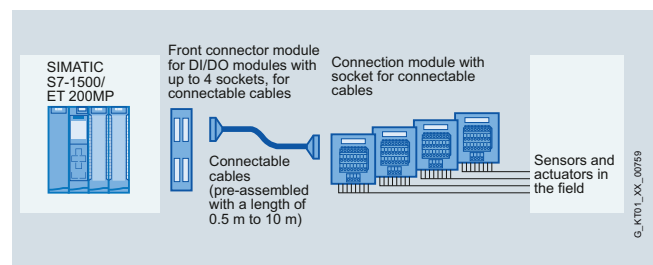
The system has digital and analog terminal modules for connecting the I/O signals. These are snapped onto the standard mounting rail. The terminal modules with basic or signal functionality are available in 1-byte or 4-byte versions.

Terminal modules are available for two different connection methods: with push-in or screw-type terminals. The potential can be fed in at the terminal module or at the front connector module.

If other voltage or power levels are required in the field, the terminal module for TPRo or TPOo output signals is used. For the TPRo terminal module, relays are used for the implementation. For the TPOo terminal module, optocouplers are used for the implementation. This converts the 24 V DC output signal simply and reliably to another voltage or power level. If 230 V AC or 110 V AC input signals have to be transmitted to the controller in the field, a connection module with relay TPRi is available that simply converts the 230/110 V AC signal to 24 V DC. This means that there is always the same voltage level on the module side.

**Use with optocouplers for the TPRo relay modules**

If higher switching frequencies of the relay terminal module are required for the output signals, the relay can simply be replaced with an optocoupler (note technical specifications) in order to increase the switching frequency here.



SIMATIC TOP connect for S7-1500/ ET200 MP, fully modular connection

## SIMATIC S7-1500 advanced controller

Connection system - SIMATIC TOP connect system cabling for SIMATIC S7-1500 and ET 200MP

### Fully modular connection

#### Technical specifications Front connector module

Rated operating voltage	<b>24 V DC</b>
Max. permissible operating voltage	60 V DC
Max. permissible continuous current • per connector pin	1 A
Max. permissible total current	2 A/byte
Permissible ambient temperature	0 to +60 °C
Test voltage	0.5 kV, 50 Hz, 60 sec.
Clearance and creepage distances	IEC 664 (1980), IEC 664 A (1981), in accordance with DIN VDE 0110 (01.89), overvoltage class II, pollution degree 2

#### Wiring rules for the front connector modules

##### SIMATIC TOP connect front connector module, connection for potential infeed

	Push-in	Screw terminals
	<b>Modules up to 4 connections</b>	
Connectable cable cross-sections		
• Solid conductors	No	
• Flexible cables with/without wire end ferrule	0.25 to 1.5 mm <sup>2</sup>	
Number of cables per connection	1 or a combination of 2 wires up to 1.5 mm <sup>2</sup> (total) in a common wire end ferrule	
Max. diameter of the cable insulation	3.1 mm	
Stripped length of the cables		
• Without insulating collar	6 mm	
• With insulating collar	-	
Wire end ferrules according to DIN 46228		
• Without insulating collar	Form A; 5 to 7 mm long	
• with insulating collar 0.25 to 1.0 mm <sup>2</sup>	-	
• with insulating collar 1.5 mm <sup>2</sup>	-	
Blade width of the screwdriver	3.5 mm (cylindrical design)	
Tightening torque for connecting the cables	-	0.4 Nm to 0.7 Nm

#### Technical specifications Connecting cable

##### Technical specifications of connecting cable from SIMATIC S7 to connection module

Operating voltage	60 V DC
Continuous current per signal conductor	1 A
Max. aggregate current	4 A/byte
Operating temperature	0 to +60 °C
Outer diameter of pre-assembled round cable in mm unshielded/ shielded (16-pole)	Approx. 6.5/7.0
Outer diameter of pre-assembled round cable in mm unshielded/ shielded (50-pole)	approx. 10.5/11.0
Outer diameter of round-sheath ribbon cable in mm 16-pole/2 x 16-pole	approx. 9.5/11.5

#### Ordering data

#### Article No.

##### Front connector modules

##### Front connector module for digital modules for the connection of 16-pin connecting cables

Power supply via  
• Push-in  
• Screw terminals

**6ES7921-5AH20-0AA0**  
**6ES7921-5AB20-0AA0**

##### Front connector module for digital modules for the connection of 50-pin connecting cables

Power supply via  
• Push-in  
• Screw terminals

**6ES7921-5CH20-0AA0**  
**6ES7921-5CB20-0AA0**

##### Front connector module for 2 A digital modules for the connection of 16-pin connecting cables

Power supply via  
• Push-in  
• Screw terminals

**6ES7921-5AJ00-0AA0**  
**6ES7921-5AD00-0AA0**

##### Front connector module for analog modules for the connection of 16-pin connecting cables

**6ES7921-5AK20-0AA0**

##### Front connector module for analog modules for the connection of 50-pin connecting cables

**6ES7921-5CK20-0AA0**



Ordering data	Article No.	Article No.
<b>Connecting cables</b>		
<b>Pre-assembled round cable</b>		
<u>16-pole, 0.14 mm<sup>2</sup></u>		
unshielded		
<ul style="list-style-type: none"> <li>• 0.5 m</li> <li>• 1.0 m</li> <li>• 1.5 m</li> <li>• 2.0 m</li> <li>• 2.5 m</li> <li>• 3.0 m</li> <li>• 4.0 m</li> <li>• 5.0 m</li> <li>• 6.5 m</li> <li>• 8.0 m</li> <li>• 10.0 m</li> </ul>	<ul style="list-style-type: none"> <li>6ES7923-0BA50-0CB0</li> <li>6ES7923-0BB00-0CB0</li> <li>6ES7923-0BB50-0CB0</li> <li>6ES7923-0BC00-0CB0</li> <li>6ES7923-0BC50-0CB0</li> <li>6ES7923-0BD00-0CB0</li> <li>6ES7923-0BE00-0CB0</li> <li>6ES7923-0BF00-0CB0</li> <li>6ES7923-0BG50-0CB0</li> <li>6ES7923-0BJ00-0CB0</li> <li>6ES7923-0CB00-0CB0</li> </ul>	
shielded		
<ul style="list-style-type: none"> <li>• 1.0 m</li> <li>• 2.0 m</li> <li>• 2.5 m</li> <li>• 3.0 m</li> <li>• 4.0 m</li> <li>• 5.0 m</li> <li>• 6.5 m</li> <li>• 8.0 m</li> <li>• 10.0 m</li> </ul>	<ul style="list-style-type: none"> <li>6ES7923-0BB00-0DB0</li> <li>6ES7923-0BC00-0DB0</li> <li>6ES7923-0BC50-0DB0</li> <li>6ES7923-0BD00-0DB0</li> <li>6ES7923-0BE00-0DB0</li> <li>6ES7923-0BF00-0DB0</li> <li>6ES7923-0BG50-0DB0</li> <li>6ES7923-0BJ00-0DB0</li> <li>6ES7923-0CB00-0DB0</li> </ul>	
<u>50-pole, 0.14 mm<sup>2</sup></u>		
Unshielded		
<ul style="list-style-type: none"> <li>• 0.5 m</li> <li>• 1.0 m</li> <li>• 1.5 m</li> <li>• 2.0 m</li> <li>• 2.5 m</li> <li>• 3.0 m</li> <li>• 4.0 m</li> <li>• 5.0 m</li> <li>• 6.5 m</li> <li>• 8.0 m</li> <li>• 10.0 m</li> </ul>	<ul style="list-style-type: none"> <li>6ES7923-5BA50-0CB0</li> <li>6ES7923-5BB00-0CB0</li> <li>6ES7923-5BB50-0CB0</li> <li>6ES7923-5BC00-0CB0</li> <li>6ES7923-5BC50-0CB0</li> <li>6ES7923-5BD00-0CB0</li> <li>6ES7923-5BE00-0CB0</li> <li>6ES7923-5BF00-0CB0</li> <li>6ES7923-5BG50-0CB0</li> <li>6ES7923-5BJ00-0CB0</li> <li>6ES7923-5CB00-0CB0</li> </ul>	
Shielded		
<ul style="list-style-type: none"> <li>• 1.0 m</li> <li>• 2.0 m</li> <li>• 2.5 m</li> <li>• 3.0 m</li> <li>• 4.0 m</li> <li>• 5.0 m</li> <li>• 6.5 m</li> <li>• 8.0 m</li> <li>• 10.0 m</li> </ul>	<ul style="list-style-type: none"> <li>6ES7923-5BB00-0DB0</li> <li>6ES7923-5BC00-0DB0</li> <li>6ES7923-5BC50-0DB0</li> <li>6ES7923-5BD00-0DB0</li> <li>6ES7923-5BE00-0DB0</li> <li>6ES7923-5BF00-0DB0</li> <li>6ES7923-5BG50-0DB0</li> <li>6ES7923-5BJ00-0DB0</li> <li>6ES7923-5CB00-0DB0</li> </ul>	
<b>Round-sheath ribbon cable</b>		
<u>16-pole, 0.14 mm<sup>2</sup></u>		
Unshielded		
<ul style="list-style-type: none"> <li>• 30 m</li> <li>• 60 m</li> </ul>	<ul style="list-style-type: none"> <li>6ES7923-0CD00-0AA0</li> <li>6ES7923-0CG00-0AA0</li> </ul>	
Shielded		
<ul style="list-style-type: none"> <li>• 30 m</li> <li>• 60 m</li> </ul>	<ul style="list-style-type: none"> <li>6ES7923-0CD00-0BA0</li> <li>6ES7923-0CG00-0BA0</li> </ul>	
<b>Round-sheath ribbon cable</b>		
<u>2 x 16-pole, 0.14 mm<sup>2</sup></u>		
Unshielded		
<ul style="list-style-type: none"> <li>• 30 m</li> <li>• 60 m</li> </ul>	<ul style="list-style-type: none"> <li>6ES7923-2CD00-0AA0</li> <li>6ES7923-2CG00-0AA0</li> </ul>	
<b>Connector (female ribbon connector)</b>		
16-pole, insulation displacement system, with strain relief devices; packing unit: 8 connectors and 8 cable grips		
6ES7921-3BE10-0AA0		
<b>Accessories</b>		
<b>Manual pliers</b>		
6ES7928-0AA00-0AA0		
For preparing the connectors (female ribbon connector)		
<b>Terminal modules (for 16-pin connecting cables)</b>		
<b>Terminal module TP1</b>		
for 1-wire connection		
<ul style="list-style-type: none"> <li>• Push-in terminals without LEDs</li> <li>• Screw-type terminals without LEDs</li> <li>• Push-in terminals with LEDs</li> <li>• Screw-type terminals with LEDs</li> </ul>	<ul style="list-style-type: none"> <li>6ES7924-0AA20-0AC0</li> <li>6ES7924-0AA20-0AA0</li> <li>6ES7924-0AA20-0BC0</li> <li>6ES7924-0AA20-0BA0</li> </ul>	
<b>Terminal module TP3</b>		
for 3-wire connection		
<ul style="list-style-type: none"> <li>• Push-in terminals without LEDs</li> <li>• Screw-type terminals without LEDs</li> <li>• Push-in terminals with LEDs</li> <li>• Screw-type terminals with LEDs</li> <li>• Push-in terminals with LEDs and one isolating terminal per channel</li> <li>• Screw-type terminals with LEDs and one isolating terminal per channel</li> <li>• Push-in terminals with LED and fuse per channel</li> <li>• Push-in terminals with LED and fuse per channel</li> </ul>	<ul style="list-style-type: none"> <li>6ES7924-0CA20-0AC0</li> <li>6ES7924-0CA20-0AA0</li> <li>6ES7924-0CA20-0BC0</li> <li>6ES7924-0CA20-0BA0</li> <li>6ES7924-0CH20-0BC0</li> <li>6ES7924-0CH20-0BA0</li> <li>6ES7924-0CL20-0BC0</li> <li>6ES7924-0CL20-0BA0</li> </ul>	
<b>Terminal module TPRo</b>		
Relay module for 8 outputs, relay as normally open contact		
<ul style="list-style-type: none"> <li>• Push-in terminals with LEDs</li> <li>• Screw-type terminals with LEDs</li> </ul>	<ul style="list-style-type: none"> <li>6ES7924-0BD20-0BC0</li> <li>6ES7924-0BD20-0BA0</li> </ul>	
<b>Terminal module TPRI</b>		
Relay module for 8 outputs (110 V AC), relay as normally open contact		
<ul style="list-style-type: none"> <li>• Push-in terminals with LEDs</li> <li>• Screw-type terminals with LEDs</li> </ul>	<ul style="list-style-type: none"> <li>6ES7924-0BG20-0BC0</li> <li>6ES7924-0BG20-0BA0</li> </ul>	
<b>Terminal module TPRI</b>		
Relay module for 8 outputs (230 V AC), relay as normally open contact		
<ul style="list-style-type: none"> <li>• Push-in terminals with LEDs</li> <li>• Screw-type terminals with LEDs</li> </ul>	<ul style="list-style-type: none"> <li>6ES7924-0BE20-0BC0</li> <li>6ES7924-0BE20-0BA0</li> </ul>	
<b>Terminal module TPOo</b>		
Optocoupler module for 8 outputs (max. 24 V DC/4 A)		
<ul style="list-style-type: none"> <li>• Push-in terminals with LEDs</li> <li>• Screw-type terminals with LEDs</li> </ul>	<ul style="list-style-type: none"> <li>6ES7924-0BF20-0BC0</li> <li>6ES7924-0BF20-0BA0</li> </ul>	
<b>Connection modules for digital output modules 2 A</b>		
Terminal module TP2		
<ul style="list-style-type: none"> <li>• Push-in terminals without LEDs</li> <li>• Screw-type terminals without LEDs</li> </ul>	<ul style="list-style-type: none"> <li>6ES7924-0BB20-0AC0</li> <li>6ES7924-0BB20-0AA0</li> </ul>	
<b>Terminal module for analog modules (for S7-1500 only)</b>		
Terminal module TPA		
<ul style="list-style-type: none"> <li>• Push-in terminals without LEDs</li> <li>• Screw-type terminals without LEDs</li> </ul>	<ul style="list-style-type: none"> <li>6ES7924-0CC20-0AC0</li> <li>6ES7924-0CC20-0AA0</li> </ul>	
<b>Accessories</b>		
<b>ID labels for terminal modules in S7-1500 design</b>		
ID labels, insertable, PU = 340 units		
3RT1900-1SB20		
<b>Shield for analog terminal module</b>		
PU = 4 units (for connection of 16-pin connecting cable)		
6ES7928-1AA20-4AA0		
<b>Shield connection clamp</b>		
for shield plate at SIMATIC end, PU = 10 units		
6ES7590-5BA00-0AA0		
for shield plate at field end, 2 x 2 ... 6 mm		
6ES7390-5AB00-0AA0		
for shield plate at field end, 3 ... 8 mm		
6ES7390-5BA00-0AA0		
for shield plate at field end, 4 ... 13 mm		
6ES7390-5CA00-0AA0		



**SIMATIC S7-1500 advanced controller**

Connection system - SIMATIC TOP connect system cabling for SIMATIC S7-1500 and ET 200MP

**Fully modular connection****Ordering data****Article No.****Article No.****Terminal modules (for 50-pin connecting cables)****Terminal module TP1**

for 1-wire connection

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs

**6ES7924-2AA20-0AC0****6ES7924-2AA20-0BA0****6ES7924-2AA20-0BC0****6ES7924-2AA20-0BA0****Terminal module TP3**

for 3-wire connection

- Push-in terminals without LEDs
- Screw-type terminals without LEDs
- Push-in terminals with LEDs
- Screw-type terminals with LEDs

**6ES7924-2CA20-0AC0****6ES7924-2CA20-0AA0****6ES7924-2CA20-0BC0****6ES7924-2CA20-0BA0****Terminal module for analog modules (for S7-1500 only)**

Terminal module TPA

- Push-in terminals without LEDs
- Screw-type terminals without LEDs

**6ES7924-2CC20-0AC0****6ES7924-2CC20-0AA0****Accessories****ID labels for terminal modules in S7-1500 design**ID labels, insertable  
PU = 340 units**3RT1900-1SB20****Shield for analog terminal module**

PU = 4 units (for connection of 50-pin connecting cable)

**6ES7928-1BA20-4AA0****Shield connection clamp**for shield plate at SIMATIC end,  
PU = 10 units**6ES7590-5BA00-0AA0**for shield plate at field end,  
2 x 2 ... 6 mm**6ES7390-5AB00-0AA0**for shield plate at field end,  
3 ... 8 mm**6ES7390-5BA00-0AA0**for shield plate at field end,  
4 ... 13 mm**6ES7390-5CA00-0AA0**

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**SIMATIC S7-1500 advanced controller**

Connection system - SIMATIC TOP connect system cabling for S7-1500 and ET 200MP

**Front connectors with single cores****Overview**

Can be used for SIMATIC S7-1500 and ET 200MP digital modules (24 V DC)

The front connectors with single cores replace the SIMATIC standard connectors

- 6ES7592-1AM00-0XB0

**Technical specifications**

<b>Front connector with single cores for 16 channels (pins 1-20)</b>	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all cores, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K, UL 1007/1569; CSA TR64, or halogen-free
Number of single cores	20
Core cross-section	0.5 mm <sup>2</sup> ; Cu
Bundle diameter in mm	approx. 15
Wire color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 20 (front connector contact = core number)
Assembly	Screw contacts
<b>Front connector with single cores for 32 channels (pins 1-40)</b>	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all cores, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K, UL 1007/1569; CSA TR64, or halogen-free
Number of single cores	40
Core cross-section	0.5 mm <sup>2</sup> ; Cu
Bundle diameter in mm	approx. 17
Wire color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 40 (front connector contact = core number)
Assembly	Screw contacts

**Ordering data****Article No.**

**Front connector with single cores for 32 channels (pins 1-40)**

**Core type H05V-K (0.5 mm<sup>2</sup> with screwed connection)**

- 2.5 m
- 3.2 m
- 5.0 m
- 6.5 m
- 8.0 m
- 10.0 m

6ES7922-5BC50-0AC0  
6ES7922-5BD20-0AC0  
6ES7922-5BF00-0AC0  
6ES7922-5BG50-0AC0  
6ES7922-5BJ00-0AC0  
6ES7922-5CB00-0AC0

**Core type H05Z-K, halogen-free (0.5 mm<sup>2</sup> with screwed connection)**

- 2.5 m
- 3.2 m
- 5.0 m
- 6.5 m
- 8.0 m
- 10.0 m

6ES7922-5BC50-0HC0  
6ES7922-5BD20-0HC0  
6ES7922-5BF00-0HC0  
6ES7922-5BG50-0HC0  
6ES7922-5BJ00-0HC0  
6ES7922-5CB00-0HC0

**Core type UL/CSA-certified (0.5 mm<sup>2</sup> with screw connection)**

- 3.2 m
- 5.0 m
- 6.5 m

6ES7922-5BD20-0UC0  
6ES7922-5BF00-0UC0  
6ES7922-5BG50-0UC0

**Front connector with single cores for 16 channels (pins 1-20)**

**Core type H05V-K (0.5 mm<sup>2</sup> with screwed connection)**

- 2.5 m
- 3.2 m
- 5.0 m
- 6.5 m
- 8.0 m
- 10.0 m

6ES7922-5BC50-0AB0  
6ES7922-5BD20-0AB0  
6ES7922-5BF00-0AB0  
6ES7922-5BG50-0AB0  
6ES7922-5BJ00-0AB0  
6ES7922-5CB00-0AB0

**Core type H05Z-K, halogen-free (0.5 mm<sup>2</sup> with screwed connection)**

- 2.5 m
- 3.2 m
- 5.0 m
- 6.5 m
- 8.0 m
- 10.0 m

6ES7922-5BC50-0HB0  
6ES7922-5BD20-0HB0  
6ES7922-5BF00-0HB0  
6ES7922-5BG50-0HB0  
6ES7922-5BJ00-0HB0  
6ES7922-5CB00-0HB0

**Core type UL/CSA-certified (0.5 mm<sup>2</sup> with screw connection)**

- 3.2 m
- 5.0 m
- 6.5 m

6ES7922-5BD20-0UB0  
6ES7922-5BF00-0UB0  
6ES7922-5BG50-0UB0

## SIMATIC S7-1500 advanced controller

### Power supplies

#### 1-phase, 24 V DC (for S7-1500 and ET 200MP)

#### Overview



The design and functionality of the SIMATIC PM 1507 single-phase load power supply (PM = power module) with automatic range selection of the input voltage makes it an optimal match to the SIMATIC S7-1500 PLC. It supplies the S7-1500 system components such as CPU, system power supply (PS), I/O circuits of the input and output modules and, if necessary, the sensors and actuators with 24 V DC.

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#### Technical specifications

Article number	6EP1332-4BA00	6EP1333-4BA00
Product	S7-1500 PM1507	S7-1500 PM1507
Power supply, type	24 V/3 A	24 V/8 A
<b>Input</b>		
Input	1-phase AC	1-phase AC
Supply voltage		
• 1 with AC Rated value	120 V	120 V
• 2 with AC Rated value	230 V	230 V
• Note	Automatic range selection	Automatic range selection
Input voltage		
• 1 with AC	85 ... 132 V	85 ... 132 V
• 2 with AC	170 ... 264 V	170 ... 264 V
Wide-range input	No	No
Overvoltage resistance	$2.3 \times V_{in \text{ rated}}, 1.3 \text{ ms}$	$2.3 \times V_{in \text{ rated}}, 1.3 \text{ ms}$
Mains buffering at $I_{out \text{ rated}}, \text{ min.}$	20 ms; at $V_{in} = 93/187 \text{ V}$	20 ms; at $V_{in} = 93/187 \text{ V}$
Rated line frequency	50 ... 60 Hz	50 ... 60 Hz
Rated line range	45 ... 65 Hz	45 ... 65 Hz
Input current		
• at rated input voltage 120 V	1.4 A	3.7 A
• at rated input voltage 230 V	0.8 A	1.7 A
Switch-on current limiting (+25 °C), max.	23 A	62 A
Duration of inrush current limiting at 25 °C		
• maximum	3 ms	3 ms
$I^2t, \text{ max.}$	1.3 A <sup>2</sup> ·s	12 A <sup>2</sup> ·s
Built-in incoming fuse	T 3, 15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 10 A characteristic B or 6 A characteristic C	Recommended miniature circuit breaker: 16 A characteristic B or 10 A characteristic C

**Technical specifications** (continued)

Article number	<b>6EP1332-4BA00</b>	<b>6EP1333-4BA00</b>
Product	S7-1500 PM1507	S7-1500 PM1507
Power supply, type	24 V/3 A	24 V/8 A
<b>Output</b>		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $V_{out}$ DC	24 V	24 V
Total tolerance, static $\pm$	1 %	1 %
Static mains compensation, approx.	0.1 %	0.1 %
Static load balancing, approx.	0.1 %	0.1 %
Residual ripple peak-peak, max.	50 mV	50 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	150 mV	150 mV
Product function	No	No
Output voltage adjustable		
Status display	LED green for 24 V OK; LED red for error; LED yellow for stand-by	LED green for 24 V OK; LED red for error; LED yellow for stand-by
On/off behavior	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)
Startup delay, max.	1.5 s	1.5 s
Voltage rise, typ.	10 ms	10 ms
Rated current value I <sub>out</sub> rated	3 A	8 A
Current range	0 ... 3 A	0 ... 8 A
Active power supplied typical	72 W	192 W
Short-term overload current		
• on short-circuiting during the start-up typical	12 A	35 A
• at short-circuit during operation typical	12 A	35 A
Duration of overloading capability for excess current		
• on short-circuiting during the start-up	70 ms	70 ms
• at short-circuit during operation	70 ms	70 ms
Parallel switching for enhanced performance	Yes; Parallel switching of 3 A and 8 A possible, devices must be switched on at the same time, max. 75% per device with I-load	Yes; Parallel switching of 3 A and 8 A possible, devices must be switched on at the same time, max. 75% per device with I-load
Numbers of parallel switchable units for enhanced performance	2	2
<b>Efficiency</b>		
Efficiency at $V_{out}$ rated, I <sub>out</sub> rated, approx.	87 %	90 %
Power loss at $V_{out}$ rated, I <sub>out</sub> rated, approx.	11 W	21 W
<b>Closed-loop control</b>		
Dynamic mains compensation ( $V_{in}$ rated $\pm$ 15 %), max.	0.1 %	0.1 %
Dynamic load smoothing ( $I_{out}$ : 50/100/50 %), $U_{out} \pm$ typ.	1 %	2 %
Dynamic load smoothing ( $I_{out}$ : 10/90/10 %), $U_{out} \pm$ typ.	3 %	3 %
Load step setting time 10 to 90%, typ.	5 ms	5 ms
Load step setting time 90 to 10%, typ.	5 ms	5 ms
Setting time maximum	5 ms	5 ms
<b>Protection and monitoring</b>		
Output overvoltage protection	Additional control loop, limitation (closed loop control) at < 28.8 V	Additional control loop, limitation (closed loop control) at < 28.8 V
Current limitation	3.15 ... 3.6 A	8.4 ... 9.6 A
Current limitation, typ.	3.4 A	9 A
Property of the output Short-circuit proof	Yes	Yes
Short-circuit protection	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart
Overload/short-circuit indicator	-	-

**SIMATIC S7-1500 advanced controller**

## Power supplies

**1-phase, 24 V DC (for S7-1500 and ET 200MP)****Technical specifications** (continued)

Article number	<b>6EP1332-4BA00</b>	<b>6EP1333-4BA00</b>
Product	S7-1500 PM1507	S7-1500 PM1507
Power supply, type	24 V/3 A	24 V/8 A
<b>Safety</b>		
Primary/secondary isolation	Yes	Yes
Galvanic isolation	Safety extra-low output voltage U <sub>out</sub> acc. to EN 60950-1 and EN 50178 and EN 61131-2	Safety extra-low output voltage U <sub>out</sub> acc. to EN 60950-1 and EN 50178 and EN 61131-2
Protection class	Class I	Class I
Leakage current		
• maximum	3.5 mA	3.5 mA
• typical	0.4 mA	1.3 mA
CE mark	Yes	Yes
UL/CSA approval	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289
Explosion protection	ATEX (EX) II 3G Ex nA nC IIC T4 Gc; cULus (ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455	ATEX (EX) II 3G Ex nA nC IIC T3 Gc; cULus (ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T3, File E330455
Certificate of suitability IECEx	No	No
Certificate of suitability NEC Class 2	No	No
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes
Marine approval	GL, DNV	GL, DNV
Degree of protection (EN 60529)	IP20	IP20
<b>EMC</b>		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	EN 61000-3-2	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2
<b>Operating data</b>		
Ambient temperature		
• during operation	0 ... 60 °C	0 ... 60 °C
- Note	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation
<b>Mechanics</b>		
Connection technology	Screw-/spring clamp connection	Screw-/spring clamp connection
Connections		
• Supply input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>
• Output	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm <sup>2</sup>	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm <sup>2</sup>
Product function		
• removable terminal at input	Yes	Yes
• removable terminal at output	Yes	Yes
Width of the enclosure	50 mm	75 mm
Height of the enclosure	147 mm	147 mm
Depth of the enclosure	129 mm	129 mm
Weight, approx.	0.45 kg	0.74 kg
Product property of the enclosure housing for side-by-side mounting	Yes	Yes
Installation	Can be mounted onto S7-1500 rail	Can be mounted onto S7-1500 rail
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

**Ordering data****Article No.****Article No.****SIMATIC PM 1507****6EP1332-4BA00****SIMATIC PM 1507****6EP1333-4BA00**

Stabilized power supply for SIMATIC S7-1500  
Input 120/230 V AC,  
output 24 V DC, 3 A

Stabilized power supply for SIMATIC S7-1500  
Input 120/230 V AC,  
output 24 V DC, 8 A

### Overview



- Power supplies for the SIMATIC S7-1500
- For conversion of AC or DC line voltages to the operating voltages required for the internal electronics
- 25 or 60 W output power
- Can be used for S7-1500 or ET 200MP
- Configuration via STEP 7 V12 and higher

### Technical specifications

Article number	6ES7505-0KA00-0AB0 PS 25W 24V DC	6ES7505-0RA00-0AB0 PS 60W 24/48/60V DC	6ES7507-0RA00-0AB0 PS 60W 120/230V AC/DC
<b>Product type designation</b>			
<b>Engineering with</b>			
• STEP 7 TIA Portal can be configured/integrated as of version	V12 / V12	V12 / V12	V12 / V12
• STEP 7 can be configured/integrated as of version	V5.5 SP3 or higher	V5.5 SP3 or higher	V5.5 SP3 or higher
<b>FH technology</b>			
<b>Redundancy</b>			
• Redundancy capability	Yes	Yes	Yes
- for increased power	Yes	Yes	Yes
<b>Supply voltage</b>			
Rated value (DC)	24 V; SELV	24 V / 48 V / 60 V	120 V / 230 V
permissible range, lower limit (DC)	Static 19.2 V, dynamic 18.5 V	Static 19.2 V, dynamic 18.5 V	88 V
permissible range, upper limit (DC)	Static 28.8 V, dynamic 30.2 V	Static 72 V, dynamic 75.5 V	300 V
Rated value (AC)			120 V / 230 V
permissible range, lower limit (AC)			85 V
permissible range, upper limit (AC)			264 V
Reverse polarity protection	Yes	Yes	
short-circuit protection	Yes	Yes	Yes
<b>Line frequency</b>			
• Rated value 50 Hz			Yes
• permissible frequency range, lower limit			47 Hz
• permissible frequency range, upper limit			63 Hz
<b>Mains buffering</b>			
• Mains/voltage failure stored energy time	20 ms	20 ms	20 ms
<b>Input current</b>			
Rated value at 48 V DC		1.5 A	
Rated value at 60 V DC		1.2 A	
Rated value at 120 V DC			0.6 A
Rated value at 230 V DC			0.3 A
Rated value at 120 V AC			0.6 A
Rated value at 230 V AC			0.34 A
<b>Output current</b>			
short-circuit protection	Yes	Yes	Yes

# SIMATIC S7-1500 advanced controller

## Power supplies

### System power supplies

#### Technical specifications (continued)

Article number	<b>6ES7505-0KA00-0AB0</b> PS 25W 24V DC	<b>6ES7505-0RA00-0AB0</b> PS 60W 24/48/60V DC	<b>6ES7507-0RA00-0AB0</b> PS 60W 120/230V AC/DC
<b>Power</b>			
Infeed power to the backplane bus	25 W	60 W	60 W
<b>Power losses</b>			
Power loss at nominal rating conditions	6.2 W	12 W	12 W
<b>Interrupts/diagnostics/ status information</b>			
Status indicator	Yes	Yes	Yes
<b>Galvanic isolation</b>			
primary/secondary	Yes; Electrical isolation for max. 60 V AC/75 V DC (base isolation)	Yes; Electrical isolation for 230 V AC (reinforced isolation)	Yes
<b>Isolation</b>			
Isolation checked with	707 V DC (type test)	2500V DC 2s (routine test)	2500V DC 2s (routine test)
<b>EMC</b>			
<b>Surge immunity</b>			
• on the supply lines acc. to IEC 61000-4-5	Yes; +/- 1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), +/- 2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; +/- 1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), +/- 2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; +/- 1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), +/- 2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required
<b>Degree and class of protection</b>			
Degree of protection to EN 60529	IP20	IP20	IP20
Protection class	3; with protective conductor	1; with protective conductor	1; with protective conductor
<b>Dimensions</b>			
Width	35 mm	70 mm	70 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
<b>Weights</b>			
Weight, approx.	350 g	600 g	600 g

#### Ordering data

##### Power supplies

For supplying the backplane bus of the S7-1500

24 V DC input voltage, power 25 W

24/48/60 V DC input voltage, power 60 W

120/230 V AC input voltage, power 60 W

##### Article No.

**6ES7505-0KA00-0AB0**

**6ES7505-0RA00-0AB0**

**6ES7507-0RA00-0AB0**

##### Article No.

##### Accessories

##### SIMATIC S7-1500 mounting rails

Fixed lengths, with grounding elements

- 160 mm
- 245 mm
- 482 mm
- 530 mm
- 830 mm

For cutting to length by customer, without drill holes; grounding elements must be ordered separately

- 2000 mm

##### PE connection element for mounting rail 2000 mm

Spare part, 20 units

##### Power connector

With coding element for power supply module; spare part, 10 units

**6ES7590-1AB60-0AA0**

**6ES7590-1AC40-0AA0**

**6ES7590-1AE80-0AA0**

**6ES7590-1AF30-0AA0**

**6ES7590-1AJ30-0AA0**

**6ES7590-1BC00-0AA0**

**6ES7590-5AA00-0AA0**

**6ES7590-8AA00-0AA0**

## SIMATIC S7-1500 advanced controller

### SIPLUS power supplies

Single-phase, 24 V DC/3 A (SIPLUS PM 1507)

#### Application



The design and functionality of the SIMATIC PM 1507 single-phase load power supply (PM = power module) with automatic range selection of the input voltage are an optimal match to the SIMATIC S7-1500 PLC. It supplies the S7-1500 system components such as CPU, system power supply (PS), I/O circuits of the input and output modules and, if necessary, the sensors and actuators with 24 V DC.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Ordering data

##### SIPLUS S7-1500 PM 1507

(extended temperature range and medial exposure)

Input 120/230 V AC,  
output 24 V DC, 3 A

#### Article No.

**6AG1332-4BA00-7AA0**



**SIMATIC S7-1500 advanced controller**

SIPLUS power supplies

Single-phase, 24 V DC/8 A (SIPLUS PM 1507)

**Application**

The design and functionality of the SIMATIC PM 1507 single-phase load power supply (PM = power module) with automatic range selection of the input voltage are an optimal match to the SIMATIC S7-1500 PLC. It supplies the S7-1500 system components such as CPU, system power supply (PS), I/O circuits of the input and output modules and, if necessary, the sensors and actuators with 24 V DC.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Ordering data****SIPLUS S7-1500 PM 1507**

(extended temperature range and medial exposure)

Input 120/230 V AC,  
output 24 V DC, 8 A

**Article No.****6AG1333-4BA00-7AA0**

### Overview



- System power supplies for the SIMATIC S7-1500
- For conversion of AC or DC line voltages to the operating voltages required for the internal electronics
- 25 or 60 W output power
- Can be used for S7-1500 or ET 200MP
- Configuration via STEP 7 V12

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Technical specifications

Article number	6AG1505-0KA00-7AB0	6AG1505-0RA00-7AB0	6AG1507-0RA00-7AB0
Based on	6ES7505-0KA00-0AB0 SIPLUS S7-1500 PS 25W 24V DC	6ES7505-0RA00-0AB0 SIPLUS S7-1500 PS 60W 24/48/60V DC	6ES7507-0RA00-0AB0 SIPLUS S7-1500 PS 60W 120/230V AC/DC
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	70 °C; = Tmax; for vertical mounting position Tmax = +40 °C	70 °C; = Tmax; > +60 °C max. power input 30 W; for vertical mounting position Tmax = +40 °C	70 °C; = Tmax; for vertical mounting position Tmax = +40 °C
<b>Storage/transport temperature</b>			
• Min.		-40 °C	
• max.		70 °C	
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>			
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-1500 advanced controller**

## SIPLUS power supplies

## SIPLUS system power supplies

**Ordering data****Article No.****SIPLUS system power supplies**

(extended temperature range and  
medial exposure)

For supplying the backplane bus  
of the S7-1500

24 V DC input voltage, power 25 W

**6AG1505-0KA00-7AB0**

24/48/60 V DC input voltage,  
power 60 W

**6AG1505-0RA00-7AB0**

120/230 V AC input voltage,  
power 60 W

**6AG1507-0RA00-7AB0**

## SIMATIC S7-1500 advanced controller

### Operator control and monitoring

#### SIMATIC HMI Basic Panels and Comfort Panels

##### Overview SIMATIC HMI Basic Panels (2<sup>nd</sup> Generation)



SIMATIC HMI Basic Panels, 2<sup>nd</sup> generation

With their fully developed HMI basic functions, 2<sup>nd</sup> generation SIMATIC HMI Basic Panels are the ideal entry level series for simple HMI applications.

The device family offers panels with 4", 7", 9" and 12" widescreen displays, as well as combined key and touch operation.

The innovative high-resolution widescreen displays with 64 000 colors are also suitable for upright installation, and they can be dimmed down to 100 %. The innovative operator interface with improved usability opens up a diverse range of options thanks to new controls and graphics. The new USB interface enables the connection of keyboard, mouse or barcode scanner, and supports the simple archiving of data on a USB stick.

The integrated Ethernet or RS 485/422 interface (version-specific) enables simple connection to the controller.

For further information, see chapter 3, page 3/145.

##### Overview SIMATIC HMI Basic Panels (1<sup>st</sup> Generation)



- Ideal entry-level series from 3" to 15" for operating and monitoring compact machines and systems
- Clear process representation thanks to use of pixel-graphics displays
- Intuitive operation using Touch and tactile function keys
- Equipped with all the necessary basic functions such as alarm logging, recipe management, plots, vector graphics, and language switching
- Simple connection to the controller via integral Ethernet interface or separate version with RS 485/422
- Faster commissioning thanks to integrated diagnostics viewer and IP setting for SIMATIC S7-1200 and S7-1500 PLCs

For further information, see chapter 3, page 3/146.

## SIMATIC S7-1500 advanced controller

Operator control and monitoring

### SIMATIC HMI Basic Panels and Comfort Panels

#### Overview SIMATIC HMI Comfort Panels



SIMATIC HMI Comfort Panels

- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player and Web Server
- Dimmable displays from 0 to 100% via PROFIenergy, via the HMI project or via a controller

- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Optimal selection option: seven touch and five key versions are available
- Data security in the event of a power failure for the device and for the SIMATIC HMI Memory Card
- Innovative service and commissioning concept through second SD card (automatic backup)
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22 and marine approvals
- Wide range of communication options: PROFIBUS and PROFINET onboard; 2 x PROFINET with integrated switch for 7" models or larger; plus 1 x PROFINET with Gigabit support for 15" models or larger
- All versions can be used as an OPC UA client or as an OPC DA server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal

For further information, see chapter 3, page 3/151.

### SIPLUS Basic Panels and Comfort Panels

#### Overview

SIPLUS extreme products are based on SIMATIC standard products.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

For further information, see chapter 3, page 3/152.

#### Overview



- Aluminum mounting rail for mounting the SIMATIC S7-1500 or ET 200MP
- With integrated DIN rail for snapping on a wide range of standard components
- Attachment of modules with a single screw
- Installation by screwing to the control cabinet wall
- Entire length of rail can be used

#### Ordering data

##### SIMATIC S7-1500 mounting rails

Fixed lengths, with grounding elements

- 160 mm
- 245 mm
- 482 mm
- 530 mm
- 830 mm

For cutting to length by customer, without drill holes; grounding elements must be ordered separately

##### PE connection element for mounting rail 2000 mm

20 units

#### Article No.

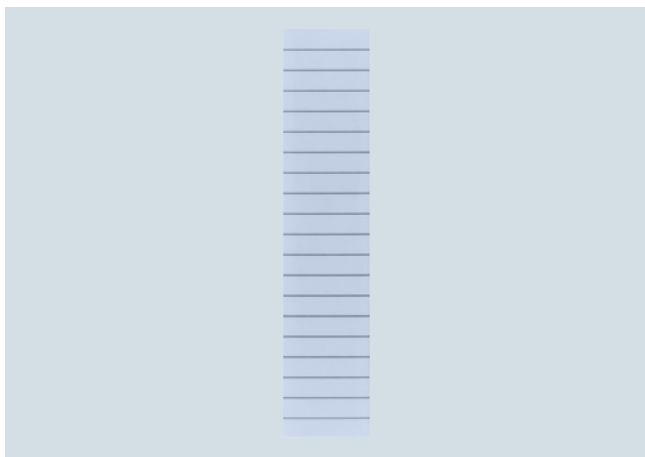
**6ES7590-1AB60-0AA0**  
**6ES7590-1AC40-0AA0**  
**6ES7590-1AE80-0AA0**  
**6ES7590-1AF30-0AA0**  
**6ES7590-1AJ30-0AA0**

**6ES7590-1BC00-0AA0**

**6ES7590-5AA00-0AA0**

### Labeling sheets

#### Overview



- Film sheets for the application-specific, automatic labeling of I/O modules of the SIMATIC S7-1500 using standard laser printers
- Printing direct from the TIA Portal possible
  - No double entry of symbols and/or addresses
  - Saves time and avoids typing errors
- Plain color films, tear-resistant, dirt-repellent
- Simple handling:
  - Perforated labeling sheets in DIN A4 format for easy separation of the labeling strips
  - Detached strips can be inserted directly into the I/O modules
- Different colors to differentiate module types; yellow reserved for failsafe systems

#### Ordering data

##### DIN A4 labeling sheets

For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, color Al grey

For 25 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, color Al grey

#### Article No.

**6ES7592-2AX00-0AA0**

**6ES7592-1AX00-0AA0**

## SIMATIC S7-1500 advanced controller

### Accessories

#### Spare parts

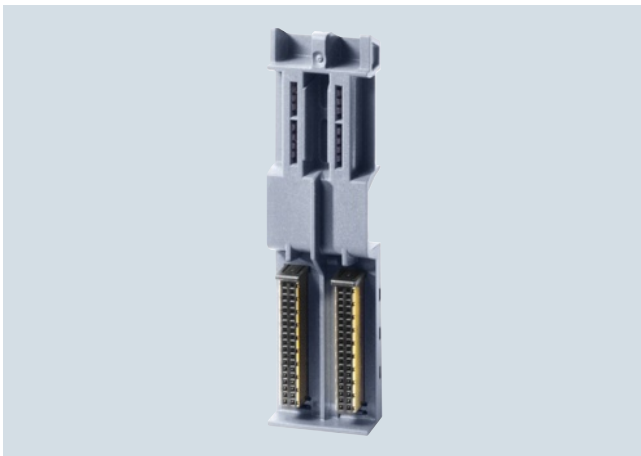
#### Overview

##### Front doors



- Versions:
  - Universal front doors for digital and analog I/O modules
  - Universal front doors for the interface module IM155-5 PN ST
- Included in the scope of delivery of the respective modules  
Can be ordered as a spare part in a set consisting of five universal (unlabeled) front doors
- Front doors for I/O modules: Universal labeling sheets and cabling diagrams are included. Cabling diagrams can be detached from preperforated sheets and inserted inside the door

##### U connector



- To interconnect the modules (self-assembling backplane bus)
- Implementation of a rugged, interference-free station setup through
  - consistent separation of supply voltage of modules and data signals
  - fully shielded, gold-plated contacts for the data bus
- Included in the scope of delivery of each module. Available as spare part in sets of 5

##### Shielding



- Components for implementing the integrated shielding concept of the S7-1500:
  - 24 V DC infeed element for supplying the analog module: Strict separation of infeed and analog signals ensures high EMC stability
  - Shield clamp for insertion in the front connector: Allows a low-impedance connection and optimally dissipates interference
  - Universal shield terminal: Connects the cable shield with the shield clamp and is simultaneously used for mechanical fixing
- Included in the scope of delivery of the analog modules. Available as a spare part in two versions:
  - Shielding set, comprising infeed element, shield clamp, and shield terminal (pack of 5 units each)
  - Individual shield terminals (pack of 20)
- No tool required for assembly/disassembly

##### Ordering data

##### Article No.

##### Universal front door for IM 155-5 PN ST

6ES7528-0AA70-7AA0

5 front doors; spare part

##### Universal front door for I/O modules

6ES7528-0AA00-7AA0

5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part

- For module width 35 mm

6ES7528-0AA00-0AA0

- For module width 25 mm

##### U connector

6ES7590-0AA00-0AA0

5 units; spare part

##### Shielding set I/O

6ES7590-5CA00-0AA0

Infeed element, shield clamp, and shield terminal; 5 units, spare part

- For module width 35 mm

6ES7590-5CA00-0AA0

- For module width 25 mm

6ES7590-5CA10-0AA0

##### Shield terminal element

6ES7590-5BA00-0AA0

10 units; spare part

## SIMATIC S7-300 advanced controller



<b>5/2</b>	<b>Introduction</b>	<b>5/168</b>	<b>Function modules</b> (continued)
5/2	S7-300/S7-300F, SIPLUS S7-300	5/168	IM 174 PROFIBUS modules
<b>5/4</b>	<b>Central processing units</b>	5/171	SIWAREX U
5/4	Standard CPUs	5/174	SIWAREX FTA
5/15	SIPLUS standard CPUs	5/177	SIWAREX FTC
5/23	Compact CPUs	5/180	SIFLOW FC070
5/33	SIPLUS compact CPUs	<b>5/183</b>	<b>SIPLUS S7-300 function modules</b>
5/40	Fail-safe CPUs	5/183	SIPLUS S7-300 FM 350-1 counter modules
5/47	SIPLUS fail-safe CPUs	5/184	SIPLUS S7-300 FM 350-2 counter modules
5/55	Technology CPUs	5/185	SIPLUS SIWAREX U
<b>5/62</b>	<b>I/O modules</b>	5/186	SIPLUS DCF 77 radio clock modules
5/62	<u>Digital modules</u>	<b>5/187</b>	<b>Communication</b>
5/62	SM 321 digital input modules	5/187	CP 340
5/68	SM 322 digital output modules	5/189	CP 341
5/75	SM 323/SM 327 digital input/output modules	5/191	Loadable drivers for CP 441-2 and CP 341
5/79	<u>SIPLUS S7-300 digital modules</u>	5/193	CP 343-2P / CP 343-2
5/87	<u>Analog modules</u>	5/195	CP 342-5
5/87	SM 331 analog input modules	5/197	CP 342-5 FO
5/95	SM 332 analog output modules	5/199	CP 343-5
5/98	SM 334 analog input/output modules	5/201	CP 343-1 Lean
5/102	<u>SIPLUS S7-300 analog modules</u>	5/204	CP 343-1
5/108	<u>F digital / analog modules</u>	5/207	CP 343-1 Advanced
5/108	SM 326 F digital input modules - Safety Integrated	5/212	CP 343-1 ERPC
5/111	SM 326 F digital output modules - Safety Integrated	5/215	CSM 377 unmanaged
5/114	SM 336 F analog input modules - Safety Integrated	5/217	TIM 3V-IE for WAN and Ethernet
5/116	Isolation module	5/220	TIM 3V-IE Advanced
5/117	<u>SIPLUS F digital/analog modules</u>	5/223	TIM 4R-IE for WAN and Ethernet
5/123	<u>Ex digital modules</u>	5/226	TIM 3V-IE DNP3
5/123	Ex digital input modules	5/228	TIM 4R-IE DNP3
5/125	Ex digital output modules	5/231	ASM 475
5/127	<u>SIPLUS S7-300 Ex digital modules</u>	<b>5/233</b>	<b>SIPLUS S7-300 communication</b>
5/128	<u>Ex analog modules</u>	<b>5/244</b>	<b>Special modules</b>
5/128	Ex analog input modules	5/244	SM 374 simulators
5/131	Ex analog output modules	5/245	DM 370 dummy modules
5/133	<u>SIPLUS S7-300 Ex analog modules</u>	<b>5/246</b>	<b>Connection methods</b>
<b>5/134</b>	<b>Function modules</b>	5/246	Front connectors
5/134	FM 350-1 counter modules	5/247	Fully modular connection
5/137	FM 350-2 counter modules	5/252	Flexible connection
5/140	FM 351 positioning modules	<b>5/253</b>	<b>Power supplies</b>
5/143	FM 352 cam controllers	<b>5/257</b>	<b>SIPLUS power supplies</b>
5/145	FM 352-5 high-speed Boolean processors	<b>5/260</b>	<b>Interface modules</b>
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5/151	FM 354 positioning modules	<b>5/262</b>	<b>Accessories</b>
5/154	FM 357-2 positioning modules		
5/156	FM 355 controller modules		
5/161	FM 355-2 temperature controller modules		
5/166	SM 338 POS input modules		

**Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

[www.siemens.com/simatic/printmaterial](http://www.siemens.com/simatic/printmaterial)



# SIMATIC S7-300 advanced controller

## Introduction

### S7-300/S7-300F, SIPLUS S7-300

#### Overview



#### S7-300

- The modular mini PLC system for the low and mid-performance ranges
- With comprehensive range of modules for optimum adaptation to the automation task
- Flexible use through simple implementation of distributed structures and versatile networking
- User-friendly handling and uncomplicated design without a fan
- Can be expanded without problems when the tasks increase
- Powerful thanks to a range of integrated functions

#### S7-300F

- Failsafe automation system for plants with increased safety requirements for production technology
- Based on S7-300
- Additional ET 200S and ET 200M distributed I/O stations complete with safety-related modules can be connected
- Safety-related communication via PROFIBUS DP with PROFIsafe profile
- Standard modules can be used in addition for non-safety-relevant applications

#### Technical specifications

##### General technical data SIMATIC S7-300

Degree of protection	IP20 according to IEC 60 529
Ambient temperature	0 to 60 °C
• For horizontal installation	0 to 60 °C
• For vertical installation	0 to 40 °C
Relative humidity	10 to 95%, without condensation, corresponds to relative humidity (RH), stress level 2 acc. to IEC 61131, Part 2
Air pressure	From 1080 to 795 hPa (corresponds to an altitude of -1000 to +2000 m)
Insulation	500 V DC test voltage
• < 50 V	2500 V DC test voltage
• < 150 V	4000 V DC test voltage
• < 250 V	
Electromagnetic compatibility	Requirements of the EMC directive; interference immunity according to IEC 61000-6-2
• Pulse-shaped disturbance variables	Test according to: Electrostatic discharge according to IEC 61000-4-2, burst pulses according to IEC 61000-4-4, energy single pulse (surge) according to IEC 61000-4-5,
• Sinusoidal disturbance variables	Test according to: HF irradiation according to IEC 61000-4-3, HF decoupling according to IEC 61000-4-6
• Emission of radio interference	Interference emission according to EN 50081-2 Test according to: Emitted interference of electromagnetic fields according to EN 55016: Limit value class A, (measured at a distance of 10 m) Interference emission via AC mains according to EN 55011: Limit value class A, Group 1
Mechanical strength	
• Vibrations	Frequency range 10 Hz ≤ f ≤ 58 Hz • Continuous: 0.0375 mm amplitude • Occasionally 0.75 mm amplitude Frequency range 58 Hz ≤ f ≤ 150 Hz • Continuous: 0.5 g constant acceleration • Occasionally 1 g constant acceleration Testing according to IEC 60068-2-6 Tested with: 5 Hz ≤ f ≤ 9 Hz, constant amplitude 3.5 mm; 9 Hz ≤ f ≤ 150 Hz, constant acceleration 1 g; Duration of oscillation: 10 frequency passes per axis in each direction of the 3 mutually perpendicular axes
• Shock	Testing according to IEC 60068-2-27 Tested with: Half-sine wave: strength of shock 15 g peak value, 11 ms duration; Shock direction: 3 shocks each in ± direction in each of the 3 mutually vertical axes

**Technical specifications** (continued)

<b>General technical data SIPLUS S7-300</b>	
Ambient temperature range	-40/-25 ... +60/70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the environmental conditions.

**Ambient conditions:**

## Extended ambient conditions

<ul style="list-style-type: none"> <li>Relative to ambient temperature-atmospheric pressure-installation altitude</li> </ul>	<p>Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)</p>
Relative humidity <ul style="list-style-type: none"> <li>With condensation, max.</li> </ul>	<p>100 %; RH incl. condensation/frost (no commissioning under condensation conditions)</p>
Resistance <ul style="list-style-type: none"> <li>against biologically active substances / conformity with EN 60721-3-3</li> <li>against chemically active substances / conformity with EN 60721-3-3</li> <li>against mechanically active substances / conformity with EN 60721-3-3</li> </ul>	<p>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!</p> <p>Yes; Class 3C4 (RH &lt; 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!</p> <p>Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!</p>

## SIMATIC S7-300 advanced controller

### Central processing units

#### Standard CPUs

##### Overview CPU 312



- The entry level CPU in Totally Integrated Automation (TIA)
- For smaller applications with moderate processing performance requirements

SIMATIC Micro Memory Card required for operation of the CPU.

##### Overview CPU 314



- For plants with medium program scope requirements
- High processing power in binary and floating-point arithmetic

SIMATIC Micro Memory Card required for operation of CPU.

##### Overview CPU 315-2 DP



- The CPU with medium to large program memory and quantity structures for optional use of SIMATIC engineering tools
- High processing power in binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFIBUS DP master/slave interface
- For comprehensive I/O expansion
- For configuring distributed I/O structures
- Isochronous mode on PROFIBUS

SIMATIC Micro Memory Card required for operation of CPU.

### Overview CPU 315-2 PN/DP



- The CPU with mid-range program memory and quantity frameworks
- High processing power in binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET interface with 2-port switch
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as intelligent PROFINET device under a SIMATIC or third-party PROFINET I/O Controller
- Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- Integrated web server with the option of creating user-defined web pages
- Combined MPI/PROFIBUS DP master/slave interface
- Isochronous mode on PROFIBUS and PROFINET

SIMATIC Micro Memory Card required for operation of CPU.

### Overview CPU 317-2 DP



- The CPU with a large program memory and quantity framework for demanding applications
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- High processing power in binary and floating-point arithmetic
- 2 PROFIBUS DP master/slave interfaces
- For comprehensive I/O expansion
- For configuring distributed I/O structures
- Isochronous mode on PROFIBUS
- Optionally supports the use of SIMATIC engineering tools

SIMATIC Micro Memory Card required for operation of CPU.

## SIMATIC S7-300 advanced controller

### Central processing units

#### Standard CPUs

##### Overview CPU 317-2 PN/DP



- The CPU with a large program memory and quantity framework for demanding applications
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- High processing power in binary and floating-point arithmetic
- PROFINET interface with 2-port switch
- PROFINET I/O Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as intelligent PROFINET device under a SIMATIC or third-party PROFINET I/O Controller
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- Integrated web server with the option of creating user-defined web pages
- Combined MPI/PROFIBUS DP master/slave interface
- Isochronous mode on PROFIBUS and PROFINET
- Optionally supports the use of SIMATIC engineering tools

SIMATIC Micro Memory Card required for operation of CPU.

##### Overview CPU 319-3 PN/DP



- The CPU with high command processing performance, large program memory and quantity framework for demanding applications
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O on PROFIBUS and PROFINET
- PROFINET I/O controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- PROFINET interface with 2-port switch
- Isochronous mode on PROFIBUS or PROFINET
- Integrated web server with the option of creating user-defined web pages
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- Optionally supports the use of SIMATIC engineering tools

SIMATIC Micro Memory Card required for operation of the CPU.

### Technical specifications

Article number	6ES7312-1AE14-0AB0 CPU312, 32KB	6ES7314-1AG14-0AB0 CPU314, 128 KB	6ES7315-2AH14-0AB0 CPU315-2DP, 256 KB	6ES7315-2EH14-0AB0 CPU315-2 PN/DP, 384 KB
<b>Product type designation</b>				
<b>General information</b>				
<b>Engineering with</b>				
• Programming package	STEP 7 V5.5 + SP1 or higher or STEP7 V5.2 + SP1 or higher with HSP 218	STEP 7 V5.5 + SP1 or higher or STEP7 V5.2 + SP1 or higher with HSP 218	STEP 7 V5.5 + SP1 or higher or STEP7 V5.2 + SP1 or higher with HSP 218	STEP7 V 5.5 or higher
<b>Supply voltage</b>				
Rated value (DC)				
• 24 V DC	Yes	Yes	Yes	Yes
<b>Power losses</b>				
Power loss, typ.	4 W	4 W	4.5 W	4.65 W
<b>Memory</b>				
<b>Work memory</b>				
• Integrated	32 kbyte	128 kbyte	256 kbyte	384 kbyte
• Size of retentive memory for retentive data blocks	32 kbyte	64 kbyte	128 kbyte	128 kbyte
<b>Load memory</b>				
• pluggable (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte	8 Mbyte
<b>CPU processing times</b>				
for bit operations, typ.	0.1 µs	0.06 µs	0.05 µs	0.05 µs
for word operations, typ.	0.24 µs	0.12 µs	0.09 µs	0.09 µs
for fixed point arithmetic, typ.	0.32 µs	0.16 µs	0.12 µs	0.12 µs
for floating point arithmetic, typ.	1.1 µs	0.59 µs	0.45 µs	0.45 µs
<b>Counters, timers and their retentivity</b>				
<b>S7 counter</b>				
• Number	256	256	256	256
<b>IEC counter</b>				
• present	Yes	Yes	Yes	Yes
<b>S7 times</b>				
• Number	256	256	256	256
<b>IEC timer</b>				
• present	Yes	Yes	Yes	Yes
<b>Data areas and their retentivity</b>				
<b>Flag</b>				
• Number, max.	256 byte	256 byte	2 048 byte	2 048 byte
<b>Address area</b>				
<b>I/O address area</b>				
• Inputs	1 024 byte	1 024 byte	2 048 byte	2 048 byte
• Outputs	1 024 byte	1 024 byte	2 048 byte	2 048 byte
<b>Process image</b>				
• Inputs, adjustable	1 024 byte	1 024 byte	2 048 byte	2 048 byte
• Outputs, adjustable	1 024 byte	1 024 byte	2 048 byte	2 048 byte
<b>Time of day</b>				
<b>Clock</b>				
• Hardware clock (real-time clock)		Yes	Yes	Yes
<b>Operating hours counter</b>				
• Number	1	1	1	1

# SIMATIC S7-300 advanced controller

## Central processing units

### Standard CPUs

#### Technical specifications (continued)

Article number	<b>6ES7312-1AE14-0AB0</b> CPU312, 32KB	<b>6ES7314-1AG14-0AB0</b> CPU314, 128 KB	<b>6ES7315-2AH14-0AB0</b> CPU315-2DP, 256 KB	<b>6ES7315-2EH14-0AB0</b> CPU315-2 PN/DP, 384 KB
<b>1st interface</b>				
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485	RS 485
<b>Functionality</b>				
• MPI	Yes	Yes	Yes	Yes
• DP master	No	No	No	Yes
• DP slave	No	No	No	Yes
• Point-to-point connection	No	No	No	No
<b>DP master</b>				
• Number of DP slaves, max.				124
<b>2nd interface</b>				
Interface type			Integrated RS 485 interface	PROFINET
Physics			RS 485	Ethernet RJ45
Number of ports				2
<b>Functionality</b>				
• MPI			No	No
• DP master			Yes	No
• DP slave			Yes	No
• PROFINET IO Controller				Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device				Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA				Yes
<b>DP master</b>				
• Number of DP slaves, max.			124; Per station	
<b>PROFINET IO Controller</b>				
• Max. number of connectable IO devices for RT				128
• Number of IO devices with IRT and the option "high flexibility"				128
• Number of IO Devices with IRT and the option "high performance", max.				64
<b>Isochronous mode</b>				
Isochronous operation (application synchronized up to terminal)			Yes	Yes; Via PROFIBUS DP or PROFINET interface
<b>Communication functions</b>				
PG/OP communication	Yes	Yes	Yes	Yes
Data record routing	No	No	Yes	Yes
<b>Global data communication</b>				
• supported	Yes	Yes	Yes	Yes
<b>S7 basic communication</b>				
• supported	Yes	Yes	Yes	Yes
<b>S7 communication</b>				
• supported	Yes	Yes	Yes	Yes
<b>S5-compatible communication</b>				
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC

# SIMATIC S7-300 advanced controller

## Central processing units

### Standard CPUs

#### Technical specifications (continued)

Article number	6ES7312-1AE14-0AB0 CPU312, 32KB	6ES7314-1AG14-0AB0 CPU314, 128 KB	6ES7315-2AH14-0AB0 CPU315-2DP, 256 KB	6ES7315-2EH14-0AB0 CPU315-2 PN/DP, 384 KB
<b>Open IE communication</b>				
• TCP/IP				Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.				8
• ISO-on-TCP (RFC1006)				Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.				8
• UDP				Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.				8
<b>Web server</b>				
• supported				Yes
<b>Number of connections</b>				
• overall	6	12	16	16
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	0 °C	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C	60 °C
<b>Configuration programming</b>				
<b>Programming language</b>				
- LAD	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- CFC		Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes	Yes
<b>Know-how protection</b>				
• User program protection/password protection	Yes	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>				
Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm	130 mm
<b>Weights</b>				
Weight, approx.	270 g	280 g	290 g	340 g



# SIMATIC S7-300 advanced controller

## Central processing units

### Standard CPUs

#### Technical specifications (continued)

Article number	<b>6ES7317-2AK14-0AB0</b> CPU317-2 DP, 1 MB	<b>6ES7317-2EK14-0AB0</b> CPU317-2 PN/DP, 1 MB	<b>6ES7318-3EL01-0AB0</b> CPU319-3 PN/DP, 2 MB
<b>Product type designation</b>			
<b>General information</b>			
<b>Engineering with</b>			
• Programming package	STEP7 as of V5.5 + SP1 or STEP 7 V5.2 + SP1 or higher with HSP 202	STEP7 V 5.5 or higher	STEP7 V 5.5 or higher
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
<b>Power losses</b>			
Power loss, typ.	4.5 W	4.65 W	14 W
<b>Memory</b>			
<b>Work memory</b>			
• Integrated	1 024 kbyte	1 024 kbyte	2 048 kbyte
• Size of retentive memory for retentive data blocks	256 kbyte	256 kbyte	700 kbyte
<b>Load memory</b>			
• pluggable (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte
<b>CPU processing times</b>			
for bit operations, typ.	0.025 µs	0.025 µs	0.004 µs
for word operations, typ.	0.03 µs	0.03 µs	0.01 µs
for fixed point arithmetic, typ.	0.04 µs	0.04 µs	0.01 µs
for floating point arithmetic, typ.	0.16 µs	0.16 µs	0.04 µs
<b>Counters, timers and their retentivity</b>			
<b>S7 counter</b>			
• Number	512	512	2 048
<b>IEC counter</b>			
• present	Yes	Yes	Yes
<b>S7 times</b>			
• Number	512	512	2 048
<b>IEC timer</b>			
• present	Yes	Yes	Yes
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Number, max.	4 096 byte	4 096 byte	8 192 byte
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	8 192 byte	8 192 byte	8 192 byte
• Outputs	8 192 byte	8 192 byte	8 192 byte
<b>Process image</b>			
• Inputs, adjustable	8 192 byte	8 192 byte	8 192 byte
• Outputs, adjustable	8 192 byte	8 192 byte	8 192 byte
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time clock)	Yes	Yes	Yes
<b>Operating hours counter</b>			
• Number	4	4	4
<b>1st interface</b>			
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485
<b>Functionality</b>			
• MPI	Yes	Yes	Yes
• DP master	Yes	Yes	Yes
• DP slave	Yes; A DP slave at both interfaces simultaneously is not possible	Yes	Yes; A DP slave at both interfaces simultaneously is not possible
• Point-to-point connection	No	No	No
<b>DP master</b>			
• Number of DP slaves, max.	124	124	124

# SIMATIC S7-300 advanced controller

## Central processing units

### Standard CPUs

#### Technical specifications (continued)

Article number	<b>6ES7317-2AK14-0AB0</b> CPU317-2 DP, 1 MB	<b>6ES7317-2EK14-0AB0</b> CPU317-2 PN/DP, 1 MB	<b>6ES7318-3EL01-0AB0</b> CPU319-3 PN/DP, 2 MB
<b>2nd interface</b>			
Interface type	Integrated RS 485 interface	PROFINET	Integrated RS 485 interface
Physics	RS 485	Ethernet RJ45	RS 485
Number of ports		2	
<b>Functionality</b>			
• MPI	No	No	No
• DP master	Yes	No	Yes
• DP slave	Yes; A DP slave at both interfaces simultaneously is not possible	No	Yes; A DP slave at both interfaces simultaneously is not possible
• PROFINET IO Controller		Yes; Also simultaneously with IO-Device functionality	No
• PROFINET IO Device		Yes; Also simultaneously with IO Controller functionality	No
• PROFINET CBA		Yes	No
<b>DP master</b>			
• Number of DP slaves, max.	124		124
<b>PROFINET IO Controller</b>			
• Max. number of connectable IO devices for RT		128	
• Number of IO devices with IRT and the option "high flexibility"		128	
• Number of IO Devices with IRT and the option "high performance", max.		64	
<b>3rd interface</b>			
Interface type			PROFINET
Physics			Ethernet RJ45
Number of ports			2
<b>Functionality</b>			
• MPI			No
• DP master			No
• DP slave			No
• PROFINET IO Controller			Yes; Also simultaneously with I-Device functionality
• PROFINET IO Device			Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA			Yes
<b>PROFINET IO Controller</b>			
• Max. number of connectable IO devices for RT			256
• Number of IO devices with IRT and the option "high flexibility"			256
• Number of IO Devices with IRT and the option "high performance", max.			64
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)		Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via 2nd PROFIBUS DP or PROFINET interface

# SIMATIC S7-300 advanced controller

## Central processing units

### Standard CPUs

#### Technical specifications (continued)

Article number	<b>6ES7317-2AK14-0AB0</b> CPU317-2 DP, 1 MB	<b>6ES7317-2EK14-0AB0</b> CPU317-2 PN/DP, 1 MB	<b>6ES7318-3EL01-0AB0</b> CPU319-3 PN/DP, 2 MB
<b>Communication functions</b>			
PG/OP communication	Yes	Yes	Yes
Data record routing	Yes	Yes	Yes
<b>Global data communication</b>			
• supported	Yes	Yes	Yes
<b>S7 basic communication</b>			
• supported	Yes	Yes	Yes
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>S5-compatible communication</b>			
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
<b>Open IE communication</b>			
• TCP/IP		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		16	32
• ISO-on-TCP (RFC1006)		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		16	32
• UDP		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		16	32
<b>Web server</b>			
• supported		Yes	Yes
<b>Number of connections</b>			
• overall	32	32	32
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
<b>Configuration</b>			
<b>programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- CFC	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes
<b>Know-how protection</b>			
• User program protection/password protection	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>			
Width	40 mm	40 mm	120 mm
Height	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm
<b>Weights</b>			
Weight, approx.	360 g	340 g	1 250 g

# SIMATIC S7-300 advanced controller

## Central processing units

### Standard CPUs

Ordering data	Article No.	Article No.	
<b>CPU 312</b> 32 KB main memory, 24 V DC power supply, MPI; MMC required	6ES7312-1AE14-0AB0	<b>SIMATIC Manual Collection</b> 6ES7998-8XC01-8YE0  Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
<b>CPU 314</b> 128 KB main memory, 24 V DC power supply, MPI; MMC required	6ES7314-1AG14-0AB0		
<b>CPU 315-2 DP</b> 256 KB main memory, 24 V DC power supply, MPI, PROFIBUS DP master/slave interface, MMC required	6ES7315-2AH14-0AB0		
<b>CPU 315-2 PN/DP</b> 384 KB main memory, 24 V DC power supply, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface with 2-port switch; MMC required	6ES7315-2EH14-0AB0		
<b>CPU 317-2 DP</b> Main memory 1 MB, power supply 24 V DC, MPI, PROFIBUS DP master/slave interface, MMC required	6ES7317-2AK14-0AB0		
<b>CPU 317-2 PN/DP</b> 1 MB main memory, 24 V DC power supply, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface with 2-port switch; MMC required	6ES7317-2EK14-0AB0		
<b>CPU 319-3 PN/DP</b> 1.4 MB main memory, 24 V DC power supply, combined MPI/PROFIBUS DP master/slave interface, PROFIBUS DP master/ slave interface, Ethernet/PROFINET interface with 2-port switch; MMC required	6ES7318-3EL01-0AB0		
<b>SIMATIC Micro Memory Card</b> 64 KB	6ES7953-8LF30-0AA0		
128 KB	6ES7953-8LG30-0AA0		
512 KB	6ES7953-8LJ30-0AA0		
2 MB	6ES7953-8LL31-0AA0		
4 MB	6ES7953-8LM31-0AA0		
8 MB	6ES7953-8LP31-0AA0		
<b>MPI cable</b> for connection of SIMATIC S7 and PG via MPI; 5 m in length	6ES7901-0BF00-0AA0	<b>SIMATIC Manual Collection</b> 6ES7998-8XC01-8YE2  Current "Manual Collection" DVD and the three subsequent updates	
<b>Slot number plates</b>	6ES7912-0AA00-0AA0		
<b>Power supply connector</b>	6ES7391-1AA00-0AA0 10 units, spare part		
<b>USB A2 PC adapter</b>	6GK1571-0BA00-0AA0  For connecting a PG/PC or Notebook to PROFIBUS or MPI; USB cable included in scope of delivery		
<b>PROFIBUS bus components</b>	<b>PROFIBUS DP bus connector RS 485</b> <ul style="list-style-type: none"> <li>with 90° cable outlet, max. transfer rate 12 Mbit/s <ul style="list-style-type: none"> <li>Without PG interface</li> <li>With PG interface</li> </ul> </li> <li>with 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbit/s <ul style="list-style-type: none"> <li>Without PG interface, 1 unit</li> <li>Without PG interface, 100 units</li> <li>With PG interface, 1 unit</li> <li>With PG interface, 100 units</li> </ul> </li> <li>With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS</li> </ul>		
			6ES7972-0BA12-0XA0 6ES7972-0BB12-0XA0
			6ES7972-0BA52-0XA0 6ES7972-0BA52-0XB0 6ES7972-0BB52-0XA0 6ES7972-0BB52-0XB0 6GK1500-0EA02
<b>PROFIBUS FastConnect bus cable</b>			6XV1830-0EH10  Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m
<b>RS 485 repeater for PROFIBUS</b>			6ES7972-0AA02-0XA0  Transmission rate up to 12 Mbit/s; 24 V DC; IP20 enclosure

## SIMATIC S7-300 advanced controller

### Central processing units

#### Standard CPUs

Ordering data	Article No.		Article No.
<b>PROFINET bus components</b> <b>IE FC TP Standard Cable GP 2x2</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter	<b>6XV1840-2AH10</b>	<b>IE FC RJ45 Plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
<b>FO Standard Cable GP (50/125)</b> Standard cable, splittable, UL approval, sold by the meter	<b>6XV1873-2A</b>	<b>IE FC RJ45 Plug 145</b> 145° cable outlet 1 unit 10 units 50 units	<b>6GK1901-1BB30-0AA0</b> <b>6GK1901-1BB30-0AB0</b> <b>6GK1901-1BB30-0AE0</b>
<b>SCALANCE X204-2 Industrial Ethernet Switch</b> Industrial Ethernet switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports	<b>6GK5204-2BB10-2AA3</b>	<b>IE FC RJ45 Plug 180</b> 180° cable outlet 1 unit 10 units 50 units	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>
<b>Compact Switch Module CSM 377</b> Unmanaged switch for connecting a SIMATIC S7-300, ET200 M and up to three other stations to Industrial Ethernet with 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module incl. electronic manual on CD-ROM	<b>6GK7377-1AA00-0AA0</b>	<b>PROFIBUS/PROFINET bus components</b> For establishing MPI/PROFIBUS/PROFINET communication	See catalogs IK PI, CA 01

### Overview SIPLUS CPU 314



- For plants with medium requirements on the program scope
- High processing performance in binary and floating-point arithmetic

SIMATIC Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Technical specifications

Article number	6AG1314-1AG14-2AY0	6AG1314-1AG14-7AB0
Based on	6ES7314-1AG14-0AB0 SIPLUS CPU314 EN50155	6ES7314-1AG14-0AB0 SIPLUS S7-300 CPU314
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-300 advanced controller**

## Central processing units

**SIPLUS standard CPUs****Ordering data****Article No.****Article No.****SIPLUS S7-300 CPU 314**

CPU, work memory 128 KB,  
power supply 24 V DC, MPI;  
MMC required

Extended temperature range and  
exposure to media

Conformity to EN 50155

**6AG1314-1AG14-7AB0****6AG1314-1AG14-2AY0****Accessories****SIPLUS Upmiter upstream device****6AG1305-1AA00-2AA0**

for reliable operation when  
connected to the battery of  
combustion engines

Output current 4 A

**SIPLUS RS 485 repeater  
for PROFIBUS****6AG1972-0AA02-7XA0**

Transfer rate up to max. 12 Mbit/s,  
24 V DC, enclosure IP20

for temperature range  
-25 °C to +70 °C and use when  
exposed to media  
(e.g. sulfur chloride atmosphere)

**RS 485 bus connector  
with 90° cable outlet**

Max. transfer rate 12 Mbit/s

Extended temperature range and  
exposure to media

without PG interface

**6AG1972-0BA12-2XA0**

with PG interface

**6AG1972-0BB12-2XA0****RS 485 bus connector with axial  
cable outlet****6AG1500-0EA02-2AA0**

for SIPLUS OP, for connection to  
PPI, MPI, PROFIBUS

**Additional accessories**

See SIMATIC S7-300 CPU 314,  
page 5/13

### Overview SIPLUS CPU 315-2 DP



- The CPU with medium to large program memory and quantity structures for optional use of SIMATIC engineering tools
- High processing performance in binary and floating-point arithmetic
- PROFIBUS DP master/slave interface
- For comprehensive I/O expansion
- For configuring distributed I/O structures

SIPLIC Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Technical specifications

Article number	6AG1315-2AH14-2AY0	6AG1315-2AH14-7AB0
Based on	6ES7315-2AH14-0AB0 SIPLUS CPU 315-2DP EN50155	6ES7315-2AH14-0AB0 SIPLUS S7-300 CPU 315-2DP
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation in corrosive atmospheres!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!



**SIMATIC S7-300 advanced controller**

## Central processing units

**SIPLUS standard CPUs****Ordering data****Article No.****Article No.****SIPLUS S7-300 CPU 315-2 DP**

CPU, work memory 256 KB,  
power supply 24 V DC, MPI,  
PROFIBUS DP master/slave  
interface; MMC required

Extended temperature range and  
exposure to media

Conforms to EN 50155

**6AG1315-2AH14-7AB0**

**6AG1315-2AH14-2AY0**

**Accessories****SIPLUS Upmiter upstream device**

**6AG1305-1AA00-2AA0**

for reliable operation when  
connected to the battery of  
combustion engines

Output current 4 A

**SIPLUS RS 485 repeater  
for PROFIBUS**

**6AG1972-0AA02-7XA0**

Transfer rate up to max. 12 Mbit/s,  
24 V DC, enclosure IP20

for temperature range  
-25 °C to +70 °C and use when  
exposed to media  
(e.g. sulfur chloride atmosphere)

**RS 485 bus connector  
with 90° cable outlet**

Max. transfer rate 12 Mbit/s

Extended temperature range and  
exposure to media

without PG interface

**6AG1972-0BA12-2XA0**

with PG interface

**6AG1972-0BB12-2XA0**

**RS 485 bus connector with axial  
cable outlet**

**6AG1500-0EA02-2AA0**

for SIPLUS OP, for connection to  
PPI, MPI, PROFIBUS

**Additional accessories**

See SIMATIC S7-300  
CPU 315-2 DP, page 5/13

### Overview SIPLUS CPU 315-2 PN/DP



- The CPU with medium-sized program memory and quantity frameworks
- High processing performance in binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- Combined MPI/PROFIBUS DP master/slave interface
- Isochronous mode on PROFIBUS

SIPLIC Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Technical specifications

Article number	6AG1315-2EH14-2AY0	6AG1315-2EH14-7AB0
Based on	6ES7315-2EH14-0AB0 SIPLUS S7-300 CPU315-2PN/DP EN 50155	6ES7315-2EH14-0AB0 SIPLUS S7-300 CPU315-2PN/DP
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation in corrosive atmospheres!	
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	

**SIMATIC S7-300 advanced controller**

## Central processing units

**SIPLUS standard CPUs****Ordering data****Article No.****Article No.****SIPLUS S7-300 CPU 315-2 PN/DP**

CPU, main memory 384 KB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface with 2-port switch; MMC required

Extended temperature range and exposure to media

Conforms to EN 50155

**6AG1315-2EH14-7AB0****6AG1315-2EH14-2AY0****Accessories****SIPLUS Upmiter upstream device****6AG1305-1AA00-2AA0**

for reliable operation when connected to the battery of combustion engines

Output current 4 A

**SIPLUS RS 485 repeater for PROFIBUS****6AG1972-0AA02-7XA0**

Transfer rate up to max. 12 Mbit/s, 24 V DC, enclosure IP20

for temperature range -25 °C to +70 °C and use when exposed to media (e.g. sulfur chloride atmosphere)

**RS 485 bus connector with 90° cable outlet**

max. transfer rate 12 Mbit/s

Extended temperature range and exposure to media

without PG interface

**6AG1972-0BA12-2XA0**

with PG interface

**6AG1972-0BB12-2XA0****RS 485 bus connector with axial cable outlet****6AG1500-0EA02-2AA0**

for SIPLUS OP, for connection to PPI, MPI, PROFIBUS

**SIPLUS NET SCALANCE X-200 Industrial Ethernet switches**

Industrial Ethernet switches with integral SNMP access, online diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; with integrated redundancy manager (except: SCALANCE X208PRO); incl. operating instructions, Industrial Ethernet network manual and configuration software on CD-ROM

- with electrical and optical ports for glass multimode FOC up to 3 km
- Extended temperature range and exposure to media
  - SIPLUS NET SCALANCE X204-2 with four 10/100 Mbit/s RJ45 ports and two fiber-optic ports

**6AG1204-2BB10-4AA3****Additional accessories**

See SIMATIC S7-300 CPU 315-2 PN/DP, page 5/13

### Overview SIPLUS CPU 317-2 PN/DP



- The CPU with a large program memory and quantity framework for demanding applications
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET I/O Controller for operating distributed I/O on PROFINET
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- For comprehensive I/O expansion
- For configuring distributed I/O structures
- High processing performance in binary and floating-point arithmetic
- Combined MPI/PROFIBUS DP master/slave interface
- Optionally supports the use of SIMATIC engineering tools

Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Technical specifications

Article number	6AG1317-2EK14-2AY0	6AG1317-2EK14-7AB0
Based on	6ES7317-2EK14-0AB0 SIPLUS S7-300 CPU317-2PN/DP EN50155	6ES7317-2EK14-0AB0 SIPLUS S7-300 CPU317-2PN/DP
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
<ul style="list-style-type: none"> <li>• Min.</li> <li>• max.</li> </ul>	-25 °C; = Tmin 60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	-25 °C; = Tmin 70 °C
<b>Extended ambient conditions</b>		
<ul style="list-style-type: none"> <li>• Relative to ambient temperature-atmospheric pressure-installation altitude</li> </ul>	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation in corrosive atmospheres!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-300 advanced controller**

## Central processing units

**SIPLUS standard CPUs****Ordering data****Article No.****Article No.****SIPLUS S7-300 CPU 317-2 PN/DP**

CPU, main memory 1 MB,  
power supply 24 V DC, combined  
MPI/PROFIBUS DP master/slave  
interface, Ethernet/PROFINET  
interface  
MMC required

Extended temperature range and  
exposure to media

Conforms to EN 50155

**6AG1317-2EK14-7AB0****6AG1317-2EK14-2AY0****Accessories****SIPLUS Upmiter upstream device****6AG1305-1AA00-2AA0**

for reliable operation when  
connected to the battery of  
combustion engines

Output current 4 A

**SIPLUS RS 485 repeater  
for PROFIBUS****6AG1972-0AA02-7XA0**

Transfer rate up to max. 12 Mbit/s,  
24 V DC, enclosure IP20

for temperature range  
-25 °C to +70 °C and use when  
exposed to media  
(e.g. sulfur chloride atmosphere)

**RS 485 bus connector  
with 90° cable outlet**

max. transfer rate 12 Mbit/s

Extended temperature range and  
exposure to media

without PG interface

**6AG1972-0BA12-2XA0**

with PG interface

**6AG1972-0BB12-2XA0****RS 485 bus connector with axial  
cable outlet****6AG1500-0EA02-2AA0**

for SIPLUS OP, for connection to  
PPI, MPI, PROFIBUS

**SIPLUS NET SCALANCE X-200  
Industrial Ethernet switches**

Industrial Ethernet switches  
with integral SNMP access, online  
diagnostics, copper cable  
diagnostics and PROFINET  
diagnostics for configuring line, star  
and ring topologies; with integrated  
redundancy manager (except:  
SCALANCE X208PRO);  
incl. operating instructions,  
Industrial Ethernet network manual  
and configuration software on  
CD-ROM

- with electrical and optical ports for  
glass multimode FOC up to 3 km
- Extended temperature range and  
exposure to media
  - SIPLUS NET SCALANCE X204-2  
with four 10/100 Mbit/s RJ45  
ports and two fiber-optic ports

**6AG1204-2BB10-4AA3****Additional accessories**

See SIMATIC S7-300  
CPU 317-2 PN/DP, page 5/13

### Overview CPU 312C



- The compact CPU with integral digital inputs/outputs
- For small applications with increased processing performance requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of CPU.

### Overview CPU 313C-2 PtP



- The compact CPU with integrated digital inputs/outputs as well as second serial interface
- For plants with high processing performance and response time requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of the CPU.

### Overview CPU 313C



- The compact CPU with integral digital and analog inputs/outputs
- For plants with high processing performance and response time requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of the CPU.

### Overview CPU 313C-2 DP



- The compact CPU with integral digital inputs/outputs and PROFIBUS DP master/slave interface
- For plants with high processing performance and response time requirements
- With technological functions
- For tasks with special functions
- For connecting distributed I/Os

SIMATIC Micro Memory Card required for operation of the CPU.

## SIMATIC S7-300 advanced controller

### Central processing units

#### Compact CPUs

##### Overview CPU 314C-2 PtP



- The compact CPU with integrated digital and analog inputs/outputs as well as second serial interface
- For plants with high processing performance and response time requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of the CPU.

##### Overview CPU 314C-2 DP



- The compact CPU with integral digital and analog inputs/outputs and PROFIBUS DP master/slave interface
- With technological functions
- For plants with high processing performance and response time requirements
- For connecting distributed I/Os

SIMATIC Micro Memory Card required for operation of the CPU.

##### Overview CPU 314C-2 PN/DP



- The compact CPU with integral digital and analog inputs/outputs and technological functions
- High processing performance in binary and floating-point arithmetic
- For connecting distributed I/O via PROFIBUS and PROFINET
- Combined MPI/PROFIBUS DP master/slave interface
- PROFINET interface with 2-port switch
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as intelligent PROFINET device under a SIMATIC or third-party PROFINET I/O controller
- Component based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component based Automation (CBA)
- Integrated Web server with the option of creating user-defined web pages
- Isochronous mode on PROFINET

SIMATIC Micro Memory Card required for operation of CPU.



### Technical specifications

Article number	6ES7312-5BF04-0AB0 CPU312C, 10DI/6DO, 64 KB	6ES7313-5BG04-0AB0 CPU313C, 24DI/16DO/ 5AI/2AO, 128 KB	6ES7313-6BG04-0AB0 CPU313C-2 PTP, 16DI/16DO, 128 KB	6ES7313-6CG04-0AB0 CPU313C-2 DP, 16DI/16DO, 128 KB
<b>Product type designation</b>				
<b>General information</b>				
<b>Engineering with</b>				
• Programming package	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203	STEP7 as of V5.5 + SP1 or STEP 7 V5.3 + SP2 or higher with HSP 204	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203
<b>Supply voltage</b>				
Rated value (DC)				
• 24 V DC	Yes	Yes	Yes	Yes
<b>Power losses</b>				
Power loss, typ.				
	8 W	12 W	9 W	9 W
<b>Memory</b>				
<b>Work memory</b>				
• Integrated	64 kbyte	128 kbyte	128 kbyte	128 kbyte
• Size of retentive memory for retentive data blocks	64 kbyte	64 kbyte	64 kbyte	64 kbyte
<b>Load memory</b>				
• pluggable (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte	8 Mbyte
<b>CPU processing times</b>				
for bit operations, typ.				
	0.1 µs	0.07 µs	0.07 µs	0.07 µs
for word operations, typ.				
	0.24 µs	0.15 µs	0.15 µs	0.15 µs
for fixed point arithmetic, typ.				
	0.32 µs	0.2 µs	0.2 µs	0.2 µs
for floating point arithmetic, typ.				
	1.1 µs	0.72 µs	0.72 µs	0.72 µs
<b>Counters, timers and their retentivity</b>				
<b>S7 counter</b>				
• Number	256	256	256	256
<b>IEC counter</b>				
• present	Yes	Yes	Yes	Yes
<b>S7 times</b>				
• Number	256	256	256	256
<b>IEC timer</b>				
• present	Yes	Yes	Yes	Yes
<b>Data areas and their retentivity</b>				
<b>Flag</b>				
• Number, max.	256 byte	256 byte	256 byte	256 byte
<b>Address area</b>				
<b>I/O address area</b>				
• Inputs	1 024 byte	1 024 byte	1 024 byte	2 048 byte
• Outputs	1 024 byte	1 024 byte	1 024 byte	2 048 byte
<b>Process image</b>				
• Inputs, adjustable	1 024 byte	1 024 byte	1 024 byte	2 048 byte
• Outputs, adjustable	1 024 byte	1 024 byte	1 024 byte	2 048 byte
<b>Time of day</b>				
<b>Clock</b>				
• Hardware clock (real-time clock)		Yes	Yes	Yes
<b>Operating hours counter</b>				
• Number	1	1	1	1
<b>Digital inputs</b>				
integrated channels (DI)				
	10	24	16	16
<b>Digital outputs</b>				
integrated channels (DO)				
	6	16	16	16



# SIMATIC S7-300 advanced controller

## Central processing units

### Compact CPUs

#### Technical specifications (continued)

Article number	6ES7312-5BF04-0AB0 CPU312C, 10DI/6DO, 64 KB	6ES7313-5BG04-0AB0 CPU313C, 24DI/16DO/ 5AI/2AO, 128 KB	6ES7313-6BG04-0AB0 CPU313C-2 PTP, 16DI/16DO, 128 KB	6ES7313-6CG04-0AB0 CPU313C-2 DP, 16DI/16DO, 128 KB
<b>Analog inputs</b>				
Integrated channels (AI)	0	5; 4 x current/voltage, 1 x resistance	0	0
<b>Input ranges</b>				
• Voltage		Yes; $\pm 10$ V / 100 k $\Omega$ ; 0 V to 10 V / 100 k $\Omega$		
• Current		Yes; $\pm 20$ mA / 100 $\Omega$ ; 0 mA to 20 mA / 100 $\Omega$ ; 4 mA to 20 mA / 100 $\Omega$		
• Resistance thermometer		Yes; Pt 100 / 10 M $\Omega$		
• Resistance		Yes; 0 $\Omega$ to 600 $\Omega$ / 10 M $\Omega$		
<b>Analog outputs</b>				
Integrated channels (AO)	0	2	0	0
<b>Output ranges, voltage</b>				
• 0 to 10 V		Yes		
• -10 V to +10 V		Yes		
<b>Output ranges, current</b>				
• 0 to 20 mA		Yes		
• -20 mA to +20 mA		Yes		
• 4 mA to 20 mA		Yes		
<b>1st interface</b>				
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485	RS 485
<b>Functionality</b>				
• MPI	Yes	Yes	Yes	Yes
• DP master	No	No	No	No
• DP slave	No	No	No	No
• Point-to-point connection	No	No	No	No
<b>2nd interface</b>				
Interface type			Integrated RS 422/485 interface	Integrated RS 485 interface
Physics			RS 422/RS 485 (X.27)	RS 485
<b>Functionality</b>				
• MPI			No	No
• DP master			No	Yes
• DP slave			No	Yes
• PROFINET IO Controller			No	No
• PROFINET IO Device			No	No
• PROFINET CBA			No	No
<b>DP master</b>				
• Number of DP slaves, max.				124
<b>Communication functions</b>				
PG/OP communication	Yes	Yes	Yes	Yes
Data record routing	No	No	No	Yes
<b>Global data communication</b>				
• supported	Yes	Yes	Yes	Yes
<b>S7 basic communication</b>				
• supported	Yes	Yes	Yes; Server	Yes
<b>S7 communication</b>				
• supported	Yes	Yes	Yes	Yes
<b>S5-compatible communication</b>				
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
<b>Number of connections</b>				
• overall	6	8	8	8

# SIMATIC S7-300 advanced controller

## Central processing units

### Compact CPUs

#### Technical specifications (continued)

Article number	<b>6ES7312-5BF04-0AB0</b> CPU312C, 10DI/6DO, 64 KB	<b>6ES7313-5BG04-0AB0</b> CPU313C, 24DI/16DO/ 5AI/2AO, 128 KB	<b>6ES7313-6BG04-0AB0</b> CPU313C-2 PTP, 16DI/16DO, 128 KB	<b>6ES7313-6CG04-0AB0</b> CPU313C-2 DP, 16DI/16DO, 128 KB
<b>Integrated Functions</b>				
Number of counters	2; See "Technological Functions" manual	3; See "Technological Functions" manual	3; See "Technological Functions" manual	3; See "Technological Functions" manual
Counter frequency (counter) max.	10 kHz	30 kHz	30 kHz	30 kHz
Frequency measurement	Yes	Yes	Yes	Yes
Number of frequency meters	2; up to 10 kHz (see "Technological Functions" manual)	3; up to 30 kHz (see "Technological Functions" manual)	3; up to 30 kHz (see "Technological Functions" manual)	3; up to 30 kHz (see "Technological Functions" manual)
controlled positioning	No	No	No	No
Integrated function blocks (closed-loop control)	No	Yes; PID controller (see "Technological Functions" manual)	Yes; PID controller (see "Technological Functions" manual)	Yes; PID controller (see "Technological Functions" manual)
PID controller	No	Yes	Yes	Yes
Number of pulse outputs	2; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	3; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	3; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	3; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)
Limit frequency (pulse)	2.5 kHz	2.5 kHz	2.5 kHz	2.5 kHz
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	0 °C	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C	60 °C
<b>Configuration</b>				
<b>programming</b>				
<b>Programming language</b>				
- LAD	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- CFC		Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes	Yes
<b>Know-how protection</b>				
• User program protection/password protection	Yes	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>				
Width	80 mm	120 mm	80 mm	80 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm	130 mm
<b>Weights</b>				
Weight, approx.	410 g	660 g	500 g	500 g

# SIMATIC S7-300 advanced controller

## Central processing units

### Compact CPUs

#### Technical specifications (continued)

Article number	<b>6ES7314-6BH04-0AB0</b> CPU314C-2PTP, 24DI/16DO/5AI/2AO, 192 KB	<b>6ES7314-6CH04-0AB0</b> CPU314C-2DP, 24DI/16DO/5AI/2AO, 192 KB	<b>6ES7314-6EH04-0AB0</b> CPU314C-2PN/DP, 24DI/16DO/4AI/2AO, 192KB
<b>Product type designation</b>			
<b>General information</b>			
<b>Engineering with</b>			
• Programming package	STEP7 as of V5.5 + SP1 or STEP 7 V5.3 + SP2 or higher with HSP 204	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203	STEP7 V5.5 or higher with HSP191
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
<b>Power losses</b>			
Power loss, typ.	13 W	13 W	14 W
<b>Memory</b>			
<b>Work memory</b>			
• Integrated	192 kbyte	192 kbyte	192 kbyte
• Size of retentive memory for retentive data blocks	64 kbyte	64 kbyte	64 kbyte
<b>Load memory</b>			
• pluggable (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte
<b>CPU processing times</b>			
for bit operations, typ.	0.06 µs	0.06 µs	0.06 µs
for word operations, typ.	0.12 µs	0.12 µs	0.12 µs
for fixed point arithmetic, typ.	0.16 µs	0.16 µs	0.16 µs
for floating point arithmetic, typ.	0.59 µs	0.59 µs	0.59 µs
<b>Counters, timers and their retentivity</b>			
<b>S7 counter</b>			
• Number	256	256	256
<b>IEC counter</b>			
• present	Yes	Yes	Yes
<b>S7 times</b>			
• Number	256	256	256
<b>IEC timer</b>			
• present	Yes	Yes	Yes
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Number, max.	256 byte	256 byte	256 byte
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	1 024 byte	2 048 byte	2 048 byte
• Outputs	1 024 byte	2 048 byte	2 048 byte
<b>Process image</b>			
• Inputs, adjustable	1 024 byte	2 048 byte	2 048 byte
• Outputs, adjustable	1 024 byte	2 048 byte	2 048 byte
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time clock)	Yes	Yes	Yes
<b>Operating hours counter</b>			
• Number	1	1	1
<b>Digital inputs</b>			
integrated channels (DI)	24	24	24
<b>Digital outputs</b>			
integrated channels (DO)	16	16	16

### Technical specifications (continued)

Article number	<b>6ES7314-6BH04-0AB0</b> CPU314C-2PTP, 24DI/16DO/5AI/2AO, 192 KB	<b>6ES7314-6CH04-0AB0</b> CPU314C-2DP, 24DI/16DO/5AI/2AO, 192 KB	<b>6ES7314-6EH04-0AB0</b> CPU314C-2PN/DP, 24DI/16DO/4AI/2AO, 192KB
<b>Analog inputs</b>			
Integrated channels (AI)	5; 4 x current/voltage, 1 x resistance	5; 4 x current/voltage, 1 x resistance	5; 4 x current/voltage, 1 x resistance
<b>Input ranges</b>			
• Voltage	Yes; $\pm 10\text{ V} / 100\text{ k}\Omega$ ; 0 V to 10 V / 100 k $\Omega$	Yes; $\pm 10\text{ V} / 100\text{ k}\Omega$ ; 0 V to 10 V / 100 k $\Omega$	Yes; $\pm 10\text{ V} / 100\text{ k}\Omega$ ; 0 V to 10 V / 100 k $\Omega$
• Current	Yes; $\pm 20\text{ mA} / 100\ \Omega$ ; 0 mA to 20 mA / 100 $\Omega$ ; 4 mA to 20 mA / 100 $\Omega$	Yes; $\pm 20\text{ mA} / 100\ \Omega$ ; 0 mA to 20 mA / 100 $\Omega$ ; 4 mA to 20 mA / 100 $\Omega$	Yes; $\pm 20\text{ mA} / 100\ \Omega$ ; 0 mA to 20 mA / 100 $\Omega$ ; 4 mA to 20 mA / 100 $\Omega$
• Resistance thermometer	Yes; Pt 100 / 10 M $\Omega$	Yes; Pt 100 / 10 M $\Omega$	Yes; Pt 100 / 10 M $\Omega$
• Resistance	Yes; 0 $\Omega$ to 600 $\Omega$ / 10 M $\Omega$	Yes; 0 $\Omega$ to 600 $\Omega$ / 10 M $\Omega$	Yes; 0 $\Omega$ to 600 $\Omega$ / 10 M $\Omega$
<b>Analog outputs</b>			
Integrated channels (AO)	2	2	2
<b>Output ranges, voltage</b>			
• 0 to 10 V	Yes	Yes	Yes
• -10 V to +10 V	Yes	Yes	Yes
<b>Output ranges, current</b>			
• 0 to 20 mA	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes
<b>1st interface</b>			
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485
<b>Functionality</b>			
• MPI	Yes	Yes	Yes
• DP master	No	No	Yes
• DP slave	No	No	Yes
• Point-to-point connection	No	No	No
<b>DP master</b>			
• Number of DP slaves, max.			124
<b>2nd interface</b>			
Interface type	Integrated RS 422/ 485 interface	Integrated RS 485 interface	PROFINET
Physics	RS 422/RS 485 (X.27)	RS 485	Ethernet RJ45
Number of ports			2
<b>Functionality</b>			
• MPI	No	No	No
• DP master	No	Yes	No
• DP slave	No	Yes	No
• PROFINET IO Controller	No	No	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	No	No	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	No	No	Yes
<b>DP master</b>			
• Number of DP slaves, max.		124	
<b>PROFINET IO Controller</b>			
• Max. number of connectable IO devices for RT			128
• Number of IO devices with IRT and the option "high flexibility"			128
• Number of IO Devices with IRT and the option "high performance", max.			64
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)			Yes; For PROFINET only
<b>Communication functions</b>			
PG/OP communication	Yes	Yes	Yes
Data record routing	No	Yes	Yes
<b>Global data communication</b>			
• supported	Yes	Yes	Yes

# SIMATIC S7-300 advanced controller

## Central processing units

### Compact CPUs

#### Technical specifications (continued)

Article number	<b>6ES7314-6BH04-0AB0</b> CPU314C-2PTP, 24DI/16DO/5AI/2AO, 192 KB	<b>6ES7314-6CH04-0AB0</b> CPU314C-2DP, 24DI/16DO/5AI/2AO, 192 KB	<b>6ES7314-6EH04-0AB0</b> CPU314C-2PN/DP, 24DI/16DO/4AI/2AO, 192KB
<b>S7 basic communication</b>			
• supported	Yes	Yes	Yes
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>S5-compatible communication</b>			
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
<b>Open IE communication</b>			
• TCP/IP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			8
• ISO-on-TCP (RFC1006)			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			8
• UDP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			8
<b>Web server</b>			
• supported			Yes
<b>Number of connections</b>			
• overall	12	12	12
<b>Integrated Functions</b>			
Number of counters	4; See "Technological Functions" manual	4; See "Technological Functions" manual	4; See "Technological Functions" manual
Counter frequency (counter) max.	60 kHz	60 kHz	60 kHz
Frequency measurement	Yes	Yes	Yes
Number of frequency meters	4; up to 60 kHz (see "Technological Functions" manual)	4; up to 60 kHz (see "Technological Functions" manual)	4; up to 60 kHz (see "Technological Functions" manual)
controlled positioning	Yes	Yes	Yes
Integrated function blocks (closed-loop control)	Yes; PID controller (see "Technological Functions" manual)	Yes; PID controller (see "Technological Functions" manual)	Yes; PID controller (see "Technological Functions" manual)
PID controller	Yes	Yes	Yes
Number of pulse outputs	4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)
Limit frequency (pulse)	2.5 kHz	2.5 kHz	2.5 kHz
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
<b>Configuration</b>			
<b>programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- CFC	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes
<b>Know-how protection</b>			
• User program protection/password protection	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>			
Width	120 mm	120 mm	120 mm
Height	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm
<b>Weights</b>			
Weight, approx.	680 g	680 g	730 g

# SIMATIC S7-300 advanced controller

## Central processing units

### Compact CPUs

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Ordering data	Article No.	Article No.
<b>CPU 312C</b> Compact CPU, 64 KB main memory, 24 V DC power supply, 10 DI/6 DO integrated, integrated functions, MPI; including slot number labels; MMC required	<b>6ES7312-5BF04-0AB0</b>	<b>MPI cable</b> for connection of SIMATIC S7 and PG via MPI; 5 m in length
<b>CPU 313C</b> Compact CPU, 128 KB main memory, 24 V DC power supply, 24 DI/16 DO, 4 AI/2 AO integrated, integrated functions, MPI; MMC required	<b>6ES7313-5BG04-0AB0</b>	<b>Point-to-point link cable</b> for connection to CPU 31xC-2 PtP 5 m 10 m 50 m
<b>CPU 313C-2 PtP</b> Compact CPU, 128 KB, 24 V DC power supply, 16 DI/16 DO integrated, integrated functions, MPI, RS 422/485 interface; MMC required	<b>6ES7313-6BG04-0AB0</b>	<b>Front connector (1 unit)</b> For compact CPUs 40-pin, with screw contacts • 1 unit • 100 units 40-pin, with spring-loaded contacts • 1 unit • 100 units
<b>CPU 313C-2 DP</b> Compact CPU, 128 KB main memory, 24 V DC power supply, 16 DI/16 DO integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; MMC required	<b>6ES7313-6CG04-0AB0</b>	<b>SIMATIC TOP connect</b> See page 5/247; for information about which components can be used for the respective module, see Industry Mall or Catalog KT 10.2
<b>CPU 314C-2 PtP</b> Compact CPU, 192 KB main memory, 24 V DC power supply, 24DI/16DO/4AI/2AO integrated, integrated functions, MPI, RS 422/485 interface; MMC required	<b>6ES7314-6BH04-0AB0</b>	<b>Front door, elevated design</b> For compact CPUs; for connecting 1.3 mm <sup>2</sup> /16 AWG wires; wiring diagram and labels in petrol
<b>CPU 314C-2 DP</b> Compact CPU, 192 KB main memory, 24 V DC power supply, 24DI/16DO/4AI/2AO integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; MMC required	<b>6ES7314-6CH04-0AB0</b>	<b>Slot number plates</b> English
<b>CPU 314C-2 PN/DP</b> Compact CPU, 192 KB main memory, 24 V DC power supply, 24 DI/16 DO/4 AI/2 AO integrated, integrated functions, MPI; PROFIBUS DP master/slave interface; PROFINET IO Controller/I-Device interface, MMC is required	<b>6ES7314-6EH04-0AB0</b>	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC
<b>SIMATIC Micro Memory Card</b> 64 KB 128 KB 512 KB 2 MB 4 MB 8 MB	<b>6ES7953-8LF30-0AA0</b> <b>6ES7953-8LG30-0AA0</b> <b>6ES7953-8LJ30-0AA0</b> <b>6ES7953-8LL31-0AA0</b> <b>6ES7953-8LM31-0AA0</b> <b>6ES7953-8LP31-0AA0</b>	<b>SIMATIC Manual Collection            update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates
		<b>Power supply connector</b> 10 units, spare part
		<b>Labeling strips</b> 10 units, spare part
		<b>Label cover</b> 10 units, spare part

**SIMATIC S7-300 advanced controller**

## Central processing units

## Compact CPUs

Ordering data	Article No.	Ordering data	Article No.
<b>Labeling sheets for machine inscription</b> for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units  petrol light-beige yellow red	<b>6ES7392-2AX10-0AA0</b> <b>6ES7392-2BX10-0AA0</b> <b>6ES7392-2CX10-0AA0</b> <b>6ES7392-2DX10-0AA0</b>	<b>PROFINET bus components</b>  <b>IE FC TP Standard Cable GP 2x2</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter	<b>6XV1840-2AH10</b>
<b>USB A2 PC adapter</b> for connecting a PG/PC or Notebook to PROFIBUS or MPI; USB cable included in scope of delivery	<b>6GK1571-0BA00-0AA0</b>	<b>FO Standard Cable GP (50/125)</b> Standard cable, splittable, UL approval, sold by the meter	<b>6XV1873-2A</b>
<b>PROFIBUS DP bus connectors RS 485</b> <ul style="list-style-type: none"> <li>with 90° cable outlet, max. transfer rate 12 Mbit/s               <ul style="list-style-type: none"> <li>without PG interface</li> <li>with PG interface</li> </ul> </li> <li>with 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbit/s               <ul style="list-style-type: none"> <li>without PG interface, 1 unit</li> <li>without PG interface, 100 units</li> <li>with PG interface, 1 unit</li> <li>with PG interface, 100 units</li> </ul> </li> <li>with axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS</li> </ul>	<b>6ES7972-0BA12-0XA0</b> <b>6ES7972-0BB12-0XA0</b>  <b>6ES7972-0BA52-0XA0</b> <b>6ES7972-0BA52-0XB0</b> <b>6ES7972-0BB52-0XA0</b> <b>6ES7972-0BB52-0XB0</b> <b>6GK1500-0EA02</b>	<b>SCALANCE X204-2 Industrial Ethernet Switch</b> Industrial Ethernet Switches with integral SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports	<b>6GK5204-2BB10-2AA3</b>
<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	<b>6XV1830-0EH10</b>	<b>Compact Switch Module CSM 377</b> Unmanaged switch for connecting a SIMATIC S7-300, ET200 M and up to three other stations to Industrial Ethernet with 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module incl. electronic manual on CD-ROM	<b>6GK7377-1AA00-0AA0</b>
<b>RS 485 repeater for PROFIBUS</b> Transmission rate up to 12 Mbit/s; 24 V DC; IP20 enclosure	<b>6ES7972-0AA02-0XA0</b>	<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
		<b>IE FC RJ45 plug 180</b> 180° cable outlet  1 unit 10 units 50 units	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>
		<b>PROFIBUS/PROFINET bus components</b> For establishing MPI/PROFIBUS/PROFINET communication	See catalogs IK PI, CA 01

# SIMATIC S7-300 advanced controller

## Central processing units

SIPLUS compact CPUs

### Overview SIPLUS CPU 312C



- The compact CPU with integral digital inputs/outputs
- For small applications with increased processing performance requirements
- With technological functions

Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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### Technical specifications

Article number	6AG1312-5BF04-2AY0	6AG1312-5BF04-7AB0
Based on	6ES7312-5BF04-0AB0 SIPLUS S7-300 CPU312C EN50155	6ES7312-5BF04-0AB0 SIPLUS S7-300 CPU312C
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude		Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.		100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3		Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3		Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3		Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

### Ordering data

Article No.	Article No.
<b>SIPLUS S7-300 CPU 312C</b> Compact CPU, 64 KB main memory, 24 V DC power supply, 10 DI/6 DO integrated, integrated functions, MPI; including slot number labels; MMC required  Extended temperature range and exposure to media  Conforms to EN 50155	<b>6AG1312-5BF04-7AB0</b>  <b>6AG1312-5BF04-2AY0</b>
<b>SIPLUS accessories</b>	See SIPLUS CPU 313C-2 DP, page 5/36
<b>Additional accessories</b>	See SIMATIC S7-300 CPU 312C, page 5/31



**SIMATIC S7-300 advanced controller**

Central processing units

**SIPLUS compact CPUs****Overview SIPLUS CPU 313C**

- The compact CPU with integral digital and analog inputs/ outputs
- For plants with high processing performance and response time requirements
- With technological functions

Micro Memory Card required to operate the CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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**Technical specifications**

Article number	<b>6AG1313-5BG04-2AY0</b>	<b>6AG1313-5BG04-7AB0</b>
Based on	<b>6ES7313-5BG04-0AB0</b> SIPLUS S7-300 CPU313C EN50155	<b>6ES7313-5BG04-0AB0</b> SIPLUS S7-300 CPU313C
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude		Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.		100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3		Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3		Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3		Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****SIPLUS S7-300 CPU 313C**

Compact CPU,  
128 KB main memory,  
24 V DC power supply,  
24 DI/16 DO, 4 AI/2 AO integrated,  
integrated functions, MPI;  
MMC required

Extended temperature range and exposure to media

Conforms to EN 50155

**Article No.****6AG1313-5BG04-7AB0****6AG1313-5BG04-2AY0****Article No.****SIPLUS accessories**

See SIPLUS CPU 313C-2 DP, page 5/36

**Accessories**

See SIMATIC S7-300 CPU 313C, page 5/31

### Overview SIPLUS CPU 313C-2 DP



- The compact CPU with integral digital inputs/outputs and PROFIBUS DP master/slave interface
- With technological functions
- For tasks with special functions
- For connecting distributed I/O

Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Technical specifications

Article number	6AG1313-6CG04-2AY0	6AG1313-6CG04-7AB0
Based on	6ES7313-6CG04-0AB0 SIPLUS S7-300 CPU 313C-2 DP EN 50155	6ES7313-6CG04-0AB0 SIPLUS S7-300 CPU 313C-2 DP
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-300 advanced controller**

## Central processing units

**SIPLUS compact CPUs****Ordering data****Article No.****Article No.****SIPLUS S7-300 CPU 313C-2 DP**

Compact CPU,  
128 KB work memory,  
power supply 24 V DC,  
16 DI/16 DO integrated,  
integrated functions, MPI,  
PROFIBUS DP master/slave  
interface  
MMC required

Extended temperature range and  
exposure to media

Conforms to EN 50155

**6AG1313-6CG04-7AB0**

**6AG1313-6CG04-2AY0**

**Accessories****SIPLUS Upmiter upstream device**

**6AG1305-1AA00-2AA0**

for reliable operation when  
connected to the battery of  
combustion engines

Output current 4 A

**SIPLUS RS 485 repeater  
for PROFIBUS**

**6AG1972-0AA02-7XA0**

Transfer rate up to max. 12 Mbit/s,  
24 V DC, enclosure IP20

for temperature range  
-25 °C to +70 °C and use when  
exposed to media  
(e.g. sulfur chloride atmosphere)

**RS 485 bus connector  
with 90° cable outlet**

Max. transfer rate 12 Mbit/s

Extended temperature range and  
exposure to media

without PG interface

**6AG1972-0BA12-2XA0**

with PG interface

**6AG1972-0BB12-2XA0**

**RS 485 bus connector with axial  
cable outlet**

**6AG1500-0EA02-2AA0**

for SIPLUS OP, for connection to  
PPI, MPI, PROFIBUS

**Additional accessories**

See SIMATIC S7-300  
CPU 313C-2 DP, page 5/31

### Overview SIPLUS CPU 314C-2 PtP



- The compact CPU with integrated digital and analog inputs/ outputs as well as second serial interface
- For plants with high processing performance and response time requirements
- With technological functions

SIPLIC Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Technical specifications

Article number	<b>6AG1314-6BH04-7AB0</b>
Based on	<b>6ES7314-6BH04-0AB0</b> SIPLUS S7-300 CPU314C-2 PTP
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL use
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Article number	<b>6AG1314-6BH04-7AB0</b>
Based on	<b>6ES7314-6BH04-0AB0</b> SIPLUS S7-300 CPU314C-2 PTP
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-300 advanced controller**

## Central processing units

**SIPLUS compact CPUs****Ordering data****Article No.****Article No.****SIPLUS S7-300 CPU 314C-2 PtP****6AG1314-6BH04-7AB0**

Compact CPU,  
192 KB main memory,  
24 V DC power supply,  
24DI/16DO/4AI/2AO integrated,  
integrated functions, MPI,  
RS 422/485 interface;  
MMC required

Extended temperature range and  
exposure to media

**Accessories****SIPLUS Upmiter upstream device****6AG1305-1AA00-2AA0**

for reliable operation when  
connected to the battery of  
combustion engines

Output current 4 A

**SIPLUS RS 485 repeater  
for PROFIBUS****6AG1972-0AA02-7XA0**

Transfer rate up to max. 12 Mbit/s,  
24 V DC, enclosure IP20

for temperature range  
-25 °C to +70 °C and use when  
exposed to media  
(e.g. sulfur chloride atmosphere)

**RS 485 bus connector  
with 90° cable outlet**

Max. transfer rate 12 Mbit/s

Extended temperature range and  
exposure to media

without PG interface

**6AG1972-0BA12-2XA0**

with PG interface

**6AG1972-0BB12-2XA0****RS 485 bus connector with axial  
cable outlet****6AG1500-0EA02-2AA0**

for SIPLUS OP, for connection to  
PPI, MPI, PROFIBUS

**Additional accessories**

See SIMATIC S7-300  
CPU 314C-2 PtP, page 5/31

# SIMATIC S7-300 advanced controller

## Central processing units

SIPLUS compact CPUs

### Overview SIPLUS CPU 314C-2 DP



- The compact CPU with integral digital and analog inputs/ outputs and PROFIBUS DP master/slave interface
- With technological functions
- For tasks with special functions
- For connecting distributed I/O

Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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### Technical specifications

Article number	6AG1314-6CH04-2AY0	6AG1314-6CH04-7AB0
Based on	6ES7314-6CH04-0AB0 SIPLUS S7-300 CPU314C-2DP EN50155	6ES7314-6CH04-0AB0 SIPLUS S7-300 CPU314C-2DP
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude		Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.		100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3		Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3		Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3		Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

### Ordering data

Article No.	Article No.
<b>SIPLUS S7-300 CPU 314C-2 DP</b> Compact CPU, 192 KB main memory, 24 V DC power supply, 24DI/16DO/4AI/2AO integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; MMC required  Extended temperature range and exposure to media  Conforms to EN 50155	<b>6AG1314-6CH04-7AB0</b>  <b>6AG1314-6CH04-2AY0</b>
<b>SIPLUS accessories</b>	See SIPLUS CPU 313C-2 DP, page 5/36
<b>Additional accessories</b>	see SIMATIC S7-300 CPU 314C-2 DP, page 5/31

## SIMATIC S7-300 advanced controller

### Central processing units

#### Fail-safe CPUs

##### Overview CPU 315F-2 DP



- Based on the SIMATIC CPU 315-2 DP
- For setting up a fail-safe automation system in plants with increased safety requirements
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- Distributed fail-safe I/O modules can be connected through the integral PROFIBUS DP interface (PROFIsafe)
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Central and distributed use of standard modules for non safety-oriented applications

SIMATIC Micro Memory Card required for operation of CPU.

##### Overview CPU 315F-2 PN/DP



- Based on CPU 315-2 PN/DP
- The CPU with medium-sized program memory and quantity structures for setting up a fail-safe automation system in plants with increased safety requirements
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- Fail-safe I/O modules in distributed stations can be connected through the integrated PROFINET interface (PROFIsafe) and/or through the integrated PROFIBUS DP interface (PROFIsafe)

- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Central and distributed use of standard modules for non safety-relevant applications
- Component based Automation (CBA) on PROFINET
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

SIMATIC Micro Memory Card required for operation of CPU.

##### Overview CPU 317F-2 DP



- The fail-safe CPU with a large program memory and quantity framework for demanding applications
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- Fail-safe I/O modules can be connected in a distributed configuration to both integral PROFIBUS DP interfaces (PROFIsafe)
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Standard modules for non-safety-related applications can be operated centrally and decentralized

SIMATIC Micro Memory Card required for operation of CPU.



### Overview CPU 317F-2 PN/DP



- Based on CPU 317-2 PN/DP
- The fail-safe CPU with a large program memory and quantity framework for demanding applications; for setting up a fail-safe automation system in plants with increased safety requirements.
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- Fail-safe I/O modules in distributed stations can be connected through the integrated PROFINET interface (PROFIsafe) and/or through the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Central and distributed use of standard modules for non safety-relevant applications
- Component based Automation (CBA) on PROFINET
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

SIMATIC Micro Memory Card required for operation of CPU.

### Overview CPU 319F-3 PN/DP



- The fail-safe CPU with high-performance command processing, large program memory and large quantity structure for demanding applications
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to 13849.1
- Fail-safe I/O modules can be connected decentralized over the integrated PROFINET interface (PROFIsafe) and/or over the integrated PROFIBUS DP interface (PROFIsafe);
- Fail-safe I/O modules of ET200M can also be connected centrally
- Standard modules for non-safety-related applications can be operated centrally and decentralized
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- Isochronous mode on PROFIBUS
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component based Automation (CBA)

SIMATIC Micro Memory Card required for operation of CPU.



# SIMATIC S7-300 advanced controller

## Central processing units

### Fail-safe CPUs

#### Technical specifications

Article number	<b>6ES7315-6FF04-0AB0</b> CPU315F, 384KB	<b>6ES7315-2FJ14-0AB0</b> CPU315F-2 PN/DP, 512 KB	<b>6ES7317-6FF04-0AB0</b> CPU317F-2DP, 1.5 MB	<b>6ES7317-2FK14-0AB0</b> CPU317F-2 PN/DP, 1.5 MB	<b>6ES7318-3FL01-0AB0</b> CPU319F-3 PN/DP, 2.5 MB
<b>Product type designation</b>					
<b>General information</b>					
<b>Engineering with</b>					
• Programming package	STEP 7 V5.5 + SP1 or higher or STEP7 V5.2 + SP1 or higher with HSP 218 + Distributed Safety	STEP 7 V 5.5 or higher, Distributed Safety V 5.4 SP4	STEP 7 V5.5 + SP1 or higher or STEP7 V5.2 + SP1 or higher with HSP 202 + Distributed Safety	STEP 7 V 5.5 or higher, Distributed Safety V 5.4 SP4	STEP 7 V 5.5 or higher, Distributed Safety V 5.4 SP4
<b>Supply voltage</b>					
Rated value (DC)					
• 24 V DC	Yes	Yes	Yes	Yes	Yes
<b>Power losses</b>					
Power loss, typ.	4.5 W	4.65 W	4.5 W	4.65 W	14 W
<b>Memory</b>					
<b>Work memory</b>					
• Integrated	384 kbyte	512 kbyte	1 536 kbyte	1 536 kbyte	2 560 kbyte
• Size of retentive memory for retentive data blocks	128 kbyte	128 kbyte	256 kbyte	256 kbyte	700 kbyte
<b>Load memory</b>					
• pluggable (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte	8 Mbyte	8 Mbyte
<b>CPU processing times</b>					
for bit operations, typ.	0.05 µs	0.05 µs	0.025 µs	0.025 µs	0.004 µs
for word operations, typ.	0.09 µs	0.09 µs	0.03 µs	0.03 µs	0.01 µs
for fixed point arithmetic, typ.	0.12 µs	0.12 µs	0.04 µs	0.04 µs	0.01 µs
for floating point arithmetic, typ.	0.45 µs	0.45 µs	0.16 µs	0.16 µs	0.04 µs
<b>Counters, timers and their retentivity</b>					
<b>S7 counter</b>					
• Number	256	256	512	512	2 048
<b>IEC counter</b>					
• present	Yes	Yes	Yes	Yes	Yes
<b>S7 times</b>					
• Number	256	256	512	512	2 048
<b>IEC timer</b>					
• present	Yes	Yes	Yes	Yes	Yes
<b>Data areas and their retentivity</b>					
<b>Flag</b>					
• Number, max.	2 048 byte	2 048 byte	4 096 byte	4 096 byte	8 192 byte
<b>Address area</b>					
<b>I/O address area</b>					
• Inputs	2 048 byte	2 048 byte	8 192 byte	8 192 byte	8 192 byte
• Outputs	2 048 byte	2 048 byte	8 192 byte	8 192 byte	8 192 byte
<b>Process image</b>					
• Inputs, adjustable	2 048 byte	2 048 byte	8 192 byte	8 192 byte	8 192 byte
• Outputs, adjustable	2 048 byte	2 048 byte	8 192 byte	8 192 byte	8 192 byte
<b>Time of day</b>					
<b>Clock</b>					
• Hardware clock (real-time clock)	Yes	Yes	Yes	Yes	Yes
<b>Operating hours counter</b>					
• Number	1	1	4	4	4

# SIMATIC S7-300 advanced controller

## Central processing units

Fail-safe CPUs

### Technical specifications (continued)

Article number	<b>6ES7315-6FF04-0AB0</b> CPU315F, 384KB	<b>6ES7315-2FJ14-0AB0</b> CPU315F-2 PN/DP, 512 KB	<b>6ES7317-6FF04-0AB0</b> CPU317F-2DP, 1.5 MB	<b>6ES7317-2FK14-0AB0</b> CPU317F-2 PN/DP, 1.5 MB	<b>6ES7318-3FL01-0AB0</b> CPU319F-3 PN/DP, 2.5 MB
<b>1st interface</b>					
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485	RS 485	RS 485
<b>Functionality</b>					
• MPI	Yes	Yes	Yes	Yes	Yes
• DP master	No	Yes	Yes	Yes	Yes
• DP slave	No	Yes	Yes; A DP slave at both interfaces simultaneously is not possible	Yes	Yes; A DP slave at both interfaces simultaneously is not possible
• Point-to-point connection	No	No	No	No	No
<b>DP master</b>					
• Number of DP slaves, max.		124	124	124	124
<b>2nd interface</b>					
Interface type	Integrated RS 485 interface	PROFINET	Integrated RS 485 interface	PROFINET	Integrated RS 485 interface
Physics	RS 485	Ethernet RJ45	RS 485	Ethernet RJ45	RS 485
Number of ports		2		2	
<b>Functionality</b>					
• MPI	No	No	No	No	No
• DP master	Yes	No	Yes	No	Yes
• DP slave	Yes	No	Yes; A DP slave at both interfaces simultaneously is not possible	No	Yes; A DP slave at both interfaces simultaneously is not possible
• PROFINET IO Controller		Yes; Also simultaneously with IO-Device functionality		Yes; Also simultaneously with IO-Device functionality	No
• PROFINET IO Device		Yes; Also simultaneously with IO Controller functionality		Yes; Also simultaneously with IO Controller functionality	No
• PROFINET CBA		Yes		Yes	No
<b>DP master</b>					
• Number of DP slaves, max.	124; Per station		124		124
<b>PROFINET IO Controller</b>					
• Max. number of connectable IO devices for RT		128		128	
• Number of IO devices with IRT and the option "high flexibility"		128		128	
• Number of IO Devices with IRT and the option "high performance", max.		64		64	

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# SIMATIC S7-300 advanced controller

## Central processing units

### Fail-safe CPUs

#### Technical specifications (continued)

Article number	<b>6ES7315-6FF04-0AB0</b> CPU315F, 384KB	<b>6ES7315-2FJ14-0AB0</b> CPU315F-2 PN/DP, 512 KB	<b>6ES7317-6FF04-0AB0</b> CPU317F-2DP, 1.5 MB	<b>6ES7317-2FK14-0AB0</b> CPU317F-2 PN/DP, 1.5 MB	<b>6ES7318-3FL01-0AB0</b> CPU319F-3 PN/DP, 2.5 MB
<b>3rd interface</b>					
Interface type					PROFINET
Physics					Ethernet RJ45
Number of ports					2
<b>Functionality</b>					
• MPI					No
• DP master					No
• DP slave					No
• PROFINET IO Controller					Yes; Also simultaneously with I-Device functionality
• PROFINET IO Device					Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA					Yes
<b>PROFINET IO Controller</b>					
• Max. number of connectable IO devices for RT					256
• Number of IO devices with IRT and the option "high flexibility"					256
• Number of IO Devices with IRT and the option "high performance", max.					64
<b>Isochronous mode</b>					
Isochronous operation (application synchronized up to terminal)	Yes	Yes; Via PROFIBUS DP or PROFINET interface		Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via 2nd PROFIBUS DP or PROFINET interface
<b>Communication functions</b>					
PG/OP communication	Yes	Yes	Yes	Yes	Yes
Data record routing	Yes	Yes	Yes	Yes	Yes
<b>Global data communication</b>					
• supported	Yes	Yes	Yes	Yes	Yes
<b>S7 basic communication</b>					
• supported	Yes	Yes	Yes	Yes	Yes
<b>S7 communication</b>					
• supported	Yes	Yes	Yes	Yes	Yes
<b>S5-compatible communication</b>					
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
<b>Open IE communication</b>					
• TCP/IP		Yes; via integrated PROFINET interface and loadable FBs		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		8		16	32
• ISO-on-TCP (RFC1006)		Yes; via integrated PROFINET interface and loadable FBs		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		8		16	32
• UDP		Yes; via integrated PROFINET interface and loadable FBs		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		8		16	32
<b>Web server</b>					
• supported		Yes; only read function		Yes	Yes
<b>Number of connections</b>					
• overall	16	16	32	32	32

# SIMATIC S7-300 advanced controller

## Central processing units

Fail-safe CPUs

### Technical specifications (continued)

Article number	6ES7315-6FF04-0AB0	6ES7315-2FJ14-0AB0	6ES7317-6FF04-0AB0	6ES7317-2FK14-0AB0	6ES7318-3FL01-0AB0
	CPU315F, 384KB	CPU315F-2 PN/DP, 512 KB	CPU317F-2DP, 1.5 MB	CPU317F-2 PN/DP, 1.5 MB	CPU319F-3 PN/DP, 2.5 MB
<b>Ambient conditions</b>					
<b>Ambient temperature in operation</b>					
• Min.	0 °C	0 °C	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C	60 °C	60 °C
<b>Configuration</b>					
<b>programming</b>					
<b>Programming language</b>					
- LAD	Yes	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes	Yes
- CFC	Yes	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes	Yes	Yes
<b>Know-how protection</b>					
• User program protection/password protection	Yes	Yes	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>					
Width	40 mm	40 mm	40 mm	40 mm	120 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm	130 mm	130 mm
<b>Weights</b>					
Weight, approx.	290 g	340 g	360 g	340 g	1 250 g

### Ordering data

	Article No.		Article No.
<b>CPU 315F-2 DP</b> CPU for SIMATIC S7-300F; 384 KB RAM, power supply 24 V DC, MPI, PROFIBUS DP master/slave interface, incl. slot number labels; MMC required	6ES7315-6FF04-0AB0	<b>CPU 319F-3 PN/DP</b> Main memory 2.5 MB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, PROFIBUS DP master/slave interface, Ethernet/PROFINET interface; MMC required	6ES7318-3FL01-0AB0
<b>CPU 315F-2 PN/DP</b> CPU for SIMATIC S7-300F; 512 KB main memory, 24 V DC power supply, MPI/PROFIBUS DP master/slave interface, Industrial Ethernet/PROFINET interface; incl. slot number labels; MMC required	6ES7315-2FJ14-0AB0	<b>S7 Distributed Safety V5.4 programming tool</b> <b>Task:</b> Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200ISP, ET 200pro, ET 200eco <b>Requirement:</b> STEP 7 V5.3 SP3 and higher	
<b>CPU 317F-2 DP</b> Main memory 1.5 MB, power supply 24 V DC, MPI, PROFIBUS DP master/slave interface, MMC required	6ES7317-6FF04-0AB0	Floating license	6ES7833-1FC02-0YA5 6ES7833-1FC02-0YH5
<b>CPU 317F-2 PN/DP</b> Main memory 1.5 MB, 2 4 V DC power supply, MPI/PROFIBUS DP master/slave interface, Industrial Ethernet/PROFINET interface; MMC required	6ES7317-2FK14-0AB0	<b>S7 Distributed Safety upgrade</b> From V5.x to V5.4; Floating license for 1 user	6ES7833-1FC02-0YE5

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

# SIMATIC S7-300 advanced controller

## Central processing units

### Fail-safe CPUs

Ordering data	Article No.	Article No.
<b>STEP 7 Safety Advanced V13 SP1</b> Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1 Floating license for 1 user Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FA13-0YA5</b> <b>6ES7833-1FA13-0YH5</b>	<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m <b>RS 485 repeater for PROFIBUS</b> Transmission rate up to 12 Mbit/s; 24 V DC; IP20 enclosure <b>PROFINET bus components</b> <b>IE FC TP Standard Cable GP 2x2</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; Sold by the meter <b>FO Standard Cable GP (50/125)</b> Standard cable, splittable, UL approval, sold by the meter <b>SCALANCE X204-2 Industrial Ethernet Switch</b> Industrial Ethernet Switches with integral SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports <b>Compact Switch Module CSM 377</b> Unmanaged switch for connecting a SIMATIC S7-300, ET200 M and up to three other stations to Industrial Ethernet with 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module incl. electronic manual on CD-ROM <b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables <b>IE FC RJ45 plug 145</b> 145° cable outlet 1 unit 10 units 50 units <b>IE FC RJ45 plug 180</b> 180° cable outlet 1 unit 10 units 50 units <b>PROFIBUS/PROFINET bus components</b> For establishing MPI/PROFIBUS/PROFINET communication
<b>SIMATIC Micro Memory Card</b> 64 KB 128 KB 512 KB 2 MB 4 MB 8 MB	<b>6ES7953-8LF30-0AA0</b> <b>6ES7953-8LG30-0AA0</b> <b>6ES7953-8LJ30-0AA0</b> <b>6ES7953-8LL31-0AA0</b> <b>6ES7953-8LM31-0AA0</b> <b>6ES7953-8LP31-0AA0</b>	<b>6XV1830-0EH10</b> <b>6ES7972-0AA02-0XA0</b> <b>6XV1840-2AH10</b> <b>6XV1873-2A</b> <b>6GK5204-2BB10-2AA3</b> <b>6GK7377-1AA00-0AA0</b>
<b>MPI cable</b> for connection of SIMATIC S7 and PG via MPI; 5 m in length	<b>6ES7901-0BF00-0AA0</b>	
<b>Slot number plates</b>	<b>6ES7912-0AA00-0AA0</b>	
<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>	
<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>	
<b>Power supply connector</b> 10 units, spare part	<b>6ES7391-1AA00-0AA0</b>	
<b>USB A2 PC adapter</b> for connecting a PG/PC or Notebook to PROFIBUS or MPI; USB cable included in scope of delivery	<b>6GK1571-0BA00-0AA0</b>	
<b>PROFIBUS DP bus connector RS 485</b> <ul style="list-style-type: none"> <li>with 90° cable outlet, max. transfer rate 12 Mbit/s               <ul style="list-style-type: none"> <li>without PG interface</li> <li>with PG interface</li> </ul> </li> <li>with 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbit/s               <ul style="list-style-type: none"> <li>without PG interface, 1 unit</li> <li>without PG interface, 100 units</li> <li>with PG interface, 1 unit</li> <li>with PG interface, 100 units</li> </ul> </li> <li>with axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS</li> </ul>	<b>6ES7972-0BA12-0XA0</b> <b>6ES7972-0BB12-0XA0</b>  <b>6ES7972-0BA52-0XA0</b> <b>6ES7972-0BA52-0XB0</b> <b>6ES7972-0BB52-0XA0</b> <b>6ES7972-0BB52-0XB0</b> <b>6GK1500-0EA02</b>	<b>6GK1901-1BB30-0AA0</b> <b>6GK1901-1BB30-0AB0</b> <b>6GK1901-1BB30-0AE0</b>  <b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## SIMATIC S7-300 advanced controller

### Central processing units

SIPLUS fail-safe CPUs

#### Overview SIPLUS CPU 315F-2 DP



- For configuring a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508 and up to Cat. 4 according to EN 954-1
- Distributed fail-safe I/O modules can be connected through the integral PROFIBUS DP interface (PROFIsafe)
- The fail-safe I/O modules of ET 200M can be also centrally connected
- The standard modules for non-safety applications can be operated both centrally and locally

Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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#### Technical specifications

Article number	6AG1315-6FF04-2AB0	6AG1315-6FF04-2AY0
Based on	6ES7315-6FF04-0AB0 SIPLUS S7-300 CPU 315F-2DP	6ES7315-6FF04-0AB0 SIPLUS S7-300 CPU 315F-2DP EN50155
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C	-25 °C; = Tmin
• max.	60 °C	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	

**SIMATIC S7-300 advanced controller**

## Central processing units

**SIPLUS fail-safe CPUs****Ordering data****Article No.****Article No.****SIPLUS S7-300 CPU 315F-2 DP**

CPU for SIPLUS S7-300F;  
384 KB work memory,  
24 V DC supply voltage, MPI,  
PROFIBUS DP master/slave  
interface, incl. slot number labels;  
MMC required

Extended temperature range and  
exposure to media

Conforms to EN 50155

**6AG1315-6FF04-2AB0**

**6AG1315-6FF04-2AY0**

**Accessories****SIPLUS Upmiter upstream device**

**6AG1305-1AA00-2AA0**

for reliable operation when  
connected to the battery of  
combustion engines

Output current 4 A

**SIPLUS RS 485 repeater  
for PROFIBUS**

**6AG1972-0AA02-7XA0**

Transfer rate up to max. 12 Mbit/s,  
24 V DC, enclosure IP20

for temperature range  
-25 °C to +70 °C and use when  
exposed to media  
(e.g. sulfur chloride atmosphere)

**RS 485 bus connector  
with 90° cable outlet**

Max. transfer rate 12 Mbit/s

Extended temperature range and  
exposure to media

without PG interface

**6AG1972-0BA12-2XA0**

with PG interface

**6AG1972-0BB12-2XA0**

**RS 485 bus connector with axial  
cable outlet**

**6AG1500-0EA02-2AA0**

for SIPLUS OP, for connection to  
PPI, MPI, PROFIBUS

**Additional accessories**

See SIMATIC S7-300  
CPU 315F-2 DP, page 5/45

### Overview SIPLUS CPU 315F-2 PN/DP



- The CPU with a medium sized program memory and quantity structures to build a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, PL e in accordance with ISO 13849 and up to category 4 of EN 954-1
- The fail-safe I/O modules can be locally connected to the integrated PROFINET interface (PROFIsafe) and/or to the integrated PROFIBUS DP interface (PROFIsafe)
- The fail-safe I/O modules of ET 200M can be also centrally connected
- The standard modules for non-safety applications can be operated both centrally and locally
- Component based Automation (CBA) on PROFINET
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component based Automation (CBA)

Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Technical specifications

Article number	6AG1315-2FJ14-2AB0	6AG1315-2FJ14-2AY0
Based on	6ES7315-2FJ14-0AB0 SIPLUS S7-300 CPU315F-2PN/DP	6ES7315-2FJ14-0AB0 SIPLUS S7-300 CPU315F-2PN/DP EN50155
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN 50155
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	



**SIMATIC S7-300 advanced controller**

## Central processing units

**SIPLUS fail-safe CPUs****Ordering data****Article No.****Article No.****SIPLUS S7-300 CPU 315F-2 PN/DP**

CPU for SIPLUS S7-300F;  
work memory 512 KB,  
power supply 24 V DC,  
MPI/PROFIBUS DP master/slave  
interface,  
Industrial Ethernet/PROFINET  
interface; incl. slot number labels

Extended temperature range and  
exposure to media

Conforms to EN 50155

**6AG1315-2FJ14-2AB0****6AG1315-2FJ14-2AY0****Accessories****SIPLUS Upmiter upstream device****6AG1305-1AA00-2AA0**

for reliable operation when  
connected to the battery of  
combustion engines

Output current 4 A

**SIPLUS RS 485 repeater for PROFIBUS****6AG1972-0AA02-7XA0**

Transfer rate up to max. 12 Mbit/s,  
24 V DC, enclosure IP20

for temperature range  
-25 °C to +70 °C and use when  
exposed to media  
(e.g. sulfur chloride atmosphere)

**RS 485 bus connector with 90° cable outlet**

Max. transfer rate 12 Mbit/s

Extended temperature range and  
exposure to media

without PG interface

**6AG1972-0BA12-2XA0**

with PG interface

**6AG1972-0BB12-2XA0****RS 485 bus connector with axial cable outlet****6AG1500-0EA02-2AA0**

for SIPLUS OP, for connection to  
PPI, MPI, PROFIBUS

**SIPLUS NET SCALANCE X-200 Industrial Ethernet switches**

Industrial Ethernet switches with  
integral SNMP access,  
online diagnostics, copper cable  
diagnostics and PROFINET  
diagnostics for configuring line, star  
and ring topologies; with integrated  
redundancy manager (exception:  
SCALANCE X208PRO);  
incl. operating instructions,  
Industrial Ethernet network manual  
and configuration software  
on CD-ROM

- with electrical and optical ports for  
glass multimode FOC up to 3 km
- Extended temperature range and  
exposure to media
  - SIPLUS NET SCALANCE X204-2  
with four 10/100 Mbit/s RJ45  
ports and two fiber-optic ports

**6AG1204-2BB10-4AA3****Additional accessories**

See SIMATIC S7-300  
CPU 315F-2 PN/DP, page 5/45

# SIMATIC S7-300 advanced controller

## Central processing units

SIPLUS fail-safe CPUs

### Overview SIPLUS CPU 317F-2 DP



- The fail-safe CPU with a large program memory and quantity framework for demanding applications
- For configuring a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508 and up to Cat. 4 according to EN 954-1
- Fail-safe I/O modules can be connected in a distributed configuration to both integral PROFIBUS DP interfaces (PROFIsafe)
- The fail-safe I/O modules of ET 200M can be also centrally connected
- The standard modules for non-safety applications can be operated both centrally and locally

Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Technical specifications

Article number	<b>6AG1317-6FF04-2AB0</b>
Based on	<b>6ES7317-6FF04-0AB0</b> SIPLUS S7-300 CPU317F-2DP
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-300 advanced controller**

## Central processing units

**SIPLUS fail-safe CPUs****Ordering data****Article No.****Article No.****SIPLUS S7-300 CPU 315F-2 DP****6AG1317-6FF04-2AB0**

CPU for SIMATIC S7-300F,  
1.5 MB work memory,  
24 V DC power supply,  
MPI, PROFIBUS DP master/slave  
interface;  
MMC required

Extended temperature range and  
exposure to media

**Accessories****SIPLUS Upmiter upstream device****6AG1305-1AA00-2AA0**

for reliable operation connected to  
the battery of combustion engines

Output current 4 A

**SIPLUS RS 485 repeater  
for PROFIBUS****6AG1972-0AA02-7XA0**

Transfer rate up to max. 12 Mbit/s,  
24 V DC, enclosure IP20

for temperature range  
-25 °C to +70 °C and use when  
exposed to media  
(e.g. sulfur chloride atmosphere)

**RS 485 bus connector  
with 90° cable outlet**

Max. transfer rate 12 Mbit/s

Extended temperature range and  
exposure to media

without PG interface

**6AG1972-0BA12-2XA0**

with PG interface

**6AG1972-0BB12-2XA0****RS 485 bus connector with axial  
cable outlet****6AG1500-0EA02-2AA0**

for SIPLUS OP, for connection to  
PPI, MPI, PROFIBUS

**Additional accessories**

See SIMATIC S7-300  
CPU 317F-2 DP, page 5/45

### Overview SIPLUS CPU 317F-2 PN/DP



- The failsafe CPU with a large program memory and quantity structures for demanding applications to build a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, PL e in accordance with ISO 13849-1 and up to category 4 of EN 954-1
- The fail-safe I/O modules can be locally connected via the integrated PROFINET interface (PROFIsafe) and/or via the integrated PROFIBUS DP interface (PROFIsafe)
- The fail-safe I/O modules of ET 200M can be also centrally connected
- The standard modules for non-safety applications can be operated both centrally and locally
- Component Based Automation (CBA) on PROFINET
- PROFINET IO Controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

SIMATIC Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

### Technical specifications

Article number	6AG1317-2FK14-2AB0	6AG1317-2FK14-2AY0
Based on	6ES717-2FK14-0AB0 SIPLUS S7-300 CPU317F-2PN/DP	6ES717-2FK14-0AB0 SIPLUS S7-300 CPU317F-2PN/DP EN50155
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	

**SIMATIC S7-300 advanced controller**

## Central processing units

**SIPLUS fail-safe CPUs****Ordering data****Article No.****Article No.****SIPLUS S7-300 CPU 317F-2 PN/DP**

CPU for SIPLUS S7-300F, work memory 1.5 MB, power supply 24 V DC, MPI/PROFIBUS DP master/slave interface; Industrial Ethernet/PROFINET interface; MMC required

Extended temperature range and exposure to media

Conforms to EN 50155

**6AG1317-2FK14-2AB0**

**6AG1317-2FK14-2AY0**

**Accessories****SIPLUS Upmiter upstream device**

**6AG1305-1AA00-2AA0**

for reliable operation when connected to the battery of combustion engines

Output current 4 A

**SIPLUS RS 485 repeater for PROFIBUS**

**6AG1972-0AA02-7XA0**

Transfer rate up to max. 12 Mbit/s, 24 V DC, enclosure IP20

for temperature range -25 °C to +70 °C and use when exposed to media (e.g. sulfur chloride atmosphere)

**RS 485 bus connector with 90° cable outlet**

Max. transfer rate 12 Mbit/s

Extended temperature range and exposure to media

without PG interface

**6AG1972-0BA12-2XA0**

with PG interface

**6AG1972-0BB12-2XA0**

**RS 485 bus connector with axial cable outlet**

**6AG1500-0EA02-2AA0**

for SIPLUS OP, for connection to PPI, MPI, PROFIBUS

**SIPLUS NET SCALANCE X-200 Industrial Ethernet switches**

Industrial Ethernet switches with integral SNMP access, online diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; with integrated redundancy manager (exception: SCALANCE X208PRO); incl. operating instructions, Industrial Ethernet network manual and configuration software on CD-ROM

- with electrical and optical ports for glass multimode FOC up to 3 km
- Extended temperature range and exposure to media
  - SIPLUS NET SCALANCE X204-2 with four 10/100 Mbit/s RJ45 ports and two fiber-optic ports

**6AG1204-2BB10-4AA3**

**Additional accessories**

See SIMATIC S7-300 CPU 317F-2 PN/DP, page 5/45

### Overview CPU 315T-3 PN/DP



- SIMATIC CPU with integral Technology/Motion Control functionality
- With full standard CPU 315-2 PN/DP functionality (except for CBA)
- For cross-industry automation tasks in series machine, special machine and plant construction
- Ideal for synchronized motion, such as coupling to a virtual/real master, gear synchronization, cam disk, path interpolation, or print mark compensation
- 3D path interpolation with different kinematics
- Position and pressure-regulated hydraulic axes
- Used as central controller in production lines with central and distributed I/O
- With integrated I/O for high-speed technology functions (e.g. camming, reference point acquisition)
- PROFIBUS DP (DRIVE) interface for isochronous connection of drive components
- PROFINET interface with 2-port switch
- PROFINET I/O controller for operating distributed I/O on PROFINET
- One common S7 user program for control and motion control tasks (no additional programming language necessary for motion control)
- "S7 technology" option package required (version V4.2 SP3 and higher)

SIMATIC Micro Memory Card (8 MB) required for operation of the CPU.

### Overview CPU 317T-3 PN/DP



- SIMATIC CPU with integral Technology/Motion Control functionality
- With full standard CPU 317-2 PN/DP functionality (except for CBA)
- For cross-industry automation tasks in series machine, special machine and plant construction
- Ideal for synchronized motion, such as coupling to a virtual/real master, gear synchronization, cam disk, path interpolation, or print mark compensation
- 3D path interpolation with different kinematics
- Position and pressure-regulated hydraulic axes
- Used as central controller in production lines with central and distributed I/O
- With integrated I/O for high-speed technology functions (e.g. camming, reference point acquisition)
- PROFIBUS DP (DRIVE) interface for isochronous connection of drive components
- PROFINET interface with 2-port switch
- PROFINET I/O controller for operating distributed I/O on PROFINET
- One common S7 user program for control and motion control tasks (no additional programming language necessary for motion control)
- "S7 Technology" option package required (version V4.2 SP3 and higher)

SIMATIC Micro Memory Card (8 MB) required for operation of the CPU.

## SIMATIC S7-300 advanced controller

Central processing units

### Technology CPUs

#### Overview CPU 317TF-3 PN/DP



- Fail-safe SIMATIC CPU 317TF-3 PN/DP with integral Technology/Motion Control functionality
- Spare-part-compatible successor to the CPU 317TF-2 DP (Article No. 6ES7317-6TF14-0AB0)
- With full functionality of the standard CPU 317-2 PN/DP and CPU 317F-2 PN/DP (except for CBA)
- For cross-industry automation tasks in series machine, special machine and plant construction

- Ideal for synchronized motion, such as coupling to a virtual/real master, gear synchronization, cam disk, path interpolation, or print mark compensation
- 3D path interpolation with different kinematics
- Position and pressure-regulated hydraulic axes
- Used as central controller in production lines with central and distributed I/O
- With integrated I/O for high-speed technology functions (e.g. camming, reference point acquisition)
- PROFIBUS DP (DRIVE) interface for isochronous connection of drive components
- PROFINET interface with 2-port switch
- PROFINET I/O controller for operating distributed I/O on PROFINET
- One common S7 user program for control and motion control tasks (no additional programming language necessary for motion control)
- "S7-Technology" option package required
- "S7 Distributed Safety" option package required (version V4.2 SP3 and higher)

SIMATIC Micro Memory Card (8 MB) required for operation of the CPU.

#### Technical specifications

Article number	6ES7315-7TJ10-0AB0 CPU315T-3 PN/DP, 384KB	6ES7317-7TK10-0AB0 CPU317T-3 PN/DP, 1024KB	6ES7317-7UL10-0AB0 CPU317TF-3 PN/DP, 1,5 MB
<b>Product type designation</b>			
<b>General information</b>			
<b>Engineering with</b>			
• Programming package	STEP 7 V5.5 SP2 or higher and S7-Technology option package V4.2 SP3	STEP 7 V5.5 SP2 or higher and S7-Technology option package V4.2 SP3	STEP 7 V5.5 SP2 or higher; S7-Technology option package V4.2 SP3 or higher, Distributed Safety V5.4 SP5 or higher, S7-F Configuration Pack V5.5 SP10 or higher
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
<b>Power losses</b>			
Power loss, typ.	7.5 W	7.5 W	8.5 W
<b>Memory</b>			
<b>Work memory</b>			
• Integrated	384 kbyte	1 024 kbyte	1 536 kbyte
• Size of retentive memory for retentive data blocks	128 kbyte	256 kbyte	256 kbyte
<b>Load memory</b>			
• pluggable (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte
<b>CPU processing times</b>			
for bit operations, typ.	0.05 µs	0.025 µs	0.025 µs
for word operations, typ.	0.09 µs	0.03 µs	0.03 µs
for fixed point arithmetic, typ.	0.12 µs	0.04 µs	0.04 µs
for floating point arithmetic, typ.	0.45 µs	0.16 µs	0.16 µs

**Technical specifications (continued)**

Article number	<b>6ES7315-7TJ10-0AB0</b> CPU315T-3 PN/DP, 384KB	<b>6ES7317-7TK10-0AB0</b> CPU317T-3 PN/DP, 1024KB	<b>6ES7317-7UL10-0AB0</b> CPU317TF-3 PN/DP, 1,5 MB
<b>Counters, timers and their retentivity</b>			
<b>S7 counter</b>			
• Number	256	512	512
<b>IEC counter</b>			
• present	Yes	Yes	Yes
<b>S7 times</b>			
• Number	256	512	512
<b>IEC timer</b>			
• present	Yes	Yes	Yes
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Number, max.	2 048 byte	4 096 byte	4 096 byte
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	2 048 byte	8 192 byte	8 192 byte
• Outputs	2 048 byte	8 192 byte	8 192 byte
<b>Process image</b>			
• Inputs, adjustable	2 048 byte	8 192 byte	8 192 byte
• Outputs, adjustable	2 048 byte	8 192 byte	8 192 byte
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time clock)	Yes	Yes	Yes
<b>Operating hours counter</b>			
• Number	1	4	4
<b>Digital outputs</b>			
<b>Integrated high-speed cams</b>			
• Switching accuracy, (+/-)	70 µs	70 µs	70 µs
<b>1st interface</b>			
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485
<b>Functionality</b>			
• MPI	Yes	Yes	Yes
• DP master	Yes	Yes	Yes
• DP slave	Yes	Yes	Yes
• Point-to-point connection	No	No	No
<b>DP master</b>			
• Number of DP slaves, max.	124	124	124
<b>2nd interface</b>			
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485
<b>Functionality</b>			
• MPI	No	No	No
• DP master	Yes; DP(DRIVE)-Master	Yes; DP(DRIVE)-Master	Yes; DP(DRIVE)-Master
• DP slave	No	No	No
<b>DP master</b>			
• Number of DP slaves, max.	64	64	64



# SIMATIC S7-300 advanced controller

## Central processing units

### Technology CPUs

#### Technical specifications (continued)

Article number	<b>6ES7315-7TJ10-0AB0</b> CPU315T-3 PN/DP, 384KB	<b>6ES7317-7TK10-0AB0</b> CPU317T-3 PN/DP, 1024KB	<b>6ES7317-7UL10-0AB0</b> CPU317TF-3 PN/DP, 1,5 MB
<b>3rd interface</b>			
Interface type	PROFINET	PROFINET	PROFINET
Physics	Ethernet RJ45	Ethernet RJ45	Ethernet RJ45
Number of ports	2	2	2
<b>Functionality</b>			
• MPI	No	No	No
• DP master	No	No	No
• DP slave	No	No	No
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality	Yes; Also simultaneously with IO-Device functionality	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality	Yes; Also simultaneously with IO Controller functionality	Yes; Also simultaneously with IO Controller functionality
<b>PROFINET IO Controller</b>			
• Max. number of connectable IO devices for RT	128	128	128
• Number of IO Devices with IRT and the option "high performance", max.	64	64	64
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)	Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via PROFIBUS DP or PROFINET interface
<b>Communication functions</b>			
PG/OP communication	Yes	Yes	Yes
Data record routing	Yes	Yes	Yes
<b>Global data communication</b>			
• supported	Yes	Yes	Yes
<b>S7 basic communication</b>			
• supported	Yes	Yes	Yes
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>S5-compatible communication</b>			
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
<b>Open IE communication</b>			
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8	16	16
• ISO-on-TCP (RFC1006)	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8	16	16
• UDP	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8	16	16
<b>Web server</b>			
• supported	Yes	Yes	Yes
<b>Number of connections</b>			
• overall	16	32	32

### Technical specifications (continued)

Article number	<b>6ES7315-7TJ10-0AB0</b> CPU315T-3 PN/DP, 384KB	<b>6ES7317-7TK10-0AB0</b> CPU317T-3 PN/DP, 1024KB	<b>6ES7317-7UL10-0AB0</b> CPU317TF-3 PN/DP, 1,5 MB
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
<b>Configuration</b>			
<b>programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- CFC	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes
<b>Know-how protection</b>			
• User program protection/password protection	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>			
Width	120 mm	120 mm	120 mm
Height	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm
<b>Weights</b>			
Weight, approx.	640 g	640 g	640 g

# SIMATIC S7-300 advanced controller

## Central processing units

### Technology CPUs

Ordering data	Article No.	Ordering data	Article No.
<b>CPU 315T-3 PN/DP</b> 384 KB main memory, 24 V DC power supply, MPI, PROFIBUS DP master/slave interface, PROFIBUS DP(DRIVE) interface, Ethernet/PROFINET interface with 2-port switch; with technology/motion control functions; MMC required	<b>6ES7315-7TJ10-0AB0</b>	<b>S7 Distributed Safety V5.4            programming tool</b>  <b>Task:</b> Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco <b>Requirement:</b> STEP 7 V5.3 SP3 and higher  Floating License for 1 user	<b>6ES7833-1FC02-0YA5</b>
<b>CPU 317T-3 PN/DP</b> 1024 KB main memory, 24 V DC power supply, MPI, PROFIBUS DP master/slave interface, PROFIBUS DP(DRIVE) interface, Ethernet/PROFINET interface with 2-port switch; with technology/motion control functions; MMC required	<b>6ES7317-7TK10-0AB0</b>	Floating License for 1 user, license key download without software or documentation <sup>1)</sup> ; email address required for delivery  S7 Distributed Safety upgrade from V5.x to V5.4); Floating License for 1 user	<b>6ES7833-1FC02-0YH5</b>
<b>CPU 317TF-3 PN/DP</b> 1.5 MB main memory, 24 V DC power supply, MPI, PROFIBUS DP master/slave interface, PROFIBUS DP(DRIVE) interface, Ethernet/PROFINET interface with 2-port switch; with technology/motion control functions; MMC required	<b>6ES7317-7UL10-0AB0</b>	<b>S7 Distributed Safety upgrade</b> from V5.x to V5.4); Floating License for 1 user	<b>6ES7833-1FC02-0YE5</b>
<b>S7-Technology V4.2</b>  V4.2 SP3 and higher can be used for CPU 315T-3 PN/DP  <b>Task:</b> Option package for configuring and programming technology tasks with the SIMATIC S7 CPU 31xT and SIMATIC S7 CPU 317TF <b>Requirement:</b> STEP 7 V5.5 SP5 and higher <b>Delivery form:</b> incl. up-to-date Service Pack; on DVD; incl. documentation for CPU 31xT-2 DP, CPU 317TF-2 DP (also on DVD)  Floating License  Floating License for 1 user, license key download without software or documentation <sup>1)</sup> ; email address required for delivery  Upgrade to V4.2  Trial License	<b>6ES7864-1CC42-0YA5</b>  <b>6ES7864-1CC42-0XH5</b>  <b>6ES7864-1CC42-0YE5</b>  <b>6ES7864-1CC42-0YA7</b>	<b>SIMATIC Micro Memory Card</b>  8 MB	<b>6ES7953-8LP31-0AA0</b>
		<b>MPI cable</b>  for connection of SIMATIC S7 and PG via MPI; 5 m in length	<b>6ES7901-0BF00-0AA0</b>
		<b>Front connectors</b>  40-pin, with screw contacts <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 100 units</li> </ul> 40-pin, with spring-loaded contacts <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 100 units</li> </ul>	<b>6ES7392-1AM00-0AA0</b> <b>6ES7392-1AM00-1AB0</b>  <b>6ES7392-1BM01-0AA0</b> <b>6ES7392-1BM01-1AB0</b>
		<b>Slot number plates</b>	<b>6ES7912-0AA00-0AA0</b>
		<b>SIMATIC Manual Collection</b>  Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
		<b>SIMATIC Manual Collection            update service for 1 year</b>  Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>
		<b>Power supply connector</b>  10 units, spare part	<b>6ES7391-1AA00-0AA0</b>
		<b>Labeling strips</b>  10 units, spare part	<b>6ES7392-2XX00-0AA0</b>
		<b>Label cover</b>  10 units, spare part	<b>6ES7392-2XY00-0AA0</b>

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

Ordering data	Article No.	Article No.
<b>Labeling sheets for machine inscription</b> for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units  petrol light-beige yellow red	<b>6ES7392-2AX10-0AA0</b> <b>6ES7392-2BX10-0AA0</b> <b>6ES7392-2CX10-0AA0</b> <b>6ES7392-2DX10-0AA0</b>	
<b>USB A2 PC adapter</b> for connecting a PG/PC or Notebook to PROFIBUS or MPI; USB cable included in scope of delivery	<b>6GK1571-0BA00-0AA0</b>	
<b>PROFIBUS bus components</b>		
<b>PROFIBUS DP bus connector RS 485</b> <ul style="list-style-type: none"> <li>with 90° cable outlet, max. transfer rate 12 Mbit/s               <ul style="list-style-type: none"> <li>without PG interface</li> <li>with PG interface</li> </ul> </li> <li>with 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbit/s               <ul style="list-style-type: none"> <li>without PG interface, 1 unit</li> <li>without PG interface, 100 units</li> <li>with PG interface, 1 unit</li> <li>with PG interface, 100 units</li> </ul> </li> <li>with axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS</li> </ul>	<b>6ES7972-0BA12-0XA0</b> <b>6ES7972-0BB12-0XA0</b>  <b>6ES7972-0BA52-0XA0</b> <b>6ES7972-0BA52-0XB0</b> <b>6ES7972-0BB52-0XA0</b> <b>6ES7972-0BB52-0XB0</b> <b>6GK1500-0EA02</b>	
<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	<b>6XV1830-0EH10</b>	
<b>RS 485 repeater for PROFIBUS</b> Transmission rate up to 12 Mbit/s; 24 V DC; IP20 enclosure	<b>6ES7972-0AA02-0XA0</b>	
		<b>PROFINET bus components</b>
		<b>IE FC TP Standard Cable GP 2x2</b> <b>6XV1840-2AH10</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter
		<b>FO Standard Cable GP (50/125)</b> <b>6XV1873-2A</b> Standard cable, splittable, UL approval, sold by the meter
		<b>SCALANCE X204-2 Industrial Ethernet Switch</b> <b>6GK5204-2BB10-2AA3</b> Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports
		<b>Compact Switch Module CSM 377</b> <b>6GK7377-1AA00-0AA0</b> Unmanaged Switch for connecting a SIMATIC S7-300, ET200 M and up to three other stations to Industrial Ethernet with 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module incl. electronic manual on CD-ROM
		<b>IE FC RJ45 Plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables
		<b>IE FC RJ45 Plug 180</b> 180° cable outlet 1 unit <b>6GK1901-1BB10-2AA0</b> 10 units <b>6GK1901-1BB10-2AB0</b> 50 units <b>6GK1901-1BB10-2AE0</b>
		<b>PROFIBUS/PROFINET bus components</b> See catalogs IK PI, CA 01
		For establishing MPI/PROFIBUS/PROFINET communication

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

**SIMATIC S7-300 advanced controller**

I/O modules

Digital modules

**SM 321 digital input modules****Overview**

- Digital inputs
- For connecting standard switches and two-wire proximity switches (BERO)

5

**Technical specifications**

Article number	<b>6ES7321-1BH02-0AA0</b> SM321, 16DI, DC24V	<b>6ES7321-1BH50-0AA0</b> SM321, 16DI, DC24V, SOURCE INPUT	<b>6ES7321-1BL00-0AA0</b> SM321, 32DI, DC24V	<b>6ES7321-1BP00-0AA0</b> SM321, 64 DI, DC 24V, 3MS, SINK/SOURCE	<b>6ES7321-1BH10-0AA0</b> SM321, 16DI, DC24V, 0.05MS INPUT DELAY.
<b>Product type designation</b>					
<b>Supply voltage</b>					
<b>Load voltage L+</b>					
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
<b>Input current</b>					
from backplane bus 5 V DC, max.	10 mA	10 mA	15 mA	100 mA	110 mA
<b>Power losses</b>					
Power loss, typ.	3.5 W	3.5 W	6.5 W	7 W	3.8 W
<b>Digital inputs</b>					
Number of digital inputs	16	16	32	64	16
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes	Yes
<b>Number of simultaneously controllable inputs</b>					
<b>horizontal installation</b>					
- up to 40 °C, max.	16	16	32	64	16
- up to 60 °C, max.	16	16	16	32	16
<b>vertical installation</b>					
- up to 40 °C, max.	16	16	32	32	16
<b>Input voltage</b>					
• Type of input voltage	DC	DC	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
• for signal "0"	-30 to +5V	-5 to +30V	-30 to +5V	-30 to +5V	-30 to +5V
• for signal "1"	13 to 30V	-13 to -30V	13 to 30V	13 to 30V	13 to 30V
<b>Input current</b>					
• for signal "1", typ.	7 mA	7 mA	7 mA	4.2 mA; Typical	7 mA
<b>Input delay (for rated value of input voltage)</b>					
<b>for standard inputs</b>					
- Parameterizable	No	No	No	No	No
- at "0" to "1", min.	1.2 ms	1.2 ms	1.2 ms	1.2 ms	25 µs
- at "0" to "1", max.	4.8 ms	4.8 ms	4.8 ms	4.8 ms	75 µs
<b>Cable length</b>					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m

## Technical specifications (continued)

Article number	6ES7321-1BH02-0AA0 SM321, 16DI, DC24V	6ES7321-1BH50-0AA0 SM321, 16DI, DC24V, SOURCE INPUT	6ES7321-1BL00-0AA0 SM321, 32DI, DC24V	6ES7321-1BP00-0AA0 SM321, 64 DI, DC 24V, 3MS, SINK/SOURCE	6ES7321-1BH10-0AA0 SM321, 16DI, DC24V, 0.05MS INPUT DELAY.
<b>Encoder</b>					
<b>Connectable encoders</b>					
• 2-wire sensor	Yes	Yes	Yes	No	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA		1.5 mA
<b>Isochronous mode</b>					
Isochronous operation (application synchronized up to terminal)	No	No	No	No	Yes
<b>Interrupts/diagnostics/ status information</b>					
<b>Alarms</b>					
• Alarms	No	No	No	No	No
• Diagnostic alarm	No	No	No	No	No
• Hardware interrupt	No	No	No	No	No
<b>Diagnostic messages</b>					
• Diagnostic functions	No	No	No	No	No
<b>Diagnostics indication LED</b>					
• Status indicator digital input (green)	Yes	Yes	Yes	Yes	Yes
<b>Galvanic isolation</b>					
<b>Galvanic isolation digital inputs</b>					
• between the channels	No	No	No	No	No
• between the channels, in groups of	16	16	16	16	16
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
<b>Isolation</b>					
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC
<b>Connection method</b>					
required front connector	20-pin	20-pin	40-pin	Cable: 6ES7 392-4Bxx0-0AA0 terminal blocks: 6ES7 392-1xN00-0AA0	20-pin
<b>Dimensions</b>					
Width	40 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	112 mm	120 mm
<b>Weights</b>					
Weight, approx.	200 g	200 g	260 g	230 g; approx.	200 g

**SIMATIC S7-300 advanced controller**

I/O modules

Digital modules

**SM 321 digital input modules****Technical specifications (continued)**

Article number	<b>6ES7321-7BH01-0AB0</b> SM321, 16DI, 24V DC	<b>6ES7321-1CH00-0AA0</b> SM321, 16 DI, AC/DC 24-48V, 1CH/COMMON	<b>6ES7321-1CH20-0AA0</b> SM321, 16DI, DC48-125V	<b>6ES7321-1FH00-0AA0</b> SM321, 16 DI, 120/230V AC
<b>Product type designation</b>				
<b>Supply voltage</b>				
<b>Load voltage L+</b>				
• Rated value (DC)	24 V	24 V	48 V	
<b>Load voltage L1</b>				
• Rated value (AC)		24 V		230 V; 120/230 V AC; all load voltages must have the same phase.
<b>Input current</b>				
from load voltage L+ (without load), max.	90 mA			
from backplane bus 5 V DC, max.	130 mA	100 mA	40 mA	29 mA
<b>Power losses</b>				
Power loss, typ.	4 W	1.5 W; at 24 V; 2,8 W at 48 V	4,3 W	4,9 W
<b>Digital inputs</b>				
Number of digital inputs	16	16	16	16
Input characteristic curve in accordance with IEC 61131, type 1		Yes	Yes	Yes
Input characteristic curve in accordance with IEC 61131, type 2	Yes			
<b>Number of simultaneously controllable inputs</b>				
<b>horizontal installation</b>				
- up to 40 °C, max.	16	16	8	16
- up to 60 °C, max.	16	16	8; 6 to U <sub>e</sub> 146 V	16
<b>vertical installation</b>				
- up to 40 °C, max.	16	16	8	16
<b>Input voltage</b>				
• Type of input voltage	DC	AC/DC	DC	AC
• Rated value (AC)		24 V; AC 24 or 48 V		230 V; 120/230V AC
• Rated value (DC)	24 V	24 V; DC 24 or 48 V	48 V; 48V DC to 125V DC	
• for signal "0"	-30 to +5V	-5 to +5 V AC	DC -146V to DC +15V	0 to 40V
• for signal "1"	13 to 30V	14V AC to 60V AC	30V DC to 146V DC	79 to 264V
• Frequency range		0 to 63 Hz		47 ... 63 Hz
<b>Input current</b>				
• for signal "1", typ.	7 mA	2,7 mA	3,5 mA	6,5 mA; (120V, 60Hz), 16mA (230V, 50Hz)
<b>Input delay (for rated value of input voltage) for standard inputs</b>				
- Parameterizable	Yes; 0.1 / 0.5 / 3 / 15 / 20 ms	No	No	No
- at "0" to "1", min.		16 ms	0.1 ms	25 ms
- at "0" to "1", max.		16 ms	3,5 ms	25 ms
<b>Cable length</b>				
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m
<b>Encoder</b>				
<b>Connectable encoders</b>				
• 2-wire sensor	Yes	Yes	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	2 mA	1 mA	1 mA	2 mA
<b>Isochronous mode</b>				
Isochronous operation (application synchronized up to terminal)	Yes	No	No	No

## Technical specifications (continued)

Article number	<b>6ES7321-7BH01-0AB0</b> SM321, 16DI, 24V DC	<b>6ES7321-1CH00-0AA0</b> SM321, 16 DI, AC/DC 24-48V, 1CH/COMMON	<b>6ES7321-1CH20-0AA0</b> SM321, 16DI, DC48-125V	<b>6ES7321-1FH00-0AA0</b> SM321, 16 DI, 120/230V AC
<b>Interrupts/diagnostics/ status information</b>				
<b>Alarms</b>				
• Alarms	Yes	No	No	No
• Diagnostic alarm	Yes; Parameterizable	No	No	No
• Hardware interrupt	Yes; Parameterizable	No	No	No
<b>Diagnostic messages</b>				
• Diagnostic functions	Yes; Parameterizable	No	No	No
<b>Diagnostics indication LED</b>				
• Status indicator digital input (green)	Yes	Yes	Yes	Yes
<b>Galvanic isolation</b>				
<b>Galvanic isolation digital inputs</b>				
• between the channels	No	Yes	No	No
• between the channels, in groups of 16	16	1	8	4
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
<b>Isolation</b>				
Isolation checked with	500 V DC	1500 V AC	1500 V DC	4000 VDC
<b>Connection method</b>				
required front connector	20-pin	40-pin	20-pin	20-pin
<b>Dimensions</b>				
Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	120 mm
<b>Weights</b>				
Weight, approx.	200 g	260 g	200 g	240 g
Article number	<b>6ES7321-1EL00-0AA0</b> SM321, 32DI, AC120V	<b>6ES7321-1FF01-0AA0</b> SM321, 8DI, AC120/230V	<b>6ES7321-1FF10-0AA0</b> SM321, 8 DI, AC/DC 120/230V, 1CH/COMMON	
<b>Product type designation</b>				
<b>Load voltage L1</b>				
• Rated value (AC)	120 V	230 V; 120/230V AC	230 V; 120/230 V AC; all load voltages must have the same phase.	
<b>Input current</b>				
from backplane bus 5 V DC, max.	16 mA	29 mA	100 mA	
<b>Power losses</b>				
Power loss, typ.	4 W	4.9 W	4.9 W	
<b>Digital inputs</b>				
Number of digital inputs	32	8	8	
Input characteristic curve in accordance with IEC 61131, type 1		Yes	Yes	
Input characteristic curve in accordance with IEC 61131, type 2	Yes			
<b>Number of simultaneously controllable inputs</b>				
<b>horizontal installation</b>				
- up to 40 °C, max.	32			
- up to 60 °C, max.	24	8	8	
<b>vertical installation</b>				
- up to 40 °C, max.	32	8	8	



**SIMATIC S7-300 advanced controller**

I/O modules

Digital modules

**SM 321 digital input modules****Technical specifications (continued)**

Article number	<b>6ES7321-1EL00-0AA0</b> SM321, 32DI, AC120V	<b>6ES7321-1FF01-0AA0</b> SM321, 8DI, AC120/230V	<b>6ES7321-1FF10-0AA0</b> SM321, 8 DI, AC/DC 120/230V, 1CH/COMMON
<b>Input voltage</b>			
• Type of input voltage	AC	AC	AC
• Rated value (AC)	120 V	230 V; 120/230V AC	120 V; 120/230V AC
• for signal "0"	0 to 20V	0 to 40V	0 to 40V
• for signal "1"	74 to 132V	79 to 264V	79 to 264V
• Frequency range	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
<b>Input current</b>			
• for signal "1", typ.	21 mA	6.5 mA; (120 V); 11 mA (230 V)	7.5 mA; (120 V); 17.3 mA (230 V)
<b>Input delay (for rated value of input voltage)</b>			
<b>for standard inputs</b>			
- Parameterizable	No	No	No
- at "0" to "1", max.	15 ms	25 ms	25 ms
<b>Cable length</b>			
• shielded, max.	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m
<b>Encoder</b>			
<b>Connectable encoders</b>			
• 2-wire sensor	Yes	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	4 mA	2 mA	2 mA
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)	No	No	No
<b>Interrupts/diagnostics/status information</b>			
<b>Alarms</b>			
• Alarms	No	No	No
• Diagnostic alarm	No	No	No
• Hardware interrupt	No	No	No
<b>Diagnostic messages</b>			
• Diagnostic functions	No	No	No
<b>Diagnostics indication LED</b>			
• Status indicator digital input (green)	Yes; per channel	Yes	Yes
<b>Galvanic isolation</b>			
<b>Galvanic isolation digital inputs</b>			
• between the channels	No	No	Yes
• between the channels, in groups of 8	8	2	1
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
<b>Isolation</b>			
Isolation checked with	2500 V DC	4000 VDC	1500 V AC
<b>Connection method</b>			
required front connector	40-pin	20-pin	40-pin
<b>Dimensions</b>			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
<b>Weights</b>			
Weight, approx.	300 g	240 g	240 g

Ordering data	Article No.	Ordering data	Article No.
<b>SM 321 digital input modules</b>		<b>Bus connectors</b>	<b>6ES7390-0AA00-0AA0</b>
incl. labeling strips, bus connector		1 unit (spare part)	
16 inputs, 24 V DC	<b>6ES7321-1BH02-0AA0</b>	<b>Labeling strips</b>	
16 inputs, 24 V DC, active low	<b>6ES7321-1BH50-0AA0</b>	10 units (spare part)	
32 inputs, 24 V DC	<b>6ES7321-1BL00-0AA0</b>	for modules with 20-pin front connector	<b>6ES7392-2XX00-0AA0</b>
64 inputs, 24 V DC, active high/low	<b>6ES7321-1BP00-0AA0</b>	for modules with 40-pin front connector	<b>6ES7392-2XX10-0AA0</b>
<b>Note:</b> 6ES7392-4...0-0AA0 connection cable and 6ES7392-1.N00-0AA0 terminal blocks necessary.		<b>Label cover</b>	
16 inputs, 24 to 48 V DC	<b>6ES7321-1CH00-0AA0</b>	10 units (spare part)	
16 inputs, 48 to 125 V DC	<b>6ES7321-1CH20-0AA0</b>	for modules with 20-pin front connector	<b>6ES7392-2XY00-0AA0</b>
16 inputs, 24 V DC, for isochronous mode	<b>6ES7321-1BH10-0AA0</b>	for modules with 40-pin front connector	<b>6ES7392-2XY10-0AA0</b>
32 inputs, 120 V AC	<b>6ES7321-1EL00-0AA0</b>	<b>Labeling sheets for machine inscription</b>	
8 inputs, 120/230 V AC	<b>6ES7321-1FF01-0AA0</b>	for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
8 inputs, 120/230 V AC, single root	<b>6ES7321-1FF10-0AA0</b>	petrol	<b>6ES7392-2AX00-0AA0</b>
16 inputs, 120/230 V AC	<b>6ES7321-1FH00-0AA0</b>	light-beige	<b>6ES7392-2BX00-0AA0</b>
16 inputs, 24 V DC, for isochronous mode, diagnostics-capable	<b>6ES7321-7BH01-0AB0</b>	yellow	<b>6ES7392-2CX00-0AA0</b>
<b>Front connectors</b>		red	<b>6ES7392-2DX00-0AA0</b>
20-pin, with screw contacts		for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units	
• 1 unit	<b>6ES7392-1AJ00-0AA0</b>	petrol	<b>6ES7392-2AX10-0AA0</b>
• 100 units	<b>6ES7392-1AJ00-1AB0</b>	light-beige	<b>6ES7392-2BX10-0AA0</b>
20-pin, with spring-loaded contacts		yellow	<b>6ES7392-2CX10-0AA0</b>
• 1 unit	<b>6ES7392-1BJ00-0AA0</b>	red	<b>6ES7392-2DX10-0AA0</b>
• 100 units	<b>6ES7392-1BJ00-1AB0</b>	<b>SIMATIC Manual Collection</b>	<b>6ES7998-8XC01-8YE0</b>
40-pin, with screw contacts		Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
• 1 unit	<b>6ES7392-1AM00-0AA0</b>	<b>SIMATIC Manual Collection update service for 1 year</b>	<b>6ES7998-8XC01-8YE2</b>
• 100 units	<b>6ES7392-1AM00-1AB0</b>	Current "Manual Collection" DVD and the three subsequent updates	
40-pin, with spring-loaded contacts			
• 1 unit	<b>6ES7392-1BM01-0AA0</b>		
• 100 units	<b>6ES7392-1BM01-1AB0</b>		
<b>S7-300 connecting cables</b>			
For 64-channel modules; 2 units			
1 m	<b>6ES7392-4BB00-0AA0</b>		
2.5 m	<b>6ES7392-4BC50-0AA0</b>		
5 m	<b>6ES7392-4BF00-0AA0</b>		
<b>Terminal blocks</b>			
For 64-channel modules; 2 units			
With screw contacts	<b>6ES7392-1AN00-0AA0</b>		
With spring-loaded contacts	<b>6ES7392-1BN00-0AA0</b>		
<b>Front door, elevated design</b>	<b>6ES7328-0AA00-7AA0</b>		
e.g. for 32-channel modules; for connecting 1.3 mm <sup>2</sup> /16 AWG conductors; circuit diagram and name-plates in petrol			
<b>SIMATIC TOP connect</b>	See page 5/247		

**SIMATIC S7-300 advanced controller**

I/O modules

Digital modules

**SM 322 digital output modules****Overview**

- Digital outputs
- For connecting solenoid valves, contactors, low-power motors, lamps and motor starters

**Technical specifications**

Article number	6ES7322-1BH01-0AA0	6ES7322-1BH10-0AA0	6ES7322-1BL00-0AA0	6ES7322-1BP00-0AA0	6ES7322-1BP50-0AA0	6ES7322-8BF00-0AB0
	SM322, 16DO 24V DC, 0,5A	SM322 HIGH SPEED, 16DO 24V DC, 0,5A	SM322, 32DO 24V DC, 0,5A	SM322 64DA, DC24V, 0,3A P-WRITE	SM322 64DO, DC24V, 0,3A M-WRITE	SM322, 8DO, 24V DC, 0,5A
<b>Product type designation</b>						
<b>Supply voltage</b>						
<b>Load voltage L+</b>						
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V
<b>Input current</b>						
from load voltage L+ (without load), max.	80 mA	110 mA	160 mA	75 mA	75 mA	90 mA
from backplane bus 5 V DC, max.	80 mA	70 mA	110 mA	100 mA	100 mA	70 mA
<b>Power losses</b>						
Power loss, typ.	4.9 W	5 W	6.6 W	6 W	6 W	5 W
<b>Digital outputs</b>						
Number of digital outputs	16	16	32	64	64	8
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)	L+ (-53 V)	L+ (-53 V)	M+ (45 V)	L+ (-45 V)
<b>Switching capacity of the outputs</b>						
• on lamp load, max.	5 W	5 W	5 W	5 W	5 W	5 W
<b>Load resistance range</b>						
• lower limit	48 Ω	48 Ω	48 Ω	80 Ω	80 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ	10 kΩ	10 kΩ	3 kΩ
<b>Output voltage</b>						
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.5 V)	M+ (0.5 V)	L+ (-0.8 to -1.6 V)
<b>Output current</b>						
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	0.3 A	0.3 A	0.5 A
• for signal "1" permissible range, min.				2.4 mA	2.4 mA	
• for signal "1" permissible range, max.				0.36 A	0.36 A	
• for signal "1" permissible range for 0 to 40 °C, min.	5 mA	5 mA	5 mA			10 mA
• for signal "1" permissible range for 0 to 40 °C, max.	0.6 A	0.6 A	0.6 A			0.6 A
• for signal "1" permissible range for 40 to 60 °C, min.	5 mA	5 mA	5 mA			10 mA
• for signal "1" permissible range for 40 to 60 °C, max.	0.6 A	0.6 A	0.6 A			0.6 A
• for signal "1" minimum load current	5 mA	5 mA	5 mA			10 mA
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	0.1 mA		0.5 mA

## Technical specifications (continued)

Article number	6ES7322-1BH01-0AA0	6ES7322-1BH10-0AA0	6ES7322-1BL00-0AA0	6ES7322-1BP00-0AA0	6ES7322-1BP50-0AA0	6ES7322-8BF00-0AB0
	SM322, 16DO 24V DC, 0,5A	SM322 HIGH SPEED, 16DO 24V DC, 0,5A	SM322, 32DO 24V DC, 0,5A	SM322 64DA, DC24V, 0,3A P-WRITE	SM322 64DO, DC24V, 0,3A M-WRITE	SM322, 8DO, 24V DC, 0,5A
<b>Switching frequency</b>						
• with resistive load, max.	100 Hz	1 000 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz
<b>Aggregate current of outputs (per group)</b>						
<b>horizontal installation</b>						
- up to 40 °C, max.	4 A	4 A	4 A	1.6 A	1.6 A	4 A
- up to 60 °C, max.	3 A	3 A	3 A	1.2 A	1.2 A	3 A
<b>vertical installation</b>						
- up to 40 °C, max.	2 A	2 A	2 A	1.6 A	1.6 A	4 A
<b>Total current of the outputs (per module)</b>						
<b>horizontal installation</b>						
- up to 60 °C, max.				4.8 A	4.8 A	
<b>all other mounting positions</b>						
- up to 40 °C, max.				6.4 A	6.4 A	
<b>Cable length</b>						
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m
<b>Interrupts/diagnostics/ status information</b>						
<b>Alarms</b>						
• Diagnostic alarm	No	No	No	No	No	Yes; Parameterizable
<b>Diagnostic messages</b>						
• Diagnostics	No	No	No	No	No	Yes
<b>Galvanic isolation</b>						
<b>Galvanic isolation digital outputs</b>						
• between the channels, in groups of	8	8	8	16	16	8
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
<b>Isolation</b>						
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC
<b>Connection method</b>						
required front connector	20-pin	20-pin	40-pin	Cable: 6ES7 392-4Bxx0-0AA0 Terminal blocks: 6ES7 392-1xN00-0AA0	Cable: 6ES7 392-4Bxx0-0AA0 Terminal blocks: 6ES7 392-1xN00-0AA0	20-pin
<b>Dimensions</b>						
Width	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	112 mm	112 mm	120 mm
<b>Weights</b>						
Weight, approx.	190 g	200 g	260 g	230 g	230 g	210 g

# SIMATIC S7-300 advanced controller

I/O modules

Digital modules

## SM 322 digital output modules

### Technical specifications (continued)

Article number	6ES7322-5GH00-0AB0 SM322, 16DO, AC120/230V, 2A	6ES7322-1CF00-0AA0 SM322, 8DO, 48-125V DC, 1,5A	6ES7322-1BF01-0AA0 SM322, 8DO, 24V DC, 2A	6ES7322-1FF01-0AA0 SM322, 8DO, 120/230V AC, 1A	6ES7322-5FF00-0AB0 SM322, 8DO, AC120/230V, 2A	6ES7322-1FH00-0AA0 SM322, 16DO, 120/230V AC, 1A
<b>Product type designation</b>						
<b>Supply voltage</b>						
<b>Load voltage L+</b>						
• Rated value (DC)	24 V; 24 / 48	48 V; 48V DC to 125V DC	24 V			
<b>Load voltage L1</b>						
• Rated value (AC)				230 V; 120/230V AC	230 V; 120/230V AC	230 V; 120/230V AC
<b>Input current</b>						
from load voltage L+ (without load), max.	200 mA	2 mA	60 mA			2 mA
from load voltage L1 (without load), max.				2 mA	2 mA	3 mA
from backplane bus 5 V DC, max.	100 mA	100 mA	40 mA	100 mA	100 mA	200 mA
<b>Power losses</b>						
Power loss, typ.	2.8 W	7.2 W	6.8 W	8.6 W	8.6 W	8.6 W
<b>Digital outputs</b>						
Number of digital outputs	16	8	8	8	8	16
Limitation of inductive shutdown voltage to		M (-1 V)	L+ (-48 V)			
<b>Switching capacity of the outputs</b>						
• on lamp load, max.	2.5 W	15 W; 15 W (48 V) or 40 W (125 V)	10 W	50 W	50 W	50 W
<b>Load resistance range</b>						
• lower limit			12 Ω			
• upper limit			4 kΩ			
<b>Output voltage</b>						
• for signal "1", min.	L+ (-0.25 V)	L+ (-1.2 V)	L+ (-0.8 V)	L1 (-1.5 V)	L1 (-8.5 V)	
<b>Output current</b>						
• for signal "1" rated value	0.5 A	1.5 A	2 A	2 A	2 A	1 A
• for signal "1" permissible range for 0 to 40 °C, min.		10 mA	5 mA	10 mA	10 mA	10 mA
• for signal "1" permissible range for 0 to 40 °C, max.	0.5 A	1.5 A	2.4 A	2 A	2 A	1 A
• for signal "1" permissible range for 40 to 60 °C, min.		10 mA	5 mA	10 mA	10 mA	10 mA
• for signal "1" permissible range for 40 to 60 °C, max.	0.5 A	1.5 A	2.4 A	1 A	1 A	0.5 A
• for signal "1" minimum load current		10 mA	5 mA	10 mA	10 mA	10 mA
• for signal "1" permissible surge current, max.	1.5 A; for 50 ms, 1 A 2 s one-time	3 A; for 10 ms		20 A; max. 1 AC cycle	20 A; with 2 half waves	20 A; with 2 half waves
• for signal "0" residual current, max.	10 μA	0.5 mA	0.5 mA	2 mA	2 mA	2 mA
<b>Switching frequency</b>						
• with resistive load, max.	10 Hz	25 Hz	100 Hz	10 Hz	10 Hz	10 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	0.5 Hz	10 Hz	10 Hz	1 Hz	1 Hz	1 Hz

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## Technical specifications (continued)

Article number	6ES7322-5GH00-0AB0 SM322, 16DO, AC120/230V, 2A	6ES7322-1CF00-0AA0 SM322, 8DO, 48-125V DC, 1,5A	6ES7322-1BF01-0AA0 SM322, 8DO, 24V DC, 2A	6ES7322-1FF01-0AA0 SM322, 8DO, 120/230V AC, 1A	6ES7322-5FF00-0AB0 SM322, 8DO, AC120/230V, 2A	6ES7322-1FH00-0AA0 SM322, 16DO, 120/230V AC, 1A
<b>Aggregate current of outputs (per group)</b>						
<b>horizontal installation</b>						
- up to 40 °C, max.	0.5 A; 8 A per module	6 A	4 A	4 A	8 A	4 A
- up to 50 °C, max.		4 A				
- up to 60 °C, max.	0.5 A; 8 A per module	3 A	4 A	2 A	4 A	2 A
<b>vertical installation</b>						
- up to 40 °C, max.	0.5 A; 8 A per module	4 A	4 A	2 A	4 A	2 A
<b>Cable length</b>						
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m
<b>Interrupts/diagnostics/status information</b>						
<b>Alarms</b>						
• Diagnostic alarm	Yes; Parameterizable	No	No	No	Yes; Parameterizable	No
<b>Diagnostic messages</b>						
• Diagnostics	Yes; Parameters can be assigned	No	No	Yes	Yes	Yes
<b>Galvanic isolation</b>						
<b>Galvanic isolation digital outputs</b>						
• between the channels, in groups of	1	4	4	4	1	8
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
<b>Isolation</b>						
Isolation checked with	1500 V AC	1500 V AC	500 V DC	1500 V AC	1500 V AC	4000 VDC
<b>Connection method</b>						
required front connector	40-pin	20-pin	20-pin	20-pin	40-pin	20-pin
<b>Dimensions</b>						
Width	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	120 mm	120 mm	120 mm
<b>Weights</b>						
Weight, approx.	260 g	250 g	190 g	275 g	275 g	275 g

**SIMATIC S7-300 advanced controller**

I/O modules

Digital modules

**SM 322 digital output modules****Technical specifications (continued)**

Article number	<b>6ES7322-1FL00-0AA0</b> SM322, 32DO, 120/230V AC, 1A	<b>6ES7322-1HF01-0AA0</b> SM322, 8DA, 24V DC/2A OR 230V AC/2A	<b>6ES7322-1HF10-0AA0</b> SM322, 8DA, 24V DC/5A OR 230V AC/5A	<b>6ES7322-5HF00-0AB0</b> SM322, 8DO RELAY, 24VDC, 120-230V AC, 5A	<b>6ES7322-1HH01-0AA0</b> SM322, 16DO RELAY
<b>Product type designation</b>					
<b>Supply voltage</b>					
<b>Load voltage L+</b>					
• Rated value (DC)		24 V	120 V	24 V	120 V
<b>Load voltage L1</b>					
• Rated value (AC)	120 V; 120/230V AC		230 V	230 V	230 V
<b>Input current</b>					
from load voltage L+ (without load), max.		110 mA; Current consumption of relay			
from load voltage L1 (without load), max.	10 mA	110 mA			
from backplane bus 5 V DC, max.	190 mA	40 mA	40 mA	100 mA	100 mA
<b>Power losses</b>					
Power loss, typ.	25 W	3.2 W	4.2 W	3.5 W	4.5 W
<b>Digital outputs</b>					
Number of digital outputs	32	8; Relays	8; Relays	8; Relays	16; Relays
<b>Switching capacity of the outputs</b>					
• on lamp load, max.	50 W	50 W	1 500 W; 230 V AC	1 500 W; 230 V AC	50 W; 230 V AC
<b>Output voltage</b>					
• for signal "1", min.	L1 (-0.8 V)				
<b>Output current</b>					
• for signal "1" rated value	1 A	2 A	5 A	5 A	2 A
• for signal "1" permissible range for 0 to 40 °C, min.	10 mA				
• for signal "1" permissible range for 0 to 40 °C, max.	1 A				
• for signal "1" permissible range for 40 to 60 °C, min.	10 mA				
• for signal "1" permissible range for 40 to 60 °C, max.	1 A				
• for signal "1" minimum load current	10 mA	5 mA	5 mA	10 mA	10 mA
• for signal "1" permissible surge current, max.	10 A; per group (for 2 AC cycles)				
• for signal "0" residual current, max.	2 mA				
<b>Switching frequency</b>					
• with resistive load, max.	10 Hz	2 Hz	2 Hz	2 Hz	1 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	2 Hz	2 Hz	2 Hz	1 Hz
• mechanical, max.		10 Hz	10 Hz	10 Hz	10 Hz
<b>Aggregate current of outputs (per group)</b>					
<b>horizontal installation</b>					
- up to 40 °C, max.	4 A				
- up to 60 °C, max.	3 A		5 A	5 A	8 A
<b>vertical installation</b>					
- up to 40 °C, max.	4 A		5 A	5 A	8 A

## Technical specifications (continued)

Article number	6ES7322-1FL00-0AA0	6ES7322-1HF01-0AA0	6ES7322-1HF10-0AA0	6ES7322-5HF00-0AB0	6ES7322-1HH01-0AA0
	SM322, 32DO, 120/230V AC, 1A	SM322, 8DA, 24V DC/2A OR 230V AC/2A	SM322, 8DA, 24V DC/5A OR 230V AC/5A	SM322, 8DO RELAY, 24VDC, 120-230V AC, 5A	SM322, 16DO RELAY
<b>Relay outputs</b>					
• Rated input voltage of relay coil L+ (DC)		24 V; 110 mA	24 V		24 V
• Number of operating cycles, max.		300 000; 230 V AC; 100000; 120 V AC; 200000; 24 V DC; 300000 (at 2 A)	300 000; 300000 (24 V DC, at 2 A); 200000 (120 V AC, at 3 A); 100000 (230 V AC, at 3 A)	100 000; 100000 (24 V DC, at 5 A); 100000 (230 V AC, at 5 A)	100 000; 50000 (24 V DC, at 2 A); 700000 (120 V AC, at 2 A); 100000 (230 V AC, at 2 A)
<b>Switching capacity of contacts</b>					
- with inductive load, max.		2 A; 2 A (230 V AC), 2 A (24 V DC)	3 A; 3 A (230 V DC); 2 A (24 V AC)	5 A; 5 A (230 V DC); 5 A (24 V AC)	2 A; 2 A (230 V AC), 2 A (24 V DC)
- with resistive load, max.		2 A	8 A; 8 A (230 V DC); 5 A (24 V AC)	5 A; 5 A (230 V DC); 5 A (24 V AC)	2 A; 2 A (230 V AC), 2 A (24 V DC)
<b>Cable length</b>					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m
<b>Interrupts/diagnostics/ status information</b>					
<b>Alarms</b>					
• Diagnostic alarm	No	No	No	Yes; Parameterizable	No
<b>Diagnostic messages</b>					
• Diagnostics	Yes	No	No	Yes	No
<b>Galvanic isolation</b>					
<b>Galvanic isolation digital outputs</b>					
• between the channels, in groups of 8	8	2	1	1	8
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
<b>Isolation</b>					
Isolation checked with	4000 VDC	1500 V AC	2000 V AC	1500 V AC	1500 V AC
<b>Connection method</b>					
required front connector	20-pin	20-pin	40-pin	40-pin	20-pin
<b>Dimensions</b>					
Width	80 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	117 mm	120 mm	120 mm	120 mm	120 mm
<b>Weights</b>					
Weight, approx.	500 g	190 g	320 g	320 g	250 g



**SIMATIC S7-300 advanced controller**

I/O modules

Digital modules

**SM 322 digital output modules****Ordering data****Article No.****SM 322 digital output modules**

incl. labeling strips, bus connector

8 outputs, 24 V DC, 2 A

**6ES7322-1BF01-0AA0**

16 outputs, 24 V DC, 0.5 A

**6ES7322-1BH01-0AA0**16 outputs, 24 V DC, 0.5 A,  
high speed**6ES7322-1BH10-0AA0**

32 outputs, 24 V DC, 0.5 A

**6ES7322-1BL00-0AA0**

64 outputs, 24 V DC, 0.3 A

**6ES7322-1BP00-0AA0****Note:**6ES7392-4...0-0AA0 connection  
cable and 6ES7392-1.N00-0AA0  
terminal blocks necessary.**6ES7322-1BP50-0AA0**64 outputs, 24 V DC, 0.3 A,  
sink output**Note:**6ES7392-4...0-0AA0 connection  
cable and 6ES7392-1.N00-0AA0  
terminal blocks necessary.8 outputs, 24 V DC, 0.5 A,  
diagnostics-capable**6ES7322-8BF00-0AB0**

16 outputs, 24/48 V DC, 0.5 A

**6ES7322-5GH00-0AB0**

8 outputs, 48 to 125 V DC, 1.5 A

**6ES7322-1CF00-0AA0**

8 outputs, 120/230 V AC, 1 A

**6ES7322-1FF01-0AA0**

8 outputs, 120/230 V AC, 2 A

**6ES7322-5FF00-0AB0**

16 outputs, 120/230 V AC, 1 A

**6ES7322-1FH00-0AA0**

32 outputs, 120 V AC, 1 A

**6ES7322-1FL00-0AA0**

8 outputs, relay contacts, 2 A

**6ES7322-1HF01-0AA0**

8 outputs, relay contacts, 5 A

**6ES7322-1HF10-0AA0**8 outputs, relay contacts, 5 A, with  
RC filter, overvoltage protection**6ES7322-5HF00-0AB0**

16 outputs, relay contacts, 8 A

**6ES7322-1HH01-0AA0****Front connectors**

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0****6ES7392-1AJ00-1AB0**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0****6ES7392-1BJ00-1AB0**

40-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AM00-0AA0****6ES7392-1AM00-1AB0**

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0****6ES7392-1BM01-1AB0****S7-300 connecting cables**

For 64-channel modules; 2 units

1 m

**6ES7392-4BB00-0AA0**

2.5 m

**6ES7392-4BC50-0AA0**

5 m

**6ES7392-4BF00-0AA0****Terminal blocks**

For 64-channel modules; 2 units

With screw contacts

**6ES7392-1AN00-0AA0**

With spring-loaded contacts

**6ES7392-1BN00-0AA0****Article No.****Front door, elevated design****6ES7328-0AA00-7AA0**e.g. for 32-channel modules;  
for connecting 1.3 mm<sup>2</sup>/  
16 AWG conductors**SIMATIC TOP connect**

See page 5/247

**Bus connectors****6ES7390-0AA00-0AA0**

1 unit (spare part)

**Set of fuses for SM 322**10 fuses 8 A quick-response,  
2 fuse holders;  
for 6ES7 322-1FF01-0AA0,  
6ES7 322-1FH00-0AA0**6ES7973-1HD00-0AA0**10 fuses 6.3 A;  
for 6ES7 322-1CF00-0AA0**6ES7973-1GC00-0AA0****Labeling strips**

10 units (spare part)

for modules with 20-pin  
front connector**6ES7392-2XX00-0AA0**for modules with 40-pin  
front connector**6ES7392-2XX10-0AA0****Label cover**

10 units (spare part)

for modules with 20-pin  
front connector**6ES7392-2XY00-0AA0**for modules with 40-pin  
front connector**6ES7392-2XY10-0AA0****Labeling sheets for machine  
inscription**for modules with 20-pin front  
connector, DIN A4, for printing with  
laser printer; 10 units

petrol

**6ES7392-2AX00-0AA0**

light-beige

**6ES7392-2BX00-0AA0**

yellow

**6ES7392-2CX00-0AA0**

red

**6ES7392-2DX00-0AA0**for modules with 40-pin front  
connector, DIN A4, for printing with  
laser printer; 10 units

petrol

**6ES7392-2AX10-0AA0**

light-beige

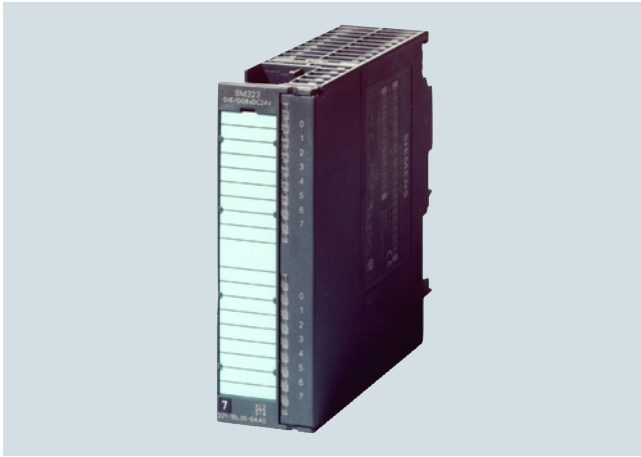
**6ES7392-2BX10-0AA0**

yellow

**6ES7392-2CX10-0AA0**

red

**6ES7392-2DX10-0AA0****SIMATIC Manual Collection****6ES7998-8XC01-8YE0**Electronic manuals on DVD,  
multilingual: LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC Based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC**SIMATIC Manual Collection  
update service for 1 year****6ES7998-8XC01-8YE2**Current "Manual Collection" DVD  
and the three subsequent updates

**Overview**

- Digital inputs and outputs
- For connecting standard switches, two-wire proximity switches, solenoid valves, contactors, low-power motors, lamps and motor starters

**Technical specifications**

Article number	<b>6ES7323-1BH01-0AA0</b> SM323, 8DI/8DO, DC24V, 0,5A	<b>6ES7323-1BL00-0AA0</b> SM323, 16DI/DO, DC24V, 0,5A	<b>6ES7327-1BH00-0AB0</b> SM327, 8DI/8DX, DC24V, 0,5A
<b>Product type designation</b>			
<b>Supply voltage</b>			
<b>Load voltage L+</b>			
• Rated value (DC)	24 V	24 V	24 V
<b>Input current</b>			
from load voltage L+ (without load), max.	40 mA	80 mA	20 mA
from backplane bus 5 V DC, max.	40 mA	80 mA	60 mA
<b>Power losses</b>			
Power loss, typ.	3.5 W	6.5 W	3 W
<b>Digital inputs</b>			
Number of digital inputs	8	16	8; 8 hard-wired, 8 others individually parameterizable
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes
<b>Number of simultaneously controllable inputs</b>			
<b>all mounting positions</b>			
- up to 40 °C, max.	8	16	16
- up to 60 °C, max.	8	8	16
<b>Input voltage</b>			
• Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-30 to +5V	-30 to +5V	-30 to +5V
• for signal "1"	13 to 30V	13 to 30V	
<b>Input current</b>			
• for signal "1", typ.	7 mA	7 mA	6 mA
<b>Input delay (for rated value of input voltage)</b>			
<b>for standard inputs</b>			
- at "0" to "1", min.	1.2 ms	1.2 ms	1.2 ms
- at "0" to "1", max.	4.8 ms	4.8 ms	4.8 ms
- at "1" to "0", min.	1.2 ms	1.2 ms	1.2 ms
- at "1" to "0", max.	4.8 ms	4.8 ms	4.8 ms
<b>Cable length</b>			
• shielded, max.	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m

**SIMATIC S7-300 advanced controller**

I/O modules

Digital modules

**SM 323/SM 327 digital input/output modules****Technical specifications (continued)**

Article number	<b>6ES7323-1BH01-0AA0</b> SM323, 8DI/8DO, DC24V, 0,5A	<b>6ES7323-1BL00-0AA0</b> SM323, 16DI/DO, DC24V, 0,5A	<b>6ES7327-1BH00-0AB0</b> SM327, 8DI/8DX, DC24V, 0,5A
<b>Digital outputs</b>			
Number of digital outputs	8	16	8; can also be parameterized individually as DI
short-circuit protection	Yes	Yes	Yes
• Response threshold, typ.	1 A	1 A	1 A
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-48 V)	L+ (-54 V)
Controlling a digital input	Yes	Yes	Yes
<b>Switching capacity of the outputs</b>			
• on lamp load, max.	5 W	5 W	5 W
<b>Load resistance range</b>			
• lower limit	48 Ω	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ
<b>Output voltage</b>			
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-1.5 V)
<b>Output current</b>			
• for signal "1" rated value	0.5 A	0.5 A	0.5 A
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA	5 mA	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.	0.6 A	0.6 A	0.6 A
• for signal "1" minimum load current	5 mA	5 mA	
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
<b>Output delay with resistive load</b>			
• "0" to "1", max.	100 μs	100 μs	350 μs
• "1" to "0", max.	500 μs	500 μs	500 μs
<b>Parallel switching of 2 outputs</b>			
• for increased power	No	No	No
• for redundant control of a load	Yes; only outputs of the same group	Yes; only outputs of the same group	Yes; only outputs of the same group
<b>Switching frequency</b>			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	10 Hz	100 Hz	10 Hz
<b>Aggregate current of outputs (per group)</b>			
<b>horizontal installation</b>			
- up to 40 °C, max.	4 A	4 A	4 A
- up to 60 °C, max.	4 A	3 A	3 A
<b>vertical installation</b>			
- up to 40 °C, max.	4 A	2 A	2 A
<b>Cable length</b>			
• shielded, max.	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m

## Technical specifications (continued)

Article number	6ES7323-1BH01-0AA0 SM323, 8DI/8DO, DC24V, 0,5A	6ES7323-1BL00-0AA0 SM323, 16DI/DO, DC24V, 0,5A	6ES7327-1BH00-0AB0 SM327, 8DI/8DX, DC24V, 0,5A
<b>Encoder</b>			
<b>Connectable encoders</b>			
• 2-wire sensor	Yes	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	2 mA	1.5 mA	1.5 mA
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)	No	No	No
<b>Interrupts/diagnostics/ status information</b>			
<b>Alarms</b>			
• Alarms	No	No	No
<b>Diagnostic messages</b>			
• Diagnostic functions	No	No	No
<b>Diagnostics indication LED</b>			
• Status indicator digital output (green)	Yes	Yes	Yes
• Status indicator digital input (green)	Yes	Yes	Yes
<b>Galvanic isolation</b>			
<b>Galvanic isolation digital inputs</b>			
• between the channels	Yes	Yes	No
• between the channels, in groups of	8	16	
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
<b>Galvanic isolation digital outputs</b>			
• between the channels	Yes	Yes	No
• between the channels, in groups of	8	8	
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
<b>Permissible potential difference</b>			
between different circuits	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>			
Isolation checked with	500 V DC	500 V DC	500 V DC
<b>Connection method</b>			
required front connector	20-pin	40-pin	20-pin
<b>Dimensions</b>			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
<b>Weights</b>			
Weight, approx.	220 g	260 g	200 g

**SIMATIC S7-300 advanced controller**

I/O modules

Digital modules

**SM 323/SM 327 digital input/output modules**

Ordering data	Article No.	Ordering data	Article No.
<b>SM 323 digital input/output modules</b>		<b>Label cover</b>	
incl. labeling strips, bus connector		10 units (spare part)	
8 inputs, 8 outputs	<b>6ES7323-1BH01-0AA0</b>	for modules with 20-pin front connector	<b>6ES7392-2XY00-0AA0</b>
16 inputs, 16 outputs	<b>6ES7323-1BL00-0AA0</b>	for modules with 40-pin front connector	<b>6ES7392-2XY10-0AA0</b>
<b>SM 327 digital input/output modules</b>	<b>6ES7327-1BH00-0AB0</b>	<b>Labeling sheets for machine inscription</b>	
incl. labeling strips, bus connector		for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
8 inputs, 8 inputs or outputs (can be configured)		petrol	<b>6ES7392-2AX00-0AA0</b>
<b>Front connectors</b>		light-beige	<b>6ES7392-2BX00-0AA0</b>
20-pin, with screw contacts		yellow	<b>6ES7392-2CX00-0AA0</b>
• 1 unit	<b>6ES7392-1AJ00-0AA0</b>	red	<b>6ES7392-2DX00-0AA0</b>
• 100 units	<b>6ES7392-1AJ00-1AB0</b>	for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units	
20-pin, with spring-loaded contacts		petrol	<b>6ES7392-2AX10-0AA0</b>
• 1 unit	<b>6ES7392-1BJ00-0AA0</b>	light-beige	<b>6ES7392-2BX10-0AA0</b>
• 100 units	<b>6ES7392-1BJ00-1AB0</b>	yellow	<b>6ES7392-2CX10-0AA0</b>
40-pin, with screw contacts		red	<b>6ES7392-2DX10-0AA0</b>
• 1 unit	<b>6ES7392-1AM00-0AA0</b>	<b>SIMATIC Manual Collection</b>	<b>6ES7998-8XC01-8YE0</b>
• 100 units	<b>6ES7392-1AM00-1AB0</b>	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
40-pin, with spring-loaded contacts		<b>SIMATIC Manual Collection update service for 1 year</b>	<b>6ES7998-8XC01-8YE2</b>
• 1 unit	<b>6ES7392-1BM01-0AA0</b>	Current "Manual Collection" DVD and the three subsequent updates	
• 100 units	<b>6ES7392-1BM01-1AB0</b>		
<b>Front door, elevated design</b>	<b>6ES7328-0AA00-7AA0</b>		
e.g. for 32 channel modules; enables connection of 1.3 mm <sup>2</sup> /16 AWG wires			
<b>SIMATIC TOP connect</b>	See page 5/247		
<b>Bus connectors</b>	<b>6ES7390-0AA00-0AA0</b>		
1 unit (spare part)			
<b>Labeling strips</b>			
10 units (spare part)			
for modules with 20-pin front connector	<b>6ES7392-2XX00-0AA0</b>		
for modules with 40-pin front connector	<b>6ES7392-2XX10-0AA0</b>		

**Overview**

- Digital inputs
- For connection of switches and 2-wire proximity switches (BERO)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS S7-300 digital modules

**SIPLUS S7-300 SM 321 digital input modules****Technical specifications**

Article number	<b>6AG1321-1BH02-2AA0</b>	<b>6AG1321-1BL00-2AA0</b>	<b>6AG1321-1CH20-2AA0</b>	<b>6AG1321-1FF01-2AA0</b>	<b>6AG1321-1FF10-7AA0</b>
Based on	<b>6ES7321-1BH02-0AA0</b> SIPLUS SM321 16DE/24VDC	<b>6ES7321-1BL00-0AA0</b> SIPLUS SM321 32DE/24VDC	<b>6ES7321-1CH20-0AA0</b> SIPLUS S7-300 SM321 16DE/48-125VDC	<b>6ES7321-1FF01-0AA0</b> SIPLUS S7-300 SM321 8DE/120/220VAC	<b>6ES7321-1FF10-0AA0</b> SIPLUS S7-300 SM321 8 DI
<b>Ambient conditions</b>					
<b>Ambient temperature in operation</b>					
• Min.	-40 °C; = Tmin	-40 °C; = Tmin		-40 °C; = Tmin	-25 °C
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; for use on railway vehicles according to EN 50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ ATEX/FM use applies	70 °C; = Tmax; for use on railway vehicles according to EN 50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ ATEX/FM use applies	70 °C; = Tmax; for use on railway vehicles according to EN 50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ ATEX/FM use applies	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>					
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>					
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>					
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

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## Technical specifications (continued)

Article number	6AG1321-1FH00-7AA0	6AG1321-7BH01-2AB0	6AG1321-7TH00-4AB0
Based on	6ES7321-1FH00-0AA0 SIPLUS S7-300 SM321 16DI	6ES7321-7BH01-0AB0 SIPLUS SM321 16DE/24VDC	6ES7321-7TH00-0AB0 SIPLUS PCS7 SM321 16DE
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-40 °C; = Tmin	-25 °C	0 °C
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	60 °C
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m) 0 °C
• At cold restart, min.			0 °C
<b>Relative humidity</b>			
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	
- With condensation, tested in accordance with IEC 60068-2-38, max.			100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!



**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS S7-300 digital modules

**SIPLUS S7-300 SM 321 digital input modules****Ordering data****Article No.****SIPLUS S7-300 SM 321 digital input modules**Extended temperature range and exposure to media

16 inputs, 24 V DC

**6AG1321-1BH02-2AA0**

32 inputs, 24 V DC

**6AG1321-1BL00-2AA0**

16 inputs, 48 to 120 V DC

**6AG1321-1CH20-2AA0**

8 inputs, 120/230 V AC

**6AG1321-1FF01-2AA0**

8 inputs, 120/230 V AC, single root

**6AG1321-1FF10-7AA0**

16 inputs, 120/230 V AC

**6AG1321-1FH00-7AA0**

16 inputs, 24 V DC, diagnostics-capable

**6AG1321-7BH01-2AB0**Exposure to media

16 inputs, NAMUR, redundant design possible

**6AG1321-7TH00-4AB0**Conforms to EN 50155

16 inputs, 24 V DC

**6AG1321-1BH02-2AA0**

32 inputs, 24 V DC

**6AG1321-1BL00-2AA0**

16 inputs, 48 to 120 V DC

**6AG1321-1CH20-2AA0**

8 inputs, 120/230 V AC

**6AG1321-1FF01-2AA0**

16 inputs, 24 V DC, diagnostics-capable

**6AG1321-7BH01-2AB0****Accessories****Article No.**

See SIMATIC S7-300 digital input modules, page 5/67

## Overview



- Digital outputs
- For connecting solenoid valves, contactors, small-power motors, lamps and motor starters

### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

## Technical specifications

Article number	6AG1322-1BF01-2XB0	6AG1322-8BF00-2AB0	6AG1322-1BH01-2AA0	6AG1322-1BL00-2AA0
Based on	6ES7322-1BF01-0AA0 SIPLUS S7-300 SM322	6ES7322-8BF00-0AB0 SIPLUS SM322 8DA/24VDC	6ES7322-1BH01-0AA0 SIPLUS SM322 16DA/24VDC	6ES7322-1BL00-0AA0 SIPLUS S7-300 DIGITAL OUTPUT SM322
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	-25 °C	-25 °C; = Tmin	-25 °C	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL use	70 °C; = Tmax; 60 °C @ UL/cUL use	70 °C; = Tmax; for use on railway vehicles according to EN 50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies	70 °C; = Tmax; for use on railway vehicles according to EN 50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS S7-300 digital modules

**SIPLUS S7-300 SM 322 digital output modules****Technical specifications (continued)**

Article number	<b>6AG1322-1CF00-7AA0</b>	<b>6AG1322-1HF10-2AA0</b>	<b>6AG1322-5HF00-4AB0</b>	<b>6AG1322-1FF01-7AA0</b>
Based on	<b>6ES7322-1CF00-0AA0</b>	<b>6ES7322-1HF10-0AA0</b>	<b>6ES7322-5HF00-0AB0</b>	<b>6ES7322-1FF01-0AA0</b>
	SIPLUS S7-300 SM322 8DO 48-125VDC	SIPLUS S7-300 SM322 8DA - RELAIS	SIPLUS S7-300 SM322 8RO	SIPLUS SM322 8DA/120/220VAC
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	-25 °C	-25 °C	0 °C; = Tmin	-40 °C
• max.	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies	60 °C	60 °C; = Tmax	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/UL hazardous use applies
<b>Extended ambient conditions</b>				
• Relative to ambient temperature- atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>				
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused inter- faces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused inter- faces during operation!

## Technical specifications (continued)

Article number	6AG1322-5FF00-4AB0	6AG1322-1FH00-7AA0	6AG1322-1HH01-2AA0
Based on	6ES7322-5FF00-0AB0 SIPLUS S7-300 SM322 8DO	6ES7322-1FH00-0AA0 SIPLUS S7-300 SM322 16DO	6ES7322-1HH01-0AA0 SIPLUS S7-300 SM322
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	0 °C; = Tmin	-40 °C; = Tmin	-40 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>			
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)		100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

## Ordering data

## Article No.

## Article No.

## SIPLUS S7-300 SM 322 digital output modules

## Extended temperature range and exposure to media

8 outputs, 24 V DC, 2 A

6AG1322-1BF01-2XB0

16 outputs, 24 V DC, 0.5 A

6AG1322-1BH01-2AA0

32 outputs, 24 V DC, 0.5 A

6AG1322-1BL00-2AA0

8 outputs, 48 to 125 V DC, 1.5 A

6AG1322-1CF00-7AA0

8 outputs, 120/230 V AC, 1 A

6AG1322-1FF01-7AA0

16 outputs, 120/230 V AC, 1 A

6AG1322-1FH00-7AA0

8 outputs, relay contacts, 5 A

6AG1322-1HF10-2AA0

16 outputs, relay contacts, 8 A

6AG1322-1HH01-2AA0

8 outputs, 24 V DC, 0.5 A, diagnostics-capable

6AG1322-8BF00-2AB0

## Exposure to media

8 outputs, 120/230 V AC, 2 A

6AG1322-5FF00-4AB0

8 outputs, relay contacts, 5 A, with RC filter, overvoltage protection

6AG1322-5HF00-4AB0

## Conforms to EN 50155

16 outputs, 24 V DC, 0.5 A, high speed

6AG1322-1BH01-2AA0

32 outputs, 24 V DC, 0.5 A

6AG1322-1BL00-2AA0

8 outputs, relay contacts, 5 A

6AG1322-1HF10-2AA0

16 outputs, relay contacts, 8 A

6AG1322-1HH01-2AA0

8 outputs, 24 V DC, 0.5 A, diagnostics-capable

6AG1322-8BF00-2AB0

## Accessories

See SIMATIC S7-300 digital output modules, page 5/74

**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS S7-300 digital modules

**SIPLUS S7-300 SM 323 digital input/output modules****Overview**

- Digital inputs and outputs
- For connection of switches, 2-wire proximity switches (BERO), solenoid valves, contactors, low-power motors, lamps and motor starters

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	<b>6AG1323-1BH01-2AA0</b>
Based on	<b>6ES7323-1BH01-0AA0</b> SIPLUS S7-300 SM323 8DE/8DA
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-40 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.****SIPLUS S7-300 SM 323 digital input/output module**

Extended temperature range and exposure to media

8 inputs, 8 outputs

Conforms to EN 50155

8 inputs, 8 outputs

**Accessories**

**6AG1323-1BH01-2AA0**

**6AG1323-1BH01-2AA0**

See SIMATIC S7-300 digital input/output modules, page 5/78

## Overview



- Analog inputs
- For connection of voltage and current sensors, thermocouples, resistors and resistance thermometers

## Technical specifications

Article number	6ES7331-7KF02-0AB0 SM331, 8AI, 9/12/14BIT	6ES7331-7HF01-0AB0 SM331, 8AI, 14BIT, 0,052MS/CHANNEL	6ES7331-1KF02-0AB0 SM331, 8AI, 13BIT	6ES7331-7KB02-0AB0 SM331, 2AI, 9/12/14BIT
<b>Product type designation</b>				
<b>Supply voltage</b>				
<b>Load voltage L+</b>				
• Rated value (DC)	24 V	24 V		24 V
• Reverse polarity protection	Yes	Yes		Yes
<b>Input current</b>				
from load voltage L+ (without load), max.	30 mA	50 mA		80 mA
from backplane bus 5 V DC, max.	50 mA	60 mA	90 mA	50 mA
<b>Power losses</b>				
Power loss, typ.	1 W	1.5 W	0.4 W	1.3 W
<b>Analog inputs</b>				
Number of analog inputs	8	8	8	2
• For resistance measurement	4		8	1
permissible input voltage for voltage input (destruction limit), max.	20 V; continuous; 75 V for max. 1 s (mark to space ratio 1:20)	20 V; 20 V DC permanent, 75 V DC for max. 1 s (duty factor 1:20)	30 V; 12 V continuous, 30 V for max. 1 s	20 V; continuous; 75 V for max. 1 s (mark to space ratio 1:20)
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA	40 mA
<b>Input ranges (rated values), voltages</b>				
• 0 to +10 V	No	No	Yes	No
• 1 V to 5 V	Yes	Yes	Yes	Yes
• 1 V to 10 V	No		No	No
• -1 V to +1 V	Yes	Yes	Yes	Yes
• -10 V to +10 V	Yes	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes		No	Yes
• -250 mV to +250 mV	Yes		No	Yes
• -5 V to +5 V	Yes	Yes	Yes	Yes
• -50 mV to +50 mV	No		Yes	No
• -500 mV to +500 mV	Yes	Yes	Yes	Yes
• -80 mV to +80 mV	Yes	Yes	No	Yes
<b>Input ranges (rated values), currents</b>				
• 0 to 20 mA	Yes	Yes	Yes	Yes
• -10 mA to +10 mA	Yes		No	Yes
• -20 mA to +20 mA	Yes	Yes	Yes	Yes
• -3.2 mA to +3.2 mA	Yes		No	Yes
• 4 mA to 20 mA	Yes	Yes	Yes	Yes

**SIMATIC S7-300 advanced controller**

I/O modules

Analog modules

**SM 331 analog input modules****Technical specifications (continued)**

Article number	<b>6ES7331-7KF02-0AB0</b> SM331, 8AI, 9/12/14BIT	<b>6ES7331-7HF01-0AB0</b> SM331, 8AI, 14BIT, 0,052MS/CHANNEL	<b>6ES7331-1KF02-0AB0</b> SM331, 8AI, 13BIT	<b>6ES7331-7KB02-0AB0</b> SM331, 2AI, 9/12/14BIT
<b>Input ranges (rated values), thermoelements</b>				
• Type B	No		No	No
• Type E	Yes		No	Yes
• Type J	Yes		No	Yes
• Type K	Yes		No	Yes
• Type L	Yes		No	No
• Type N	Yes		No	Yes
• Type R	No		No	No
• Type S	No		No	No
• Type T	No		No	No
• Type U	No		No	No
• Type TXK/TXK(L) to GOST	No		No	No
<b>Input ranges (rated values), resistance thermometer</b>				
• Cu 10	No		No	No
• Ni 100	Yes; Standard		Yes; Standard/climate	Yes
• Ni 1000	No		Yes	No
• LG-Ni 1000	No		Yes; Standard/climate	No
• Ni 120	No		No	No
• Ni 200	No		No	No
• Ni 500	No		No	No
• Pt 100	Yes; Standard		Yes; Standard/climate	Yes
• Pt 1000	No		No	No
• Pt 200	No		No	No
• Pt 500	No		No	No
<b>Input ranges (rated values), resistors</b>				
• 0 to 150 ohms	Yes		No	Yes
• 0 to 300 ohms	Yes		No	Yes
• 0 to 600 ohms	Yes		Yes	Yes
• 0 to 6000 ohms	No		Yes	No
<b>Thermocouple (TC)</b>				
<b>Temperature compensation</b>				
- Parameterizable	Yes		No	Yes
- internal temperature compensation	Yes		No	Yes
- external temperature compensation with compensations socket	Yes		No	Yes
<b>Characteristic linearization</b>				
• Parameterizable	Yes		Yes	Yes
- for thermocouples	Type E, J, K, L, N		No	Type E, J, K, L, N
- for resistance thermometer	Pt100 (standard, climatic range), Ni100 (standard, climatic range)		yes; Pt100 standard/air con.; Ni100 standard/air con.; Ni1000 standard/air con.; LG-Ni1000 standard/air con.	Pt100 (standard, climatic range), Ni100 (standard, climatic range)
<b>Cable length</b>				
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m	200 m; max. 50 m at 50 mV	200 m; 50 m at 80 mV and thermocouples

## Technical specifications (continued)

Article number	6ES7331-7KF02-0AB0 SM331, 8AI, 9/12/14BIT	6ES7331-7HF01-0AB0 SM331, 8AI, 14BIT, 0,052MS/CHANNEL	6ES7331-1KF02-0AB0 SM331, 8AI, 13BIT	6ES7331-7KB02-0AB0 SM331, 2AI, 9/12/14BIT
<b>Analog value creation</b>				
Measurement principle	integrating	Actual value encryption	integrating	integrating
<b>Integration and conversion time/ resolution per channel</b>				
<ul style="list-style-type: none"> <li>Resolution with overrange (bit including sign), max.</li> <li>Integration time, parameterizable</li> <li>Basic conversion time (ms)</li> <li>Interference voltage suppression for interference frequency f1 in Hz</li> </ul>	15 bit; Unipolar: 9/12/12/14 bits; bipolar: 9 bits + sign/ 12 bits + sign/12 bits + sign/ 14 bits + sign  Yes; 2,5 / 16,67 / 20 / 100 ms 3 / 17 / 22 / 102 ms 10 / 50 / 60 / 400 Hz	14 bit; Unipolar: 14 bits; bipolar: 13 bits + sign  Yes 52 µs per channel none / 400 / 60 / 50 Hz	13 bit  Yes; 60 / 50 ms 66 / 55 ms 50 / 60 Hz	15 bit; Unipolar: 9/12/12/14 bits; bipolar: 9 bits + sign/ 12 bits + sign/12 bits + sign/ 14 bits + sign  Yes; 2,5 / 16,67 / 20 / 100 ms 3 / 17 / 22 / 102 ms 10 / 50 / 60 / 400 Hz
<b>Encoder</b>				
<b>Connection of signal encoders</b>				
<ul style="list-style-type: none"> <li>for current measurement as 2-wire transducer</li> <li>for current measurement as 4-wire transducer</li> <li>for resistance measurement with two-wire connection</li> <li>for resistance measurement with three-wire connection</li> <li>for resistance measurement with four-wire connection</li> </ul>	Yes	Yes	Yes; with external supply	Yes
<ul style="list-style-type: none"> <li>for current measurement as 2-wire transducer</li> <li>for current measurement as 4-wire transducer</li> <li>for resistance measurement with two-wire connection</li> <li>for resistance measurement with three-wire connection</li> <li>for resistance measurement with four-wire connection</li> </ul>	Yes	Yes	Yes	Yes
<ul style="list-style-type: none"> <li>for current measurement as 2-wire transducer</li> <li>for current measurement as 4-wire transducer</li> <li>for resistance measurement with two-wire connection</li> <li>for resistance measurement with three-wire connection</li> <li>for resistance measurement with four-wire connection</li> </ul>	Yes		Yes	Yes
<ul style="list-style-type: none"> <li>for current measurement as 2-wire transducer</li> <li>for current measurement as 4-wire transducer</li> <li>for resistance measurement with two-wire connection</li> <li>for resistance measurement with three-wire connection</li> <li>for resistance measurement with four-wire connection</li> </ul>	Yes		Yes	Yes
<ul style="list-style-type: none"> <li>for current measurement as 2-wire transducer</li> <li>for current measurement as 4-wire transducer</li> <li>for resistance measurement with two-wire connection</li> <li>for resistance measurement with three-wire connection</li> <li>for resistance measurement with four-wire connection</li> </ul>	Yes		Yes	Yes
<b>Errors/accuracies</b>				
<b>Operational limit in overall temperature range</b>				
<ul style="list-style-type: none"> <li>Voltage, relative to input area, (+/-)</li> <li>Current, relative to input area, (+/-)</li> <li>Resistance, relative to input area, (+/-)</li> <li>Resistance thermometer, relative to input area, (+/-)</li> </ul>	1 %; ±1% (80 mV); ±0.6% (250 mV to 1 000 mV); ±0.8% (2.5 V to 10 V)	0.4 %	0.6 %; +/-0.6% (+/-5 V, 10 V, 1 to 5 V, 0 to 10 V); +/-0.5% (+/-50 mV, 500 mV, 1 V)	1 %; ±1% (80 mV); ±0.6% (250 mV to 1 000 mV); ±0.8% (2.5 V to 10 V)
<ul style="list-style-type: none"> <li>Voltage, relative to input area, (+/-)</li> <li>Current, relative to input area, (+/-)</li> <li>Resistance, relative to input area, (+/-)</li> <li>Resistance thermometer, relative to input area, (+/-)</li> </ul>	0.7 %; From 3.2 to 20 mA	0.3 %	0.5 %; +/-20 mA, 0 to 20 mA, 4 to 20 mA	0.7 %; From 3.2 to 20 mA
<ul style="list-style-type: none"> <li>Voltage, relative to input area, (+/-)</li> <li>Current, relative to input area, (+/-)</li> <li>Resistance, relative to input area, (+/-)</li> <li>Resistance thermometer, relative to input area, (+/-)</li> </ul>	0.7 %; 150, 300, 600 Ohm		0.5 %; 0 to 6 kohms, 0 to 600 kohms	0.7 %; 150, 300, 600 Ohm
<ul style="list-style-type: none"> <li>Voltage, relative to input area, (+/-)</li> <li>Current, relative to input area, (+/-)</li> <li>Resistance, relative to input area, (+/-)</li> <li>Resistance thermometer, relative to input area, (+/-)</li> </ul>	0.7 %; +/-0.7% (Pt100/ Ni100); +/-0.8% (Pt100 climate)		1 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic); 1.2 Kelvin (Pt100, Ni100, standard)	0.7 %; +/-0.7% (Pt100/ Ni100); +/-0.8% (Pt100 climate)
<b>Basic error limit (operational limit at 25 °C)</b>				
<ul style="list-style-type: none"> <li>Voltage, relative to input area, (+/-)</li> <li>Current, relative to input area, (+/-)</li> <li>Resistance, relative to input area, (+/-)</li> <li>Resistance thermometer, relative to input area, (+/-)</li> </ul>	0.6 %; +/-0.4% (250 to 1000 mV); +/-0.6% (2.5 to 10 mV); +/-0.7% (80 mV)	0.25 %	0.4 %; 0.4% (+/-5 V, 10 V, 1 to 5 V, 0 to 10 V); 0.3% (+/-50 mV, 500 mV, 1 V)	0.6 %; ±0.6% (80 mV, 2.5 V to 10 V); ±0.4% (250 mV to 1 000 mV)
<ul style="list-style-type: none"> <li>Voltage, relative to input area, (+/-)</li> <li>Current, relative to input area, (+/-)</li> <li>Resistance, relative to input area, (+/-)</li> <li>Resistance thermometer, relative to input area, (+/-)</li> </ul>	0.5 %; 3.2 to 20 mA	0.2 %	0.3 %; +/-20 mA, 0 to 20 mA, 4 to 20 mA	0.5 %; 3.2 to 20 mA
<ul style="list-style-type: none"> <li>Voltage, relative to input area, (+/-)</li> <li>Current, relative to input area, (+/-)</li> <li>Resistance, relative to input area, (+/-)</li> <li>Resistance thermometer, relative to input area, (+/-)</li> </ul>	0.5 %; 150, 300, 600 Ohm		0.3 %; 0 to 6 kohms, 0 to 600 kohms	0.5 %; 150, 300, 600 Ohm
<ul style="list-style-type: none"> <li>Voltage, relative to input area, (+/-)</li> <li>Current, relative to input area, (+/-)</li> <li>Resistance, relative to input area, (+/-)</li> <li>Resistance thermometer, relative to input area, (+/-)</li> </ul>	0.6 %; ±0.5% (Pt100/ Ni100), ±0.6% (Pt100 climate)		1 Kelvin (Pt100, Ni100, standard); 0.8 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic)	0.6 %; ±0.5% (Pt100/ Ni100), ±0.6% (Pt100 climate)



**SIMATIC S7-300 advanced controller**

I/O modules

Analog modules

**SM 331 analog input modules****Technical specifications (continued)**

Article number	<b>6ES7331-7KF02-0AB0</b> SM331, 8AI, 9/12/14BIT	<b>6ES7331-7HF01-0AB0</b> SM331, 8AI, 14BIT, 0,052MS/CHANNEL	<b>6ES7331-1KF02-0AB0</b> SM331, 8AI, 13BIT	<b>6ES7331-7KB02-0AB0</b> SM331, 2AI, 9/12/14BIT	
<b>Isochronous mode</b>					
Isochronous operation (application synchronized up to terminal)	No	Yes	No	No	
<b>Interrupts/diagnostics/ status information</b>					
<b>Alarms</b>					
• Diagnostic alarm	Yes; Parameterizable, channels 0 and 2	Yes; Parameterizable	No	Yes	
• Limit value alarm	Yes; Parameterizable	Yes; Parameterizable, channels 0 and 2	No	Yes; Parameterizable, channel 0	
<b>Diagnostic messages</b>					
• Diagnostic information readable	Yes	Yes	No	Yes	
<b>Galvanic isolation</b>					
<b>Galvanic isolation analog inputs</b>					
• between the channels	No	No	No	No	
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	
<b>Isolation</b>					
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC	
<b>Connection method</b>					
required front connector	20-pin	20-pin	40-pin	20-pin	
<b>Dimensions</b>					
Width	40 mm	40 mm	40 mm	40 mm	
Height	125 mm	125 mm	125 mm	125 mm	
Depth	120 mm	120 mm	117 mm	120 mm	
<b>Weights</b>					
Weight, approx.	250 g	200 g	250 g	250 g	
Article number	<b>6ES7331-7PF01-0AB0</b> SM331, 8AI, RESIST., PT100/200/1000, ..	<b>6ES7331-7PF11-0AB0</b> SM331, 8AI, 16BIT, THERMOCOUPLE	<b>6ES7331-7PE10-0AB0</b> SM331, 6AI, 16BIT, THERMOCOUPLE	<b>6ES7331-7NF00-0AB0</b> SM331,8AI, +/-5/10V,1-5V, +/-20MA,0/4-20MA	<b>6ES7331-7NF10-0AB0</b> SM331,8AI, +/-5/10V,1-5V, +/-20MA,0/4-20MA
<b>Product type designation</b>					
<b>Supply voltage</b>					
<b>Load voltage L+</b>					
• Rated value (DC)	24 V	24 V	24 V		24 V
• Reverse polarity protection	Yes	Yes	Yes		Yes
<b>Input current</b>					
from load voltage L+ (without load), max.	240 mA	200 mA	150 mA		200 mA
from backplane bus 5 V DC, max.	100 mA	100 mA	100 mA	130 mA	100 mA
<b>Power losses</b>					
Power loss, typ.	4.6 W	3 W	2.2 W	0.6 W	3 W
<b>Analog inputs</b>					
Number of analog inputs	8	8	6	8	8
• For resistance measurement	8				
permissible input voltage for voltage input (destruction limit), max.	75 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)	75 V; 20 V DC permanent, 75 V DC for max. 1 s (duty factor 1:20)	35 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)	50 V; Permanent	75 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)
permissible input current for current input (destruction limit), max.				32 mA	40 mA

## Technical specifications (continued)

Article number	6ES7331-7PF01-0AB0 SM331, 8AI, RESIST., PT100/200/1000, ..	6ES7331-7PF11-0AB0 SM331, 8AI, 16BIT, THERMOCOUPLE	6ES7331-7PE10-0AB0 SM331, 6AI, 16BIT, THERMOCOUPLE	6ES7331-7NF00-0AB0 SM331,8AI, +/-5/10V,1-5V, +/-20MA,0/4-20MA	6ES7331-7NF10-0AB0 SM331,8AI, +/-5/10V,1-5V, +/-20MA,0/4-20MA
<b>Input ranges (rated values), voltages</b>					
• 0 to +10 V	No	No	No	No	No
• 1 V to 5 V	No	No	No	Yes	Yes
• 1 V to 10 V	No	No	No	No	No
• -1 V to +1 V	No	No	Yes	No	No
• -10 V to +10 V	No	No	No	Yes	Yes
• -2.5 V to +2.5 V	No	No	No	No	No
• -250 mV to +250 mV	No	No	Yes	No	No
• -5 V to +5 V	No	No	No	Yes	Yes
• -50 mV to +50 mV	No	No	Yes	No	No
• -500 mV to +500 mV	No	No	Yes	No	No
• -80 mV to +80 mV	No	No	Yes	No	No
<b>Input ranges (rated values), currents</b>					
• 0 to 20 mA	No	No	No	Yes	Yes
• -10 mA to +10 mA	No	No	No	No	No
• -20 mA to +20 mA	No	No	No	Yes	Yes
• -3.2 mA to +3.2 mA	No	No	No	No	No
• 4 mA to 20 mA	No	No	No	Yes	Yes
<b>Input ranges (rated values), thermoelements</b>					
• Type B	No	Yes	Yes	No	No
• Type E	No	Yes	Yes	No	No
• Type J	No	Yes	Yes	No	No
• Type K	No	Yes	Yes	No	No
• Type L	No	Yes	Yes	No	No
• Type N	No	Yes	Yes	No	No
• Type R	No	Yes	Yes	No	No
• Type S	No	Yes	Yes	No	No
• Type T	No	Yes	Yes	No	No
• Type U	No	Yes	Yes	No	No
• Type TXK/TXK(L) to GOST	No	Yes	Yes	No	No
• Input resistance (Type TXK/TXK(L) to GOST)			10 MΩ		
<b>Input ranges (rated values), resistance thermometer</b>					
• Cu 10	Yes	No	No	No	No
• Ni 100	Yes	No	No	No	No
• Ni 1000	Yes	No	No	No	No
• LG-Ni 1000	Yes	No	No	No	No
• Ni 120	Yes	No	No	No	No
• Ni 200	Yes	No	No	No	No
• Ni 500	Yes	No	No	No	No
• Pt 100	Yes	No	No	No	No
• Pt 1000	Yes	No	No	No	No
• Pt 200	Yes	No	No	No	No
• Pt 500	Yes	No	No	No	No

**SIMATIC S7-300 advanced controller**

I/O modules

Analog modules

**SM 331 analog input modules****Technical specifications (continued)**

Article number	<b>6ES7331-7PF01-0AB0</b> SM331, 8AI, RESIST., PT100/200/1000, ..	<b>6ES7331-7PF11-0AB0</b> SM331, 8AI, 16BIT, THERMOCOUPLE	<b>6ES7331-7PE10-0AB0</b> SM331, 6AI, 16BIT, THERMOCOUPLE	<b>6ES7331-7NF00-0AB0</b> SM331,8AI, +/-5/10V,1-5V, +/-20MA,0/4-20MA	<b>6ES7331-7NF10-0AB0</b> SM331,8AI, +/-5/10V,1-5V, +/-20MA,0/4-20MA
<b>Input ranges (rated values), resistors</b>					
• 0 to 150 ohms	Yes	No	No	No	No
• 0 to 300 ohms	Yes	No	No	No	No
• 0 to 600 ohms	Yes	No	No	No	No
• 0 to 6000 ohms		No	No	No	No
<b>Thermocouple (TC)</b>					
<b>Temperature compensation</b>					
- Parameterizable		Yes	Yes		
- internal temperature compensation		Yes	Yes		
- external temperature compensation with compensations socket		Yes	Yes		
- external temperature compensation with Pt100		Yes	Yes		
<b>Characteristic linearization</b>					
• Parameterizable	Yes	Yes	Yes		
- for thermocouples		Type B, E, J, K, L, N, R, S, T, U, C	Type B, E, J, K, L, N, R, S, T, U, C, TXK, XK(L)		
- for resistance thermometer	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10; (standard/ climate)		No		
<b>Cable length</b>					
• shielded, max.	200 m	100 m	200 m	200 m	200 m
<b>Analog value creation</b>					
Measurement principle	integrating	integrating	integrating	integrating	integrating
<b>Integration and conversion time/ resolution per channel</b>					
• Resolution with overrange (bit including sign), max.	16 bit; Two's complement	16 bit; Two's complement	16 bit; Two's complement	16 bit; Unipolar: 15/15/15/15 bits; bipolar: 15 bits + sign/ 15 bits + sign/ 15 bits + sign/ 15 bits + sign	16 bit; Unipolar: 15/15/15/15 bits; bipolar: 15 bits + sign/ 15 bits + sign/ 15 bits + sign/ 15 bits + sign
• Integration time, parameterizable	Yes	Yes	Yes	Yes; 10/ 16.67/ 20/ 100 ms	Yes; 23 / 72 / 83 / 95 ms
• Basic conversion time (ms)	up to 4 channels: 10 ms per module, over 5 channels: 190 ms per module, 8 channels: 80 ms	Up to 4 channels: 10 ms per module, 5 channels upwards: 190 ms per module	30 / 50 / 60 / 300		10 ms (4-channel mode); 95/83/72/23 ms (8-channel mode)
• Integration time (ms)			10 / 16,67 / 20 / 100		
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 Hz	400 / 60 / 50 Hz	10 / 50 / 60 / 400 Hz	10 / 50 / 60 / 400 Hz	400 / 60 / 50 Hz, combinations of 400, 60, 50 Hz
<b>Encoder</b>					
<b>Connection of signal encoders</b>					
• for current measurement as 2-wire transducer				Yes; with external transmitter; possible with separate supply for transmitter	Yes; with external transmitter, current supply; possible with separate supply for transmitter
• for current measurement as 4-wire transducer				Yes	Yes
• for resistance measurement with two-wire connection	Yes; without resistance correction				
• for resistance measurement with three-wire connection	Yes				
• for resistance measurement with four-wire connection	Yes				

## Technical specifications (continued)

Article number	6ES7331-7PF01-0AB0 SM331, 8AI, RESIST., PT100/200/1000, ..	6ES7331-7PF11-0AB0 SM331, 8AI, 16BIT, THERMOCOUPLE	6ES7331-7PE10-0AB0 SM331, 6AI, 16BIT, THERMOCOUPLE	6ES7331-7NF00-0AB0 SM331,8AI, +/-5/10V,1-5V, +/-20MA,0/4-20MA	6ES7331-7NF10-0AB0 SM331,8AI, +/-5/10V,1-5V, +/-20MA,0/4-20MA
<b>Errors/accuracies</b>					
<b>Operational limit in overall temperature range</b>					
• Voltage, relative to input area, (+/-)		+/- 1 K	Operating error at 0 ... 60 °C: ±0.12% @ ±25 mV, ±0.08% @ ±50 mV, ±0.6% @ ±80 mV, ±0.05% @ ±250 mV, ±0.05% @ 500 mV, ±0.05% @ ±1 V	0.1 %; At Ucm = 0 V or ±0.7 % at Ucm = 50 V	0.1 %
• Current, relative to input area, (+/-)				0.3 %; At Ucm = 0 V or ±0.9 % at Ucm = 50 V	0.1 %
• Resistance, relative to input area, (+/-)	0.1 %				
• Resistance thermometer, relative to input area, (+/-)	+/- 1 K				
<b>Basic error limit (operational limit at 25 °C)</b>					
• Voltage, relative to input area, (+/-)			See manual for details	0.05 %	0.05 %
• Current, relative to input area, (+/-)				0.05 %	0.05 %
• Resistance, relative to input area, (+/-)	0.05 %				
• Resistance thermometer, relative to input area, (+/-)	+/- 0,5 K				
<b>Isochronous mode</b>					
Isochronous operation (application synchronized up to terminal)	No	No	No	No	No
<b>Interrupts/diagnostics/status information</b>					
<b>Alarms</b>					
• Diagnostic alarm	Yes; Parameterizable per group	Yes; Parameterizable per group	Yes; channel by channel	Yes; Parameterizable	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable, channels 0 and 2	Yes; Parameterizable all channels (end of cycle interrupt is also supported across modules)
<b>Diagnostic messages</b>					
• Diagnostic information readable	Yes	Yes	Yes	Yes	Yes
<b>Galvanic isolation</b>					
<b>Galvanic isolation analog inputs</b>					
• between the channels	No	No	Yes	No	No
• between the channels, in groups of	2	2	1	2	2
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes
<b>Isolation</b>					
Isolation checked with	500 V DC	500 V DC	2500 V DC	500 V DC	500 V AC
<b>Connection method</b>					
required front connector	40-pin	40-pin	40-pin	40-pin	40-pin
<b>Dimensions</b>					
Width	40 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	120 mm	120 mm
<b>Weights</b>					
Weight, approx.	272 g	272 g	272 g	272 g	272 g

**SIMATIC S7-300 advanced controller**

I/O modules

Analog modules

**SM 331 analog input modules****Ordering data****Article No.****Article No.****SM 331 analog input modules**Including labeling strips,  
bus connector,  
measuring range modules

8 inputs, 13-bit resolution

**6ES7331-1KF02-0AB0**

8 inputs, resolution 9/12/14 bits

**6ES7331-7KF02-0AB0**

2 inputs, resolution 9/12/14 bits

**6ES7331-7KB02-0AB0**8 inputs, enhanced resolution  
16 bits**6ES7331-7NF00-0AB0**8 inputs, enhanced resolution  
16 bits, 4-channel mode**6ES7331-7NF10-0AB0**8 inputs, resolution 14 bits,  
for isochronous mode**6ES7331-7HF01-0AB0**6 inputs, for thermal elements,  
resolution 16 bits**6ES7331-7PE10-0AB0**

8 inputs, for thermal resistors

**6ES7331-7PF01-0AB0**

8 inputs, for thermoelements

**6ES7331-7PF11-0AB0****Measuring range module  
for analog inputs****6ES7974-0AA00-0AA0**1 module for 2 analog inputs;  
2 units (spare part)**Front connectors**

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0**  
**6ES7392-1AJ00-1AB0**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0**  
**6ES7392-1BJ00-1AB0**

40-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AM00-0AA0**  
**6ES7392-1AM00-1AB0**

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0**  
**6ES7392-1BM01-1AB0****Front door, elevated design****6ES7328-0AA00-7AA0**e.g. for 32-channel modules;  
for connecting  
1.3 mm<sup>2</sup>/16 AWG wires**SIMATIC TOP connect**

See page 5/247

**Bus connectors****6ES7390-0AA00-0AA0**

1 unit (spare part)

**Shield connecting element****6ES7390-5AA00-0AA0**80 mm wide, with 2 rows  
for 4 terminal elements each**Terminal elements**

2 units

For 2 cables with 2 mm to 6 mm  
diameter**6ES7390-5AB00-0AA0**For 1 cable with 3 mm to 8 mm  
diameter**6ES7390-5BA00-0AA0**For 1 cable with 4 mm to 13 mm  
diameter**6ES7390-5CA00-0AA0****Label cover****6ES7392-2XY00-0AA0**10 units (spare part), for modules  
with 20-pin front connector**Labeling strips****6ES7392-2XX00-0AA0**10 units (spare part), for modules  
with 20-pin front connector**Labeling sheets for machine  
labeling**for modules with 20-pin front  
connector, DIN A4, for printing with  
laser printer; 10 units

petrol

**6ES7392-2AX00-0AA0**

light-beige

**6ES7392-2BX00-0AA0**

yellow

**6ES7392-2CX00-0AA0**

red

**6ES7392-2DX00-0AA0**for modules with 40-pin front  
connector, DIN A4, for printing with  
laser printer; 10 units

petrol

**6ES7392-2AX10-0AA0**

light-beige

**6ES7392-2BX10-0AA0**

yellow

**6ES7392-2CX10-0AA0**

red

**6ES7392-2DX10-0AA0****SIMATIC Manual Collection****6ES7998-8XC01-8YE0**Electronic manuals on DVD,  
multilingual: LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC Based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC**SIMATIC Manual Collection  
update service for 1 year****6ES7998-8XC01-8YE2**Current "Manual Collection" DVD  
and the three subsequent updates

## Overview



- Analog outputs
- For the connection of analog actuators

## Technical specifications

Article number	6ES7332-5HB01-0AB0	6ES7332-5HD01-0AB0	6ES7332-5HF00-0AB0	6ES7332-7ND02-0AB0
	SM332, 2AA, U/I, 11/12BIT	SM332, 4AA, U/I, 11/12BIT	SM332, 8AA, U/I, 11/12BIT	SM332, 4AA, 0-10V, 0-5V, +/-10V,+/-20MA
<b>Product type designation</b>				
<b>Supply voltage</b>				
<b>Load voltage L+</b>				
• Rated value (DC)	24 V	24 V	24 V	24 V
<b>Input current</b>				
from load voltage L+ (without load), max.	135 mA	240 mA	340 mA	290 mA
from backplane bus 5 V DC, max.	60 mA	60 mA	100 mA	120 mA
<b>Power losses</b>				
Power loss, typ.	3 W	3 W	6 W	3 W
<b>Analog outputs</b>				
Number of analog outputs	2	4	8	4; Isochronous mode
Voltage output, short-circuit protection	Yes	Yes	Yes	Yes
Voltage output, short-circuit current, max.	25 mA	25 mA	25 mA	40 mA
Current output, no-load voltage, max.	18 V	18 V	18 V	18 V
<b>Output ranges, voltage</b>				
• 0 to 10 V	Yes	Yes	Yes	Yes
• 1 V to 5 V	Yes	Yes	Yes	Yes
• -10 V to +10 V	Yes	Yes	Yes	Yes
<b>Output ranges, current</b>				
• 0 to 20 mA	Yes	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes	Yes
<b>Load impedance (in rated range of output)</b>				
• with voltage outputs, min.	1 k $\Omega$	1 k $\Omega$	1 k $\Omega$	1 k $\Omega$
• with voltage outputs, capacitive load, max.	1 $\mu$ F	1 $\mu$ F	1 $\mu$ F	1 $\mu$ F
• with current outputs, max.	500 $\Omega$	500 $\Omega$	500 $\Omega$	500 $\Omega$
• with current outputs, inductive load, max.	10 mH	10 mH	10 mH	1 mH
<b>Cable length</b>				
• shielded, max.	200 m	200 m	200 m	200 m

**SIMATIC S7-300 advanced controller**

I/O modules

Analog modules

**SM 332 analog output modules****Technical specifications (continued)**

Article number	<b>6ES7332-5HB01-0AB0</b> SM332, 2AA, U/I, 11/12BIT	<b>6ES7332-5HD01-0AB0</b> SM332, 4AA, U/I, 11/12BIT	<b>6ES7332-5HF00-0AB0</b> SM332, 8AA, U/I, 11/12BIT	<b>6ES7332-7ND02-0AB0</b> SM332, 4AA, 0-10V, 0-5V, +/-10V,+/-20MA
<b>Analog value creation</b>				
<b>Integration and conversion time/ resolution per channel</b>				
• Resolution with overrange (bit including sign), max.	12 bit; +/-10 V, +/-20 mA, 4 to 20 mA, 1 to 5 V: 11 bits + sign; 0 to 10 V, 0 to 20 mA: 12 bits	12 bit; +/-10 V, +/-20 mA, 4 to 20 mA, 1 to 5 V: 11 bits + sign; 0 to 10 V, 0 to 20 mA: 12 bits	12 bit; +/-10 V, +/-20 mA, 4 to 20 mA, 1 to 5 V: 11 bits + sign; 0 to 10 V, 0 to 20 mA: 12 bits	16 bit
• Conversion time (per channel)	0.8 ms	0.8 ms	0.8 ms	200 µs; in isochronous mode 640 µs
<b>Settling time</b>				
• for resistive load	0.2 ms	0.2 ms	0.2 ms	0.2 ms
• for capacitive load	3.3 ms	3.3 ms	3.3 ms	3.3 ms
• for inductive load	0.5 ms; 0.5 ms (1 mH); 3.3 ms (10 mH)	0.5 ms; 0.5 ms (1 mH); 3.3 ms (10 mH)	0.5 ms; 0.5 ms (1 mH); 3.3 ms (10 mH)	0.5 ms
<b>Errors/accuracies</b>				
<b>Operational limit in overall temperature range</b>				
• Voltage, relative to output area, (+/-)	0.5 %	0.5 %	0.5 %	0.12 %
• Current, relative to output area, (+/-)	0.6 %	0.6 %	0.6 %	0.18 %
<b>Basic error limit (operational limit at 25 °C)</b>				
• Voltage, relative to output area, (+/-)	0.4 %	0.4 %	0.4 %	0.02 %
• Current, relative to output area, (+/-)	0.5 %	0.5 %	0.5 %	0.02 %
<b>Interrupts/diagnostics/ status information</b>				
Substitute values connectable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
<b>Alarms</b>				
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnostic messages</b>				
• Diagnostic information readable	Yes	Yes	Yes	Yes
<b>Galvanic isolation</b>				
<b>Galvanic isolation analog outputs</b>				
• between the channels and the backplane bus	Yes	Yes	Yes	Yes
<b>Isolation</b>				
Isolation checked with	500 V DC	500 V DC	500 V DC	1500 V DC
<b>Connection method</b>				
required front connector	20-pin	20-pin	40-pin	20-pin
<b>Dimensions</b>				
Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	120 mm
<b>Weights</b>				
Weight, approx.	220 g	220 g	272 g	220 g

Ordering data	Article No.		Article No.
<b>SM 332 analog output modules</b>		<b>Label cover</b>	<b>6ES7392-2XY00-0AA0</b>
incl. labeling strips, bus connector		10 units (spare part), for modules with 20-pin front connector	
4 outputs, 11/12 bit	<b>6ES7332-5HD01-0AB0</b>	<b>Labeling strips</b>	<b>6ES7392-2XX00-0AA0</b>
4 outputs, 16 bit	<b>6ES7332-7ND02-0AB0</b>	10 units (spare part), for modules with 20-pin front connector	
2 outputs, 11/12 bit	<b>6ES7332-5HB01-0AB0</b>	<b>Labeling sheets for machine labeling</b>	
8 outputs, 11/12 bit	<b>6ES7332-5HF00-0AB0</b>	for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
<b>Front connectors</b>		petrol	<b>6ES7392-2AX00-0AA0</b>
20-pin, with screw contacts		light-beige	<b>6ES7392-2BX00-0AA0</b>
• 1 unit	<b>6ES7392-1AJ00-0AA0</b>	yellow	<b>6ES7392-2CX00-0AA0</b>
• 100 units	<b>6ES7392-1AJ00-1AB0</b>	red	<b>6ES7392-2DX00-0AA0</b>
20-pin, with spring-loaded contacts		for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units	
• 1 unit	<b>6ES7392-1BJ00-0AA0</b>	petrol	<b>6ES7392-2AX10-0AA0</b>
• 100 units	<b>6ES7392-1BJ00-1AB0</b>	light-beige	<b>6ES7392-2BX10-0AA0</b>
40-pin, with screw contacts		yellow	<b>6ES7392-2CX10-0AA0</b>
• 1 unit	<b>6ES7392-1AM00-0AA0</b>	red	<b>6ES7392-2DX10-0AA0</b>
• 100 units	<b>6ES7392-1AM00-1AB0</b>	<b>SIMATIC Manual Collection</b>	<b>6ES7998-8XC01-8YE0</b>
40-pin, with spring-loaded contacts		Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
• 1 unit	<b>6ES7392-1BM01-0AA0</b>	<b>SIMATIC Manual Collection update service for 1 year</b>	<b>6ES7998-8XC01-8YE2</b>
• 100 units	<b>6ES7392-1BM01-1AB0</b>	Current "Manual Collection" DVD and the three subsequent updates	
<b>Front door, elevated design</b>	<b>6ES7328-0AA00-7AA0</b>		
e.g. for 32-channel modules; for connecting 1.3 mm <sup>2</sup> /16 AWG wires			
<b>SIMATIC TOP connect</b>	See page 5/247		
<b>Bus connectors</b>			
1 unit (spare part)	<b>6ES7390-0AA00-0AA0</b>		
<b>Shield connecting element</b>	<b>6ES7390-5AA00-0AA0</b>		
80 mm wide, with 2 rows for 4 terminal elements each			
<b>Terminal elements</b>			
2 units			
For 2 cables with 2 mm to 6 mm diameter	<b>6ES7390-5AB00-0AA0</b>		
For 1 cable with 3 mm to 8 mm diameter	<b>6ES7390-5BA00-0AA0</b>		
For 1 cable with 4 mm to 13 mm diameter	<b>6ES7390-5CA00-0AA0</b>		



**SIMATIC S7-300 advanced controller**

I/O modules

Analog modules

**SM 334 analog input/output modules****Overview**

- Analog inputs and outputs
- For the connection of analog sensors and actuators

5

**Technical specifications**

Article number	<b>6ES7334-0CE01-0AA0</b> SM334, 4AI, 2AO, NON ISOL.	<b>6ES7334-0KE00-0AB0</b> SM334, 4AI/2AO, 0-10V F.PT100
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
<b>Input current</b>		
from load voltage L+ (without load), max.	110 mA	80 mA
from backplane bus 5 V DC, max.	55 mA	60 mA
<b>Power losses</b>		
Power loss, typ.	3 W	2 W
<b>Analog inputs</b>		
Number of analog inputs	4	4
• For voltage measurement	4	2
• For resistance measurement		4
permissible input voltage for voltage input (destruction limit), max.	20 V	20 V; continuous; 75 V for max. 1 s (mark to space ratio 1:20)
permissible input current for current input (destruction limit), max.	40 mA	
Cycle time (all channels) max.	5 ms	85 ms
<b>Input ranges (rated values), voltages</b>		
• 0 to +10 V	Yes	Yes
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes	
<b>Input ranges (rated values), resistance thermometer</b>		
• Pt 100		Yes; only climatic range
<b>Input ranges (rated values), resistors</b>		
• 0 to 10000 ohms		Yes

## Technical specifications (continued)

Article number	6ES7334-0CE01-0AA0 SM334, 4AI, 2AO, NON ISOL.	6ES7334-0KE00-0AB0 SM334, 4AI/2AO, 0-10V FPT100
<b>Analog outputs</b>		
Number of analog outputs	2	2
Voltage output, short-circuit protection	Yes	Yes
Voltage output, short-circuit current, max.	11 mA	10 mA
Current output, no-load voltage, max.	15 V	
<b>Output ranges, voltage</b>		
• 0 to 10 V	Yes	Yes
<b>Output ranges, current</b>		
• 0 to 20 mA	Yes	
<b>Load impedance (in rated range of output)</b>		
• with voltage outputs, min.	5 kΩ	2.5 kΩ
• with voltage outputs, capacitive load, max.	1 μF	1 μF
• with current outputs, max.	300 Ω	
• with current outputs, inductive load, max.	1 mH	
<b>Cable length</b>		
• shielded, max.	200 m	100 m
<b>Analog value creation</b>		
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	8 bit	12 bit
• Integration time (ms)		16,67 / 20 ms
<b>Settling time</b>		
• for resistive load	0.3 ms	0.8 ms
• for capacitive load	3 ms	0.8 ms
• for inductive load	0.3 ms	
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
• for current measurement as 4-wire transducer	Yes	
• for resistance measurement with two-wire connection		Yes
• for resistance measurement with three-wire connection		Yes
• for resistance measurement with four-wire connection		Yes

**SIMATIC S7-300 advanced controller**

I/O modules

Analog modules

**SM 334 analog input/output modules****Technical specifications (continued)**

Article number	<b>6ES7334-0CE01-0AA0</b> SM334, 4AI, 2AO, NON ISOL.	<b>6ES7334-0KE00-0AB0</b> SM334, 4AI/2AO, 0-10V FPT100
<b>Errors/accuracies</b>		
<b>Operational limit in overall temperature range</b>		
• Voltage, relative to input area, (+/-)	0.9 %	0.7 %; 0 to 10 V
• Current, relative to input area, (+/-)	0.8 %	
• Resistance, relative to input area, (+/-)		3.5 %; 10 kOhm
• Resistance thermometer, relative to input area, (+/-)		1 %
• Voltage, relative to output area, (+/-)	0.6 %	1 %
• Current, relative to output area, (+/-)	1 %	
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to input area, (+/-)	0.7 %	0.5 %; 0 to 10 V
• Current, relative to input area, (+/-)	0.6 %	
• Resistance, relative to input area, (+/-)		2.8 %; 10 kOhm
• Resistance thermometer, relative to input area, (+/-)		0.8 %
• Voltage, relative to output area, (+/-)	0.5 %	0.85 %
• Current, relative to output area, (+/-)	0.5 %	
<b>Interrupts/diagnostics/status information</b>		
<b>Alarms</b>		
• Alarms	No	No
<b>Diagnostic messages</b>		
• Diagnostic functions	No	No
<b>Galvanic isolation</b>		
<b>Galvanic isolation analog inputs</b>		
• between the channels and the backplane bus	No	Yes
<b>Galvanic isolation analog outputs</b>		
• between the channels and the backplane bus	No	Yes
<b>Isolation</b>		
Isolation checked with	500 V DC	500 V DC
<b>Connection method</b>		
required front connector	20-pin	20-pin
<b>Dimensions</b>		
Width	40 mm	40 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
<b>Weights</b>		
Weight, approx.	285 g	200 g

Ordering data	Article No.	Article No.
<b>SM 334 analog input/output modules</b>		
incl. labeling strips, bus connector		
4 inputs, 2 outputs	<b>6ES7334-0CE01-0AA0</b>	
4 inputs, 2 outputs, resistance measurement, Pt 100	<b>6ES7334-0KE00-0AB0</b>	
<b>Front connectors</b>		
20-pin, with screw contacts		
• 1 unit	<b>6ES7392-1AJ00-0AA0</b>	
• 100 units	<b>6ES7392-1AJ00-1AB0</b>	
20-pin, with spring-loaded terminals		
• 1 unit	<b>6ES7392-1BJ00-0AA0</b>	
• 100 units	<b>6ES7392-1BJ00-1AB0</b>	
<b>Front door, elevated design</b>	<b>6ES7328-0AA00-7AA0</b>	
e.g. for 32-channel modules; for connecting 1.3 mm <sup>2</sup> /16 AWG wires		
<b>SIMATIC TOP connect</b>	See page 5/247	
<b>Bus connectors</b>	<b>6ES7390-0AA00-0AA0</b>	
1 unit (spare part)		
<b>Shield connecting element</b>	<b>6ES7390-5AA00-0AA0</b>	
80 mm wide, with 2 rows for 4 terminal elements each		
<b>Terminal elements</b>		
2 units		
For 2 cables with 2 mm to 6 mm diameter	<b>6ES7390-5AB00-0AA0</b>	
For 1 cable with 3 mm to 8 mm diameter	<b>6ES7390-5BA00-0AA0</b>	
For 1 cable with 4 mm to 13 mm diameter	<b>6ES7390-5CA00-0AA0</b>	
		<b>Label cover</b>
		10 units (spare part), for modules with 20-pin front connector
		<b>Labeling strips</b>
		10 units (spare part), for modules with 20-pin front connector
		<b>Labeling sheets for machine labeling</b>
		for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units
		petrol
		<b>6ES7392-2AX00-0AA0</b>
		light-beige
		<b>6ES7392-2BX00-0AA0</b>
		yellow
		<b>6ES7392-2CX00-0AA0</b>
		red
		<b>6ES7392-2DX00-0AA0</b>
		<b>SIMATIC Manual Collection</b>
		<b>6ES7998-8XC01-8YE0</b>
		Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC
		<b>SIMATIC Manual Collection update service for 1 year</b>
		<b>6ES7998-8XC01-8YE2</b>
		Current "Manual Collection" DVD and the three subsequent updates

**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS S7-300 analog modules

**SIPLUS S7-300 SM 331 analog input modules****Overview**

- Analog inputs
- For connecting voltage sensors and current sensors, thermocouples, resistors and resistance thermometers

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	<b>6AG1331-1KF02-7AB0</b>	<b>6AG1331-7KB02-2AB0</b>	<b>6AG1331-7KF02-2AB0</b>
Based on	<b>6ES7331-1KF02-0AB0</b> SIPLUS SM331 8AI	<b>6ES7331-7KB02-0AB0</b> SIPLUS SM331 2AE	<b>6ES7331-7KF02-0AB0</b> SIPLUS SM331 8AI
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-25 °C	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; for use on railway vehicles according to EN 50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)		
<b>Relative humidity</b>			
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

## Technical specifications (continued)

Article number	6AG1331-7NF00-2AB0	6AG1331-7NF10-2AB0	6AG1331-7PF01-4AB0	6AG1331-7PF11-4AB0
Based on	6ES7331-7NF00-0AB0	6ES7331-7NF10-0AB0	6ES7331-7PF01-0AB0	6ES7331-7PF11-0AB0
	SIPLUS S7-300 SM331 8AI	SIPLUS SM331 8AI - 40POL	SIPLUS SM331 8AI	SIPLUS_SM331_8AI
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	-25 °C; = Tmin	-25 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin
• max.	70 °C; = Tmax; for use on railway vehicles according to EN 50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/UL hazardous use applies	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude		Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)			
- With condensation, tested in accordance with IEC 60068-2-38, max.		100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS S7-300 analog modules

**SIPLUS S7-300 SM 331 analog input modules****Ordering data****Article No.****SIPLUS S7-300 SM 331  
analog input modules**Extended temperature range and  
exposure to media

8 inputs, 13-bit resolution

**6AG1331-1KF02-7AB0**

2 inputs, 9/12/14-bit resolution

**6AG1331-7KB02-2AB0**

8 inputs, 9/12/14-bit resolution

**6AG1331-7KF02-2AB0**

8 inputs, enhanced 16-bit resolution

**6AG1331-7NF00-2AB0**8 inputs, enhanced 16-bit  
resolution, 4-channel mode**6AG1331-7NF10-2AB0**Exposure to media

8 inputs, for thermal resistors

**6AG1331-7PF01-4AB0**

8 inputs, for thermocouples

**6AG1331-7PF11-4AB0**Conforms to EN 50155

8 inputs, 9/12/14-bit resolution

**6AG1331-7KF02-2AB0**

8 inputs, enhanced 16-bit resolution

**6AG1331-7NF00-2AB0****Accessories****Article No.**See SIMATIC S7-300  
analog input modules,  
page 5/94

**Overview**

- Analog outputs
- For connection of analog actuators

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	<b>6AG1332-5HD01-7AB0</b>	<b>6AG1332-7ND02-4AB0</b>	<b>6AG1332-5HB01-2AB0</b>	<b>6AG1332-5HF00-2AB0</b>
Based on	<b>6AG1332-5HD01-0AB0</b> SIPLUS S7-300 SM332 4AA U/I	<b>6AG1332-7ND02-0AB0</b> SIPLUS SM332 4AA CHANNELS ISOLATED INDIV.	<b>6AG1332-5HB01-0AB0</b> SIPLUS SM332 2AA	<b>6AG1332-5HF00-0AB0</b> SIPLUS S7-300 SM332 8AO
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	-25 °C; = Tmin	0 °C; = Tmin	-25 °C; = Tmin	-25 °C
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	60 °C; = Tmax	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!



**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS S7-300 analog modules

**SIPLUS S7-300 SM 332 analog output modules****Ordering data****Article No.****SIPLUS S7-300 SM 332  
analog output modules**Extended temperature range and  
exposure to media

2 outputs, 11/12-bit

**6AG1332-5HB01-2AB0**

4 outputs, 11/12-bit

**6AG1332-5HD01-7AB0**

8 outputs, 11/12-bit

**6AG1332-5HF00-2AB0**Exposure to media4 outputs, 16-bit;  
only medial exposure**6AG1332-7ND02-4AB0**Conforms to EN 50155

2 outputs, 11/12-bit

**6AG1332-5HB01-2AB0****Article No.****Accessories**See SIMATIC S7-300  
analog output modules,  
page 5/97

**Overview**

- Analog inputs and outputs
- For connection of analog sensors and actuators

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	<b>6AG1334-0KE00-7AB0</b>
Based on	<b>6ES7334-0KE00-0AB0</b> SIPLUS S7-300 SM334 4AE 2AA
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>	
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.****SIPLUS S7-300 SM 334 analog input/output modules****6AG1334-0KE00-7AB0**Extended temperature range and exposure to media

4 inputs, 2 outputs;  
resistance measurement, Pt 100

**Accessories**

See SIMATIC S7-300 analog input/output modules, page 5/101

**SIMATIC S7-300 advanced controller**

I/O modules

F digital / analog modules

**SM 326 F digital input modules - Safety Integrated****Overview**

- Digital inputs for the fail-safe SIMATIC S7 systems
- For connecting:
  - Switches and 2-wire proximity switches
  - Sensors according to NAMUR and mechanical contacts, also for signals from hazardous areas
- With integral safety functions for fail-safe operation
- Can be used in fail-safe operation
  - Centrally: with S7-31xF-2 DP
  - Distributed in ET 200M: with SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH
- In standard operation can be used in the same way as S7-300 modules

**Technical specifications**

Article number	<b>6ES7326-1RF01-0AB0</b> SM326, 8DE, DC24V, FAILSAFE	<b>6ES7326-1BK02-0AB0</b> SM326, F-DI 24 X DC24V, FAILSAFE
<b>Product type designation</b>		
<b>Supply voltage</b>		
Rated value (DC)		24 V
<b>Input current</b>		
from load voltage L+ (without load), max.	160 mA	450 mA
from backplane bus 5 V DC, max.	90 mA	100 mA
<b>Encoder supply</b>		
Number of outputs	8	4; Isolated
Type of output voltage	8.2 V DC	
<b>Output current</b>		
• nominal		400 mA
<b>Power losses</b>		
Power loss, typ.		10 W
<b>Digital inputs</b>		
Number of digital inputs	8	24
<b>Number of simultaneously controllable inputs</b>		
<b>all mounting positions</b>		
- up to 40 °C, max.	8	24
- up to 60 °C, max.	8	24; (at 24 V) or 18 (at 28.8 V)
<b>Input voltage</b>		
• Type of input voltage		DC
• Rated value (DC)		24 V
• for signal "0"		-30 to +5V
• for signal "1"		+11 to +30V
<b>Input current</b>		
• for signal "0", max. (permissible quiescent current)	0.35 to 1.2 mA	2 mA
• for signal "1", typ.	2.1 to 7 mA	10 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>		
- at "0" to "1", max.		3.4 ms
- at "1" to "0", max.		3.4 ms
<b>for NAMUR inputs</b>		
- at "0" to "1", max.	1.2 to 3 ms	
- at "1" to "0", max.	1.2 to 3 ms	
<b>Cable length</b>		
• shielded, max.	200 m	200 m
• Unshielded, max.	100 m	100 m

## Technical specifications (continued)

Article number	6ES7326-1RF01-0AB0	6ES7326-1BK02-0AB0
	SM326, 8DE, DC24V, FAILSAFE	SM326, F-DI 24 X DC24V, FAILSAFE
<b>Encoder</b>		
<b>Connectable encoders</b>		
<ul style="list-style-type: none"> <li>2-wire sensor</li> <li>- Permissible quiescent current (2-wire sensor), max.</li> </ul>		Yes; if short-circuit test is deactivated 2 mA
<b>Interrupts/diagnostics/status information</b>		
<b>Alarms</b>		
<ul style="list-style-type: none"> <li>Diagnostic alarm</li> </ul>	Yes; Parameterizable	Yes
<b>Diagnostic messages</b>		
<ul style="list-style-type: none"> <li>Diagnostic information readable</li> </ul>		Yes
<b>Ex(i) characteristics</b>		
Module for Ex(i) protection	Yes	
<b>Max. values of input circuits (per channel)</b>		
<ul style="list-style-type: none"> <li>Co (permissible external capacity), max.</li> <li>Io (short-circuit current), max.</li> <li>Lo (permissible external inductivity), max.</li> <li>Po (power of load), max.</li> <li>Uo (output no-load voltage), max.</li> <li>Um (fault voltage), max.</li> <li>Ta (permissible ambient temperature), max.</li> </ul>	3 µF 13.9 mA 80 mH 33.1 mW 10 V 60V DC/30V AC 60 °C	60 °C
<b>Galvanic isolation</b>		
<b>Galvanic isolation digital inputs</b>		
<ul style="list-style-type: none"> <li>between the channels</li> <li>between the channels, in groups of</li> <li>between the channels and the backplane bus</li> </ul>	Yes  Yes	Yes 12 Yes
<b>Isolation</b>		
Isolation checked with		500V DC/350V AC
<b>Standards, approvals, certificates</b>		
<b>Highest safety class achievable in safety mode</b>		
<ul style="list-style-type: none"> <li>acc. to DIN VDE 0801</li> <li>acc. to EN 954</li> <li>SIL according to IEC 61508</li> </ul>	SIL 2 (single-channel), SIL 3 (two-channel)	AK 6 Cat. 4 SIL 3
<b>Use in hazardous areas</b>		
<ul style="list-style-type: none"> <li>Test number KEMA</li> </ul>	99 ATEX 2671 X	
<b>Connection method</b>		
required front connector	1x 40-pin	40-pin
<b>Dimensions</b>		
Width	80 mm	80 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
<b>Weights</b>		
Weight, approx.	482 g	442 g

**SIMATIC S7-300 advanced controller**

I/O modules

F digital / analog modules

**SM 326 F digital input modules - Safety Integrated**

Ordering data	Article No.	Ordering data	Article No.
<b>SM 326 F digital input modules</b>		<b>Active bus module</b>	<b>6ES7195-7HC00-0XA0</b>
24 inputs, 24 V DC	<b>6ES7326-1BK02-0AB0</b>	BM 1 x 80 for 1 module with 80 mm width	
8 inputs, 24 V DC, NAMUR	<b>6ES7326-1RF01-0AB0</b>	<b>SITOP power supply module</b>	<b>6ES7307-1EA01-0AA0</b>
<b>S7 Distributed Safety V5.4 programming tool</b>		for ET 200M; 120/230 V AC, 24 V DC, 5 A; Type PS 307-1E	
Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco		<b>Front connectors</b>	
Requirement: STEP 7 V5.3 SP3 and higher		40-pin, with screw contacts	
Floating License	<b>6ES7833-1FC02-0YA5</b>	• 1 unit	<b>6ES7392-1AM00-0AA0</b>
Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FC02-0YH5</b>	• 100 units	<b>6ES7392-1AM00-1AB0</b>
		40-pin, with spring-loaded contacts	
		• 1 unit	<b>6ES7392-1BM01-0AA0</b>
		• 100 units	<b>6ES7392-1BM01-1AB0</b>
<b>S7 Distributed Safety upgrade</b>		<b>Front door, higher version, for F-modules</b>	<b>6ES7328-7AA10-0AA0</b>
From V5.x to V5.4; Floating license for 1 user	<b>6ES7833-1FC02-0YE5</b>	For F-modules; for connecting 1.3 mm <sup>2</sup> /16 AWG wires; wiring diagram and labels in yellow	
<b>STEP 7 Safety Advanced V13 SP1</b>		<b>Labeling strips</b>	<b>6ES7392-2XX20-0AA0</b>
Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco		For fail-safe modules (spare part); 10 units	
Requirement: STEP 7 Professional V13 SP1		<b>Label cover</b>	<b>6ES7392-2XY20-0AA0</b>
Floating license for 1 user	<b>6ES7833-1FA13-0YA5</b>	For fail-safe modules (spare part); 10 units	
Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FA13-0YH5</b>	<b>LK 393 cable guide</b>	<b>6ES7393-4AA10-0AA0</b>
		For F modules; L+ and M connections; 5 units	
<b>DIN rail for active bus modules</b>		<b>SIMATIC Manual Collection</b>	<b>6ES7998-8XC01-8YE0</b>
for max. 5 active bus modules for hot swapping function		Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
• 483 mm (19") long	<b>6ES7195-1GA00-0XA0</b>	<b>SIMATIC Manual Collection update service for 1 year</b>	<b>6ES7998-8XC01-8YE2</b>
• 530 mm long	<b>6ES7195-1GF30-0XA0</b>	Current "Manual Collection" DVD and the three subsequent updates	
• 620 mm long	<b>6ES7195-1GG30-0XA0</b>		
• 2000 mm long	<b>6ES7195-1GC00-0XA0</b>		

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

**Overview**

- Digital outputs for the fail-safe SIMATIC S7 systems
- Two versions (1 x current sourcing, 1 x current sinking)
- For connecting solenoid valves, DC contactors and indicator lights
- With integral safety functions for fail-safe operation
- Can be used in fail-safe operation
  - Centrally: with S7-31xF DP, S7-31xF PN/DP
  - Distributed in ET 200M: with SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-41xF-2 and S7-400F/FH

**Technical specifications**

Article number	<b>6ES7326-2BF10-0AB0</b> SM326, F-DO10XDC24V/2A PP, FAILSAFE	<b>6ES7326-2BF41-0AB0</b> SM 326, F-DO 8 X DC 24V/2A PM
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V; 1L+, 2L+, 3L+	24 V; 1L+, 2L+, 3L+
<b>Input current</b>		
from load voltage 1L+, max.	100 mA; from supply voltage	75 mA; from supply voltage
from load voltage 2L+ (without load), max.	100 mA	100 mA
from load voltage 3L+ (without load), max.	100 mA	100 mA
from backplane bus 5 V DC, max.	100 mA	100 mA
<b>Power losses</b>		
Power loss, typ.	6 W	12 W
<b>Digital outputs</b>		
Number of digital outputs	10	8
short-circuit protection	Yes	Yes
Limitation of inductive shutdown voltage to		L+ (-33 V)
<b>Switching capacity of the outputs</b>		
• on lamp load, max.	5 W	5 W
<b>Output voltage</b>		
• for signal *1* without series diode, min.		L+ (-1.0 V)
<b>Output current</b>		
• for signal *1* rated value	2 A	2 A
• for signal *1* permissible range for 0 to 40 °C, min.	7 mA	7 mA
• for signal *1* permissible range for 0 to 40 °C, max.	2.4 A	2 A; 2 A for horizontal installation, 1 A for vertical installation
• for signal *1* permissible range for 40 to 60 °C, min.	7 mA	7 mA
• for signal *1* permissible range for 40 to 60 °C, max.	2.4 A	1 A; for horizontal installation
• for signal *0* residual current, max.	0.5 mA	0.5 mA

**SIMATIC S7-300 advanced controller**

I/O modules

F digital / analog modules

**SM 326 F digital output modules - Safety Integrated****Technical specifications (continued)**

Article number	<b>6ES7326-2BF10-0AB0</b> SM326, F-DO10XDC24V/2A PP, FAILSAFE	<b>6ES7326-2BF41-0AB0</b> SM 326, F-DO 8 X DC 24V/2A PM
<b>Switching frequency</b>		
• with resistive load, max.	25 Hz	30 Hz
• with inductive load, max.	25 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz
<b>Aggregate current of outputs (per group)</b>		
<b>horizontal installation</b>		
- up to 40 °C, max.	10 A	7.5 A
- up to 60 °C, max.	6 A	5 A
<b>vertical installation</b>		
- up to 40 °C, max.	5 A	5 A
<b>Cable length</b>		
• shielded, max.	1 000 m	200 m; 200 m for SIL3, AK 6, Cat 4
• Unshielded, max.	600 m	200 m
<b>Interrupts/diagnostics/status information</b>		
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes; Parameterizable
<b>Diagnostic messages</b>		
• Diagnostic information readable	Yes	Yes
<b>Galvanic isolation</b>		
<b>Galvanic isolation digital outputs</b>		
• between the channels	Yes	Yes
• between the channels, in groups of 5	5	4
• between the channels and the backplane bus	Yes	Yes
• between the channels and the power supply of the electronics	Yes	Yes
<b>Isolation</b>		
Isolation checked with	370V for 1 min	500V DC/350V AC
<b>Standards, approvals, certificates</b>		
<b>Highest safety class achievable in safety mode</b>		
• acc. to DIN VDE 0801	AK 5 and 6	
• acc. to EN 954	Cat. 4	Cat. 4
• SIL according to IEC 61508	SIL 3	SIL 3
<b>Connection method</b>		
required front connector	40-pin	40-pin
<b>Dimensions</b>		
Width	40 mm	80 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
<b>Weights</b>		
Weight, approx.	330 g	465 g

Ordering data	Article No.	Article No.
<b>SM 326 F digital output modules</b>		<b>SITOP power supply module</b>
10 outputs, 24 V DC, 2 A PP; width 40 mm	<b>6ES7326-2BF10-0AB0</b>	<b>6ES7307-1EA01-0AA0</b>
8 outputs, 24 V DC, 2 A PM; width 80 mm	<b>6ES7326-2BF41-0AB0</b>	for ET 200M; 120/230 V AC, 24 V DC, 5 A; Type PS 307-1E
<b>S7 Distributed Safety V5.4 programming tool</b>		<b>Front connectors</b>
Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 and higher		40-pin, with screw contacts
Floating License	<b>6ES7833-1FC02-0YA5</b>	• 1 unit
Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FC02-0YH5</b>	• 100 units
<b>S7 Distributed Safety upgrade</b>		40-pin, with spring-loaded contacts
From V5.x to V5.4; Floating license for 1 user	<b>6ES7833-1FC02-0YE5</b>	• 1 unit
<b>STEP 7 Safety Advanced V13 SP1</b>		• 100 units
Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1		<b>Front door, higher version, for F-modules</b>
Floating license for 1 user	<b>6ES7833-1FA13-0YA5</b>	<b>6ES7328-7AA10-0AA0</b>
Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FA13-0YH5</b>	For F-modules; for connecting 1.3 mm <sup>2</sup> /16 AWG wires; wiring diagram and labels in yellow
<b>DIN rail for active bus modules</b>		<b>Labeling strips</b>
for max. 5 active bus modules, for function "Insertion and removal"		For fail-safe modules (spare part), 10 units
• 483 mm (19") long	<b>6ES7195-1GA00-0XA0</b>	<b>Label cover</b>
• 530 mm long	<b>6ES7195-1GF30-0XA0</b>	For fail-safe modules (spare part), 10 units
• 620 mm long	<b>6ES7195-1GG30-0XA0</b>	<b>LK 393 cable guide</b>
• 2000 mm long	<b>6ES7195-1GC00-0XA0</b>	For F modules; L+ and M connections, 5 units
<b>Active bus modules</b>		<b>SIMATIC Manual Collection</b>
BM 2 x 40 for accepting 2 IO modules each 40 mm wide	<b>6ES7195-7HB00-0XA0</b>	<b>6ES7998-8XC01-8YE0</b>
BM 1 x 80 for accepting 1 IO module 80 mm wide	<b>6ES7195-7HC00-0XA0</b>	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC
		<b>SIMATIC Manual Collection update service for 1 year</b>
		Current "Manual Collection" DVD and the three subsequent updates

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>



**SIMATIC S7-300 advanced controller**

I/O modules

F digital / analog modules

**SM 336 F analog input modules - Safety Integrated****Overview**

- Analog inputs for the fail-safe SIMATIC S7 systems
- Applicable in the ET 200M distributed I/O device with IM 153-2 HF as well as centrally with SIMATIC S7-31xF-2 DP
- Properties of the SM 336; F-AI 6 x 0/4 ... 20 mA HART:
  - 6 analog inputs with galvanic isolation between channels and backplane bus
  - Input ranges: 0 to 20 mA, 4 to 20 mA
  - Short-circuit proof power supply from 2 or 4-wire transducer via the module
  - External encoder supply possible
  - Applicable in safety mode
  - HART communication
  - Firmware update using HW Config
  - Identification data

**Technical specifications**

Article number	<b>6ES7336-4GE00-0AB0</b> SM 336, F,AI 6 X 0/4 ... 20MA HART
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
<b>Input current</b>	
from backplane bus 5 V DC, max.	90 mA
from supply voltage L+, max.	150 mA; Typical
<b>Power losses</b>	
Power loss, typ.	4.5 W
<b>Analog inputs</b>	
Number of analog inputs	6
permissible input current for current input (destruction limit), max.	40 mA
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Cable length</b>	
• shielded, max.	1 000 m
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit; 15 bits + sign
• Integration time (ms)	20 at 50 Hz 16.7 at 60 Hz
• Interference voltage suppression for interference frequency f1 in Hz	f=n x (f1+0.5%)
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes

Article number	<b>6ES7336-4GE00-0AB0</b> SM 336, F,AI 6 X 0/4 ... 20MA HART
<b>Errors/accuracies</b>	
<b>Operational limit in overall temperature range</b>	
• Current, relative to input area, (+/-)	0.2 %; 40 µA
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to input area, (+/-)	0.1 %
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnostic messages</b>	
• Diagnostic information readable	Yes
<b>Galvanic isolation</b>	
<b>Galvanic isolation analog inputs</b>	
• between the channels	Yes
• between the channels and the backplane bus	Yes
• between the channels and the power supply of the electronics	Yes
<b>Isolation</b>	
Isolation checked with	370V for 1 min
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
• acc. to EN 954	4
• SIL according to IEC 61508	SIL 3
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	350 g

Ordering data	Article No.	Ordering data	Article No.
<b>SM 336 F analog input modules</b> 6 inputs, 15 bit, 0/4 - 20 mA HART	<b>6ES7336-4GE00-0AB0</b>	<b>Active bus module BM 2x40</b> Bus module for accepting 2 I/O modules each 40 mm wide	<b>6ES7195-7HB00-0XA0</b>
<b>S7 Distributed Safety V5.4 programming tool</b>  Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 and higher Floating License Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FC02-0YA5</b> <b>6ES7833-1FC02-0YH5</b>	<b>SITOP power supply module</b> for ET 200M; 120/230 V AC, 24 V DC, 5 A; Type PS 307-1E	<b>6ES7307-1EA01-0AA0</b>
<b>S7 Distributed Safety upgrade</b> From V5.x to V5.4; Floating license for 1 user	<b>6ES7833-1FC02-0YE5</b>	<b>Front connectors</b> 20-pin, with screw contacts • 1 unit • 100 units 20-pin, with spring-loaded contacts • 1 unit • 100 units	<b>6ES7392-1AJ00-0AA0</b> <b>6ES7392-1AJ00-1AB0</b> <b>6ES7392-1BJ00-0AA0</b> <b>6ES7392-1BJ00-1AB0</b>
<b>STEP 7 Safety Advanced V13 SP1</b>  Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1 Floating license for 1 user Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FA13-0YA5</b> <b>6ES7833-1FA13-0YH5</b>	<b>Front door, higher version, for F-modules</b> For F-modules; for connecting 1.3 mm <sup>2</sup> /16 AWG wires; wiring diagram and labels in yellow	<b>6ES7328-7AA10-0AA0</b>
<b>DIN rail for active bus modules</b> for max. 5 active bus modules for hot swapping function • 483 mm long • 530 mm long • 620 mm long • 2000 mm long	<b>6ES7195-1GA00-0XA0</b> <b>6ES7195-1GF30-0XA0</b> <b>6ES7195-1GG30-0XA0</b> <b>6ES7195-1GC00-0XA0</b>	<b>Labeling strips</b> For fail-safe modules (spare part), 10 units	<b>6ES7392-2XX20-0AA0</b>
		<b>Label cover</b> For fail-safe modules (spare part), 10 units	<b>6ES7392-2XY20-0AA0</b>
		<b>LK 393 cable guide</b> For F modules; L+ and M connections, 5 units	<b>6ES7393-4AA10-0AA0</b>
		<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
		<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

**SIMATIC S7-300 advanced controller**

I/O modules

F digital / analog modules

**Isolation module****Overview**

- Supports mixed operation of fail-safe signal modules in safety mode and S7-300 standard modules in an ET 200M when Cat. 4 or SIL 3 has to be achieved.
- The isolation module is not required if the safety class or safety category to be achieved is less than SIL 3 or Cat. 4, respectively.

When Cat. 4/SIL 3 is required, the isolation module must be implemented in the following situations:

Application	Isolation module must be used
<b>Central use after CPU 31xF-2 DP or CPU 31xF-2 PN/DP</b> <ul style="list-style-type: none"> <li>• Only fail-safe modules in the tier</li> <li>• Standard and fail-safe modules in the tier</li> </ul>	Yes, behind the CPU Yes, after the last standard module and before the first fail-safe module
<b>Central use after CPU 31xF-2 DP or CPU 31xF-2 PN/DP in an expansion rack</b> <ul style="list-style-type: none"> <li>• Only fail-safe modules in the tier</li> <li>• Standard and fail-safe modules in the tier</li> </ul>	Yes, after the IM 36x Yes, after the last standard module and before the first fail-safe module
<b>Distributed behind the IM 153-2 with copper connection</b> <ul style="list-style-type: none"> <li>• Only fail-safe modules in the station</li> <li>• Standard and fail-safe modules in the station</li> </ul>	Yes, after the IM 153-2 Yes, after the last standard module and before the first fail-safe module
<b>Distributed behind the IM 153-2 with fiber-optic connection</b> <ul style="list-style-type: none"> <li>• Only fail-safe modules in the station</li> <li>• Standard and fail-safe modules in the station</li> </ul>	No Yes, after the last standard module and before the first fail-safe module

**Technical specifications**

Article number	<b>6ES7195-7KF00-0XA0</b> SEPARATOR MOD. BETW. F- AND STD-MOD.
<b>Product type designation</b>	
<b>Weights</b>	
Weight, approx.	10 g

**Ordering data****Article No.**

<b>Isolation module</b> for simultaneous operation of fail-safe and standard modules in an ET 200M	<b>6ES7195-7KF00-0XA0</b>
<b>Isolation bus module</b> for accommodating the isolating module in an ET 200M	<b>6ES7195-7HG00-0XA0</b>

**Overview**

- Digital inputs for the fail-safe SIPLUS S7 systems
- For connecting:
  - Switches and 2-wire proximity switches
  - Sensors according to NAMUR and mechanical contacts, also for signals from hazardous areas
- With integral safety functions for fail-safe operation
- Can be used in fail-safe operation
  - Centrally: With S7-31xF-2 DP
  - Distributed in ET 200M: With SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH
- In standard operation can be used in the same way as S7-300 modules

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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**Technical specifications**

Article number	<b>6AG1326-1BK02-2AB0</b>	<b>6AG1326-1BK02-2AY0</b>	<b>6AG1326-1RF00-4AB0</b>
Based on	<b>6ES7326-1BK02-0AB0</b>	<b>6ES7326-1BK02-0AB0</b>	<b>6ES7326-1RF00-0AB0</b>
	SIPLUS S7-300 SM326F DI24	SIPLUS S7-300 SM326F DI24	SIPLUS S7-300 SM326F DI8 NAMUR
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-25 °C; = Tmin	-25 °C; = Tmin	0 °C; = Tmin
• max.	60 °C; = Tmax	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN 50155	60 °C; = Tmax
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>			
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)		100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!		Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!		Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!		Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS F digital/analog modules

**SIPLUS S7-300 SM 326 F digital input modules - Safety Integrated****Ordering data****Article No.****Article No.****SIPLUS S7-300 SM 326 F  
digital input**Extended temperature range and  
exposure to media24 inputs, 24 V DC, failsafe,  
with diagnostics interrupt**6AG1326-1BK02-2AB0**For medial exposure

8 inputs, 24 V DC, NAMUR, failsafe

**6AG1326-1RF00-4AB0**Conforms to EN 5015524 inputs, 24 V DC, failsafe,  
with diagnostics interrupt**6AG1326-1BK02-2AY0****Accessories****Active bus modules**Extended temperature range and  
exposure to mediaBM 2 x 40 for accepting  
2 IO modules, each 40 mm wide**6AG1195-7HB00-7XA0**BM 1 x 80 for accepting  
1 IO module, 80 mm wide**6AG1195-7HC00-2XA0****SIPLUS S7-300 PS 307  
load power supply, 5 A**Extended temperature range and  
exposure to mediaIncl. connection bracket  
120/230 V AC; 24 V DC  
Output current 5 A  
(dimensions 60 x 125 x 120)**6AG1307-1EA01-7AA0****Additional accessories**See SIMATIC S7-300  
SM 326 F digital input,  
page 5/110

**Overview**

- Digital outputs for the fail-safe SIMATIC S7 systems
- For connection of solenoid valves, DC contactors and indicator lights
- With integral safety functions for fail-safe operation
- Can be used in fail-safe mode
  - Centrally: With S7-31xF-2 DP
  - Distributed in ET 200M: With SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	<b>6AG1326-2BF10-2AB0</b>	<b>6AG1326-2BF10-2AY0</b>	<b>6AG1326-2BF41-2AB0</b>	<b>6AG1326-2BF41-2AY0</b>
Based on	<b>6ES7326-2BF10-0AB0</b> SIPLUS S7-300 SM326F 10 DO	<b>6ES7326-2BF10-0AB0</b> SIPLUS S7-300 SM326 10F-DO	<b>6ES7326-2BF41-0AB0</b> SIPLUS S7-300 SM326F DO8	<b>6ES7326-2BF41-0AB0</b> SIPLUS S7-300 SM326 F DO8 EN50155
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	-25 °C	-25 °C; = Tmin	-25 °C	-25 °C; = Tmin
• max.	60 °C	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN 50155	60 °C	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN 50155
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)		100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!		Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!		Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!		Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	

**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS F digital/analog modules

**SIPLUS S7-300 SM 326 F digital output modules - Safety Integrated****Ordering data****Article No.****Article No.****SIPLUS S7-300 SM 326 F  
digital output**Extended temperature range and  
exposure to media

10 outputs, 24 V DC, 2 A, failsafe

8 outputs, 24 V DC, 2 A, failsafe,  
source-sinking outputConforms to EN 50155

10 outputs, 24 V DC, 2 A, failsafe

8 outputs, 24 V DC, 2 A, failsafe,  
source-sinking output**6AG1326-2BF10-2AB0****6AG1326-2BF41-2AB0****6AG1326-2BF10-2AY0****6AG1326-2BF41-2AY0****Accessories****Active bus modules**Extended temperature range and  
exposure to mediaBM 2 x 40 for accepting  
2 IO modules each 40 mm wideBM 1 x 80 for accepting  
1 IO module 80 mm wide**SIPLUS S7-300 PS 307  
load power supply, 5 A**Extended temperature range and  
exposure to mediaIncl. connection bracket  
120/230 V AC; 24 V DC  
Output current 5 A  
(dimensions 60 x 125 x 120)**Further accessories****6AG1195-7HB00-7XA0****6AG1195-7HC00-2XA0****6AG1307-1EA01-7AA0**See SIMATIC S7-300  
SM 326 F digital output,  
page 5/113

**Overview**

F-AI HART analog input module for ET 200M

- Analog inputs for fail-safe SIPLUS S7 systems
- Applicable in the ET 200M distributed I/O device with IM 153-2 HF as well as centrally with SIPLUS S7-31xF-2 DP
- Properties of the SM 336; F-AI 6 x 0/4 ... 20 mA HART:
  - 6 analog inputs with galvanic isolation between channels and backplane bus
  - Input ranges: 0 mA to 20 mA, 4 mA to 20 mA
  - Short-circuit proof power supply of 2 or 4-wire transmitter via the module
  - External encoder supply possible
  - Applicable in safety mode
  - HART communication
  - Firmware update using HW Config
  - Identification data

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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**Technical specifications**

Article number	<b>6AG1336-4GE00-4AB0</b>
Based on	<b>6ES7336-4GE00-0AB0</b> SIPLUS S7-300 SM336 6AE F
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	0 °C; = Tmin
• max.	60 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Article number	<b>6AG1336-4GE00-4AB0</b>
Based on	<b>6ES7336-4GE00-0AB0</b> SIPLUS S7-300 SM336 6AE F
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****SIPLUS S7-300 SM 336 F analog input module**Exposure to media

6 inputs, 15 bit, 0/4 - 20 mA HART

**Article No.****6AG1336-4GE00-4AB0****Article No.****Accessories****Active bus modules**Extended temperature range and exposure to media

BM 2 x 40 for accepting 2 IO modules, each 40 mm wide

**6AG1195-7HB00-7XA0**

BM 1 x 80 for accepting 1 IO module, 80 mm wide

**6AG1195-7HC00-2XA0****SIPLUS S7-300 PS 307, 5 A load power supply**Extended temperature range and exposure to media

Incl. connection bracket 120/230 V AC; 24 V DC Output current 5 A (dimensions 60 x 125 x 120)

**6AG1307-1EA01-7AA0****Additional accessories**

See SIMATIC S7-300 SM 336 F analog input module, page 5/115



**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS F digital/analog modules

**SIPLUS S7-300 isolation modules****Overview**

- Permits combined operation of fail-safe signal modules in safety mode and standard S7-300 modules in the same ET 200M system.
- The isolation module is not required if the safety class SIL 3 or safety category < Cat. 4 is to be achieved.

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	<b>6AG1195-7KF00-2XA0</b>
Based on	<b>6ES7195-7KF00-0XA0</b> SIPLUS S7-300 ISOLATION MODULE
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>	
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Article number	<b>6AG1195-7KF00-2XA0</b>
Based on	<b>6ES7195-7KF00-0XA0</b> SIPLUS S7-300 ISOLATION MODULE
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes
- against chemically active substances / conformity with EN 60721-3-3	Yes
- against mechanically active substances / conformity with EN 60721-3-3	Yes

**Ordering data****SIPLUS F isolating modules**

for simultaneous operation of fail-safe and standard modules in the same ET 200M

Extended temperature range and exposure to media

Conforms to EN 50155

**Article No.****6AG1195-7KF00-2XA0****6AG1195-7KF00-2XA0****Accessories****SIPLUS ET 200M separator bus module F**

for the simultaneous operation of failsafe and standard modules in an ET200 M for the hot swapping function

Extended temperature range and exposure to media

**Article No.****6AG1195-7HG00-2XA0**

## Overview



- Digital inputs for signals from the Ex field
- For the connection of intrinsically safe digital equipment from the Ex field
- 4 DI NAMUR
- 4 digital inputs in 4 channel modules (single-channel isolation)
- Connectable encoder in accordance with DIN EN 60947-5-6 and NAMUR, optionally with wired or unwired mechanical contacts
- Diagnostics and diagnostics alarm programmable

## Technical specifications

Article number	<b>6ES7321-7RD00-0AB0</b> SM321, 4DI, DC24V, HAZARDOUS AREAS
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
from load voltage L+ (without load), max.	50 mA
from backplane bus 5 V DC, max.	80 mA
<b>Encoder supply</b>	
Type of output voltage	via the inputs
<b>Power losses</b>	
Power loss, typ.	1.1 W
<b>Digital inputs</b>	
Number of NAMUR inputs	4
<b>Input voltage</b>	
• Rated value (DC)	8.2 V; from internal power circuit supply
<b>Input current</b>	
• on wire break, max.	0.1 mA
• on short -circuit, max.	8.5 mA
<b>for NAMUR encoders</b>	
- for signal "0"	0.35 to 1.2 mA
- for signal "1"	2.1 to 7 mA
<b>Input delay (for rated value of input voltage)</b>	
• Input frequency (with a time delay of 0.1 ms), max.	2 kHz
<b>for NAMUR inputs</b>	
- Parameterizable	Yes; 0.1 / 0.5 / 3 / 15 / 20 ms (plus 0.25 ms preparation time)
<b>Cable length</b>	
• Unshielded, max.	200 m
<b>Encoder</b>	
<b>Connectable encoders</b>	
• NAMUR encoder	Yes; Two-wire connection
<b>Interrupts/diagnostics/status information</b>	
<b>Diagnostic messages</b>	
• Diagnostic information readable	Yes

Article number	<b>6ES7321-7RD00-0AB0</b> SM321, 4DI, DC24V, HAZARDOUS AREAS
<b>Ex(i) characteristics</b>	
<b>Max. values of input circuits (per channel)</b>	
• Co (permissible external capacity), max.	3 µF
• Io (short-circuit current), max.	14.1 mA
• Lo (permissible external inductivity), max.	100 mH
• Po (power of load), max.	33.7 mW
• Uo (output no-load voltage), max.	10 V
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• Galvanic isolation digital inputs	Yes
• between the channels, in groups of	1
<b>Standards, approvals, certificates</b>	
<b>Use in hazardous areas</b>	
• Type of protection acc. to EN 50020 (CENELEC)	[EEx ib] IIC
• Type of protection acc. to FM	Class II, Division 2, Group A, B, C, D T4
• Test number PTB	Ex-96.D.2094X
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• max.	60 °C
<b>Connection method</b>	
required front connector	20-pin
<b>Weights</b>	
Weight, approx.	230 g

**SIMATIC S7-300 advanced controller**

I/O modules

Ex digital modules

**Ex digital input modules**

<b>Ordering data</b>	<b>Article No.</b>		<b>Article No.</b>
<b>Ex digital input module</b> 4 inputs, isolated, NAMUR	<b>6ES7321-7RD00-0AB0</b>	<b>Labeling sheets for machine inscription</b> for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
<b>Front connector</b> 20-pin, with screw contacts • 1 unit • 100 units	<b>6ES7392-1AJ00-0AA0</b> <b>6ES7392-1AJ00-1AB0</b>	petrol	<b>6ES7392-2AX00-0AA0</b>
<b>Front door, elevated design</b> e.g. for 32 channel modules; enables connection of 1.3 mm <sup>2</sup> /16 AWG wires	<b>6ES7328-0AA00-7AA0</b>	light-beige	<b>6ES7392-2BX00-0AA0</b>
<b>LK 393 cable guide</b> Mandatory for operation in Ex-hazard areas	<b>6ES7393-4AA00-0AA0</b>	yellow	<b>6ES7392-2CX00-0AA0</b>
<b>Labeling strips</b> 10 units (spare part), for modules with 20-pin front connector	<b>6ES7392-2XX00-0AA0</b>	red	<b>6ES7392-2DX00-0AA0</b>
<b>Label cover</b> 10 units (spare part), for modules with 20-pin front connector	<b>6ES7392-2XY00-0AA0</b>	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
		<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>

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**Overview**

- Digital outputs for signals from the Ex field
- For the connection of intrinsically safe digital equipment from the Ex field
- 4 DO DC 24 V/10mA or 4 DO DC 15 V/20 mA
- 4 digital outputs in 4 channel modules (single-channel isolation)
- Diagnostics and diagnostics alarm programmable
- Substitute value behavior programmable

**Technical specifications**

Article number	<b>6ES7322-5SD00-0AB0</b> SM322, 4DO, 15V DC, 10MA, HAZARDOUS AREAS	<b>6ES7322-5RD00-0AB0</b> SM322, 4DO, 15V DC, 20MA, HAZARDOUS AREAS
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
<b>Input current</b>		
from load voltage L+ (without load), max.	160 mA	160 mA
from backplane bus 5 V DC, max.	70 mA	70 mA
<b>Power losses</b>		
Power loss, typ.	3 W	3 W
<b>Digital outputs</b>		
Number of digital outputs	4	4
short-circuit protection	Yes; Electronic	Yes; Electronic
• Response threshold, typ.	Output current with short-circuit protection, min. 10 mA + 10 %	Output current with short-circuit protection, min. 20.5 mA + 10 %
<b>Load resistance range</b>		
• upper limit	390 Ω; Two-wire connection	200 Ω; Two-wire connection
<b>Output voltage</b>		
• Rated value (DC)	24 V	15 V
<b>Output current</b>		
• for signal "I" permissible range for 0 to 60 °C, max.	10 mA; +/-10 %	20 mA; +/-10 %
<b>Switching frequency</b>		
• with resistive load, max.	100 Hz	100 Hz
<b>Cable length</b>		
• Unshielded, max.	200 m	200 m
<b>Interrupts/diagnostics/status information</b>		
<b>Diagnostic messages</b>		
• Diagnostic information readable	Yes	Yes
• Short circuit	Yes	Yes
• Group error	Yes	Yes

**SIMATIC S7-300 advanced controller**

I/O modules

Ex digital modules

**Ex digital output modules****Technical specifications (continued)**

Article number	<b>6ES7322-5SD00-0AB0</b> SM322, 4DO, 15V DC, 10MA, HAZARDOUS AREAS	<b>6ES7322-5RD00-0AB0</b> SM322, 4DO, 15V DC, 20MA, HAZARDOUS AREAS
<b>Ex(i) characteristics</b>		
<b>Max. values of output circuits (per channel)</b>		
• Co (permissible external capacity), max.	90 nF	500 nF
• Io (short-circuit current), max.	70 mA	85 mA
• Lo (permissible external inductivity), max.	6.7 mH	5 mH
• Po (power of load), max.	440 mW	335 mW
• Uo (output no-load voltage), max.	25.2 V	15.75 V
<b>Galvanic isolation</b>		
<b>Galvanic isolation digital outputs</b>		
• Galvanic isolation digital outputs	Yes	Yes
• between the channels, in groups of	1	1
<b>Standards, approvals, certificates</b>		
<b>Use in hazardous areas</b>		
• Type of protection acc. to EN 50020 (CENELEC)	[EEx ib] IIC	[EEx ib] IIC
• Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4	AIS CL.1, DIV 1, GP A, B, C, D; CL.1, DIV 2, GP A, B, C, D T4
• Test number PTB	Ex-96.D.2093X	Ex-96.D.2102X
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• max.	60 °C	60 °C
<b>Connection method</b>		
required front connector	20-pin	20-pin
<b>Weights</b>		
Weight, approx.	230 g	230 g

**Ordering data**

	<b>Article No.</b>		<b>Article No.</b>
<b>Ex digital output modules</b>		<b>Labeling sheets for machine inscription</b>	
4 outputs, isolated, 24 V DC, 10 mA	<b>6ES7322-5SD00-0AB0</b>	for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units	
4 outputs, isolated, 15 V DC, 20 mA	<b>6ES7322-5RD00-0AB0</b>	petrol	<b>6ES7392-2AX00-0AA0</b>
<b>Front connector</b>		light-beige	<b>6ES7392-2BX00-0AA0</b>
20-pin, with screw contacts		yellow	<b>6ES7392-2CX00-0AA0</b>
• 1 unit	<b>6ES7392-1AJ00-0AA0</b>	red	<b>6ES7392-2DX00-0AA0</b>
• 100 units	<b>6ES7392-1AJ00-1AB0</b>	<b>SIMATIC Manual Collection</b>	<b>6ES7998-8XC01-8YE0</b>
<b>Front door, elevated design</b>	<b>6ES7328-0AA00-7AA0</b>	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
e.g. for 32 channel modules; enables connection of 1.3 mm <sup>2</sup> /16 AWG wires		<b>SIMATIC Manual Collection update service for 1 year</b>	<b>6ES7998-8XC01-8YE2</b>
<b>LK 393 cable guide</b>	<b>6ES7393-4AA00-0AA0</b>	Current "Manual Collection" DVD and the three subsequent updates	
Mandatory for operation in Ex-hazard areas			
<b>Labeling strips</b>	<b>6ES7392-2XX00-0AA0</b>		
10 units (spare part), for modules with 20-pin front connector			
<b>Label cover</b>	<b>6ES7392-2XY00-0AA0</b>		
10 units (spare part), for modules with 20-pin front connector			

**Overview**

- Digital inputs for signals from the Ex field
- For the connection of intrinsically safe digital equipment from the Ex field
- 4 DI NAMUR
- 4 digital inputs in 4 channel modules (single-channel isolation)
- Connectable encoder in accordance with DIN EN 60947-5-6 and NAMUR, optionally with wired or unwired mechanical contacts
- Programmable diagnostics and diagnostic interrupt

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	<b>6AG1321-7RD00-4AB0</b>
Based on	<b>6ES7321-7RD00-0AB0</b> SIPLUS SM321 4DI NAMUR
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	0 °C; = Tmin
• max.	60 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Article number	<b>6AG1321-7RD00-4AB0</b>
Based on	<b>6ES7321-7RD00-0AB0</b> SIPLUS SM321 4DI NAMUR
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data**

<b>SIPLUS S7-300 Ex digital input module</b>	<b>6AG1321-7RD00-4AB0</b>
<u>Exposure to media</u>	
4 inputs, isolated, NAMUR	

**Article No.**

<b>Accessories</b>	See SIMATIC S7-300 Ex digital input modules, page 5/124
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**SIMATIC S7-300 advanced controller**

I/O modules

Ex analog modules

**Ex analog input modules****Overview**

- Analog inputs for signals from the Ex field
- For the connection of intrinsically safe analog equipment from the Ex field
- 8 or 4 analog inputs in 4 channel groups (single-channel isolation)
- Measurement type and range can be selected for each channel
- Diagnostics and diagnostics alarm programmable
- Programmable threshold alarm
- HART-compatible inputs (only 6ES7331-7RD00-0AB0)

**Technical specifications**

Article number	<b>6ES7331-7RD00-0AB0</b>	<b>6ES7331-7SF00-0AB0</b>
	SIMATIC S7, SM 331 ANALOG INPUT	SIMATIC S7, SM 331 ANALOG INPUT
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
<b>Input current</b>		
from backplane bus 5 V DC, max.	60 mA	120 mA
from supply voltage L+, max.	150 mA	
<b>Output voltage</b>		
<b>Power supply to the transmitters</b>		
• present	Yes	
• Rated value (DC)	13 V; at 22 mA	
• No-load voltage (DC)	25.2 V	
<b>Power losses</b>		
Power loss, typ.	3 W	0.6 W
<b>Analog inputs</b>		
Number of analog inputs	4	8; 8x thermocouples; 4x RTD thermoresistors
permissible input current for current input (destruction limit), max.	40 mA	
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	
<b>Input ranges (rated values), thermoelements</b>		
• Type B		Yes
• Type E		Yes
• Type J		Yes
• Type K		Yes
• Type L		Yes
• Type N		Yes
• Type R		Yes
• Type S		Yes
• Type T		Yes
• Type U		Yes

## Technical specifications (continued)

Article number	6ES7331-7RD00-0AB0 SIMATIC S7, SM 331 ANALOG INPUT	6ES7331-7SF00-0AB0 SIMATIC S7, SM 331 ANALOG INPUT
<b>Input ranges (rated values), resistance thermometer</b>		
• Ni 100		Yes
• Pt 100		Yes
• Pt 200		Yes
<b>Cable length</b>		
• shielded, max.	200 m	200 m; TC: 50 m
<b>Analog value creation</b>		
Measurement principle	Sigma Delta	Sigma Delta
<b>Integration and conversion time/ resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	16 bit; 10 to 15 bits + sign	16 bit; 10 to 15 bits + sign
• Integration time, parameterizable	Yes, 2.5 ... 100 ms	Yes, 2.5 ... 100 ms
• Interference voltage suppression for interference frequency f1 in Hz	10 ... 400 Hz	10 ... 400 Hz
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
• for current measurement as 2-wire transducer	Yes	Yes
• for current measurement as 4-wire transducer	Yes	Yes
<b>Errors/accuracies</b>		
Temperature error (relative to input range), (+/-)		Temperature error: 0.001 to 0.002 %/K
<b>Operational limit in overall temperature range</b>		
• Current, relative to input area, (+/-)	0.45 %	
• Resistance thermometer, relative to input area, (+/-)		0.09 to 0.04%
<b>Basic error limit (operational limit at 25 °C)</b>		
• Current, relative to input area, (+/-)	0.1 %	
• Resistance thermometer, relative to input area, (+/-)		0.1 %
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, f1 = interference frequency</b>		
• Series mode interference (peak value of interference < rated value of input range), min.	60 dB	60 dB
• Common mode interference, min.	130 dB	130 dB
<b>Interrupts/diagnostics/ status information</b>		
<b>Diagnostic messages</b>		
• Diagnostic information readable	Yes	Yes
• Overrange	Yes	Yes
• Wire break in signal transmitter cable	Yes	Yes
• Short circuit of the signal encoder cable	Yes	Yes
<b>Ex(i) characteristics</b>		
<b>Max. values of input circuits (per channel)</b>		
• Co (permissible external capacity), max.	90 nF	43 µF
• Io (short-circuit current), max.	68.5 mA	28.8 mA
• Lo (permissible external inductivity), max.	7.5 mH	40 mH
• Po (power of load), max.	431 mW	41.4 mW
• Ri, max.	50 Ω	
• Uo (output no-load voltage), max.	25.2 V	5.9 V



**SIMATIC S7-300 advanced controller**

I/O modules

Ex analog modules

**Ex analog input modules****Technical specifications** (continued)

Article number	<b>6ES7331-7RD00-0AB0</b> SIMATIC S7, SM 331 ANALOG INPUT	<b>6ES7331-7SF00-0AB0</b> SIMATIC S7, SM 331 ANALOG INPUT
<b>Galvanic isolation</b>		
<b>Galvanic isolation analog inputs</b>		
• Galvanic isolation analog inputs	Yes	Yes
<b>Permissible potential difference</b>		
between the inputs (UCM)	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in NON-hazardous area	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in NON-hazardous area
between inputs and MANA (UCM)	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in NON-hazardous area	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in NON-hazardous area
<b>Standards, approvals, certificates</b>		
<b>Use in hazardous areas</b>		
• Type of protection acc. to EN 50020 (CENELEC)	[Ex ib] IIC	[Ex ib] IIC
• Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4	Class I, Division 2, Group A, B, C, D T4
• Test number PTB	Ex-96.D.2092X	Ex-96.D.2108X
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• max.	60 °C	60 °C
<b>Connection method</b>		
required front connector	20-pin	20-pin
<b>Weights</b>		
Weight, approx.	290 g	210 g

**Ordering data****Ex analog input modules**4 inputs, isolated,  
0/4 to 20 mA, 15 bit**6ES7331-7RD00-0AB0**8/4 inputs, isolated, for  
thermocouples and  
Pt100, Pt200, Ni100**6ES7331-7SF00-0AB0****Front connector**

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0**  
**6ES7392-1AJ00-1AB0****Front door, elevated design**e.g. for 32 channel modules;  
enables connection of  
1.3 mm<sup>2</sup>/16 AWG wires**6ES7328-0AA00-7AA0****LK 393 cable guide**Mandatory for operation in  
Ex-hazard areas**6ES7393-4AA00-0AA0****Labeling strips**10 units (spare part), for modules  
with 20-pin front connector**6ES7392-2XX00-0AA0****Label cover**10 units (spare part), for modules  
with 20-pin front connector**6ES7392-2XY00-0AA0****Labeling sheets for machine inscription**for modules with 20-pin front  
connector, DIN A4, for printing with  
laser printer; 10 units

petrol

**6ES7392-2AX00-0AA0**

light-beige

**6ES7392-2BX00-0AA0**

yellow

**6ES7392-2CX00-0AA0**

red

**6ES7392-2DX00-0AA0****SIMATIC Manual Collection**Electronic manuals on DVD,  
multilingual: LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC Based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC**6ES7998-8XC01-8YE0****SIMATIC Manual Collection  
update service for 1 year**Current "Manual Collection" DVD  
and the three subsequent updates**6ES7998-8XC01-8YE2**

## Overview



- Analog outputs for signals from the Ex field
- For the connection of intrinsically safe analog equipment from the Ex field
- 4 analog outputs in 4 channel modules (single-channel isolation)
- Diagnostics and diagnostics alarm programmable

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## Technical specifications

Article number	<b>6ES7332-5RD00-0AB0</b> SM332, 4AA, 0/4-20mA, HAZARD. AREA
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
from load voltage L+ (without load), max.	180 mA
from backplane bus 5 V DC, max.	80 mA
<b>Power losses</b>	
Power loss, typ.	4 W
<b>Analog outputs</b>	
Number of analog outputs	4
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	70 mA
Current output, no-load voltage, max.	14 V
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Connection of actuators</b>	
• for current output two-wire connection	Yes
<b>Load impedance (in rated range of output)</b>	
• with current outputs, max.	500 Ω
<b>Cable length</b>	
• shielded, max.	200 m

Article number	<b>6ES7332-5RD00-0AB0</b> SM332, 4AA, 0/4-20mA, HAZARD. AREA
<b>Analog value creation</b>	
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	15 bit
• Basic conversion time (ms)	2,5 ms
<b>Errors/accuracies</b>	
<b>Operational limit in overall temperature range</b>	
• Current, relative to output area, (+/-)	0.55 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to output area, (+/-)	0.2 %
<b>Interrupts/diagnostics/ status information</b>	
<b>Diagnostic messages</b>	
• Diagnostic information readable	Yes
• Overrange	Yes
• Wire break in actuator cable	Yes
• Group error	Yes
<b>Ex(i) characteristics</b>	
<b>Max. values of output circuits (per channel)</b>	
• Co (permissible external capacity), max.	850 nF
• Io (short-circuit current), max.	70 mA
• Lo (permissible external inductivity), max.	6.6 mH
• Po (power of load), max.	440 mW
• Uo (output no-load voltage), max.	14 V

**SIMATIC S7-300 advanced controller**

I/O modules

Ex analog modules

**Ex analog output modules****Technical specifications** (continued)

Article number	<b>6ES7332-5RD00-0AB0</b> SM332, 4AA, 0/4-20mA, HAZARD. AREA
<b>Galvanic isolation</b>	
<b>Galvanic isolation analog outputs</b>	
• Galvanic isolation analog outputs	Yes
<b>Permissible potential difference</b>	
between outputs and MANA (UCM)	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in NON-hazardous area
between the outputs (UCM)	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in NON-hazardous area
<b>Standards, approvals, certificates</b>	
<b>Use in hazardous areas</b>	
• Type of protection acc. to EN 50020 (CENELEC)	[Ex ib] IIC
• Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4
• Test number PTB	Ex-96.D.2026X

Article number	<b>6ES7332-5RD00-0AB0</b> SM332, 4AA, 0/4-20mA, HAZARD. AREA
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• max.	60 °C
<b>Connection method</b>	
required front connector	20-pin
<b>Weights</b>	
Weight, approx.	280 g

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**Ordering data****Article No.**

<b>Ex analog output module</b>	<b>6ES7332-5RD00-0AB0</b>
4 outputs, isolated, 0/4 to 20 mA	
<b>Front connector</b>	
20-pin, with screw contacts	
• 1 unit	<b>6ES7392-1AJ00-0AA0</b>
• 100 units	<b>6ES7392-1AJ00-1AB0</b>
<b>Front door, elevated design</b>	<b>6ES7328-0AA00-7AA0</b>
e.g. for 32 channel modules; enables connection of 1.3 mm <sup>2</sup> /16 AWG wires	
<b>LK 393 cable guide</b>	<b>6ES7393-4AA00-0AA0</b>
Mandatory for operation in Ex-hazard areas	
<b>Labeling strips</b>	<b>6ES7392-2XX00-0AA0</b>
10 units (spare part), for modules with 20-pin front connector	
<b>Label cover</b>	<b>6ES7392-2XY00-0AA0</b>
10 units (spare part), for modules with 20-pin front connector	

**Article No.**

<b>Labeling sheets for machine inscription</b>	
for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
petrol	<b>6ES7392-2AX00-0AA0</b>
light-beige	<b>6ES7392-2BX00-0AA0</b>
yellow	<b>6ES7392-2CX00-0AA0</b>
red	<b>6ES7392-2DX00-0AA0</b>
<b>SIMATIC Manual Collection</b>	<b>6ES7998-8XC01-8YE0</b>
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
<b>SIMATIC Manual Collection update service for 1 year</b>	<b>6ES7998-8XC01-8YE2</b>
Current "Manual Collection" DVD and the three subsequent updates	

**Overview**

- Analog inputs for signals from the Ex field
- For the connection of intrinsically safe analog equipment from the Ex field
- 4 analog inputs in 4 channel groups (single-channel isolation)
- Measurement type and range can be selected for each channel
- Programmable diagnostics and diagnostic interrupt
- Programmable threshold alarm
- HART-compatible inputs (6AG1331-7RD00-2AB0 only)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	6AG1331-7RD00-2AB0	6AG1331-7SF00-4AB0
Based on	6ES7331-7RD00-0AB0 SIPLUS S7-300 SM331 4AE	6ES7331-7SF00-0AB0 SIPLUS S7-300 SM331 AI
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	0 °C; = Tmin
• max.	60 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use, 70 °C only 4 wire	60 °C; = Tmax
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude		Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %	100 %
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****SIPLUS S7-300 Ex analog input modules**Extended temperature range and exposure to media

4 inputs, isolated, 0/4 to 20 mA, 15 bit

Exposure to media

8/4 inputs, isolated, for thermocouples and Pt100, Pt200, Ni100; medial exposure only

**Article No.**

6AG1331-7RD00-2AB0

6AG1331-7SF00-4AB0

**Article No.****Accessories**

See SIMATIC S7-300 Ex analog input modules, page 5/133

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**FM 350-1 counter modules****Overview**

- One-channel intelligent counter module for simple counting tasks
- For direct connection of incremental encoders
- Comparison function with 2 specifiable comparison values
- Integrated digital outputs to output the response upon reaching the comparison value.
- Operating modes:
  - Continuous counting
  - One-shot counting
  - Periodic counting
- Special functions:
  - Set counter
  - Latch counter
- Start/stop counter with gate function

**Note:**

Incremental encoders and pre-assembled connecting cables for counting and positioning functions are offered under SIMODRIVE Sensor or Motion Connect 500.

<http://www.siemens.com/simatic-technology>

**Technical specifications**

Article number	<b>6ES7350-1AH03-0AE0</b> FM350-1, COUNTER MODULE, UP TO 500 KHZ
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Aux. voltage 1L+, load voltage 2L+</b>	
• Rated value (DC)	24 V
<b>Permissible range (ripple included)</b>	
- dynamic, lower limit (DC)	18.5 V
- dynamic, upper limit (DC)	30.2 V
- static, lower limit (DC)	20.4 V
- static, upper limit (DC)	28.8 V
<b>non-periodic skip</b>	
- Duration	500 ms
- Recovery time	50 s
- Value	35 V
<b>Input current</b>	
from load voltage 1L+ (without load), max.	40 mA
from backplane bus 5 V DC, max.	160 mA
<b>5 V encoder supply</b>	
• 5 V	Yes; 5.2 V +/-2%
• Output current, max.	300 mA
<b>24 V encoder supply</b>	
• 24 V	Yes; 1L+ (-3 V)
• Output current, max.	400 mA
<b>Power losses</b>	
Power loss, typ.	4.5 W

Article number	<b>6ES7350-1AH03-0AE0</b> FM350-1, COUNTER MODULE, UP TO 500 KHZ
<b>Digital inputs</b>	
Number of digital inputs	3
Functions	1 for gate start, 1 for gate stop, 1 for setting the counter
<b>Input voltage</b>	
• for signal "0"	-28.8 ... +5V
• for signal "1"	+11 to +28.8V
<b>Input current</b>	
• for signal "1", typ.	9 mA
<b>Digital outputs</b>	
Number of digital outputs	2
short-circuit protection	Yes; Clocked electronically
Limitation of inductive shutdown voltage to	2L+ (-39 V)
<b>Output voltage</b>	
• for signal "0", max.	3 V
• for signal "1", min.	2L+ (-1.5 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.	0.6 A
<b>Output delay with resistive load</b>	
• "0" to "1", max.	300 µs

## Technical specifications (continued)

Article number	<b>6ES7350-1AH03-0AE0</b> FM350-1, COUNTER MODULE, UP TO 500 KHZ
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes; With 2 pulse trains offset by 90°
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 24 V directional element	Yes; 1 pulse train, 1 direction level
<b>Counter</b>	
Number of counter inputs	1
Counting range, description	32 bit or +/-31 bit
Minimum pulse width, adjustable	Yes; 2.5 or 25 µs
<b>Counter input 5 V</b>	
• Type	RS 422
• Terminating resistor	220 Ω
• Differential input voltage	1,3 V
• Counting frequency, max.	500 kHz
<b>Counter input 24 V</b>	
• Input voltage, for signal "0"	-28.8 ... +5V
• Input voltage, for signal "1"	+11 to +28.8V
• Input current, for signal "1", typ.	9 mA
• Counting frequency, max.	200 kHz
• Minimum pulse width	2.5 µs

Article number	<b>6ES7350-1AH03-0AE0</b> FM350-1, COUNTER MODULE, UP TO 500 KHZ
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• between the channels and the backplane bus	Yes; Optocoupler
<b>Galvanic isolation digital outputs</b>	
• between the channels and the backplane bus	Yes; Optocoupler
<b>Galvanic isolation counter</b>	
• between the channels and the backplane bus	Yes; Optocoupler
<b>Permissible potential difference</b>	
between different circuits	75V DC/60V AC
<b>Isolation</b>	
Isolation checked with	500 V
<b>Connection method</b>	
required front connector	1x 20-pin
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	250 g

**SIMATIC S7-300 advanced controller**

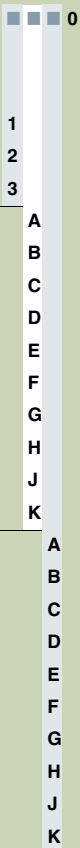
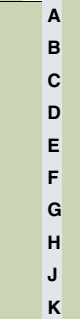
I/O modules

Function modules

**FM 350-1 counter modules****Ordering data****Article No.**

<b>FM 350-1 counter module</b> with 1 channel, max. 500 kHz; for incremental encoder	<b>6ES7350-1AH03-0AE0</b>
<b>Coding plug - Range card for analog inputs</b> Spare part	<b>6ES7974-0AA00-0AA0</b>
<b>Front connector</b> 20-pin, with screw contacts • 1 unit • 100 units	<b>6ES7392-1AJ00-0AA0</b> <b>6ES7392-1AJ00-1AB0</b>
20-pin, with spring-loaded contacts • 1 unit • 100 units	<b>6ES7392-1BJ00-0AA0</b> <b>6ES7392-1BJ00-1AB0</b>
<b>Bus connectors</b> 1 unit (spare part)	<b>6ES7390-0AA00-0AA0</b>
<b>Labeling strips</b> 10 units (spare part)	<b>6ES7392-2XX00-0AA0</b>
<b>Labeling sheets for machine inscription</b>	See under "Accessories", page 5/263
<b>Slot number label</b> Spare part	<b>6ES7912-0AA00-0AA0</b>
<b>Shield connection element</b> 80 mm wide, with 2 rows for 4 terminals each	<b>6ES7390-5AA00-0AA0</b>
<b>Terminal elements</b> 2 units For 2 cables with 2 mm to 6 mm diameter	<b>6ES7390-5AB00-0AA0</b>
For 1 cable with 3 mm to 8 mm diameter	<b>6ES7390-5BA00-0AA0</b>
For 1 cable with 4 mm to 13 mm diameter	<b>6ES7390-5CA00-0AA0</b>
<b>Connectable incremental encoders 6FX2 001-2...</b>	Refer to the Industry Mall under SIMODRIVE Sensor or Motion Connect 500 (see also <a href="http://www.siemens.com/simatic-technology">http://www.siemens.com/ simatic-technology</a> )

**Article No.**

<b>Signal cable</b> Pre-assembled for HTL and TTL encoder, without sub D connector, UL/DESINA Length code: 0 m 100 m 200 m	<b>6FX5002-2CA12-0</b> 
0 m 10 m 20 m 30 m 40 m 50 m 60 m 70 m 80 m 90 m	

## Overview



- 8-channel intelligent counter module for universal counting and measuring
- To directly connect 24 V incremental encoders, direction sensors, initiators or NAMUR encoders
- Check function with preselectable set points (number depends on mode)
- Integrated digital outputs to output the response when the setpoint is reached
- Modes:
  - Continuous/one-off/periodic counting
  - Frequency/speed measurement
  - Cycle duration measurement
  - Dosing

Note:

Incremental encoder and prefabricated connecting cables for counter and positioning function are offered under SIMODRIVE Sensor and Motion Connect 500.

<http://www.siemens.com/simatic-technology>

## Technical specifications

Article number	<b>6ES7350-2AH01-0AE0</b> FM350-2, COUNTER MOD., 8 CHANNELS, 20KHZ
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Aux. voltage 1L+, load voltage 2L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
<b>Input current</b>	
from load voltage L+ (without load), max.	150 mA
from backplane bus 5 V DC, max.	100 mA
<b>Encoder supply</b>	
Type of output voltage	NAMUR-encoder supply: 8.2 V +/-2%
short-circuit protection	Yes
<b>Output current</b>	
• nominal	200 mA
<b>Power losses</b>	
Power loss, typ.	10 W
<b>Digital inputs</b>	
Number of digital inputs	8
Functions	1 each for gate start/ gate stop
<b>Input voltage</b>	
• for signal "0"	-3 to +5V
• for signal "1"	11 to 30.2 V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	9 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at "0" to "1", max.	50 µs
<b>Cable length</b>	
• shielded, max.	100 m

Article number	<b>6ES7350-2AH01-0AE0</b> FM350-2, COUNTER MOD., 8 CHANNELS, 20KHZ
<b>Digital outputs</b>	
Number of digital outputs	8
short-circuit protection	Yes
Limitation of inductive shutdown voltage to	L+ (-40 V)
<b>Output voltage</b>	
• for signal "1", min.	L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	300 µs
<b>Switching frequency</b>	
• with resistive load, max.	500 Hz
• with inductive load, max.	0.5 Hz
<b>Aggregate current of outputs (per group)</b>	
<b>horizontal installation</b>	
- up to 40 °C, max.	4 A
- up to 60 °C, max.	2 A
<b>all other mounting positions</b>	
- up to 40 °C, max.	2 A
<b>Cable length</b>	
• shielded, max.	600 m
• Unshielded, max.	100 m



**SIMATIC S7-300 advanced controller**

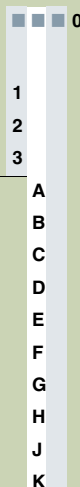
I/O modules

Function modules

**FM 350-2 counter modules****Technical specifications (continued)**

Article number	<b>6ES7350-2AH01-0AE0</b> FM350-2, COUNTER MOD., 8 CHANNELS, 20KHZ
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 24 V directional element	Yes
• NAMUR encoder	Yes
• 2-wire sensor	Yes
<b>NAMUR encoder</b>	
• Number of NAMUR inputs	8
• Input signal	to DIN 19 234
• Input current for signal "0", max.	1.2 mA
• Input current for signal "1", min.	2.1 mA
• Input delay, max.	50 µs
• Input frequency, max.	20 kHz
• Cable length, shielded, max.	100 m
<b>Interrupts/diagnostics/ status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes; Diagnostic information readable
<b>Counter input 24 V</b>	
• Number	8; 32 bit or +/-31 bit
• Input voltage, for signal "0"	-3 to +5V
• Input voltage, for signal "1"	11 to 30.2 V
• Input current, for signal "0", max. (permissible quiescent current)	2 mA
• Input current, for signal "1", typ.	9 mA
• Input delay, max.	50 µs
• Counting frequency, max.	20 kHz; Incremental encoder: 10 kHz
• Cable length, max.	100 m

Article number	<b>6ES7350-2AH01-0AE0</b> FM350-2, COUNTER MOD., 8 CHANNELS, 20KHZ
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• between the channels and the backplane bus	Yes; and shielding
• between the channels and the backplane bus (NAMUR)	Yes, against backplane bus and shielding
<b>Galvanic isolation digital outputs</b>	
• between the channels and the backplane bus	Yes; and shielding
<b>Galvanic isolation counter</b>	
• between the channels and the backplane bus	Yes; and shielding
<b>Connection method</b>	
required front connector	1x 40-pin
<b>Dimensions</b>	
Width	80 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	460 g

Ordering data	Article No.	Ordering data	Article No.
<b>FM 350-2 counter module</b> With 8 channels, max. 20 kHz; for 24 V incremental encoders and NAMUR encoders; incl. configura- tion package and electronic documentation on CD	<b>6ES7350-2AH01-0AE0</b>	<b>Signal cable</b> Pre-assembled for HTL and TTL encoder, without sub D connector, UL/DESINA	<b>6FX5002-2CA12-</b> 
<b>Front connector</b> 40-pin, with screw contacts <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 100 units</li> </ul> 40-pin, with spring-loaded contacts <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 100 units</li> </ul>	<b>6ES7392-1AM00-0AA0</b> <b>6ES7392-1AM00-1AB0</b>  <b>6ES7392-1BM01-0AA0</b> <b>6ES7392-1BM01-1AB0</b>	0 m 100 m 200 m  0 m 10 m 20 m 30 m 40 m 50 m 60 m 70 m 80 m 90 m	1 2 3  A B C D E F G H J K
<b>Bus connectors</b> 1 unit (spare part)	<b>6ES7390-0AA00-0AA0</b>	0 m 1 m 2 m 3 m 4 m 5 m 6 m 7 m 8 m 9 m	A B C D E F G H J K
<b>Labeling strips</b> 10 units (spare part)	<b>6ES7392-2XX10-0AA0</b>		
<b>Labeling sheets for machine inscription</b>	See under "Accessories", page 5/263		
<b>Slot number label</b> Spare part	<b>6ES7912-0AA00-0AA0</b>		
<b>Shield connection element</b> 80 mm wide, with 2 rows for 4 terminals each	<b>6ES7390-5AA00-0AA0</b>		
<b>Terminal elements</b> 2 units For 2 cables with 2 mm to 6 mm diameter For 1 cable with 3 mm to 8 mm diameter For 1 cable with 4 mm to 13 mm diameter	<b>6ES7390-5AB00-0AA0</b>  <b>6ES7390-5BA00-0AA0</b>  <b>6ES7390-5CA00-0AA0</b>		

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**FM 351 positioning modules****Overview**

- Two-channel positioning module for rapid-traverse/creep-speed drives
- 4 digital outputs per channel for motor control
- Incremental or synchro-serial position decoding

**Note:**

SIMODRIVE Sensor/Motion Connect 500 feature position-measuring systems and preassembled connecting cables for counting and positioning functions.

<http://www.siemens.com/simatic-technology>

**Technical specifications**

Article number	<b>6ES7351-1AH02-0AE0</b> FM351 POSITIONING MOD. RAPID/CREEP FEED
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	Yes
• 24 V DC	20.4 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
<b>Input current</b>	
Current consumption, max.	350 mA
from backplane bus 5 V DC, max.	150 mA; max.
<b>Encoder supply</b>	
<b>5 V encoder supply</b>	
• 5 V	Yes
• Output current, max.	350 mA
• Cable length, max.	32 m
<b>24 V encoder supply</b>	
• 24 V	Yes
• Output current, max.	400 mA; Per channel
• Cable length, max.	100 m

Article number	<b>6ES7351-1AH02-0AE0</b> FM351 POSITIONING MOD. RAPID/CREEP FEED
<b>Digital inputs</b>	
Number of digital inputs	8
Functions	Reference cams, reversing cams, flying actual value setting, start/stop positioning
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
<b>for 2-wire sensor</b>	
- for signal "0", typ.	2 mA
- for signal "1", typ.	6 mA
<b>Digital outputs</b>	
Number of digital outputs	8
Functions	Rapid traverse, creep, run right, run left
short-circuit protection	Yes
<b>Output voltage</b>	
• Rated value (DC)	24 V
• for signal "1", min.	UP - 0.8 V
<b>Output current</b>	
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA; with UPmax
• for signal "1" permissible range for 0 to 60 °C, max.	600 mA; with UPmax
• for signal "0" residual current, max.	0.5 mA

## Technical specifications (continued)

Article number	<b>6ES7351-1AH02-0AE0</b> FM351 POSITIONING MOD. RAPID/CREEP FEED
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	2 mA; on signal "0", max. 2 mA; on signal "1", max. 6 mA
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input signal	5 V difference signal (phys. RS 422)
• Input frequency, max.	0.5 MHz
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Trace mark signals	A, B
• Zero mark signal	N
• Input voltage	24 V
• Input frequency, max.	50 kHz; 50 kHz for 25 m cable length; 25 kHz for 100 m cable length
<b>Encoder signals, absolute encoder (SSI)</b>	
• Input signal	5 V difference signal (phys. RS 422)
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Message frame length, parameterizable	13 or 25 bit
• Clock frequency, max.	1.5 MHz
• Gray code	Yes
• Cable length, shielded, max.	200 m; At max. 188 kHz

Article number	<b>6ES7351-1AH02-0AE0</b> FM351 POSITIONING MOD. RAPID/CREEP FEED
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• Galvanic isolation digital inputs	Yes
<b>Galvanic isolation digital outputs</b>	
• Galvanic isolation digital outputs	Yes
<b>Connection method</b>	
required front connector	1x 20-pin
<b>Dimensions</b>	
Width	80 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	550 g

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**FM 351 positioning modules****Ordering data****Article No.****FM 351 positioning module****6ES7351-1AH02-0AE0**

for rapid traverse and creep speed drives

**Front connector**

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0****6ES7392-1AJ00-1AB0**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0****6ES7392-1BJ00-1AB0****Bus connectors****6ES7390-0AA00-0AA0**

1 unit (spare part)

**Labeling strips****6ES7392-2XX00-0AA0**

10 units (spare part)

**Slot number label****6ES7912-0AA00-0AA0****Labeling sheets for machine inscription**

See under "Accessories", page 5/263

Spare part

**Shield connection element****6ES7390-5AA00-0AA0**

80 mm wide, with 2 rows for 4 terminals each

**Terminal elements**

2 units

For 2 cables with 2 mm to 6 mm diameter

**6ES7390-5AB00-0AA0**

For 1 cable with 3 mm to 8 mm diameter

**6ES7390-5BA00-0AA0**

For 1 cable with 4 mm to 13 mm diameter

**6ES7390-5CA00-0AA0****Signal cables**

Pre-assembled for HTL encoder, UL/DESINA

**6FX50 2-2AL00-**

Pre-assembled for SSI absolute encoder, UL/DESINA

**6FX50 2-2CC11-**

Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA

**6FX50 2-2CD01-**

Pre-assembled for TTL encoder 24 V, UL/DESINA

**6FX50 2-2CD24-**

Not crimped

**0**

Module end crimped, connector case supplied

**1**

Motor end crimped, connector case supplied

**4**

0 m

**1**

100 m

**2**

200 m

**3**

0 m

**A**

10 m

**B**

20 m

**C**

30 m

**D**

40 m

**E**

50 m

**F**

60 m

**G**

70 m

**H**

80 m

**J**

90 m

**K**

0 m

**A**

1 m

**B**

2 m

**C**

3 m

**D**

4 m

**E**

5 m

**F**

6 m

**G**

7 m

**H**

8 m

**J**

0 m

**K**

0.0 m

**0**

0.1 m

**1**

0.2 m

**2**

0.3 m

**3**

0.4 m

**4**

0.5 m

**5**

0.6 m

**6**

0.7 m

**7**

0.8 m

**8**

## Overview



- Extremely high-speed electronic cam controller
- Low-cost alternative to mechanical cam controllers
- 32 cam tracks, 13 onboard digital outputs for direct output of actions
- Incremental or synchro-serial position decoding

Note:

SIMODRIVE Sensor/Motion Connect 500 feature position-measuring systems and preassembled connecting cables for counting and positioning functions.

<http://www.siemens.com/simatic-technology>

## Technical specifications

Article number	<b>6ES7352-1AH02-0AE0</b> FM352 ELECTRON. CAM-OPERATED CONTROL
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
<b>Input current</b>	
from load voltage L+ (without load), max.	200 mA
from backplane bus 5 V DC, max.	100 mA
<b>Encoder supply</b>	
<b>5 V encoder supply</b>	
• 5 V	Yes
• Output current, max.	300 mA
• Cable length, max.	32 m
<b>24 V encoder supply</b>	
• 24 V	Yes
• Output current, max.	300 mA
• Cable length, max.	100 m
<b>Digital inputs</b>	
Number of digital inputs	4
Functions	Reference point switch, set floating actual value/length measurement, brake release, enable track output no. 3
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
<b>for 2-wire sensor</b>	
- for signal "0", typ.	2 mA
- for signal "1", typ.	7 mA
<b>Digital outputs</b>	
Number of digital outputs	13
Functions	Cam track
short-circuit protection	Yes
<b>Output voltage</b>	
• Rated value (DC)	24 V
• for signal "1", min.	UP - 0.8 V

Article number	<b>6ES7352-1AH02-0AE0</b> FM352 ELECTRON. CAM-OPERATED CONTROL
<b>Output current</b>	
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA; with UPmax
• for signal "1" permissible range for 0 to 60 °C, max.	600 mA; with UPmax
• for signal "0" residual current, max.	0.5 mA
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	2 mA
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input signal	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Trace mark signals	A, B
• Zero mark signal	N
• Input voltage	24 V
• Input frequency, max.	50 kHz; 50 kHz for 25 m cable length; 25 kHz for 100 m cable length
<b>Encoder signals, absolute encoder (SSI)</b>	
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Message frame length, parameterizable	13 or 25 bit
• Clock frequency, max.	1 MHz
• Gray code	1
• Cable length, shielded, max.	320 m; at max. 125 kHz
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• Galvanic isolation digital inputs	No
<b>Galvanic isolation digital outputs</b>	
• Galvanic isolation digital outputs	No

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**FM 352 cam controllers****Technical specifications** (continued)

Article number	<b>6ES7352-1AH02-0AE0</b> FM352 ELECTRON. CAM-OPERATED CONTROL
<b>Connection method</b>	
required front connector	1x 20-pin

Article number	<b>6ES7352-1AH02-0AE0</b> FM352 ELECTRON. CAM-OPERATED CONTROL
<b>Dimensions</b>	
Width	80 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	550 g

**Ordering data****Article No.**

<b>FM352 electronic cam controller</b>	<b>6ES7352-1AH02-0AE0</b>
<b>Front connectors</b>	
20-pin, with screw contacts	
• 1 unit	<b>6ES7392-1AJ00-0AA0</b>
• 100 units	<b>6ES7392-1AJ00-1AB0</b>
20-pin, with spring-loaded contacts	
• 1 unit	<b>6ES7392-1BJ00-0AA0</b>
• 100 units	<b>6ES7392-1BJ00-1AB0</b>
<b>Bus connectors</b>	<b>6ES7390-0AA00-0AA0</b>
1 unit (spare part)	
<b>Labeling strips</b>	<b>6ES7392-2XX00-0AA0</b>
10 units (spare part)	
<b>Labeling sheets for machine inscription</b>	See under "Accessories", page 5/263
<b>Slot number label</b>	<b>6ES7912-0AA00-0AA0</b>
Spare part	
<b>Shield connection element</b>	<b>6ES7390-5AA00-0AA0</b>
80 mm wide, with 2 rows for 4 terminals each	
<b>Terminal elements</b>	
2 units	
For 2 cables with 2 mm to 6 mm diameter	<b>6ES7390-5AB00-0AA0</b>
For 1 cable with 3 mm to 8 mm diameter	<b>6ES7390-5BA00-0AA0</b>
For 1 cable with 4 mm to 13 mm diameter	<b>6ES7390-5CA00-0AA0</b>

**Article No.**

<b>Signal cables</b>			
Pre-assembled for HTL encoder, UL/DESINA	<b>6FX50</b>	<b>2-2AL00-</b>	
Pre-assembled for SSI absolute encoder, UL/DESINA	<b>6FX50</b>	<b>2-2CC11-</b>	
Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA	<b>6FX50</b>	<b>2-2CD01-</b>	
Pre-assembled for TTL encoder 24 V, UL/DESINA	<b>6FX50</b>	<b>2-2CD24-</b>	
Not crimped	<b>0</b>		
Module end crimped, connector case supplied	<b>1</b>		
Motor end crimped, connector case supplied	<b>4</b>		
0 m			<b>1</b>
100 m			<b>2</b>
200 m			<b>3</b>
0 m			<b>A</b>
10 m			<b>B</b>
20 m			<b>C</b>
30 m			<b>D</b>
40 m			<b>E</b>
50 m			<b>F</b>
60 m			<b>G</b>
70 m			<b>H</b>
80 m			<b>J</b>
90 m			<b>K</b>
0 m			<b>A</b>
1 m			<b>B</b>
2 m			<b>C</b>
3 m			<b>D</b>
4 m			<b>E</b>
5 m			<b>F</b>
6 m			<b>G</b>
7 m			<b>H</b>
8 m			<b>J</b>
0 m			<b>K</b>
0.0 m			<b>0</b>
0.1 m			<b>1</b>
0.2 m			<b>2</b>
0.3 m			<b>3</b>
0.4 m			<b>4</b>
0.5 m			<b>5</b>
0.6 m			<b>6</b>
0.7 m			<b>7</b>
0.8 m			<b>8</b>

5

**Overview**

- The FM 352-5 high-speed Boolean processor provides extremely fast binary control and also some of the fastest switching processes ever possible (cycle time: 1  $\mu$ s).
- Programming is possible with LAD or FBD.
- The available set of statements comprises bit statements (partial statement set of STEP 7), timers, counters, frequency dividers, frequency generators, shift registers.
- 12 integral DI / 8 integral DO.
- 2 versions: Current sinking or current sourcing digital outputs.
- 1 channel for connection of a 24-V incremental encoder, a 5-V incremental encoder (RS 422) or an SSI absolute-value sensor.

Micro memory card required for use of the FM 352-5

Note:

Displacement measuring systems and precut/preassembled cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

<http://www.siemens.com/simatic-technology>

**Technical specifications**

Article number	<b>6ES7352-5AH01-0AE0</b>	<b>6ES7352-5AH11-0AE0</b>
	FM 352-5, BOOLEAN PROCESSOR 12DE/8DA	FM 352-5 PNP, BOOLEAN PROCESSOR 12DI/8DO
<b>Product type designation</b>		
<b>Supply voltage</b>		
Rated value (DC)		
• 24 V DC	Yes	Yes
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V
• Reverse polarity protection	Yes	Yes
<b>Input current</b>		
from load voltage 1L+, max.	150 mA; typ. 60 mA	150 mA; typ. 60 mA
from load voltage 2L+ (without load), max.	200 mA; typ. 60 mA, DI/DO supply	200 mA; typ. 60 mA, DI/DO supply
from load voltage 3L+ (with encoder), max.	600 mA; typ. 80 mA plus encoder supply	600 mA; typ. 80 mA plus encoder supply
from load voltage 3L+ (without encoder), max.	200 mA; typ. 80 mA	200 mA; typ. 80 mA
from backplane bus 5 V DC, max.	135 mA; Typical	135 mA; Typical
<b>Encoder supply</b>		
<b>5 V encoder supply</b>		
• 5 V	Yes	Yes
• short-circuit protection	Yes; Electronic overload protection; no protection on applying a normal or counter voltage.	Yes; Electronic overload protection; no protection on applying a normal or counter voltage.
• Output current, max.	250 mA	250 mA
<b>24 V encoder supply</b>		
• 24 V	Yes	Yes
• short-circuit protection	Yes; Overvoltage and overheating protection if overloaded; diagnostics if output reaches temperature limit; no protection on applying a normal or counter voltage	Yes; Overvoltage and overheating protection if overloaded; diagnostics if output reaches temperature limit; no protection on applying a normal or counter voltage
• Output current, max.	400 mA	400 mA
<b>Power losses</b>		
Power loss, typ.	6.5 W	6.5 W
<b>Memory</b>		
Type of memory	RAM	RAM
Memory size	128 kbyte; required for operation, MMC	128 kbyte; required for operation, MMC



**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**FM 352-5 high-speed Boolean processors****Technical specifications (continued)**

Article number	<b>6ES7352-5AH01-0AEO</b> FM 352-5, BOOLEAN PROCESSOR 12DE/8DA	<b>6ES7352-5AH11-0AEO</b> FM 352-5 PNP, BOOLEAN PROCESSOR 12DI/8DO
<b>Digital inputs</b>		
Number of digital inputs	8; Standard and up to 12 with 24 V DC encoder inputs as digital inputs	8; Standard and up to 12 with 24 V DC encoder inputs as digital inputs
<b>Input voltage</b>		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5V	-30 to +5V
• for signal "1"	+11 to +30V	+11 to +30V
<b>Input current</b>		
• for signal "0", max. (permissible quiescent current)	1.5 mA	1.5 mA
• for signal "1", typ.	3.8 mA	3.8 mA
<b>Input delay (for rated value of input voltage)</b>		
• Input frequency (with a time delay of 0.1 ms), max.	200 kHz	200 kHz
• Programmable digital filter delay	None, 5 µs, 10 µs, 15 µs, 20 µs, 50 µs, 1.6 ms	None, 5 µs, 10 µs, 15 µs, 20 µs, 50 µs, 1.6 ms
• Minimum pulse width for program reactions	1 µs, 5 µs, 10 µs, 15 µs, 20 µs, 50 µs, 1.6 ms	1 µs, 5 µs, 10 µs, 15 µs, 20 µs, 50 µs, 1.6 ms
<b>for standard inputs</b>		
- at "0" to "1", max.	3 µs; typ. 1.5 µs	3 µs; typ. 1.5 µs
<b>Cable length</b>		
• shielded, max.	600 m	600 m
• Unshielded, max.	100 m; Shielded cable recommended if filtering delay is set to less than 1.6 ms	100 m; Shielded cable recommended if filtering delay is set to less than 1.6 ms
<b>Digital outputs</b>		
Number of digital outputs	8	8
Current-sinking	Yes	No
Current-sourcing	No	Yes
short-circuit protection	Yes; Overvoltage protection, thermal protection	Yes; Overvoltage protection, thermal protection
• Response threshold, typ.	1.7 to 3.5 A	1.7 to 3.5 A
Limitation of inductive shutdown voltage to	2M -45 V typ., (-40 V to -55 V); comment: no protection against inductive kickback >55 mJ	2M -45 V typ., (-40 V to -55 V); comment: no protection against inductive kickback >55 mJ
Controlling a digital input	No	Yes
<b>Switching capacity of the outputs</b>		
• on lamp load, max.	5 W	5 W
<b>Output voltage</b>		
• Rated value (DC)	24 V	24 V
• for signal "0", max.	28.8 V	28.8 V
• for signal "1", max.	0.5 V	0.5 V
<b>Output current</b>		
• for signal "1" rated value	0.5 A; At 60 °C	0.5 A; At 60 °C
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.	600 mA	600 mA
• for signal "0" residual current, max.	1 mA	1 mA
<b>Output delay with resistive load</b>		
• "0" to "1", max.	1 µs; 0.6 µs 50 mA / 1.0 µs 0.5 A	1 µs; 0.6 µs 50 mA / 1.0 µs 0.5 A
• "1" to "0", max.	1.5 µs; 1.7 µs 50 mA / 1.5 µs 0.5 A	1.5 µs; 1.7 µs 50 mA / 1.5 µs 0.5 A
<b>Parallel switching of 2 outputs</b>		
• for increased power	Yes; 2	Yes; 2
<b>Switching frequency</b>		
• with resistive load, max.	100 kHz; 20 kHz at 0.5 A; 100 kHz at 0.25 A	100 kHz; 20 kHz at 0.5 A; 100 kHz at 0.25 A
• with inductive load, max.	2 Hz; 2 Hz at 0.5 A with external commutator diodes; 0.5 Hz at 0.5 A without external commutator diodes	2 Hz; 2 Hz at 0.5 A with external commutator diodes; 0.5 Hz at 0.5 A without external commutator diodes
• on lamp load, max.	10 Hz	10 Hz
<b>Cable length</b>		
• shielded, max.	600 m	600 m
• Unshielded, max.	100 m	100 m

**Technical specifications (continued)**

Article number	<b>6ES7352-5AH01-0AE0</b> FM 352-5, BOOLEAN PROCESSOR 12DE/8DA	<b>6ES7352-5AH11-0AE0</b> FM 352-5 PNP, BOOLEAN PROCESSOR 12DI/8DO
<b>Encoder</b>		
<b>Connectable encoders</b>		
• Incremental encoder (symmetrical)	Yes	Yes
• Incremental encoder (asymmetrical)	Yes	Yes
• Absolute encoder (SSI)	Yes	Yes
• 2-wire sensor	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
<b>Encoder signals, incremental encoder (symmetrical)</b>		
• Trace mark signals	A, notA, B, notB	A, notA, B, notB
• Zero mark signal	N, notN	N, notN
• Input signal	5 V difference signal (phys. RS 422)	5 V difference signal (phys. RS 422)
• Input frequency, max.	500 kHz	500 kHz
• Cable length, shielded, max.	100 m; 100 m with 24 V supply and 500 kHz; 32 m with 5 V supply and 500 kHz	100 m; 100 m with 24 V supply and 500 kHz; 32 m with 5 V supply and 500 kHz
<b>Encoder signals, incremental encoder (asymmetrical)</b>		
• Trace mark signals	A, B	A, B
• Zero mark signal	N	N
• Input voltage	24 V	24 V
• Input frequency, max.	200 kHz	200 kHz
• Cable length, shielded, max.	50 m; Cable length, HTL incremental encoder, Siemens, type 6FX2001-4: 50 kHz, 25 m shielded, max., 25 kHz, 50 m shielded, max.	50 m; Cable length, HTL incremental encoder, Siemens, type 6FX2001-4: 50 kHz, 25 m shielded, max., 25 kHz, 50 m shielded, max.
<b>Encoder signals, absolute encoder (SSI)</b>		
• Data signal	DATA, notDATA	DATA, notDATA
• Clock signal	CK, notCK	CK, notCK
• Message frame length, parameterizable	13 or 25 bit	13 or 25 bit
• Clock frequency, max.	1 MHz; 125 kHz, 250 kHz, 500 kHz or 1 MHz	1 MHz; 125 kHz, 250 kHz, 500 kHz or 1 MHz
• Cable length, shielded, max.	320 m; At 125 kHz	320 m; At 125 kHz
• Monoflop time	settable: 16/32/48/64 µs	settable: 16/32/48/64 µs
• Listening mode	Yes; one or two stations	Yes; one or two stations
• Multiturn	Yes; 25 bit message frame	Yes; 25 bit message frame
<b>Encoder signal evaluation</b>		
• Counting direction, forward	Yes	Yes
• Counting direction, backward	Yes	Yes
<b>Response times</b>		
Input and output response time	5 V input to 24 V output, 0 filter: 1 to 4 µs (typ.); 24 V input to 24 V output, 0 filter: 2 to 6 µs (typ.)	5 V input to 24 V output, 0 filter: 1 to 4 µs (typ.); 24 V input to 24 V output, 0 filter: 2 to 6 µs (typ.)
<b>Interfaces</b>		
<b>Point-to-point</b>		
• Updating times	PLC interface: 1.7 ms	PLC interface: 1.7 ms
<b>Interrupts/diagnostics/status information</b>		
<b>Alarms</b>		
• Diagnostic alarm	Yes; 1L, 2L, 3L missing; MMC error; output overload (8); encoder supply overload; differential wire break; parameterization error; SSI message frame overflow	Yes; 1L, 2L, 3L missing; MMC error; output overload (8); encoder supply overload; differential wire break; parameterization error; SSI message frame overflow
• Hardware interrupt	Yes; 8 available; for generation by user program	Yes; 8 available; for generation by user program
<b>Diagnostic messages</b>		
• Wire break in signal transmitter cable	Yes	Yes
• Overflow/underflow	Yes	Yes
• Missing load voltage	Yes	Yes

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**FM 352-5 high-speed Boolean processors****Technical specifications** (continued)

Article number	<b>6ES7352-5AH01-0AE0</b> FM 352-5, BOOLEAN PROCESSOR 12DE/8DA	<b>6ES7352-5AH11-0AE0</b> FM 352-5 PNP, BOOLEAN PROCESSOR 12DI/8DO
<b>Counter</b>		
Counting range, description	Counting range (16-bit counters): -32,768 to 32,767 (user-specific within this range); counting range (32-bit counters): -2,147,483,648 to 2,147,483,647 (user-specific within this range)	Counting range (16-bit counters): -32,768 to 32,767 (user-specific within this range); counting range (32-bit counters): -2,147,483,648 to 2,147,483,647 (user-specific within this range)
Counting range, lower limit	-2 147 483 648	-2 147 483 648
Counting range, upper limit	2 147 483 647	2 147 483 647
<b>Counting mode</b>		
• Counting mode, individual	Yes	Yes
• Counting mode, continuous	Yes	Yes
• Counting mode, periodic	Yes	Yes
<b>Galvanic isolation</b>		
between 1L and 2L and 3L	Yes; 75V DC/60V AC	Yes; 75V DC/60V AC
between digital I/O and 2L and encoder I/O and 3L	Yes (75 V DC, 60 V AC)	Yes (75 V DC, 60 V AC)
between backplane bus and digital encoder I/O & 1L & 2L & 3L	Yes (75 V DC, 60 V AC)	Yes (75 V DC, 60 V AC)
<b>Galvanic isolation digital inputs</b>		
• Galvanic isolation digital inputs	Yes; Yes CPU, I/O and sensor units are isolated	Yes; Yes CPU, I/O and sensor units are isolated
<b>Configuration programming</b>		
• Program cycle time (scan)	1 µs	1 µs
<b>Connection method</b>		
required front connector	1x 40-pin	1x 40-pin
<b>Dimensions</b>		
Width	80 mm	80 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
<b>Weights</b>		
Weight, approx.	434 g; Module weight: approx. 434 g (with 1L connection and without I/O connection or MMC); shipping weight: approx. 500 g (with bus and 1L connection and without I/O connection or MMC)	434 g; Module weight: approx. 434 g (with 1L connection and without I/O connection or MMC); shipping weight: approx. 500 g (with bus and 1L connection and without I/O connection or MMC)

**Ordering data****Article No.****Article No.****FM 352-5 high-speed Boolean processor**

with current sinking digital outputs

**6ES7352-5AH01-0AE0**

with current sourcing digital outputs

**6ES7352-5AH11-0AE0****Micro Memory Card**

128 KB

**6ES7953-8LG30-0AA0**

512 KB

**6ES7953-8LJ30-0AA0**

2 MB

**6ES7953-8LL31-0AA0****Front connector**

40-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AM00-0AA0****6ES7392-1AM00-1AB0**

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0****6ES7392-1BM01-1AB0****Signal cables**

To HTL and TTL encoders, preassembled, without Sub-D connector

**6FX5002-2CA12-■■■■0**

To SSI absolute encoders 6FX2 001-5, preassembled, without Sub-D connector

**6FX5002-2CC12-■■■■■**

Length code:

See FM 351, page 5/142

## Overview



- Positioning module for stepper motors in machines with high clock-pulse rates
- Can be used for simple point-to-point positioning and for complex traversing profiles

## Technical specifications

Article number	<b>6ES7353-1AH01-0AE0</b> POSITIONING CONTROL FM 353 (FM STEP)
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	Yes
• 24 V DC	20.4 V
permissible range, lower limit (DC)	28.8 V
permissible range, upper limit (DC)	
<b>Input current</b>	
Current consumption, max.	300 mA
<b>Digital inputs</b>	
Number of digital inputs	4; + 1 input for message signal
Functions	Reference cams, flying actual value setting, flying measurement, start/stop positioning, external block change
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	6 mA; 6 to 15 mA
<b>Digital outputs</b>	
Number of digital outputs	4
Functions	Position reached: stop, axis travels forward, axis travels back, change M-function M97, change M-function M98, start enable, direct output via data record
short-circuit protection	Yes
<b>Output voltage</b>	
• Rated value (DC)	24 V
• for signal "1", min.	UP -3 V
<b>Output current</b>	
• for signal "1" permissible range for 0 to 55 °C, max.	0.6 A; with UPmax
• for signal "0" residual current, max.	2 mA

Article number	<b>6ES7353-1AH01-0AE0</b> POSITIONING CONTROL FM 353 (FM STEP)
<b>Drive interface</b>	
<b>Signal input I</b>	
• Function	"Power section ready"
<b>Signal output I</b>	
• Type	5 V difference signal (phys. RS 422)
• Function	Direction, enable, clock pulse, current control
• Differential output voltage, min.	2 V; RL = 100 Ohm
• Differential output voltage for signal "0", max.	1 V; I <sub>o</sub> = 20 mA
• Differential output voltage, for signal "1", min.	3.7 V; I <sub>o</sub> = -20 mA
• Cable length, max.	35 m
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• Galvanic isolation digital inputs	No
<b>Galvanic isolation digital outputs</b>	
• Galvanic isolation digital outputs	No
<b>Connection method</b>	
required front connector	1x 20-pin
<b>Dimensions</b>	
Width	80 mm
Height	125 mm
Depth	118 mm
<b>Weights</b>	
Weight, approx.	500 g

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**FM 353 positioning modules****Ordering data****Article No.****FM 353 positioning module****6ES7353-1AH01-0AE0**

For stepper motors;  
incl. configuration package on  
CD-ROM (Ge, En, Fr, It) comprising

- FM 353 manual, electronic
- Standard function blocks (STEP 7 interface software)
- Screen form-based configuration software for FM 353
- Standard interactive screen forms for OP7/OP17

**FM 353 manual**

German

**6ES7353-1AH01-8AG0**

English

**6ES7353-1AH01-8BG0**

French

**6ES7353-1AH01-8CG0**

Italian

**6ES7353-1AH01-8EG0****Edit FM****6FC5263-0AA03-0AB0**

Program editor for editing, loading  
and saving NC programs with the  
standard programming device/PC;  
German/English, on CD-ROM

**Connecting cables**

To stepper motor power section

**6FX80 2-3AC02- 0**

Length code

See page 5/142

**Connecting cables and encoders**See catalog NC 60, CA 01 or  
in the Industry Mall**Article No.****Front connectors**

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0**  
**6ES7392-1AJ00-1AB0**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0**  
**6ES7392-1BJ00-1AB0****Bus connectors****6ES7390-0AA00-0AA0**

1 unit (spare part)

**Labeling strips****6ES7392-2XX00-0AA0**

10 units (spare part)

**Labeling sheets for machine inscription**

See under "Accessories"

**Slot number label****6ES7912-0AA00-0AA0**

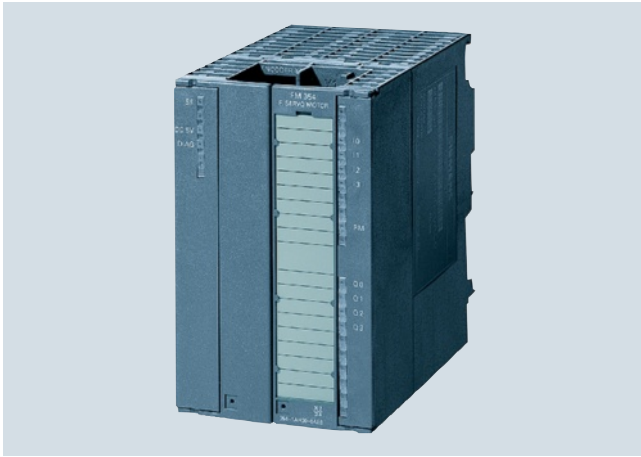
Spare part

**Shield connection element****6ES7390-5AA00-0AA0**80 mm wide, with 2 rows for  
4 terminals each**Terminal elements**

2 units

For 2 cables with 2 mm to 6 mm  
diameter**6ES7390-5AB00-0AA0**For 1 cable with 3 mm to 8 mm  
diameter**6ES7390-5BA00-0AA0**For 1 cable with 4 mm to 13 mm  
diameter**6ES7390-5CA00-0AA0**

## Overview



- Positioning module for servo motors in machines with high clock pulse rates
- Can be used for point-to-point positioning tasks and for complex traversing patterns

Note:

SIMODRIVE Sensor/Motion Connect 500 feature position-measuring systems and preassembled connecting cables for counting and positioning functions.

<http://www.siemens.com/simatic-technology>

## Technical specifications

Article number	<b>6ES7354-1AH01-0AE0</b> POSITIONING CONTROL FM 354 (FM POSITION)
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
<b>Input current</b>	
Current consumption, max.	350 mA
<b>Encoder supply</b>	
<b>5 V encoder supply</b>	
• 5 V	Yes
• Output current, max.	220 mA
• Cable length, max.	35 m
<b>24 V encoder supply</b>	
• 24 V	Yes
• Output current, max.	300 mA
• Cable length, max.	100 m
<b>Digital inputs</b>	
Number of digital inputs	4
Functions	Reference cams, flying actual value setting, flying measurement, start/stop positioning, external block change
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	6 mA; 6 to 15 mA

Article number	<b>6ES7354-1AH01-0AE0</b> POSITIONING CONTROL FM 354 (FM POSITION)
<b>Digital outputs</b>	
Number of digital outputs	4
Functions	Position reached: stop, axis travels forward, axis travels back, change M-function M97, change M-function M98, start enable, direct output via data record
short-circuit protection	Yes
<b>Output voltage</b>	
• Rated value (DC)	24 V
• for signal "1", min.	UP -3 V
<b>Output current</b>	
• for signal "1" permissible range for 0 to 55 °C, max.	0.6 A; with UPmax
• for signal "0" residual current, max.	2 mA
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes
• Absolute encoder (SSI)	Yes
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input signal	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz
<b>Encoder signals, absolute encoder (SSI)</b>	
• Input signal	5 V difference signal (phys. RS 422)
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Message frame length, parameterizable	13, 21 or 25 bit
• Clock frequency, max.	1.25 Mbit/s
• Cable length, shielded, max.	100 m; 10 m at 1.25 Mbit/s, 100 m at max. 125 kbit/s

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**FM 354 positioning modules****Technical specifications (continued)**

Article number	<b>6ES7354-1AH01-0AE0</b> POSITIONING CONTROL FM 354 (FM POSITION)
<b>Drive interface</b>	
<b>Signal input I</b>	
• Type	Input loop controller message, isolated (optocoupler)
• Function	"Drive ready"
• Input voltage, rated value (DC)	24 V
• Input voltage, for signal "0"	-3 to +5V
• Input current, for signal "1"	2 to 6 mA
<b>Signal output II</b>	
• Type	Output closed-loop controller enable (contact)
• Function	Drive disconnection for operation via contact relay
• Load	1 A/50 V/30 VA DC
<b>Signal output III</b>	
• Type	Analog output
• Function	Setpoint output for drive
• Output current	-3 to +3 mA
• Cable length, max.	35 m

Article number	<b>6ES7354-1AH01-0AE0</b> POSITIONING CONTROL FM 354 (FM POSITION)
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• Galvanic isolation digital inputs	No
<b>Galvanic isolation digital outputs</b>	
• Galvanic isolation digital outputs	No
<b>Connection method</b>	
required front connector	1x 20-pin
<b>Dimensions</b>	
Width	80 mm
Height	125 mm
Depth	118 mm
<b>Weights</b>	
Weight, approx.	550 g

Ordering data	Article No.	Ordering data	Article No.
<b>FM 354 positioning module</b> for servo motors, incl. configuration package on CD-ROM (Ge, En, Fr, It) comprising • FM 354 manual, electronic • Standard function blocks (STEP 7 interface software) • Screen form-based configuration software for FM 354 • Standard interactive screen forms for OP7/OP17	<b>6ES7354-1AH01-0AE0</b>	<b>Encoders</b> See catalog NC 60, CA 01 or in the Industry Mall	
<b>FM 354 manual</b> German English French Italian	<b>6ES7354-1AH01-8AG0</b> <b>6ES7354-1AH01-8BG0</b> <b>6ES7354-1AH01-8CG0</b> <b>6ES7354-1AH01-8EG0</b>	<b>Front connector</b> 20-pin, with screw contacts • 1 unit • 100 units 20-pin, with spring-loaded contacts • 1 unit • 100 units	<b>6ES7392-1AJ00-0AA0</b> <b>6ES7392-1AJ00-1AB0</b> <b>6ES7392-1BJ00-0AA0</b> <b>6ES7392-1BJ00-1AB0</b>
<b>Edit FM</b> Program editor for editing, loading and saving NC programs with the standard programming device/PC; German/English, on CD-ROM	<b>6FC5263-0AA03-0AB0</b>	<b>Bus connectors</b> 1 unit (spare part)	<b>6ES7390-0AA00-0AA0</b>
<b>Connecting cables</b> To SSI absolute encoders 6FX2001-5, preassembled To incremental encoders 6FX2001-1, preassembled For 24 V incremental encoders, preassembled To SIMODRIVE 611A, preassembled To SIMODRIVE 611U, preassembled To SSI absolute encoders 6FX2 001-5, preassembled, without Sub-D connector To SSI absolute encoders 6FX2 001-5, preassembled, suitable for trailing To incremental encoders 6FX2 001-2, preassembled, suitable for trailing To SIMODRIVE 611A, preassembled, suitable for trailing To SIMODRIVE 611U, preassembled, suitable for trailing, 1 free end To SIMODRIVE 611A, preassembled, suitable for trailing, free ends Length code	<b>6FX5 0 2-2CC11-■■■■■</b> <b>6FX5 0 2-2CD01-■■■■■</b> <b>6FX5 0 2-2CD24-■■■■■</b> <b>6FX5 0 2-2CJ00-■■■■■</b> <b>6FX5 0 2-2CJ10-■■■■■</b> <b>6FX5 002-2CC12-■■■■■</b> <b>6FX8 0 2-2CC11-■■■■■</b> <b>6FX8 0 2-2CD01-■■■■■</b> <b>6FX8 0 2-2CJ00-■■■■■</b> <b>6FX8 0 2-2CJ10-■■■■■</b> <b>6FX8 0 2-3AB01-■■■■■</b> See page 5/142	<b>Labeling strips</b> 10 units (spare part) <b>Labeling sheets for machine inscription</b> See "Accessories", page 5/263 <b>Slot number label</b> Spare part <b>Shield connection element</b> 80 mm wide, with 2 rows for 4 terminals each <b>Terminal elements</b> 2 units For 2 cables with 2 mm to 6 mm diameter For 1 cable with 3 mm to 8 mm diameter For 1 cable with 4 mm to 13 mm diameter	<b>6ES7392-2XX00-0AA0</b> <b>6ES7912-0AA00-0AA0</b> <b>6ES7390-5AA00-0AA0</b> <b>6ES7390-5AB00-0AA0</b> <b>6ES7390-5BA00-0AA0</b> <b>6ES7390-5CA00-0AA0</b>



**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**FM 357-2 positioning modules****Overview**

- Path and positioning control for intelligent motion control of up to 4 axes
- Comprehensive range of application, from independent single positioning axes right up to interpolatory multi-axis path control
- For controlling stepper drives and controlled servo drive axes
- User-friendly commissioning with convenient parameterization tool
- Interface for SIMODRIVE 611U and MASTERDRIVES MC via isochronous PROFIBUS (not for FM 357-2H in conjunction with HT6)

Note:

Position measuring systems and preassembled connecting cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

Additional information is available on the Internet at:

<http://www.siemens.com/simatic-technology>

**Technical specifications**

Article number	<b>6ES7357-4AH01-0AE0</b> PATH & POSITIONING CONTROL FM 357-2
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
<b>Input current</b>	
from backplane bus 5 V DC, max.	100 mA
<b>Encoder supply</b>	
<b>5 V encoder supply</b>	
• 5 V	Yes
• Output current, max.	210 mA
• Cable length, max.	35 m
<b>24 V encoder supply</b>	
• 24 V	Yes
• Output current, max.	300 mA
• Cable length, max.	100 m
<b>Power</b>	
Power consumption, typ.	24 W
<b>Memory</b>	
Type of memory	NC program memory
Memory size	750 kbyte
<b>Digital inputs</b>	
Number of digital inputs	18
Functions	4 Bero, 2 probes, 12 for any use
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	6 mA; 6 to 30 mA

Article number	<b>6ES7357-4AH01-0AE0</b> PATH & POSITIONING CONTROL FM 357-2
<b>Digital outputs</b>	
Number of digital outputs	8
Functions	8 for any purpose
<b>Output voltage</b>	
• Rated value (DC)	24 V
• for signal "1", min.	UP -3 V
<b>Output current</b>	
• for signal "1" permissible range for 0 to 55 °C, max.	0.5 A; with UPmax
• for signal "0" residual current, max.	2 mA
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes
• Absolute encoder (SSI)	Yes
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input signal	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz
<b>Encoder signals, absolute encoder (SSI)</b>	
• Input signal	5 V difference signal (phys. RS 422)
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Message frame length, parameterizable	13, 21 or 25 bit
• Clock frequency, max.	1.5 Mbit/s
• Cable length, shielded, max.	250 m; At max. 187.5 kbit/s

## Technical specifications (continued)

Article number	<b>6ES7357-4AH01-0AE0</b> PATH & POSITIONING CONTROL FM 357-2
<b>Positioning</b>	
Programmable traverse speed, max.	1 000 m/min
<b>Signal output I</b>	
• Type	5 V difference signal (phys. RS 422)
• Function	Direction, enable, clock pulse
• Differential output voltage, min.	2 V; RL = 100 Ohm
• Differential output voltage for signal "0", max.	1 V; I <sub>o</sub> = 20 mA
• Differential output voltage, for signal "1", min.	3.7 V; I <sub>o</sub> = -20 mA
• Pulse frequency	750 kHz
• Cable length, max.	50 m; 35 m in hybrid mode with servo axes
<b>Signal output II</b>	
• Type	Controller release (contact), FM-READY output (contact)
• Function	Drive disconnection for operation via contact relay, Data set ready for link with Emergency STOP
• Load	1 A/50 V/30 VA DC
<b>Signal output III</b>	
• Type	Analog output
• Function	Drive interface for analog drives: setpoint output for drive
• Output current	-3 to +3 mA
• Cable length, max.	35 m

Article number	<b>6ES7357-4AH01-0AE0</b> PATH & POSITIONING CONTROL FM 357-2
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• Galvanic isolation digital inputs	Yes
<b>Galvanic isolation digital outputs</b>	
• Galvanic isolation digital outputs	Yes
<b>Connection method</b>	
required front connector	1x 40-pin
<b>Dimensions</b>	
Width	200 mm
Height	125 mm
Depth	118 mm
<b>Weights</b>	
Weight, approx.	1 200 g

## Ordering data

Article No.	Article No.
<b>FM 357-2 positioning module</b> Basic unit	<b>6ES7357-4AH01-0AE0</b>
<b>System firmware</b> Incl. configuration package on CD-ROM, German, English, French, Italian, consisting of equipment manual (electronic), configuring software (parameterization screen-forms, standard blocks, operator control and monitoring screen-forms for OP17/OP27)	
<b>FM 357-2L system firmware</b> On memory card	<b>6ES7357-4AH03-3AE0</b>
<b>FM 357-2LX system firmware</b> With additional functions; on memory card	<b>6ES7357-4BH03-3AE0</b>
<b>FM 357-H system firmware</b> With additional functions for the handling sector; on memory card	<b>6ES7357-4CH03-3AE0</b>
<b>FM 357-2 manual</b> German	<b>6ES7357-4AH00-8AG0</b>
English	<b>6ES7357-4AH00-8BG0</b>
French	<b>6ES7357-4AH00-8CG0</b>
Italian	<b>6ES7357-4AH00-8EG0</b>
<b>Edit FM</b> Program editor for editing, loading and saving NC programs with the standard programming device/PC; German/English, on CD-ROM	<b>6FC5263-0AA03-0AB0</b>
<b>Connecting cables and encoders</b>	See catalog NC 60, CA 01 or in the Industry Mall
<b>Front connector</b> 40-pin, with screw contacts	
• 1 unit	<b>6ES7392-1AM00-0AA0</b>
• 100 units	<b>6ES7392-1AM00-1AB0</b>
40-pin, with spring-loaded contacts	
• 1 unit	<b>6ES7392-1BM01-0AA0</b>
• 100 units	<b>6ES7392-1BM01-1AB0</b>
<b>Back-up battery</b>	<b>6ES7971-1AA00-0AA0</b>
Li-Ion, 3.6 V/0.95 Ah	
<b>Signal cable</b>	
Pre-assembled for SSI absolute encoder, UL/DESINA	<b>6FX5 0 2-2CC11-■■■■■</b>
Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA	<b>6FX5 0 2-2CD01-■■■■■</b>
Pre-assembled for TTL encoder 24 V, UL/DESINA	<b>6FX5 0 2-2CD24-■■■■■</b>
Length code	See page 5/142

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**FM 355 controller modules****Overview**

- 4-channel closed-loop control module for universal control tasks
- Can be used for temperature, pressure, flow and level controls
- Convenient online self-optimization for temperature controls
- Predefined controller structures
- 2 control algorithms
- 2 versions:
  - FM 355 C as continuous controller;
  - FM 355 S as step or pulse controller
- With 4 analog outputs (FM 355 C) or 8 digital outputs (FM 355 S) for direct control of the most common actuators
- Continuation of control mode also possible with CPU stop or failure

**Technical specifications**

Article number	<b>6ES7355-0VH10-0AE0</b>	<b>6ES7355-1VH10-0AE0</b>
	SIMATIC S7-300, CONTROL MODULE	SIMATIC S7-300, CONTROL MODULE
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V
<b>Input current</b>		
from load voltage L+ (without load), max.	310 mA; Typ. 260 mA	270 mA; typ. 220 mA
from backplane bus 5 V DC, max.	75 mA; typ. 50 mA	75 mA; typ. 50 mA
<b>Power losses</b>		
Power loss, typ.	6.5 W	5.5 W
Power loss, max.	7.8 W	6.9 W
<b>Digital inputs</b>		
Number of digital inputs	8	8
Input characteristic curve in accordance with IEC 61131, type 2	Yes	Yes
<b>Input voltage</b>		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	13 to 30V	13 to 30V
<b>Input current</b>		
• for signal "1", typ.	7 mA	7 mA
<b>Cable length</b>		
• shielded, max.	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m
<b>Digital outputs</b>		
Number of digital outputs		8
short-circuit protection		Yes; Electronic
Limitation of inductive shutdown voltage to		L+ (-1.5 V)
Controlling a digital input		Yes
<b>Switching capacity of the outputs</b>		
• on lamp load, max.		5 W
<b>Load resistance range</b>		
• lower limit		240 Ω
• upper limit		4 kΩ

## Technical specifications (continued)

Article number	6ES7355-0VH10-0AE0 SIMATIC S7-300, CONTROL MODULE	6ES7355-1VH10-0AE0 SIMATIC S7-300, CONTROL MODULE
<b>Output voltage</b> • for signal *1*, min.		L+ (-2.5 V)
<b>Output current</b> • for signal *1* rated value • for signal *1* permissible range for 0 to 60 °C, min. • for signal *1* permissible range for 0 to 60 °C, max. • for signal *0* residual current, max.		100 mA 5 mA 150 mA 0.5 mA
<b>Parallel switching of 2 outputs</b> • for logic links		Yes
<b>Switching frequency</b> • with resistive load, max. • with inductive load, max. • on lamp load, max.		100 Hz 0.5 Hz 100 Hz
<b>Aggregate current of outputs (per group)</b> <b>all mounting positions</b> - up to 60 °C, max.		400 mA
<b>Cable length</b> • shielded, max. • Unshielded, max.		1 000 m 600 m
<b>Analog inputs</b> Number of analog inputs permissible input voltage for voltage input (destruction limit), max. permissible input current for current input (destruction limit), max.	4 30 V 40 mA	4 30 V 40 mA
<b>Input ranges (rated values), voltages</b> • 0 to +10 V • -1.75 V to +11.75 V • -80 mV to +80 mV	Yes Yes Yes	Yes Yes Yes
<b>Input ranges (rated values), currents</b> • 0 to 20 mA • 0 to 23.5 mA • -3.5 mA to +23.5 mA • 4 mA to 20 mA	Yes Yes Yes Yes	Yes Yes Yes Yes
<b>Input ranges (rated values), thermoelements</b> • Type B • Type J • Type K • Type R • Type S	Yes Yes Yes Yes Yes	Yes Yes Yes Yes Yes
<b>Input ranges (rated values), resistance thermometer</b> • Pt 100	Yes	Yes
<b>Thermocouple (TC)</b> <b>Temperature compensation</b> - internal temperature compensation - external temperature compensation with Pt100	Yes Yes	Yes Yes
<b>Characteristic linearization</b> • Parameterizable - for thermocouples - for resistance thermometer	Yes Type B, J, K, R, S Pt100 (standard)	Yes Type B, J, K, R, S Pt100 (standard)
<b>Cable length</b> • shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m; 50 m at 80 mV and thermocouples

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**FM 355 controller modules****Technical specifications (continued)**

Article number	<b>6ES7355-0VH10-0AE0</b> SIMATIC S7-300, CONTROL MODULE	<b>6ES7355-1VH10-0AE0</b> SIMATIC S7-300, CONTROL MODULE
<b>Analog outputs</b>		
Number of analog outputs	4	
Voltage output, short-circuit protection	Yes	
Voltage output, short-circuit current, max.	25 mA	
Current output, no-load voltage, max.	18 V	
<b>Output ranges, voltage</b>		
• 0 to 10 V	Yes	
• -10 V to +10 V	Yes	
<b>Output ranges, current</b>		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	
<b>Connection of actuators</b>		
• for voltage output two-wire connection	Yes	
• for current output two-wire connection	Yes	
<b>Load impedance (in rated range of output)</b>		
• with voltage outputs, min.	1 k $\Omega$	
• with voltage outputs, capacitive load, max.	1 $\mu$ F	
• with current outputs, max.	500 $\Omega$	
• with current outputs, inductive load, max.	1 mH	
<b>Cable length</b>		
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	
<b>Analog value creation</b>		
Measurement principle	integrating	integrating
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	14 bit; 12 or 14 bit, parameterizable	14 bit; 12 or 14 bit, parameterizable
• Conversion time (per channel)	16.67 ms; for 12 bit: 16 2/3 ms for 60 Hz, 20 ms for 50 Hz; for 14 bit: 100 ms for 50 and 60 Hz	16.67 ms; for 12 bit: 16 2/3 ms for 60 Hz, 20 ms for 50 Hz; for 14 bit: 100 ms for 50 and 60 Hz
<b>Settling time</b>		
• for resistive load	0.2 ms	0.1 ms
• for capacitive load	3.3 ms	3.3 ms
• for inductive load	0.5 ms	0.5 ms
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
• for voltage measurement	Yes	Yes
• for current measurement as 4-wire transducer	Yes	Yes
<b>Connectable encoders</b>		
• 2-wire sensor	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA

**Technical specifications (continued)**

Article number	<b>6ES7355-0VH10-0AEO</b> SIMATIC S7-300, CONTROL MODULE	<b>6ES7355-1VH10-0AEO</b> SIMATIC S7-300, CONTROL MODULE
<b>Errors/accuracies</b>		
Linearity error (relative to input range), (+/-)	0.05 %	0.05 %
Temperature error (relative to input range), (+/-)	0.005 %/K	0.005 %/K
Linearity error (relative to output range), (+/-)	0.05 %	
Temperature error (relative to output range), (+/-)	0.02 %/K	
<b>Operational limit in overall temperature range</b>		
• Voltage, relative to input area, (+/-)	0.6 %; +/-0.6 to +/-1%	0.6 %; +/-0.6 to +/-1%
• Current, relative to input area, (+/-)	0.6 %; +/-0.6 to +/-1%	0.6 %; +/-0.6 to +/-1%
• Resistance thermometer, relative to input area, (+/-)	0.6 %; +/-0.6 to +/-1%	0.6 %; +/-0.6 to +/-1%
• Voltage, relative to output area, (+/-)	0.5 %	
• Current, relative to output area, (+/-)	0.6 %	
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to input area, (+/-)	0.4 %; 80 mV: +/-0.6%; 250 to 1000 mV: +/-0.4%; 2.5 to 10 V: +/-0.6%; 3.2 to 20 mA: +/-0.5%	0.4 %; 80 mV: +/-0.6%; 250 to 1000 mV: +/-0.4%; 2.5 to 10 V: +/-0.6%; 3.2 to 20 mA: +/-0.5%
• Current, relative to input area, (+/-)	0.4 %; +/-0.4 to +/-0.6 %	0.4 %; +/-0.4 to +/-0.6 %
• Resistance thermometer, relative to input area, (+/-)	0.4 %; +/-0.4 to +/-0.6 %	0.4 %; +/-0.4 to +/-0.6 %
• Voltage, relative to output area, (+/-)	0.3 %	
• Current, relative to output area, (+/-)	0.5 %	
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>		
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB
• common mode voltage (USS < 2.5 V) , min.	70 dB	70 dB
<b>Interrupts/diagnostics/status information</b>		
Substitute values connectable	Yes; Parameterizable	Yes; Parameterizable
<b>Control technology</b>		
Number of closed-loop controllers	4	4
<b>Galvanic isolation</b>		
<b>Galvanic isolation controller</b>		
• between the channels	No	No
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler
<b>Permissible potential difference</b>		
between inputs and MANA (UCM)	2.5 V DC	2.5 V DC
between M internally and the inputs	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>		
Isolation checked with	500 V DC	500 V DC
<b>Connection method</b>		
required front connector	2x 20-pin	2x 20-pin
<b>Dimensions</b>		
Width	80 mm	80 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
<b>Weights</b>		
Weight, approx.	470 g	470 g

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**FM 355 controller modules**

<b>Ordering data</b>	<b>Article No.</b>	<b>Ordering data</b>	<b>Article No.</b>
<b>FM 355 C controller module</b> with 4 analog outputs for 4 continuous-action controllers	<b>6ES7355-0VH10-0AE0</b>	<b>Slot number label</b> Spare part	<b>6ES7912-0AA00-0AA0</b>
<b>FM 355 S controller module</b> with 8 digital outputs for 4 step or pulse controllers	<b>6ES7355-1VH10-0AE0</b>	<b>Shield connection element</b> 80 mm wide, with 2 rows for 4 terminals each	<b>6ES7390-5AA00-0AA0</b>
<b>Front connector</b> 20-pin, with screw contacts • 1 unit • 100 units 20-pin, with spring-loaded contacts • 1 unit • 100 units	<b>6ES7392-1AJ00-0AA0</b> <b>6ES7392-1AJ00-1AB0</b> <b>6ES7392-1BJ00-0AA0</b> <b>6ES7392-1BJ00-1AB0</b>	<b>Terminal elements</b> 2 units For 2 cables with 2 mm to 6 mm diameter For 1 cable with 3 mm to 8 mm diameter For 1 cable with 4 mm to 13 mm diameter	<b>6ES7390-5AB00-0AA0</b> <b>6ES7390-5BA00-0AA0</b> <b>6ES7390-5CA00-0AA0</b>
<b>Bus connectors</b> 1 unit (spare part)	<b>6ES7390-0AA00-0AA0</b>		
<b>Labeling strips</b> 10 units (spare part)	<b>6ES7392-2XX00-0AA0</b>		
<b>Labeling sheets for machine inscription</b>	See under "Accessories", page 5/263		

## Overview



- 4-channel closed-loop controller module specifically for temperature controls
- Including integrated and easy-to-use online self-optimization
- Heating and cooling controllers as well as combined controllers with heating and active cooling function feasible
- Ready-to-use controller structures
- 2 versions:
  - FM 355-2 C as a continuous controller;
  - FM 355-2 S as step or pulse controllers
- With 4 analog outputs (FM 355-2 C) or 8 digital outputs (FM 355-2 S) to directly control the most common final control elements
- It is possible to continue closed-loop control operation even if the CPU stops or fails

## Technical specifications

Article number	6ES7355-2CH00-0AE0	6ES7355-2SH00-0AE0
	TEMPERATURE CONTROL MOD. FM355-2C	SIMATIC S7-300, TEMPERATURE
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V
<b>Input current</b>		
from load voltage L+ (without load), max.	310 mA; Typ. 260 mA	270 mA; typ. 220 mA
from backplane bus 5 V DC, max.	75 mA; typ. 50 mA	75 mA; typ. 50 mA
<b>Power losses</b>		
Power loss, typ.	6.5 W	5.5 W
Power loss, max.	7.8 W	6.9 W
<b>Digital inputs</b>		
Number of digital inputs	8	8
Input characteristic curve in accordance with IEC 61131, type 2	Yes	Yes
<b>Input voltage</b>		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	13 to 30V	13 to 30V
<b>Input current</b>		
• for signal "1", typ.	7 mA	7 mA
<b>Cable length</b>		
• shielded, max.	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m
<b>Digital outputs</b>		
Number of digital outputs		8
short-circuit protection		Yes; Electronic
Limitation of inductive shutdown voltage to		L+ (-1.5 V)
Controlling a digital input		Yes
<b>Switching capacity of the outputs</b>		
• on lamp load, max.		5 W
<b>Load resistance range</b>		
• lower limit		240 Ω
• upper limit		4 kΩ
<b>Output voltage</b>		
• for signal "1", min.		L+ (-2.5 V)



**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**FM 355-2 temperature controller modules****Technical specifications (continued)**

Article number	<b>6ES7355-2CH00-0AEO</b> TEMPERATURE CONTROL MOD. FM355-2C	<b>6ES7355-2SH00-0AEO</b> SIMATIC S7-300, TEMPERATURE
<b>Output current</b>		
• for signal "1" rated value		0.1 A
• for signal "1" permissible range for 0 to 60 °C, min.		5 mA
• for signal "1" permissible range for 0 to 60 °C, max.		150 mA
• for signal "0" residual current, max.		0.5 mA
<b>Parallel switching of 2 outputs</b>		
• for logic links		Yes
<b>Switching frequency</b>		
• with resistive load, max.		100 Hz
• with inductive load, max.		0.5 Hz
• on lamp load, max.		100 Hz
<b>Aggregate current of outputs (per group)</b>		
<b>all mounting positions</b> - up to 60 °C, max.		400 mA
<b>Cable length</b>		
• shielded, max.		1 000 m
• Unshielded, max.		600 m
<b>Analog inputs</b>		
Number of analog inputs	4	4
permissible input voltage for voltage input (destruction limit), max.	20 V	20 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA
<b>Input ranges (rated values), voltages</b>		
• 0 to +10 V	Yes	Yes
• -1.75 V to +11.75 V	Yes	Yes
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes	Yes
• 0 to 23.5 mA	Yes	Yes
• -3.5 mA to +23.5 mA	Yes	Yes
• 4 mA to 20 mA	Yes	Yes
<b>Input ranges (rated values), thermoelements</b>		
• Type B	Yes	Yes
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
<b>Input ranges (rated values), resistance thermometer</b>		
• Pt 100	Yes	Yes
<b>Thermocouple (TC)</b>		
<b>Temperature compensation</b>		
- internal temperature compensation	Yes	Yes
- external temperature compensation with Pt100	Yes	Yes
<b>Characteristic linearization</b>		
• Parameterizable	Yes	Yes
- for thermocouples	Type B, E, J, K, R, S	Type B, E, J, K, R, S
- for resistance thermometer	Pt100 (standard)	Pt100 (standard)
<b>Cable length</b>		
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m; 50 m at 80 mV and thermocouples

## Technical specifications (continued)

Article number	6ES7355-2CH00-0AE0	6ES7355-2SH00-0AE0
	TEMPERATURE CONTROL MOD. FM355-2C	SIMATIC S7-300, TEMPERATURE
<b>Analog outputs</b>		
Number of analog outputs	4	
Voltage output, short-circuit protection	Yes	
Voltage output, short-circuit current, max.	25 mA	
Current output, no-load voltage, max.	18 V	
<b>Output ranges, voltage</b>		
• 0 to 10 V	Yes	
• -10 V to +10 V	Yes	
<b>Output ranges, current</b>		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	
<b>Connection of actuators</b>		
• for voltage output two-wire connection	Yes	
• for current output two-wire connection	Yes	
<b>Load impedance (in rated range of output)</b>		
• with voltage outputs, min.	1 k $\Omega$	
• with voltage outputs, capacitive load, max.	1 $\mu$ F	
• with current outputs, max.	500 $\Omega$	
• with current outputs, inductive load, max.	1 mH	
<b>Cable length</b>		
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	
<b>Analog value creation</b>		
Measurement principle	integrating	integrating
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	14 bit	14 bit
• Conversion time (per channel)	100 ms; At 50/60 Hz	100 ms; At 50/60 Hz
<b>Settling time</b>		
• for resistive load	0.2 ms	0.1 ms
• for capacitive load	3.3 ms	3.3 ms
• for inductive load	0.5 ms	0.5 ms
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
• for voltage measurement	Yes	Yes
• for current measurement as 4-wire transducer	Yes	Yes
<b>Connectable encoders</b>		
• 2-wire sensor	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**FM 355-2 temperature controller modules****Technical specifications (continued)**

Article number	<b>6ES7355-2CH00-0AE0</b> TEMPERATURE CONTROL MOD. FM355-2C	<b>6ES7355-2SH00-0AE0</b> SIMATIC S7-300, TEMPERATURE
<b>Errors/accuracies</b>		
Linearity error (relative to input range), (+/-)	0.05 %	0.05 %
Temperature error (relative to input range), (+/-)	0.005 %/K	0.005 %/K
Linearity error (relative to output range), (+/-)	0.05 %	
Temperature error (relative to output range), (+/-)	0.02 %/K	
<b>Operational limit in overall temperature range</b>		
• Voltage, relative to input area, (+/-)	0.6 %; +/-0.6 to +/-0.7%	0.06 %; +/-0.06 to +/-0.7%
• Current, relative to input area, (+/-)	0.6 %; +/-0.6 to +/-0.7%	0.06 %; +/-0.06 to +/-0.7%
• Resistance thermometer, relative to input area, (+/-)	0.6 %; +/-0.6 to +/-0.7%	0.06 %; +/-0.06 to +/-0.7%
• Voltage, relative to output area, (+/-)	0.5 %	
• Current, relative to output area, (+/-)	0.6 %	
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to input area, (+/-)	0.04 %; +/-0.04 to +/-0.5%	0.04 %; +/-0.04 to +/-0.5%
• Current, relative to input area, (+/-)	0.04 %; +/-0.04 to +/-0.5%	0.04 %; +/-0.04 to +/-0.5%
• Resistance thermometer, relative to input area, (+/-)	0.04 %; +/-0.04 to +/-0.5%	0.04 %; +/-0.04 to +/-0.5%
• Voltage, relative to output area, (+/-)	0.4 %	
• Current, relative to output area, (+/-)	0.5 %	
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, <math>f1 =</math> interference frequency</b>		
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB
• common mode voltage (USS < 2.5 V), min.	70 dB	70 dB
<b>Interrupts/diagnostics/status information</b>		
Substitute values connectable	Yes; Parameterizable	Yes; Parameterizable
<b>Control technology</b>		
Number of closed-loop controllers	4	4
<b>Galvanic isolation</b>		
<b>Galvanic isolation controller</b>		
• between the channels	No	No
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler
<b>Permissible potential difference</b>		
between inputs and MANA (UCM)	2.5 V DC	2.5 V DC
between M internally and the inputs	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>		
Isolation checked with	500 V DC	500 V DC
<b>Connection method</b>		
required front connector	2x 20-pin	2x 20-pin
<b>Dimensions</b>		
Width	80 mm	80 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
<b>Weights</b>		
Weight, approx.	470 g	470 g

Ordering data	Article No.		Article No.
<b>FM 355-2 C temperature controller module</b> with 4 analog outputs for 4 continuous-action controllers	<b>6ES7355-2CH00-0AE0</b>	<b>Slot number label</b> Spare part	<b>6ES7912-0AA00-0AA0</b>
<b>FM 355-2 S temperature controller module</b> with 8 digital outputs for 4 step or pulse controllers	<b>6ES7355-2SH00-0AE0</b>	<b>Shield connection element</b> 80 mm wide, with 2 rows for 4 terminals each	<b>6ES7390-5AA00-0AA0</b>
<b>Front connector</b> 20-pin, with screw contacts • 1 unit • 100 units	<b>6ES7392-1AJ00-0AA0</b> <b>6ES7392-1AJ00-1AB0</b>	<b>Terminal elements</b> 2 units For 2 cables with 2 mm to 6 mm diameter	<b>6ES7390-5AB00-0AA0</b>
20-pin, with spring-loaded contacts • 1 unit • 100 units	<b>6ES7392-1BJ00-0AA0</b> <b>6ES7392-1BJ00-1AB0</b>	For 1 cable with 3 mm to 8 mm diameter	<b>6ES7390-5BA00-0AA0</b>
<b>Bus connectors</b> 1 unit (spare part)	<b>6ES7390-0AA00-0AA0</b>	For 1 cable with 4 mm to 13 mm diameter	<b>6ES7390-5CA00-0AA0</b>
<b>Labeling strips</b> 10 units (spare part)	<b>6ES7392-2XX00-0AA0</b>		
<b>Labeling sheets for machine inscription</b>	See under "Accessories", page 5/263		

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**SM 338 POS input modules****Overview**

- Interface between max. 3 absolute-value sensors (SSI) and the CPU
- For provision of the displacement encoder values for further processing in STEP 7 programs
- Enables direct response of controller to encoder values in moving systems

Note:

Displacement measuring systems and pre-assembled cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

<http://www.siemens.com/simatic-technology>

**Technical specifications**

Article number	<b>6ES7338-4BC01-0AB0</b>
	SIMATIC S7-300, SIGNAL. MODULE
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
<b>Input current</b>	
from load voltage L+ (without load), max.	100 mA
from backplane bus 5 V DC, max.	160 mA
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• Output current, max.	900 mA
<b>Power losses</b>	
Power loss, typ.	3 W
<b>Digital inputs</b>	
<b>Input voltage</b>	
• for signal *0*	-3 to +5V
• for signal *1*	11 to 30.2 V
<b>Input current</b>	
• for signal *0*, max. (permissible quiescent current)	2 mA
• for signal *1*, typ.	9 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at *0* to *1*, min.	300 µs
<b>Cable length</b>	
• shielded, max.	600 m

Article number	<b>6ES7338-4BC01-0AB0</b>
	SIMATIC S7-300, SIGNAL. MODULE
<b>Encoder</b>	
Number of connectable encoders, max.	3
<b>Connectable encoders</b>	
• Absolute encoder (SSI)	Yes
• 2-wire sensor	Yes
<b>Encoder signals, absolute encoder (SSI)</b>	
• Cable length, shielded, max.	320 m; 320 m at 125 kHz; 160 m at 250 kHz; 60 m at 500 kHz; 20 m at 1 MHz
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Galvanic isolation</b>	
Galvanic isolation	No
<b>Connection method</b>	
required front connector	20-pin
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	235 g

Ordering data	Article No.		Article No.
<b>SM 338 POS input module</b> For position sensing with 3 SSI encoders	<b>6ES7338-4BC01-0AB0</b>	<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>
<b>Front connector</b> 20-pin, with screw contacts • 1 unit • 100 units 20-pin, with spring-loaded contacts • 1 unit • 100 units	<b>6ES7392-1AJ00-0AA0</b> <b>6ES7392-1AJ00-1AB0</b> <b>6ES7392-1BJ00-0AA0</b> <b>6ES7392-1BJ00-1AB0</b>	<b>Signal cable</b> Pre-assembled for SSI absolute encoder 6FX2001-5, without Sub-D connector, UL/DESINA Length code	<b>6FX5002-2CC12-■■■■■</b>  See page 5/142
<b>Front door, elevated design</b> e.g. for 32-channel modules; for connecting 1.3 mm <sup>2</sup> /16 AWG conductors	<b>6ES7328-0AA00-7AA0</b>		
<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>		

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**IM 174 PROFIBUS modules****Overview**

- For connecting up to 4 drives with analog setpoint interface or pulse-direction interface to a controller
- Operation with isochronous PROFIBUS DP
- Connectable drives:
  - Electrical drives
  - Hydraulic drives
  - Stepper drives
- Can be used with:
  - SIMATIC CPU 41x-2 DP, CPU 31x-2 DP, CPU 31xT-2 DP, WinAC RTX 2008
  - SIMOTION C2xx, SIMOTION P350, SIMOTION D4x5
- Can also be used with external encoders

**Technical specifications**

Article number	<b>6ES7174-0AA10-0AA0</b>
	IM 174 FOR CONNECTING ANALOG DRIVES
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Input current</b>	
Current consumption, max.	500 mA
from backplane bus 5 V DC, max.	100 mA
<b>Encoder supply</b>	
<b>5 V encoder supply</b>	
• 5 V	Yes
• Output current, max.	1.2 A
• Cable length, max.	25 m
<b>24 V encoder supply</b>	
• 24 V	Yes
• Output current, max.	1.4 A
• Cable length, max.	100 m
<b>Absolute encoder (SSI) encoder supply</b>	
• Absolute encoder (SSI)	Yes
• short-circuit protection	Yes
<b>Power losses</b>	
Power loss, typ.	12 W
<b>Digital inputs</b>	
Number of digital inputs	10
<b>Input voltage</b>	
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	8 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at "0" to "1", min.	15 µs
<b>Cable length</b>	
• shielded, max.	100 m

Article number	<b>6ES7174-0AA10-0AA0</b>
	IM 174 FOR CONNECTING ANALOG DRIVES
<b>Digital outputs</b>	
Number of digital outputs	8
short-circuit protection	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	1 A
• on lamp load, max.	30 W
<b>Output voltage</b>	
• Rated value (DC)	24 V; L+
• for signal "1", min.	L+ (-3 V)
• for signal "1", max.	3 V
<b>Output current</b>	
• for signal "1" permissible range for 0 to 55 °C, min.	5 mA
• for signal "1" permissible range for 0 to 55 °C, max.	300 mA
• for signal "0" residual current, max.	0.4 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	500 µs
<b>Switching frequency</b>	
• with resistive load, max.	500 Hz
• with inductive load, max.	0.5 Hz
<b>Relay outputs</b>	
• Number of relay outputs	4
• Number of operating cycles, max.	50 000
<b>Switching capacity of contacts</b>	
- with resistive load, max.	1 A
<b>Cable length</b>	
• shielded, max.	600 m
<b>Analog outputs</b>	
Number of analog outputs	4
<b>Output ranges, voltage</b>	
• -10 V to +10 V	Yes
<b>Analog value creation</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	15 bit

**Technical specifications (continued)**

Article number	<b>6ES7174-0AA10-0AA0</b> IM 174 FOR CONNECTING ANALOG DRIVES
<b>Encoder</b>	
Number of connectable encoders, max.	4
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes
• Absolute encoder (SSI)	Yes
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	2 mA
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input signal	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz
• Cable length, shielded, max.	35 m; 35 m at max. 500 kHz; 10 m at max. 1 MHz
<b>Encoder signals, absolute encoder (SSI)</b>	
• Input signal	5 V difference signal (phys. RS 422)
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Message frame length, parameterizable	13, 21, 24 bit
• Clock frequency, max.	1.5 MHz; 187.5 KHz 1.5 MHz (parameterizable)
• Binary code	1
• Gray code	1
• Cable length, shielded, max.	250 m; 250 m at 187.5 kHz, 10 m at 1.5 MHz
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes
shortest clock pulse	1.5 ms
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Drive interface</b>	
Number of drive interfaces	4
<b>Analog drive</b>	
<b>Setpoint signal</b>	
- Short circuit proof	Yes; max. 45 mA, min. 3.3 kOhm load impedance
- Range of rated voltage	-10.5 V to +10.5 V
- Output current	-3 to +3 mA
<b>Output controller release</b>	
- Number of relay contacts	4
- Switching voltage, max.	30 V
- Switching current, max.	1 A
- Switching capacity, max.	30 V·A
- Number of switching cycles, min.	50 000; at 30 V DC, 1 A
- Cable length (shielded), max.	35 m

Article number	<b>6ES7174-0AA10-0AA0</b> IM 174 FOR CONNECTING ANALOG DRIVES
<b>Signal output I</b>	
• Number of relay contacts	2
• Switching voltage, max.	30 V
• Switching current, max.	1 A
• Switching capacity, max.	30 V·A
• Number of switching cycles, min.	50 000; at 30 V DC, 1 A
• Cable length (shielded), max.	35 m
<b>Signal output II</b>	
• Differential output voltage, min.	2 V; R = 100 Ohm
• Differential output voltage for signal "1", min.	3.7 V; 3.7 V at I = -20 mA; 4.5 V at I = -100 µA,
• Differential output voltage for signal "0", max.	1 V; For I = -20 mA
• Load resistance, min.	55 Ω
• Output current, max.	60 mA
<b>Signal output III</b>	
• Pulse frequency	750 kHz
• Cable length (shielded), max.	50 m; in hybrid operation with analog axes 35 m, in asymmetrical transmission 10 m
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• Galvanic isolation digital inputs	Yes; to encoders, analog outputs, DP interface; no to other DI/DOs
<b>Galvanic isolation digital outputs</b>	
• Galvanic isolation digital outputs	Yes; to encoders, analog outputs, DP interface; no to other DI/DOs
<b>Connection method</b>	
required front connector	40-pin
<b>Dimensions</b>	
Width	160 mm
Height	125 mm
Depth	118 mm
<b>Weights</b>	
Weight, approx.	1 kg



**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**IM 174 PROFIBUS modules****Ordering data****Article No.****Article No.****IM 174 PROFIBUS module**

PROFIBUS module for connecting analog drives and stepper drives to a controller

**6ES7174-0AA10-0AA0****Setpoint cable**

for the connection between IM 174 and SIMODRIVE 611-A

for the connection between IM 174 with 3 stepper drives and one SIMODRIVE (end of cable cut off)

Length code

**6FX2002-3AD01-■ ■ ■ ■****6FX2002-3AD02-■ ■ ■ ■**

See page 5/142

## Overview



SIWAREX U is a versatile weighing module for all simple weighing and force measuring tasks. The compact module can be integrated into SIMATIC automation systems without any problems. Complete data access is possible via the SIMATIC.

## Technical specifications

SIWAREX U	
<b>Integration in automation systems</b>	
<ul style="list-style-type: none"> <li>• S7-300</li> <li>• S7-400 (H)</li> <li>• PCS 7 (H)</li> <li>• C7</li> <li>• Automation systems from other vendors</li> <li>• Stand-alone (without SIMATIC CPU)</li> </ul>	Direct integration Through ET 200M Through ET 200M Through IM or ET 200M Through ET 200M Possible with IM 153-1
<b>Communication interfaces</b>	
	<ul style="list-style-type: none"> <li>• SIMATIC S7 (P bus)</li> <li>• RS 232</li> <li>• TTY</li> </ul>
<b>Connection of remote displays (through TTY serial interface)</b>	
	Gross, channel 1, 2 or default value 1, 2
<b>Adjustment of scales settings</b>	
	Through SIMATIC (P bus) or PC using SIWATOOL U (RS 232)
<b>Measuring properties</b>	
Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K	0.05 %
Internal resolution ADC	65535
Data format of weight values	2 byte (fixed-point)
<b>Number of measurements/second</b>	
	50
<b>Digital filter</b>	
	0.05 ... 5 Hz (in 7 steps), mean value filter
<b>Weighing functions</b>	
Weight values	Gross
Limit values	2 (min./max.)
Zero setting function	Per command
<b>Load cells</b>	
	Strain gages in 4-wire or 6-wire system

SIWAREX U	
<b>Load cell powering</b>	
Supply voltage $U_s$ (rated value)	6 V DC <sup>1)</sup>
Max. supply current	≤ 150 mA per channel
Permissible load impedance	
<ul style="list-style-type: none"> <li>• <math>R_{Lmin}</math></li> <li>• <math>R_{Lmax}</math></li> </ul>	> 40 Ω per channel < 4010 Ω
With Ex(i) interface:	
<ul style="list-style-type: none"> <li>• <math>R_{Lmin}</math></li> <li>• <math>R_{Lmax}</math></li> </ul>	> 87 Ω per channel < 4010 Ω
<b>Permissible load cell characteristic</b>	
	Up to 4 mV/V
<b>Max. distance of load cells</b>	
	500 m <sup>2)</sup> 150/500 m for gas group IIC 500 m <sup>2)</sup> for gas group IIB (see SIWAREX IS Manual)
<b>Intrinsically-safe load cell powering</b>	
	Optional (Ex interface) with SIWAREX IS
<b>Auxiliary power supply</b>	
Rated voltage	24 V DC
Max. current consumption	150 mA (single-channel) / 240 mA (two-channel)
Current consumption on backplane bus	≤ 100 mA
<b>Certification</b>	
	ATEX 95, FM, cUL <sub>US</sub> Haz. Loc.
<b>IP degree of protection to DIN EN 60529; IEC 60529</b>	
	IP20
<b>Climatic requirements</b>	
$T_{min}$ (IND) to $T_{max}$ (IND) (operating temperature)	
<ul style="list-style-type: none"> <li>• Vertical installation</li> <li>• Horizontal installation</li> </ul>	0 ... +60 °C (32 ... 140 °F) 0 ... +40 °C (32 ... 104 °F)
<b>EMC requirements according to</b>	
	NAMUR NE21, Part 1 EN 61326
<b>Dimensions</b>	
	40 x 125 x 130 mm (1.58 x 4.92 x 5.12 inch)

<sup>1)</sup> Load cell supply changed to 6 V DC as compared to 7MH4601-1AA01 or ... 1BA01.

<sup>2)</sup> Up to 1000 m possible under certain conditions, provided the recommended cable is used (see Accessories).

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**SIWAREX U****Ordering data****Article No.****SIWAREX U**

for SIMATIC S7 and ET 200M,  
incl. bus connector, weight 0.3 kg  
(0.661 lb)

Single-channel version<sup>1)</sup>  
for connecting one scale

**7MH4950-1AA01**

Two-channel version<sup>2)</sup>  
for connecting two scales

**7MH4950-2AA01****SIWAREX U Manual**

Available in a range of languages  
Free download from the Internet at:  
<http://www.siemens.com/weighing>

**SIWAREX U configuration package for SIMATIC S7 version 5.4 or higher**

- on CD-ROM
- PC SIWATOOL U software (available in a range of languages), new design
  - Sample program "Getting started" – ready to use application for SIMATIC S7
  - SIWAREX U Manual on CD (in a range of languages), new design
  - HSP Hardware Support Package for integrating SIWAREX U in STEP 7

**7MH4950-1AK01****SIWAREX U configuration package for PCS7 S7, version 7.0 and V7.1**

suitable for 7MH4950-1AA01 and 7MH4950-2AA01

- on CD-ROM
- Function block for the CFC
  - Faceplate
  - SIWATOOL U commissioning software
  - Manual

**7MH4950-3AK61****SIWAREX U configuration package for PCS7, version 8.0**

- Suitable for 7MH4950-xAA01
- Function block for the CFC
  - Faceplate
  - SIWATOOL U commissioning software
  - Manual

**7MH4950-3AK62****SIWAREX U APL configuration package for PCS7, version 8.0, Update 1**

- Suitable for 7MH4950-xAA01
- Function block for the CFC
  - APL-style faceplate
  - SIWATOOL U commissioning software
  - Manual

**7MH4950-3AK65****SIWATOOL connecting cable**

from SIWAREX U/CS with serial PC interface, for 9-pin PC interfaces (RS 232), length 3 m (9.84 ft)

**7MH4607-8CA**

<sup>1)</sup> Compatible with 7MH4601-1AA01; supply of load cells changed to 6 V DC.

<sup>2)</sup> Compatible with 7MH4601-1BA01; supply of load cells changed to 6 V DC.

**Article No.****Installation material (mandatory)****20-pin front plug with screw contacts**

Required for each SIWAREX module

**6ES7392-1AJ00-0AA0****Shield contact element**

Sufficient for two SIWAREX U modules

**6ES7390-5AA00-0AA0****Shield connection terminal**

Contents: 2 units (suitable for cable with diameter 4 ... 13 mm) (0.16 ... 0.51 inch)

**6ES7390-5CA00-0AA0**

Note:  
one shield connection terminal each is required for:

- Scale connection
- RS 485 interface
- RS 232 interface

**S7 DIN rail**

- 160 mm (6.30 inch)
- 480 mm (18.90 inch)
- 530 mm (20.87 inch)
- 830 mm (32.68 inch)
- 2000 mm (78.74 inch)

**6ES7390-1AB60-0AA0****6ES7390-1AE80-0AA0****6ES7390-1AF30-0AA0****6ES7390-1AJ30-0AA0****6ES7390-1BC00-0AA0****Accessories (optional)****PS 307 load power supplies**

(only required if 24 V DC not available)

120/230 V AC; 24 V DC,  
incl. power connector

PS 307-1B; 2 A

**6ES7307-1BA00-0AA0**

PS 307-1E; 5 A

**6ES7307-1EA00-0AA0**

PS 307-1K; 10 A

**6ES7307-1KA00-0AA0****Labeling strips**

(10 units, spare part)

**6ES7392-2XX00-0AA0****Remote displays (option)**

The digital remote displays can be connected directly to SIWAREX U through a TTY interface.

The following remote displays can be used: S102, S302

Siebert Industrieelektronik GmbH  
P.O. Box 1180

D-66565 Eppelborn, Germany

Tel.: +49 6806/980-0

Fax: +49 6806/980-999

Internet:

<http://www.siebert-group.com/en>

Detailed information is available from the manufacturer.

Ordering data	Article No.	Article No.
<b>SIWAREX JB junction box, aluminum housing</b> for connecting up to 4 load cells in parallel, and for connecting multiple junction boxes	7MH4710-1BA	
<b>SIWAREX JB junction box, stainless steel housing</b> for connecting up to 4 load cells in parallel	7MH4710-1EA	
<b>Ex interface, type SIWAREX IS</b> with ATEX approval, but <b>without UL and FM approvals</b> , for intrinsically-safe connection of load cells, including manual, suitable for the SIWAREX U, CS, MS, FTA, FTC and CF weighing modules. <b>Approved for use in the EU.</b> <ul style="list-style-type: none"> <li>• With short-circuit current &lt; 199 mA DC</li> <li>• With short-circuit current &lt; 137 mA DC</li> </ul>	7MH4710-5BA  7MH4710-5CA	<b>Cables (optional)</b>  <b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath</b> for connecting SIWAREX U, CS, MS, FTA, FTC and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JB's, for fixed laying, occasional bending permitted, 10.8 mm (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-40 ... +176 °F)
		<b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath</b> To connect the junction box (JB) or extension box (EB) in a potentially explosive atmosphere to the Ex interface (Ex I), for fixed laying, occasional bending permitted, blue PVC insulating sheath, approx. 10.8 mm (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-40 ... +176 °F)
		<b>Cable LiYCY 4 x 2 x 0.25 mm<sup>2</sup></b> for TTY (connect 2 pairs of conductors in parallel), for connection of a remote display

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**SIWAREX FTA****Overview**

The SIWAREX FTA (Flexible Technology, Automatic Weighing Instrument) is a versatile and flexible weighing module for industrial use. It can be used in both non-automatic and automatic weighing operation, for example the production of mixtures, and for filling, loading, monitoring and bag filling.

It has the corresponding scale approvals and is also suitable for legal-for-trade weighing systems.

The SIWAREX FTA function module is integrated in SIMATIC S7/PCS7, and uses the features of this modern automation system, such as integrated communication, diagnostics and configuration tools.

**Technical specifications**

<b>SIWAREX FTA</b>	
<b>Use in automation systems</b>	
S7-300	Directly or through ET 200M
S7-400 (H)	Through ET 200M
PCS 7 (H)	Through ET 200M
<b>Communication interfaces</b>	
S7	Through backplane bus
RS 232	For Siwatool or printer connection
RS 485	For remote display or digital load cell
<b>Module parameterization</b>	
	Using SIMATIC S7
	Using SIWATOOL FTA software (RS 232)
<b>Measuring properties</b>	
EU type approval as non-automatic weighing machine, trade class III	3 x 6 000 d ≥ 0.5 μV/e
Internal resolution	16 million parts
Internal/external updating rate	400/100 Hz
<b>Several parameterizable digital filters</b>	
	Critically damped, Bessel, Butterworth (0.05 ... 20 Hz), mean-value filter
<b>Weighing functions</b>	
Non-automatic weighing machine	OIML R76
Automatic weighing machine	OIML R51, R61, R107
<b>Load cells</b>	
	Strain gages in 4-wire or 6-wire system
3 characteristic value ranges	1, 2 or 4 mV/V
<b>Load cell powering</b>	
Supply voltage $U_S$ (rated value)	10.3 V DC
Max. supply current	184 mA
Permissible load cell resistance	
• $R_{Lmin}$	> 56 Ω > 87 Ω with Ex interface
• $R_{Lmax}$	≤ 4 010 Ω

<b>SIWAREX FTA</b>	
<b>Max. distance of load cells</b>	
When using the recommended cable:	
Standard	1 000 m (3 280 ft)
In hazardous area <sup>1)</sup>	
• For gases of group IIC	300 m (984 ft)
• For gases of group IIB	1000 m (3 280 ft)
<b>Connection to load cells in Ex zone 1</b>	
	Optionally via SIWAREX IS Ex interface
<b>Ex approvals zone 2 and safety</b>	
	ATEX 95, FM, cUL <sub>US</sub> Haz. Loc.
<b>Auxiliary power supply</b>	
Rated voltage	24 V DC
Max. power consumption	500 mA
Current consumption from backplane bus	Typ. 55 mA
<b>Inputs/outputs</b>	
Digital inputs	7 DI electrically isolated
Digital outputs	8 DO electrically isolated
Counter input	Up to 10 kHz
Analog output	
• Current range	0/4 ... 20 mA
• Updating rate	100 Hz
<b>Approvals</b>	
	EU type approval (CE, OIML R76)
	EU prototype test to MID (OIML R51, R61, R107)
<b>Degree of protection according to EN 60529; IEC 60529</b>	
	IP20
<b>Climatic requirements</b>	
$T_{min}$ (IND) ... $T_{max}$ (IND) (operating temperature)	
• Vertical installation	-10 ... 60 °C (14 ... 140 °F)
• Horizontal installation	-10 ... 40 °C (14 ... 104 °F)
<b>EMC requirements</b>	
	EN 61326, EN 45501, NAMUR NE21, Part 1
<b>Dimensions</b>	
	80 x 125 x 130 mm (3.15 x 4.92 x 5.12 inch)
<b>Weight</b>	
	600 g (0.44 lb)

<sup>1)</sup> For further details, see Ex interface, type SIWAREX IS

Ordering data	Article No.	Ordering data	Article No.
<b>SIWAREX FTA</b> Legal-for-trade weighing electronics for automatic scales for S7-300 and ET 200M. EU type approval 3 x 6000 d Applications: proportioning, filling, bagging, loading. Note: Observe approval conditions for applications with obligation of verification. We recommend using our calibration set and contacting our SIWAREX hotline.	7MH4900-2AA01	<b>Calibration set for SIWAREX FTA</b> For verification of up to 5 scales comprising: <ul style="list-style-type: none"> <li>• 3 x inscription foil for labeling</li> <li>• 1 x protection foil</li> <li>• 10 x EU verification marks (black M on green background)</li> <li>• Guidelines for verification, verification certificates and approvals, adaptable label, SIWAREX FTA Manual on CD-ROM</li> </ul>	7MH4900-2AY10
<b>SIWAREX FTA Manual</b> Available in a range of languages Free download from the Internet at: <a href="http://www.siemens.com/weighing">www.siemens.com/weighing</a>		<b>SIWAREX Multiscale</b> STEP 7 software for SIWAREX FTA. Control of one or more scales for a scalable number of components and any number of recipes. Applications: batching plants, mixers in production process, CD-ROM	7MH4900-2AL01
<b>SIWAREX FTA "Getting started"</b> Sample software shows beginners how to program the scales in STEP 7. Free download from the Internet at: <a href="http://www.siemens.com/weighing">www.siemens.com/weighing</a>		<b>SIWAREX Multifill</b> STEP 7 software for SIWAREX FTA. Control of filling and bagging processes for one or more filling stations and any number of materials, CD-ROM	7MH4900-2AM01
<b>SIWAREX FTA configuration package for SIMATIC S7 on CD-ROM</b> <ul style="list-style-type: none"> <li>• HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7</li> <li>• SIWAREX FTA "Getting started"</li> <li>• SIWATOOL FTA commissioning software</li> <li>• Flexible software for legal-for-trade display in WinCC flexible</li> <li>• Manual</li> </ul>	7MH4900-2AK01	<b>SIWATOOL connecting cable</b> From SIWAREX FTA with serial PC interface, for 9-pin PC interfaces (RS 232) <ul style="list-style-type: none"> <li>• 2 m long (6.56 ft)</li> <li>• 5 m long (16.40 ft)</li> </ul>	7MH4702-8CA 7MH4702-8CB
<b>SIWAREX FTA configuration package for PCS 7 V7.0 on CD-ROM</b> <ul style="list-style-type: none"> <li>• HSP hardware support package for integrating SIWAREX FTA/FTC in STEP 7</li> <li>• Function block for CFC</li> <li>• Faceplate</li> <li>• SIWATOOL FTA commissioning software</li> <li>• Manual</li> </ul>	7MH4900-2AK62	<b>Front connector, 40-pin</b> Required for each SIWAREX module <ul style="list-style-type: none"> <li>• With screw contacts</li> <li>• With spring-loaded terminals</li> </ul>	6ES7392-1AM00-0AA0 6ES7392-1BM01-0AA0
<b>SIWAREX FTA configuration package for SIMATIC PCS 7, Version 8.0 on CD-ROM</b> <ul style="list-style-type: none"> <li>• HSP hardware support package for integrating SIWAREX FTA/FTC in STEP 7</li> <li>• Function block for the CFC</li> <li>• Faceplate</li> <li>• SIWATOOL FTA commissioning software</li> <li>• Manual</li> </ul>	7MH4900-2AK63	<b>Shield contact element</b> Sufficient for one SIWAREX FTA module	6ES7390-5AA00-0AA0
<b>SIWAREX FTA APL configuration package for SIMATIC PCS 7, Version 8.0, Update 1 on CD-ROM</b> <ul style="list-style-type: none"> <li>• HSP hardware support package for integrating SIWAREX FTA/FTC in STEP 7</li> <li>• Function block for the CFC</li> <li>• APL-style faceplate</li> <li>• SIWATOOL FTA commissioning software</li> <li>• Manual</li> </ul>	7MH4900-2AK65	<b>Shield connection terminal</b> Contents: 2 units (suitable for cable with diameter 4 ... 13 mm (0.16 ... 0.51 inch)) Note: One shield connection terminal each is required for: <ul style="list-style-type: none"> <li>• Scale connection</li> <li>• RS 485 interface</li> <li>• RS 232 interface</li> </ul>	6ES7390-5CA00-0AA0
		<b>S7 DIN rail</b> <ul style="list-style-type: none"> <li>• 160 mm (6.30 inch)</li> <li>• 480 mm (18.90 inch)</li> <li>• 530 mm (20.87 inch)</li> <li>• 830 mm (32.68 inch)</li> <li>• 2000 mm (78.74 inch)</li> </ul>	6ES7390-1AB60-0AA0 6ES7390-1AE80-0AA0 6ES7390-1AF30-0AA0 6ES7390-1AJ30-0AA0 6ES7390-1BC00-0AA0
		PS 307 load power supply (only required if 24 V DC is not available) 120/230 V AC; 24 V DC <ul style="list-style-type: none"> <li>• PS 307-1B; 2 A</li> <li>• PS 307-1E; 5 A</li> <li>• PS 307-1K; 10 A</li> </ul>	6ES7307-1BA00-0AA0 6ES7307-1EA00-0AA0 6ES7307-1KA00-0AA0
		<b>MMC memory</b> For data recording up to 32 MB, only for legal-for-trade applications R76, R51 and R107	7MH4900-2AY21

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**SIWAREX FTA****Ordering data****Article No.****Article No.****Remote displays (option)**

The Siebert S102 and S302 remote digital displays can be directly connected to the SIWAREX FTA via an RS 485 interface.

Siebert Industrieelektronik GmbH  
Postfach 1180  
D-66565 Eppelborn, Germany  
Tel.: +49 6806/980-0  
Fax: +49 6806/980-999  
Internet:  
<http://www.siebert-group.com/en>

Detailed information available from manufacturer.

**SIWAREX JB junction box, aluminum housing****7MH4710-1BA**

For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes

**SIWAREX JB junction box, stainless steel housing****7MH4710-1EA**

For connecting up to 4 load cells in parallel

**Ex interface, type SIWAREX IS**

With ATEX approval, but **without UL or FM approval** for intrinsically-safe connection of load cells, including manual, suitable for the SIWAREX U, CS, MS, FTA, FTC and CF weighing modules.

Approved for use in the EU.

- With short-circuit current < 199 mA DC
- With short-circuit current < 137 mA DC

**7MH4710-5BA****7MH4710-5CA****Cable (optional)****Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath****7MH4702-8AG**

For connecting SIWAREX U, CS, MS, FTA, FTC and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JBs, for fixed laying, occasional bending permitted, 10.8 mm (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-40 ... +176 °C)

**Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath****7MH4702-8AF**

To connect the junction box (JB) or extension box (EB) in a potentially explosive atmosphere to the Ex interface (Ex I), for fixed laying, occasional bending permitted, blue PVC insulating sheath, approx. 10.8 mm (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-40 ... +176 °C)

**Cable LiYCY 4 x 2 x 0.25 mm<sup>2</sup>****7MH4407-8BD0**

For TTY (connect 2 pairs of conductors in parallel), for connection of a remote display

## Overview



The SIWAREX FTC (Flexible Technology for Continuous Weighing) is a versatile and flexible weighing module for conveyor scales, differential proportioning weighers and bulk flow meters. It can also be used to record weights and measure force. The SIWAREX FTC function module is integrated in SIMATIC S7/PCS7, and uses the features of this modern automation system, such as integral communication, diagnostics and configuration tools.

## Technical specifications

SIWAREX FTC	
<b>Use in automation systems</b>	
S7-300	Directly or via ET 200M
S7-400 (H)	Through ET 200M
PCS 7 (H)	Through ET 200M
<b>Communication interfaces</b>	
S7	Through backplane bus
RS 232	For SIWATOOL or printer connection
RS 485	For remote display or digital load cell
<b>Module parameterization</b>	
	Using SIMATIC S7
	Using SIWATOOL FTC software (RS 232)
<b>Measuring properties</b>	
Accuracy to EN 45501	$3 \times 6\,000 d \geq 0.5 \mu\text{V/e}$
Internal resolution	+/- 8 million parts
Internal/external updating rate	400/100 Hz
<b>Several parameterizable digital filters</b>	Critically dampened, Bessel, Butterworth (0.05 ... 20 Hz), mean-value filter
<b>Weighing functions</b>	
	<ul style="list-style-type: none"> <li>Non-automatic weighing machine, force measurement</li> <li>Conveyor scale</li> <li>Differential proportioning weigher</li> <li>Bulk flow meter</li> </ul>
<b>Load cells</b>	
	Strain gages in 4-wire or 6-wire system
3 characteristic value ranges	1, 2 or 4 mV/V
<b>Load cell powering</b>	
Supply voltage $U_S$ (rated value)	10.3 V DC
Max. supply current	184 mA
Permissible load cell resistance	
• $R_{Lmin}$	$> 56 \Omega$
	$> 87 \Omega$ with Ex interface
• $R_{Lmax}$	$\leq 4\,010 \Omega$

SIWAREX FTC	
<b>Max. distance of load cells</b>	
When using the recommended cable:	
Standard	1 000 m (3280 ft)
In hazardous area <sup>1)</sup>	
• For gases of group IIC	300 m (984 ft)
• For gases of group IIB	1 000 m (3280 ft)
<b>Connection to load cells in Ex zone 1</b>	Optionally via SIWAREX IS Ex interface
<b>Ex approvals zone 2 and safety</b>	ATEX 95, FM, cUL <sub>US</sub> Haz. Loc.
<b>Auxiliary power supply</b>	
Rated voltage	24 V DC
Max. power consumption	500 mA
Current consumption from backplane bus	Typ. 55 mA
<b>Inputs/outputs</b>	
Digital inputs	7, electrically isolated
Digital outputs	8, electrically isolated
Counter input	Up to 10 kHz
Analog output	
• Current range	0/4 ... 20 mA
• Updating rate	100 Hz
<b>Degree of protection according to EN 60529; IEC 60529</b>	IP20
<b>Climatic requirements</b>	
$T_{min} (IND) \dots T_{max} (IND)$ (operating temperature)	
• Vertical installation	-10 ... 60 °C (14 ... 140 °F)
• Horizontal installation	-10 ... 40 °C (14 ... 104 °F)
<b>EMC requirements</b>	EN 61326, EN 45501, NAMUR NE21, Part 1
<b>Dimensions</b>	80 x 125 x 130 mm (3.15 x 4.92 x 5.12 inch)
<b>Weight</b>	600 g (0.44 lb)

<sup>1)</sup> For further details, see Ex interface, type SIWAREX IS



## SIMATIC S7-300 advanced controller

I/O modules

Function modules

## SIWAREX FTC

Ordering data	Article No.	Article No.	
<b>SIWAREX FTC</b> Weighing electronics for S7-300 and ET 200M. Applications: Belt scales, force measurement, loss-in-weight feeders and solids flowmeters	7MH4900-3AA01	<b>SIWAREX FTC_B configuration package for PCS 7 Version V7.0 and V7.1 on CD-ROM (conveyor scale)</b> • HSP hardware support package for integrating SIWAREX FTA/FTC in STEP 7 • Function block for CFC • Faceplate • Commissioning software SIWATOOL FTC_B for conveyor scales • Manual	7MH4900-3AK63
<b>SIWAREX FTC_B manual for belt scales</b> Available in a range of languages Free download from the Internet at: <a href="http://www.siemens.com/weighing">http://www.siemens.com/weighing</a>		<b>SIWAREX FTC_B configuration package for PCS 7 Version V8.0 on CD-ROM (conveyor scale)</b> • HSP hardware support package for FTA/FTC package • Function block for the CFC • Faceplate • SIWATOOL commissioning software • Manual	7MH4900-3AK65
<b>SIWAREX FTC_L manual for solids flowmeters and loss-in-weight feeders</b> Available in a range of languages Free download from the Internet at: <a href="http://www.siemens.com/weighing">http://www.siemens.com/weighing</a>		<b>Configuration package SIWAREX FTC_L for PCS 7 V8.0 on CD-ROM (loss-in-weight feeders)</b> • HSP hardware support package for integrating SIWAREX FTA/FTC in STEP 7 • Function block for the CFC • Faceplate • Commissioning software SIWATOOL FTC_L for solids flowmeters and loss-in-weight feeders • Manual	7MH4900-3AK66
<b>SIWAREX FTC "Getting started" for belt scales</b> Sample software shows beginners how to program the scales in STEP 7 for conveyor scale mode Free download from the Internet at: <a href="http://www.siemens.com/weighing">http://www.siemens.com/weighing</a>		<b>SIWAREX FTC_L configuration package for PCS 7 V7.0 and V7.1 on CD-ROM (loss-in-weight scale)</b> • HSP hardware support package for integrating SIWAREX FTA/FTC in STEP 7 • Function block for the CFC • Faceplate • Commissioning software SIWATOOL FTC_L for bulk flow meters and loss-in-weight feeders • Manual	7MH4900-3AK64
<b>SIWAREX FTC "Getting started" for solids flowmeters</b> Sample software shows beginners how to program the scales in STEP 7 for bulk flow meter mode Free download from the Internet at: <a href="http://www.siemens.com/weighing">http://www.siemens.com/weighing</a>		<b>SIWAREX FTC "Getting started" for loss-in-weight feeders</b> Sample software shows beginners how to program scales in STEP 7 for differential proportioning weigher mode Free download from the Internet at: <a href="http://www.siemens.com/weighing">http://www.siemens.com/weighing</a>	
<b>SIWAREX FTC "Getting started" for loss-in-weight feeders</b> Sample software shows beginners how to program scales in STEP 7 for differential proportioning weigher mode Free download from the Internet at: <a href="http://www.siemens.com/weighing">http://www.siemens.com/weighing</a>		<b>SIWAREX FTC "Getting started" for loss-in-weight feeders</b> Sample software shows beginners how to program scales in STEP 7 for differential proportioning weigher mode Free download from the Internet at: <a href="http://www.siemens.com/weighing">http://www.siemens.com/weighing</a>	
<b>Configuration package SIWAREX FTC_B for the TIA Portal and STEP 7 on CD-ROM (belt scales)</b> • HSP Hardware Support Package for integrating SIWAREX FTA/FTC in STEP 7 • "Getting started" for conveyor scales • Commissioning software SIWATOOL FTC_B for conveyor scales • Manual	7MH4900-3AK03	<b>SIWATOOL cable</b> From SIWAREX FTC with serial PC interface, for 9-pin PC interfaces (RS 232) • 2 m long (6.56 ft) • 5 m long (16.40 ft)	7MH4702-8CA 7MH4702-8CB
<b>Configuration package SIWAREX FTC_L for the TIA Portal and STEP 7 on CD-ROM (solids flowmeters, loss-in-weight feeders)</b> • HSP hardware support package for integrating SIWAREX FTA/FTC in STEP 7 • "Getting started" for solids flow meters • "Getting started" for loss-in-weight feeders • Commissioning software SIWATOOL_L for bulk flow meters and loss-in-weight feeders • Manual	7MH4900-3AK04	<b>40-pin front plug with screw contacts</b> Required for each SIWAREX module • With screw contacts • With spring-loaded terminals	6ES7392-1AM00-0AA0 6ES7392-1BM01-0AA0
		<b>Shield contact element</b> Sufficient for one SIWAREX FTC module	6ES7390-5AA00-0AA0
		<b>Shield connection terminal</b> Contents: 2 units (suitable for cable with diameter 4 ... 13 mm) Note: One shield connection terminal each is required for: • Scale connection • RS 485 interface • RS 232 interface	6ES7390-5CA00-0AA0

Ordering data	Article No.	Article No.
<b>S7 DIN rail</b> <ul style="list-style-type: none"> <li>• 160 mm (6.30 inch)</li> <li>• 480 mm (18.90 inch)</li> <li>• 530 mm (20.87 inch)</li> <li>• 830 mm (32.68 inch)</li> <li>• 2000 mm (78.74 inch)</li> </ul>	<b>6ES7390-1AB60-0AA0</b> <b>6ES7390-1AE80-0AA0</b> <b>6ES7390-1AF30-0AA0</b> <b>6ES7390-1AJ30-0AA0</b> <b>6ES7390-1BC00-0AA0</b>	
<b>PS 307 load power supply</b> (only required if 24 V DC is not available) 120/230 V AC; 24 V DC <ul style="list-style-type: none"> <li>• PS 307-1B; 2 A</li> <li>• PS 307-1E; 5 A</li> <li>• PS 307-1K; 10 A</li> </ul>	<b>6ES7307-1BA00-0AA0</b> <b>6ES7307-1EA00-0AA0</b> <b>6ES7307-1KA00-0AA0</b>	
<b>MMC memory</b> For data recording up to 16 MB	<b>7MH4900-2AY20</b>	
<b>Remote display (optional)</b> The Siebert S102 and S302 remote digital display can be directly connected to the SIWAREX FTC via an RS 485 interface (not suitable for band scale mode) Siebert Industrieelektronik GmbH Postfach 1180 D-66565 Eppelborn, Germany Tel.: +49 6806/980-0 Fax: +49 6806/980-999 Internet: <a href="http://www.siebert-group.com/en">http://www.siebert-group.com/en</a> Detailed information available from manufacturer.		
<b>SIWAREX JB junction box, aluminum housing</b> For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes	<b>7MH4710-1BA</b>	
<b>SIWAREX JB junction box, stainless steel housing</b> For connecting up to 4 load cells in parallel	<b>7MH4710-1EA</b>	
<b>Ex interface, type SIWAREX IS</b> With ATEX approval, but <b>without UL or FM approval</b> for intrinsically-safe connection of load cells, including manual, suitable for the SIWAREX U, CS, MS, FTA, FTC and CF weighing modules, Approved for use in the EU. <ul style="list-style-type: none"> <li>• With short-circuit current &lt; 199 mA DC</li> <li>• With short-circuit current &lt; 137 mA DC</li> </ul>	<b>7MH4710-5BA</b> <b>7MH4710-5CA</b>	
<b>Cable (optional)</b> <b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath</b> For connecting SIWAREX U, CS, MS, FTA, FTC and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JBs, for fixed laying, occasional bending permitted, 10.8 mm (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-40 ... +176 °F)		<b>7MH4702-8AG</b>
<b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath</b> To connect the junction box (JB) or extension box (EB) in a potentially explosive atmosphere to the Ex interface (Ex I), for fixed laying, occasional bending permitted, blue PVC insulating sheath, approx. 10.8 mm (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-40 ... +176 °F)		<b>7MH4702-8AF</b>
<b>Cable LiYCY 4 x 2 x 0.25 mm²</b> For TTY (connect 2 pairs of conductors in parallel), for connection of a remote display		<b>7MH4407-8BD0</b>

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**SIFLOW FC070****Overview**

SIFLOW FC070 is based on the latest developments within the digital processing technology – engineered for high performance, fast flow step response, immunity against process generated noise, easy to install, commission and maintain.

SIFLOW FC070 is available in two versions:

- SIFLOW FC070 Standard
- SIFLOW FC070 Ex CT

The SIFLOW FC070 transmitter delivers true multi-parameter measurements i.e. mass flow, volume flow, density, temperature and fraction.

SIFLOW FC070 is designed for integration in a variety of automation systems, e.g.:

- Centrally mounted in S7-300, C7
- Decentralized in ET 200M for use with S7-300 and S7-400 as PROFIBUS DP/PROFINET masters
- Decentralized in ET 200M for use with any automation system using standardized PROFIBUS DP/PROFINET masters
- Stand-alone via a Modbus RTU master, i.e. SIMATIC PDM

The SIFLOW FC070 transmitter can be connected to all sensors of types MASS 2100, MC2, FCS200 and FC300.

**Technical specifications**

<b>Measurement of</b>	Mass flow, volume flow, density, sensor temperature, fraction A flow, fraction B flow, fraction A in %
<b>Measurement functions</b>	
• Totalizer 1	Totalization of mass flow, volume flow, fraction A, fraction B
• Totalizer 2	Totalization of mass flow, volume flow, fraction A, fraction B
• Single and 2-stage batch function	Batching function with the use of one or two outputs for dosing in high and low speed
• 4 programmable limits	4 programmable high/low limits for mass flow, volume flow, density, sensor temperature, fraction A flow, fraction B flow, fraction A in %. Limits will generate an alarm if reached.
<b>Digital input</b>	
Functions	Start batch, stop batch, start/stop batch, hold/continue batch, reset totalizer 1, reset totalizer 2, reset totalizer 1 and 2, zero adjust, force frequency output, freeze frequency output
High signal	<ul style="list-style-type: none"> <li>• Nominal voltage: 24 V DC</li> <li>• Lower limit: 15 V DC</li> <li>• Upper limit: 30 V DC</li> <li>• Current: 2 ... 15 mA</li> </ul>
Low signal	<ul style="list-style-type: none"> <li>• Nominal voltage: 0 V DC</li> <li>• Lower limit: -3 V DC</li> <li>• Upper limit: 5 V DC</li> <li>• Current: -15 ... +15 mA</li> </ul>
Input	Approx. 10 kΩ
Switching	Max. 100 Hz

**Digital output 1 and 2**

Functions	<ul style="list-style-type: none"> <li>• Output 1: Pulse, frequency, redundancy pulse, redundancy frequency 2-stage batch, batch</li> <li>• Output 2: Redundancy pulse, redundancy frequency, 2-stage batch</li> </ul>
Voltage supply	3 ... 30 V DC (passive output)
Switching current	Max. 30 mA at 30 V DC
Voltage drop	≤ 3 V DC at max. current
Leakage current	≤ 0.4 mA at max. voltage 30 V DC
Load resistance	1 ... 10 kΩ
Switching frequency	0 ... 12 kHz 50 % duty cycle
Functions	Pulse, frequency, redundancy pulse, redundancy frequency 2-stage batch, batch
<b>Communication</b>	
Modbus RS 232C	<ul style="list-style-type: none"> <li>• Max. baud rate: 115 200 baud</li> <li>• Max. line length: 15 m at 115 200 baud</li> <li>• Signal level: according to EIA-RS 232C</li> </ul>
Modbus RS 485	<ul style="list-style-type: none"> <li>• Max. baud rate: 115 200 baud</li> <li>• Max. line length: 1200 m at 115 200 baud</li> <li>• Signal level: according to EIA-RS 485</li> <li>• Bus termination: Integrated. Can be enabled by inserting wire jumpers.</li> </ul>
<b>Galvanic isolation</b>	All inputs, outputs and communication interfaces are galvanically isolated. Isolation voltage: 500 V.

**Technical specifications** (continued)

<b>Power</b>	
Supply	24 V DC nominal
Tolerance	20.4 V DC ... 28.8 V DC
Consumption	Max. 7.2 W
Fuse	T1 A/125 V, not replaceable by operator
<b>Environment</b>	
Ambient temperature	<ul style="list-style-type: none"> <li>Storage -40 °C ... +70 °C (-40 °F ... +158 °F)</li> </ul>
Operation conditions	<p>Horizontally mounted rail. For SIFLOW FC070 Std.: 0 ... 60 °C (32 ... 140 °F) For SIFLOW FC070 Ex CT: -40 ... +60 °C (-40 ... +140 °F)</p> <p>Vertically mounted rail For SIFLOW FC070 Std.: 0 ... 45 °C (32 ... 113 °F) For SIFLOW FC070 Ex CT: -40 ... +45 °C (-40 ... +113 °F)</p>
Altitude	<ul style="list-style-type: none"> <li>Operation: -1000 ... 2000 m (pressure 795 ... 1080 hPa)</li> </ul>
<b>Enclosure</b>	
Material	Noryl, color: anthracite
Rating	IP20/NEMA 2 according to IEC 60529
Mechanical load	According to SIMATIC standards (S7-300 devices)
<b>Approvals Ex</b>	
SIFLOW FC070 Standard	CE, C-UL, ATEX II 3G Ex nA IIC
SIFLOW FC070 Ex CT	CE, C-UL, UL Haz.Loc., FM Class I, Div. 2 Groups A, B, C, D, ATEX II (1)G [Ex ia] IIC Ga / II 3G Ex nA IIC T4 Gc and IECEx Ex nA [ia] IIC T4

<b>Approvals Custody transfer</b>	
SIFLOW FC070 Ex CT	PTB Germany approval no.: 5.4.11/11.22 OIML R 139 - Compressed gaseous fuel measuring systems for vehicles
<b>Electromagnetic compatibility</b>	
	Requirements of EMC law; Noise immunity according to EN/ IEC 61326-1
	Emitted interference according to EN 55011/CISPR-11
<b>NAMUR</b>	
	Within the limits according to "General recommendations" with error criteria A in accordance with NE 21
<b>Programming tools</b>	
SIMATIC S7	Configuration through backplane P-BUS, PLC program and WinCC flexible
SIMATIC PCS7	Configuration trough backplane P-BUS and PLC/WinCC faceplates, certified driver
SIMATIC PDM	Through Modbus port RS 232C and RS 485, certified driver

**SIMATIC S7-300 advanced controller**

I/O modules

Function modules

**SIFLOW FC070**

Ordering data	Article No.	Article No.	
<b>SIFLOW FC070 flow transmitter</b> Remember to order 40-pin front plug connector.	<b>7ME4120-2DH20-0EA0</b>		
<b>40-pin front plug</b> with screw contacts	<b>6ES7392-1AM00-0AA0</b>		
<b>40-pin front plug</b> with spring contacts	<b>6ES7392-1BM01-0AA0</b>		
<b>SIFLOW FC070 Ex flow transmitter</b> Remember to order 20-pin front plug connector.	<b>7ME4120-2DH21-0EA0</b>		
<b>20-pin front plug</b> with screw contacts	<b>6ES7392-1AJ00-0AA0</b>		
<b>20-pin front plug</b> with spring contacts	<b>6ES7392-1BJ00-0AA0</b>		
<b>Operating instructions for SITRANS F C SIFLOW FC070</b>  This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature  All literature is also available for free at: <a href="http://www.siemens.com/flowdocumentation">http://www.siemens.com/flowdocumentation</a>			
<b>SIFLOW FC070 system manual</b> • English • German	<b>A5E00924779</b> <b>A5E00924776</b>		
<b>SIFLOW FC070 with S7</b> • English • German • French	<b>A5E02254228</b> <b>A5E02665536</b> <b>A5E02591639</b>		
<b>SIFLOW FC070 with PCS 7</b> • English	<b>A5E03694109</b>		
		<b>Accessories</b>	
		<b>Cable with multiplug</b> For connecting MASS 2100, FCS200, and FC300 sensors, 5 x 2 x 0.34 mm <sup>2</sup> twisted and screened in pairs. Temperature range -20 °C ... +110 °C (-4 °F ... +230 °F) • 5 m (16.4 ft) • 10 m (32.8 ft) • 25 m (82 ft) • 50 m (164 ft) • 75 m (246 ft) • 150 m (492 ft)	<b>FDK:083H3015</b> <b>FDK:083H3016</b> <b>FDK:083H3017</b> <b>FDK:083H3018</b> <b>FDK:083H3054</b> <b>FDK:083H3055</b>
		<b>Cable without multiplug</b> For connecting MC2 sensors, 5 x 2 x 0.34 mm <sup>2</sup> twisted and screened in pairs. Temperature range -20 °C ... +110 °C (-4 °F ... +230 °F) • 10 m (32.8 ft) • 25 m (82 ft) • 75 m (246 ft) • 150 m (492 ft)	<b>FDK:083H3001</b> <b>FDK:083H3002</b> <b>FDK:083H3003</b> <b>FDK:083H3004</b>
		<b>SIMATIC S7-300 rail</b> The mechanical mounting rack of the SIMATIC S7-300 • 160 mm (6.3") • 482 mm (18.9") • 530 mm (20.8") • 830 mm (32.7") • 2000 mm (78.7")	<b>6ES7390-1AB60-0AA0</b> <b>6ES7390-1AE80-0AA0</b> <b>6ES7390-1AF30-0AA0</b> <b>6ES7390-1AJ30-0AA0</b> <b>6ES7390-1BC00-0AA0</b>
		<b>SIFLOW FC070 Demo suitcase with MASS 2100 DI 1.5 sensor and SIMATIC HMI TP 177B touch panel</b>	<b>A5E01075465</b>
		<b>SIMATIC S7-300, stabilized power supply PS307</b>  Input: 120/230 V AC Output: 24 V DC/2 A	<b>6ES7307-1BA01-0AA0</b>

**Overview**

- Single-channel, intelligent counter module for simple counting tasks
- For direct connection of incremental encoders
- Comparison function with 2 definable comparison values
- Integrated digital outputs for output of the response on reaching the comparison value
- Operating modes:
  - Continuous counting
  - Single count
  - Periodic count
- Special functions:
  - Set counter
  - Latch counter
- Start/stop counter by gate function

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

5

**Technical specifications**

Article number	6AG1350-1AH03-2AE0	6AG1350-1AH03-2AY0
Based on	6ES7350-1AH03-0AE0 SIPLUS_FM350-1	6ES7350-1AH03-0AE0 SIPLUS_FM350-1_EN50155
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****SIPLUS S7-300 FM 350-1 counter module**

With 1 channel, max. 500 kHz; for incremental encoder

Extended temperature range and exposure to media

Conforms to EN 50155

**Article No.**

6AG1350-1AH03-2AE0

6AG1350-1AH03-2AY0

**Article No.****Accessories**

See SIMATIC S7-300 FM 350-1 counter module, page 5/136

**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS S7-300 function modules

**SIPLUS S7-300 FM 350-2 counter modules****Overview**

- 8-channel intelligent counter module for universal counting and measuring tasks
- For the direct connection of 24 V incremental encoders, directional encoders, initiators or NAMUR encoders
- Comparison function with predefined comparison values (number depending on operating mode)
- Integrated digital outputs for output of the response on reaching the comparison value
- Operating modes:
  - Continuous / single / periodic counting
  - Frequency and speed control
  - Period measurement
  - Dosing

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	<b>6AG1350-2AH01-4AE0</b>
Based on	<b>6ES7350-2AH01-0AE0</b> SIPLUS S7-300 FM350-2 8 CHANNELS
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	0 °C; = Tmin
• max.	60 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Article number	<b>6AG1350-2AH01-4AE0</b>
Based on	<b>6ES7350-2AH01-0AE0</b> SIPLUS S7-300 FM350-2 8 CHANNELS
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****SIPLUS S7-300 FM 350-2 counter module**

With 8 channels, max. 20 kHz; for 24 V incremental encoders and NAMUR encoders; includes configuration package and electronic documentation on CD

Exposure to media

**Article No.****6AG1350-2AH01-4AE0****Article No.****Accessories**

See SIMATIC S7-300 FM 350-2 counter module, page 5/139

**Overview****SIPLUS electronic weighing system SIWAREX U**

SIPLUS SIWAREX U is a flexible weighing module for all simple weighing and force measuring tasks. The compact module can be integrated into SIPLUS automation systems without any problems.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

<b>SIPLUS SIWAREX U electronic weighing system</b>	
<b>Article No.</b>	<b>6AG1950-2AA01-4AA0</b>
<b>Article No. based on</b>	<b>7MH4950-2AA01</b>
Range of ambient temperature	0 ... +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

**Ordering data****Article No.****SIPLUS SIWAREX U**

Electronic weighing system for SIPLUS S7 and ET 200M, incl. bus connector

Exposure to media

**6AG1950-2AA01-4AA0**

**Accessories**

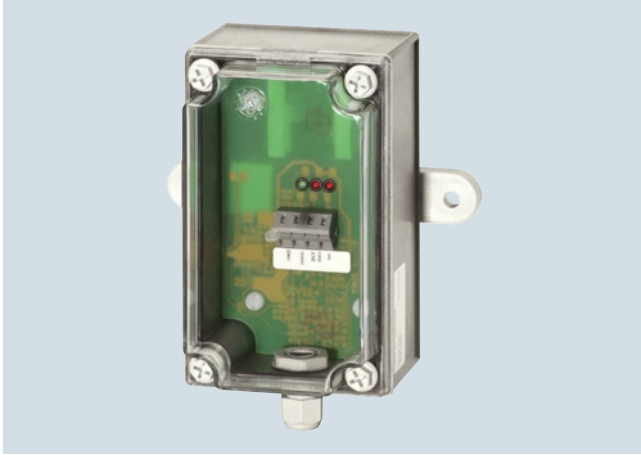
See SIWAREX U, page 5/172



**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS S7-300 function modules

**SIPLUS DCF 77 radio clock modules****Overview**

This module can be used to synchronize the real-time clock of the SIMATIC/SIPLUS S7-200, S7-300 and S7-400 automation systems with the official time of the DCF 77 time signal transmitter of the Physikalisch-Technische Bundesanstalt Braunschweig, Germany, (German Federal Testing Laboratory).

The time is received by means of a DCF receiver (antenna with electronics) which is connected via two digital inputs on the SIMATIC PLC and SIPLUS, together with a software driver available as a download (function block FB):

<http://www.siemens.com/siplus> - Support - Tools and Downloads!

**Technical specifications****SIPLUS DCF 77 radio clock module**

Radio frequency	77.5 Hz
Power supply	24 V DC (20.4 to 28.8 DC)
Power consumption, typ.	50 mA
Dimensions (W x H x D)	75 mm x 125 mm <sup>1)</sup> x 75 mm

<sup>1)</sup> Additionally 25 mm (0.98 in) for heavy duty threaded joint and bending radius for cables

**Ordering data****Article No.****SIPLUS DCF 77 radio clock module**

For synchronizing SIMATIC S7-200, S7-300 and S7-400 with the official time of the DCF 77 time signal transmitter of the Physikalisch-Technische Bundesanstalt Braunschweig (German Federal Testing Laboratory)

**6AG1057-1AA03-0AA0**

## Overview



- The economical complete solution for serial communication via point-to-point links.
- 3 versions with different transmission interfaces:
  - RS 232C (V.24)
  - 20 mA (TTY)
  - RS 422/RS 485 (X.27)
- Implemented protocols:
  - ASCII
  - 3964 (R) (not for RS 485)
  - Printer driver
- Simple parameterization via a parameterization tool integrated into STEP 7

## Technical specifications

Article number	6ES7340-1AH02-0AE0 SIMATIC S7-300, CP 340	6ES7340-1BH02-0AE0 SIMATIC S7-300, CP 340	6ES7340-1CH02-0AE0 SIMATIC S7-300, CP 340
<b>Product type designation</b>			
<b>Supply voltage</b>			
Rated value (DC)	No;	No;	No;
• 24 V DC	Power supply via backplane bus 5V	Power supply via backplane bus 5V	Power supply via backplane bus 5V
<b>Input current</b>			
from backplane bus 5 V DC, max.	165 mA	190 mA	165 mA
<b>Power losses</b>			
Power loss, typ.	0.6 W	0.85 W	0.6 W
Power loss, max.	0.85 W	0.95 W	0.85 W
<b>Interfaces</b>			
Number of interfaces	1; Isolated	1; Isolated	1; Isolated
Interface physics, 20 mA (TTY)		Yes	
Interface physics, RS 232C (V.24)	Yes		
Interface physics, RS 422/RS 485 (X.27)			Yes
Transmission rate, max.	19.2 kbit/s	19.2 kbit/s	19.2 kbit/s
Transmission rate, min.	2.4 kbit/s	2.4 kbit/s	2.4 kbit/s
<b>Point-to-point</b>			
• Cable length, max.	15 m	1 000 m; 100 m active, 1000 m passive	1 200 m
• supported printers	HP-Deskjet, HP-Laserjet, IBM-Proprietary, user-defined	HP-Deskjet, HP-Laserjet, IBM-Proprietary, user-defined	HP-Deskjet, HP-Laserjet, IBM-Proprietary, user-defined
• Connector type	9-pin sub D connector	9-pin sub D socket	15-pin sub D socket
<b>Integrated protocol driver</b>			
- 3964 (R)	Yes	Yes	Yes
- ASCII	Yes	Yes	Yes
- RK512	No	No	No
- customer-specific drivers reloadable	No	No	No
<b>Telegram length, max.</b>			
- 3964 (R)	1 024 byte	1 024 byte	1 024 byte
- ASCII	1 024 byte	1 024 byte	1 024 byte

**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**CP 340****Technical specifications** (continued)

Article number	<b>6ES7340-1AH02-0AE0</b> SIMATIC S7-300, CP 340	<b>6ES7340-1BH02-0AE0</b> SIMATIC S7-300, CP 340	<b>6ES7340-1CH02-0AE0</b> SIMATIC S7-300, CP 340
<b>Transmission speed, 20 mA (TTY)</b>		19.2 kbit/s 9.6 kbit/s 9.6 kbit/s	
- with 3964 (R) protocol, max.			
- with ASCII protocol, max.			
- with printer driver, max.,			
<b>Transmission speed, RS 422/485</b>			19.2 kbit/s 9.6 kbit/s 9.6 kbit/s
- with 3964 (R) protocol, max.			
- with ASCII protocol, max.			
- with printer driver, max.,			
<b>Transmission speed, RS232</b>	19.2 kbit/s 9.6 kbit/s 9.6 kbit/s		
- with 3964 (R) protocol, max.			
- with ASCII protocol, max.			
- with printer driver, max.,			
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
<b>Software</b>			
<b>Block</b>			
• FB length in RAM, max.	2 700 byte; Data communication, sending and receiving	2 700 byte; Data communication, sending and receiving	2 700 byte; Data communication, sending and receiving
<b>Connection method</b>			
Power supply	Over backplane bus	Over backplane bus	Over backplane bus
<b>Dimensions</b>			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
<b>Weights</b>			
Weight, approx.	300 g	300 g	300 g

**Ordering data****Article No.****Article No.****CP 340 communications processor**

With one RS 232 C (V.24) interface

**6ES7340-1AH02-0AE0****RS 232 connecting cable**

For linking to SIMATIC S7

5 m

**6ES7902-1AB00-0AA0**

10 m

**6ES7902-1AC00-0AA0**

15 m

**6ES7902-1AD00-0AA0****CP 340 communications processor**

With one 20 mA (TTY) interface

**6ES7340-1BH02-0AE0****20 mA (TTY) connecting cable**

For linking to SIMATIC S7

5 m

**6ES7902-2AB00-0AA0**

10 m

**6ES7902-2AC00-0AA0**

50 m

**6ES7902-2AG00-0AA0****CP 340 communications processor**

With one RS 422/485 (X.27) interface

**6ES7340-1CH02-0AE0****RS 422/485 connecting cable**

For linking to SIMATIC S7

5 m

**6ES7902-3AB00-0AA0**

10 m

**6ES7902-3AC00-0AA0**

50 m

**6ES7902-3AG00-0AA0**

## Overview



- For quick, high-performance data exchange via point-to-point coupling
- 3 versions with different transmission physics:
  - RS 232C (V.24)
  - 20 mA (TTY)
  - RS 422/RS 485 (X.27)
- Implemented protocols: ASCII, 3964 (R), RK 512
- The following protocols can also be loaded: Modbus RTU
- Easy configuration using a parameterization tool integrated in STEP 7

## Technical specifications

Article number	6ES7341-1AH02-0AE0 CP 341 RS232C (V.24)	6ES7341-1BH02-0AE0 CP341 20MA-INTERFACE (TTY)	6ES7341-1CH02-0AE0 CP341 RS422/485-INTERFACE
<b>Product type designation</b>			
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
<b>Input current</b>			
from backplane bus 5 V DC, max.	70 mA	70 mA	70 mA
from supply voltage L+, max.	100 mA	100 mA	100 mA
<b>Power losses</b>			
Power loss, typ.	1.6 W	1.6 W	1.6 W
Power loss, max.	2.4 W	2.4 W	2.4 W
<b>Interfaces</b>			
Number of interfaces	1; Isolated	1; Isolated	1; Isolated
Interface physics, 20 mA (TTY)		Yes	
Interface physics, RS 232C (V.24)	Yes		
Interface physics, RS 422/RS 485 (X.27)			Yes
Transmission rate, max.	115.2 kbit/s	19.2 kbit/s	115.2 kbit/s
Transmission rate, min.	0.3 kbit/s	0.3 kbit/s	0.3 kbit/s
<b>Point-to-point</b>			
• Cable length, max.	15 m	1 000 m	1 200 m
• supported printers	Serial printers	Serial printers	Serial printers
• Connector type	9-pin sub D connector	9-pin sub D socket	15-pin sub D socket
<b>Integrated protocol driver</b>			
- 3964 (R)	Yes	Yes	Yes; not with RS 485
- ASCII	Yes	Yes	Yes
- RK512	Yes	Yes	Yes; not with RS 485
<b>Telegram length, max.</b>			
- 3964 (R)	4 096 byte	4 096 byte	4 096 byte
- ASCII	4 096 byte	4 096 byte	4 096 byte
- RK 512	4 096 byte	4 096 byte	4 096 byte

**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**CP 341****Technical specifications** (continued)

Article number	<b>6ES7341-1AH02-0AE0</b> CP 341 RS232C (V.24)	<b>6ES7341-1BH02-0AE0</b> CP341 20MA-INTERFACE (TTY)	<b>6ES7341-1CH02-0AE0</b> CP341 RS422/485-INTERFACE
<b>Transmission speed, 20 mA (TTY)</b>			
- with 3964 (R) protocol, max.		19.2 kbit/s	
- with ASCII protocol, max.		19.2 kbit/s	
- with printer driver, max.,		19.2 kbit/s	
- with RK 512 protocol, max.		19.2 kbit/s	
<b>Transmission speed, RS 422/485</b>			
- with 3964 (R) protocol, max.			115.2 kbit/s
- with ASCII protocol, max.			115.2 kbit/s
- with printer driver, max.,			115.2 kbit/s
- with RK 512 protocol, max.			115.2 kbit/s
<b>Transmission speed, RS232</b>			
- with 3964 (R) protocol, max.	115.2 kbit/s		
- with ASCII protocol, max.	115.2 kbit/s		
- with printer driver, max.,	115.2 kbit/s		
- with RK 512 protocol, max.	115.2 kbit/s		
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
<b>Software</b>			
<b>Block</b>			
• FB length in RAM, max.	6 100 byte; Data communication, sending and receiving	6 100 byte; Data communication, sending and receiving	6 100 byte; Data communication, sending and receiving
<b>Connection method</b>			
Power supply	3 screw-type terminals: L+, M, GND	3 screw-type terminals: L+, M, GND	3 screw-type terminals: L+, M, GND
<b>Dimensions</b>			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
<b>Weights</b>			
Weight, approx.	300 g	300 g	300 g

**Ordering data**

Ordering data	Article No.	Ordering data	Article No.
<b>CP 341 communication module</b>	<b>6ES7341-1AH02-0AE0</b>	<b>CP 341 communication module</b>	<b>6ES7341-1CH02-0AE0</b>
With one RS 232 C (V.24) interface		With one RS 422/485 (X.27) interface	
<b>RS 232 connecting cable</b>		<b>RS 422/485 connecting cable</b>	
For linking to SIMATIC S7		For linking to SIMATIC S7	
5 m	<b>6ES7902-1AB00-0AA0</b>	5 m	<b>6ES7902-3AB00-0AA0</b>
10 m	<b>6ES7902-1AC00-0AA0</b>	10 m	<b>6ES7902-3AC00-0AA0</b>
15 m	<b>6ES7902-1AD00-0AA0</b>	50 m	<b>6ES7902-3AG00-0AA0</b>
<b>CP 341 communication module</b>	<b>6ES7341-1BH02-0AE0</b>	<b>Loadable drivers for CP 341</b>	
With one 20 mA (TTY) interface		Modbus master (RTU format)	
<b>20 mA (TTY) connecting cable</b>		• Single license	<b>6ES7870-1AA01-0YA0</b>
For linking to SIMATIC S7		• Single license, without software or documentation	<b>6ES7870-1AA01-0YA1</b>
5 m	<b>6ES7902-2AB00-0AA0</b>	Modbus slave (RTU format)	
10 m	<b>6ES7902-2AC00-0AA0</b>	• Single license	<b>6ES7870-1AB01-0YA0</b>
50 m	<b>6ES7902-2AG00-0AA0</b>	• Single license, without software or documentation	<b>6ES7870-1AB01-0YA1</b>

#### Overview

- Drivers for Modbus protocol with RTU message format; communication as master or slave
- Downloadable onto CP 341 and CP 441-2 (6ES7441-2AA04-0AE0)

#### Technical specifications

Parameterization software	Loadable drivers for CP 441-2 and CP 341
Type of license	Simple license, copy license
Target system	SIMATIC CP 341, SIMATIC CP 441-2
Technical specifications	Modbus Master
Adjustable parameters	<ul style="list-style-type: none"> <li>• Modbus protocol with RTU format</li> <li>• Master/slave coupling: SIMATIC S7 is master</li> <li>• Function codes implemented: 01, 02, 03, 04, 05, 06, 07, 08, 11, 12, 15, 16</li> <li>• No V.24 control and signal lines</li> <li>• CRC polynomial: <math>x^{16} + x^{15} + x^2 + 1</math></li> <li>• Interfaces: TTY (20 mA); V.24 (RS 232 C); X.27 (RS 422/485) 2-wire or 4-wire</li> <li>• Receive mailbox specified on BRCV</li> <li>• Character delay time 3.5 characters or multiple thereof</li> <li>• Broadcast message possible</li> <li>• Transmission rate 300 bit/s up to 76800 bit/s (TTY up to 19200 bit/s)</li> <li>• Character frame</li> <li>• With/without RS 485 operation for 2-wire connections</li> <li>• With/without modem operation (ignore smudge characters)</li> <li>• Response monitoring time 100 ms to 25.5 s in steps of 100 ms</li> <li>• Factor for the character delay time 1-10</li> <li>• Default setting of receive line when using the X.27 interface module</li> </ul>

Adjustable parameters

Modbus slave
<ul style="list-style-type: none"> <li>• Modbus protocol with RTU format</li> <li>• Master/slave coupling: SIMATIC S7 is slave</li> <li>• Function codes implemented: 01, 02, 03, 04, 05, 06, 08, 15, 16</li> <li>• No V.24 control and signal line</li> <li>• CRC polynomial: <math>x^{16} + x^{15} + x^2 + 1</math></li> <li>• Interfaces: TTY (20 mA), V.24 (RS 232C), X.27 (RS 422/485) 2-wire or 4-wire</li> <li>• Communications FB 180, instance DB 180 (use of a multi-instance)</li> <li>• Conversion of the Modbus data address to S7 data areas. Data areas which can be processed: DB, bit memories, outputs, inputs, timers, counters</li> <li>• Character delay time 3.5 characters or multiple thereof</li> <li>• Transmission rate 300 bit/s up to 76800 bit/s (TTY up to 19200 bit/s)</li> <li>• Character frame</li> <li>• Slave address of CP (1 to 255)</li> <li>• With/without RS 485 operation for 2-wire connection</li> <li>• With/without modem operation (ignore smudge characters)</li> <li>• Factor for the character delay time 1-10</li> <li>• Number of work DB (for FB processing)</li> <li>• Enabling of memory areas for writing by the master</li> <li>• Default setting of receive line when using the X.27 interface module</li> <li>• Conversion of Modbus addresses to S7 data areas</li> </ul>

**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**Loadable drivers for CP 441-2 and CP 341****Ordering data****Article No.****Article No.****Modbus Master V3.1****Task:**

Communication via Modbus protocol with RTU format, SIMATIC S7 as master

**Requirement:**

CP 341 or CP 441-2; STEP 7 V4.02 and higher

**Delivery package:**

Driver program/documentation, English, German, French

Single license

**6ES7870-1AA01-0YA0**

Single license, without software and documentation

**6ES7870-1AA01-0YA1****Modbus Slave V3.1****Task:**

Communication via Modbus protocol with RTU format, SIMATIC S7 as slave

**Requirement:**

CP 341 or CP 441-2; STEP 7 V4.02 and higher

**Delivery package:**

Driver program/documentation, English, German, French

Single license

**6ES7870-1AB01-0YA0**

Single license, without software and documentation

**6ES7870-1AB01-0YA1****SIMATIC Manual Collection****6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**SIMATIC Manual Collection update service for 1 year****6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

## Overview



CP 343-2P / CP 343-2

The CP 343-2P communications processor is the AS-Interface master for the SIMATIC S7-300 and the ET 200M distributed I/O station, with user-friendly parameterizing options.

The CP 343-2 is the basic version of the module.

The CP 343-2P / CP 343-2 has the following characteristics:

- Connection of up to 62 AS-Interface slaves
- Integrated analog value transmission
- Supports all AS-Interface master functions according to AS-Interface Specification V3.0
- Status displays of operating states and indication of the readiness for operation of connected slaves by means of LEDs in the front panel
- Fault indications (including AS-Interface voltage fault, configuration fault) by means of LEDs in the front panel
- Compact enclosure in the design of the SIMATIC S7-300
- Suitable for AS-i Power24V (from product version 2/firmware version 3.1) and for Standard AS-i with 30 V voltage.
- Additionally for CP 343-2P: Supports the configuration of the AS-Interface-network with STEP 7 V5.2 and higher

### Benefits

- Shorter start-up times through simple configuration at the press of a button
- Design of flexible machine-related structures using the ET 200M distributed I/O system
- Enables diagnostics of the AS-Interface network
- Well suited also for complex applications thanks to connection options for 62 slaves and integral analog value processing
- Reduction of standstill and servicing times in the event of a fault thanks to the LED indicators:
  - Status of the AS-Interface network
  - Slaves connected and their readiness for operation
  - Monitoring of the AS-Interface mains voltage
- Lower costs for stock keeping and spare parts inventory because the CP can be used for the SIMATIC S7-300 as well as for the ET 200M
- With CP 343-2P additionally: Improved plant documentation and support for service assignments thanks to a description of the AS-Interface configuration in the STEP 7 project

- No need for the AS-i power supply unit with AS-i Power24V: The AS-Interface cable is powered through an existing 24 V DC PELV power supply unit. For decoupling, an AS-i data decoupling module S22.5 is required (e.g. 3RK1901-1DE12-1AA0), see [Catalog IC 10, Chapter 2 "Industrial communication" → "AS-Interface" → "Power supply units and data decoupling modules"](#)
- Operation with AS-Interface power supply unit IP20 (e.g. 3RX9501-0BA00), see [Catalog IC 10, Chapter 2 "Industrial communication" → "AS-Interface" → "Power supply units and data decoupling modules"](#) is also possible without restrictions

### Application

The CP 343-2P / CP 343-2 is the AS-Interface master connection for the SIMATIC S7-300 and ET 200M.

By connecting an AS-Interface, a max. of 248 DI / 248 DO can be accessed per CP when using 62 A/B slaves with 4DI / 4DO respectively.

The integrated analog processing function can be used to easily transfer analog signals (up to 62 A/B analog slaves with a max. of 2 channels each or up to 31 standard analog slaves, each with a max. of 4 channels per CP).

The CP 343-2P is an enhancement to the CP 343-2 and has exactly the same functions. An existing STEP 7 user program for a CP 343-2 can be used for a CP 343-2P without limitations. The two assemblies are merely configured differently in STEP 7 HW Config, whereby the CP 343-2P offers additional possibilities. We recommend the CP 343-2P for these reasons.

### Design

The CP 343-2P / CP 343-2 is connected like an I/O module to the S7-300. It has:

- Two terminal connections for connecting the AS-Interface cable directly
- LEDs in the front panel for indicating the operating state and functional readiness of all connected and active slaves
- Pushbuttons for switching over the master operating state and for adopting the existing ACTUAL configuration of the AS-i slaves as the TARGET configuration

The CP 343-2P / CP 343-2 supports all specified functions of the extended AS-Interface Specification V3.0.

The CP 343-2P / CP 343-2 each occupy 16 bytes in the I/O address area of the SIMATIC S7-300. The digital I/O data of the standard slaves and A slaves is saved in this area. The digital I/O data of the B slaves and the analog I/O data can be accessed with the S7 system functions for read/write data record.

If required, master calls can be performed with the command interface, e.g. read/write parameters, read/write configuration.

For more information, see <http://support.automation.siemens.com/WW/view/en/51678777>.

### Security information

The use of this product requires suitable protective measures (including network segmentation for IT security) in order to ensure safe plant operation; see [www.siemens.com/industrialsecurity](http://www.siemens.com/industrialsecurity).



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**CP 343-2P / CP 343-2****Overview** (continued)**Configuration**

All connected AS-Interface slaves are configured at the press of a button. No further configuration of the CP is required.

Additionally for CP 343-2P

The CP 343-2P also supports configuring of the AS-Interface network with STEP 7 V5.2 and higher. Specifying the AS-i configuration in HW-Config facilitates the setting of slave parameters and documentation of the plant. Uploading the ACTUAL configuration of an already configured AS-Interface network is also supported. The saved configuration cannot be overwritten at the press of a button and is therefore tamper-proof.

**Ordering data****Article No.****CP 343-2P communications processor****6GK7343-2AH11-0XA0**

- For connection of SIMATIC S7-300 and ET 200M to AS-Interface
- Configuration of the AS-i network using the SET key or STEP 7 (V5.2 and higher)
- Without front connector
- Corresponds to AS-Interface specification V3.0
- Dimensions (W × H × D / mm): 40 × 125 × 120

**CP 343-2 communications processor****6GK7343-2AH01-0XA0**

- Basic version for connection of SIMATIC S7-300 and ET 200M to AS-Interface
- Configuration of the AS-i network using the SET key
- Without front connector
- Corresponds to AS-Interface specification V3.0
- Dimensions (W × H × D / mm): 40 × 125 × 120

**Front connector, 20-pin**

- With screw terminals
- With spring-type terminals

**6ES7392-1AJ00-0AA0****6ES7392-1BJ00-0AA0**

## Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●	●	

- PROFIBUS DP master or slave with electrical interface for connecting the SIMATIC S7-300 to PROFIBUS at up to 12 Mbit/s (including 45.45 kbit)
- Communication services:
  - PROFIBUS DP
  - PG/OP communication (OP multiplexing)
  - S7 communication (client, server)
  - Open communication (SEND/RECEIVE)
- Easy configuration and programming over PROFIBUS
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a PG

## Technical specifications

Article number	<b>6GK7342-5DA03-0XE0</b>
Product type designation	CP 342-5
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
• for power supply	4-pole terminal block
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage external	24 V
Relative positive tolerance for DC at 24 V	20 %
Relative negative tolerance for DC at 24 V	15 %
Consumed current	
• from backplane bus for DC at 5 V typical	0.15 A
• from external supply voltage for DC at 24 V typical	0.25 A
Active power loss	6.75 W

Article number	<b>6GK7342-5DA03-0XE0</b>
Product type designation	CP 342-5
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-300 single width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.3 kg
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	4
<b>Performance data open communication</b>	
Number of possible connections for open communication by means of SEND/RECEIVE blocks	
• maximum	16
Amount of data	
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte

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**CP 342-5****Technical specifications (continued)**

Article number	<b>6GK7342-5DA03-0XE0</b>
Product type designation	CP 342-5
<b>Performance data PROFIBUS DP</b>	
Service as DP master	
• DPV0	Yes
Number of DP slaves on DP master usable	124
Amount of data	
• of the address area of the inputs as DP master total	2 160 byte
• of the address area of the outputs as DP master total	2 160 byte
• of the address area of the inputs per DP slave	244 byte
• of the address area of the outputs per DP slave	244 byte
• of the address area of the diagnostic data per DP slave	240 byte
Service as DP slave	
• DPV0	Yes
Amount of data	
• of the address area of the inputs as DP slave total	240 byte
• of the address area of the outputs as DP slave total	240 byte

Article number	<b>6GK7342-5DA03-0XE0</b>
Product type designation	CP 342-5
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	16
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	
• without DP maximum	32
• with DP maximum	28
<b>Performance data telecontrol</b>	
Protocol is supported	
• TCP/IP	No
<b>Product functions management, configuration</b>	
Configuration software	
• required	STEP 7 V5.1 SP2 or higher / STEP 7 Professional V12 (TIA Portal) or higher

**Ordering data****Article No.****Article No.****CP 342-5 communications processor****6GK7342-5DA03-0XE0**

Communications processor for electrical connection of SIMATIC S7-300 to PROFIBUS at up to 12 Mbit/s, with electronic manual on CD-ROM

**Accessories****PROFIBUS FastConnect connection plug RS 485**

With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s

- Without PG interface
- With PG interface

**6ES7972-0BA52-0XA0**  
**6ES7972-0BB52-0XA0**

**PROFIBUS bus connector IP20**

With connection to PPI, MPI, PROFIBUS

- Without PG interface
- With PG interface

**6ES7972-0BA12-0XA0**  
**6ES7972-0BB12-0XA0**

**PROFIBUS FC Standard Cable**

2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order 20 m, sold by the meter

**6XV1830-0EH10****PROFIBUS bus terminal 12M**

Bus terminal for connection of PROFIBUS nodes up to 12 Mbps with connecting cable

**6GK1500-0AA10****SIMATIC S7-300 DM 370**

Dummy module; used for module replacement

**6ES7370-0AA01-0AA0**Note:

You can find order information for software for communication with PC systems in Catalog IK PI.

## Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●	●	

- PROFIBUS DP master or slave with optical interface for connecting the SIMATIC S7-300 to PROFIBUS at up to 12 Mbit/s (including 45.45 kbit)
- Direct connection to the optical PROFIBUS network over the integrated fiber-optic interface for plastic and PCF fiber-optic cables
- Communication services:
  - PROFIBUS DP
  - PG/OP communication (OP multiplexing)
  - S7 communication (client, server)
  - Open communication (SEND/RECEIVE)
- Easy configuration and programming over PROFIBUS
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a PG

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## Technical specifications

Article number	<b>6GK7342-5DF00-0XE0</b>
Product type designation	CP 342-5 FO
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• for power supply	1
Number of optical interfaces at the 1st interface acc. to PROFIBUS	2
Design of the optical interface at the 1st interface acc. to PROFIBUS	Duplex socket
Type of electrical connection	
• for power supply	4-pole terminal block
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage	24 V
Supply voltage external	24 V
Relative positive tolerance for DC at 24 V	20 %
Relative negative tolerance for DC at 24 V	15 %
Consumed current	
• from backplane bus for DC at 5 V typical	0.15 A
• from external supply voltage for DC at 24 V typical	0.25 A
Active power loss	6 W

Article number	<b>6GK7342-5DF00-0XE0</b>
Product type designation	CP 342-5 FO
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.3 kg
Mounting type	
• S7-300 rail mounting	Yes
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	4
Cable length	
• for PCF FOC maximum	300 m
• for POF FOC maximum	50 m
<b>Performance data open communication</b>	
Number of possible connections for open communication by means of SEND/RECEIVE blocks	
• maximum	16
Amount of data	
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte

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**CP 342-5 FO****Technical specifications (continued)**

Article number	<b>6GK7342-5DF00-0XE0</b>
Product type designation	CP 342-5 FO
<b>Performance data PROFIBUS DP</b>	
Service as DP master	
• DPV0	Yes
Number of DP slaves on DP master usable	124
Amount of data	
• of the address area of the inputs as DP master total	2 160 byte
• of the address area of the outputs as DP master total	2 160 byte
• of the address area of the inputs per DP slave	244 byte
• of the address area of the outputs per DP slave	244 byte
• of the address area of the diagnostic data per DP slave	240 byte
Service as DP slave	
• DPV0	Yes
Amount of data	
• of the address area of the inputs as DP slave total	240 byte
• of the address area of the outputs as DP slave total	240 byte

Article number	<b>6GK7342-5DF00-0XE0</b>
Product type designation	CP 342-5 FO
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	16
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	
• without DP maximum	32
• with DP maximum	28
<b>Performance data telecontrol</b>	
Protocol is supported	
• TCP/IP	No
<b>Product functions management, configuration</b>	
Configuration software	
• required	STEP 7 V5.1 SP2 or higher / STEP 7 Professional V12 (TIA Portal) or higher

**Ordering data****Article No.****Article No.****CP 342-5 FO communications processor****6GK7342-5DF00-0XE0**

Communications processor for optical connection of SIMATIC S7-300 to PROFIBUS up to 12 Mbit/s with electronic manual on CD-ROM

**Accessories****PROFIBUS plastic fiber optic, simplex connector/polishing set****6GK1901-0FB00-0AA0**

100 simplex connectors and 5 polishing sets for assembling PROFIBUS plastic fiber optic cables for the optical PROFIBUS DP

**PROFIBUS plastic fiber optic, stripping tool set****6GK1905-6PA10**

Tools for removing the outer sheath or core sheath of plastic fiber optic cables

**Plug-in adapter****6ES7195-1BE00-0XA0**

For assembling the plastic Simplex connector in combination with CP 342-5 FO, IM 467 FO, IM 153-2 FO and IM 151 FO

50 units

Note:

You can find order information for software for communication with PC systems in Catalog IK PI.

**Overview**

Connection of SIMATIC S7-300 to PROFIBUS at up to 12 Mbit/s (including 45.45 kbit)

- Communication services:
  - PG/OP communication
  - S7 communication
  - Open communication (SEND/RECEIVE)
  - PROFIBUS FMS
- Easy configuration and programming over PROFIBUS
- Can be easily integrated into the S7-300 system
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a PG

DP-M	DP-S	FMS	PG/OP	S7/S5	
		●	●	●	

**Technical specifications**

Article number	<b>6GK7343-5FA01-0XE0</b>
Product type designation	CP 343-5
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
• for power supply	4-pole terminal block
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage	24 V
Supply voltage external	24 V
Relative positive tolerance for DC at 24 V	20 %
Relative negative tolerance for DC at 24 V	15 %
Consumed current	
• from backplane bus for DC at 5 V typical	0.15 A
• from external supply voltage for DC at 24 V typical	0.25 A
Active power loss	5 W

Article number	<b>6GK7343-5FA01-0XE0</b>
Product type designation	CP 343-5
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-300 single width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.3 kg
Mounting type	
• S7-300 rail mounting	Yes
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	4

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**CP 343-5****Technical specifications (continued)**

Article number	<b>6GK7343-5FA01-0XE0</b>
Product type designation	CP 343-5
<b>Performance data open communication</b>	
Number of possible connections for open communication by means of SEND/RECEIVE blocks	
• maximum	16
Amount of data	
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte
<b>Performance data FMS functions</b>	
Number of possible connections for FMS connection maximum	16
Amount of data of the variables	
• for READ job maximum	237 byte
• for WRITE and REPORT job maximum	233 byte
Number of variables	
• Configurable from server to FMS partner	256
• Loadable from server to FMS partner	256

Article number	<b>6GK7343-5FA01-0XE0</b>
Product type designation	CP 343-5
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	16
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	48
<b>Performance data telecontrol</b>	
Protocol is supported	
• TCP/IP	No
<b>Product functions management, configuration</b>	
Configuration software	
• required	STEP 7 V5.1 SP3 or higher and NCM S7 for PROFIBUS

**Ordering data****Article No.****Article No.****CP 343-5 communications processor**

Communications processor for connection of S7-300 to PROFIBUS, FMS, open communication, PG/OP and S7 communication; with electronic manual on CD-ROM

**6GK7343-5FA01-0XE0****STEP 7 Version 5.5**

Target system:  
SIMATIC S7-300/400, SIMATIC C7,  
SIMATIC WinAC

Requirements:  
Windows XP Prof.,  
Windows 7 Professional/Ultimate

Type of delivery:  
German, English, French, Spanish,  
Italian;

including license key on USB stick,  
with electronic documentation

- Floating License on DVD
- Rental license for 50 hours
- Software Update Service on DVD (requires current software version)

- Floating License upgrade 3.x/4.x/5.x to V5.4; on DVD

- Trial License STEP 7 V5.4; on DVD, operational for 14 days

**6ES7810-4CC10-0YA5****6ES7810-4CC10-0YA6****6ES7810-4BC01-0YX2****6ES7810-4CC10-0YE5****6ES7810-4CC10-0YA7****PROFIBUS FastConnect bus connector RS 485**

With 90° cable outlet;  
insulation displacement technology,  
max. transfer rate 12 Mbit/s (1 unit)

- Without PG interface
- With PG interface

**6ES7972-0BA52-0XA0****6ES7972-0BB52-0XA0****PROFIBUS bus connector IP20**

With connection to PPI, MPI,  
PROFIBUS

- Without PG interface
- With PG interface

**6ES7972-0BA12-0XA0****6ES7972-0BB12-0XA0****PROFIBUS bus terminal 12M**

Bus terminal for connection of  
PROFIBUS nodes at up to 12 Mbit/s  
with connecting cable

**6GK1500-0AA10****SIMATIC S7-300 DM 370**

Dummy module; used for module  
replacement

**6ES7370-0AA01-0AA0****Accessories****PROFIBUS FastConnect connection plug RS 485**

With 90° cable outlet;  
insulation displacement technology,  
max. transmission rate 12 Mbit/s

- Without PG interface
- With PG interface

**6ES7972-0BA52-0XA0****6ES7972-0BB52-0XA0****PROFIBUS bus connector IP20**

With connection to PPI, MPI,  
PROFIBUS

- Without PG interface
- With PG interface

**6ES7972-0BA12-0XA0****6ES7972-0BB12-0XA0****PROFIBUS bus terminal 12M**

Bus terminal for connection of  
PROFIBUS nodes at up to 12 Mbit/s  
with connecting cable

**6GK1500-0AA10**

## Overview



Communications processor for connecting a SIMATIC S7-300 to Industrial Ethernet networks, also as PROFINET IO Device.

The CP supports:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication

ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
	●	●	●			●	●

## Technical specifications

Article number	<b>6GK7343-1CX10-0XE0</b>
Product type designation	CP 343-1 Lean
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	2
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
• of Industrial Ethernet interface	RJ45 port
• for power supply	2-pole plugable terminal block
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage	24 V
Supply voltage external	24 V
Relative positive tolerance for DC at 24 V	20 %
Relative negative tolerance for DC at 24 V	15 %
Consumed current	
• from backplane bus for DC at 5 V typical	0.2 A
• from external supply voltage for DC at 24 V typical	0.16 A
• from external supply voltage for DC at 24 V maximum	0.2 A
Active power loss	5.8 W

Article number	<b>6GK7343-1CX10-0XE0</b>
Product type designation	CP 343-1 Lean
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-300 single width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.22 kg
Mounting type	
• S7-300 rail mounting	Yes
<b>Performance data open communication</b>	
Number of possible connections for open communication by means of SEND/RECEIVE blocks	
• maximum	8
Amount of data	
• as user data per ISO on TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks maximum	2 Kibyte
Number of Multicast stations	8



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Communication

**CP 343-1 Lean****Technical specifications (continued)**

Article number	<b>6GK7343-1CX10-0XE0</b>
Product type designation	CP 343-1 Lean
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	4
Service	
• of SIMATIC communication as server	Yes
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	12
<b>Performance data PROFINET communication as PN IO-Controller</b>	
Product function PROFINET IO controller	No
<b>Performance data PROFINET communication as PN IO-Device</b>	
Product function PROFINET IO device	Yes
Amount of data	
• as user data for input variables as PROFINET IO device maximum	512 byte
• as user data for input variables as PROFINET IO device maximum	512 byte
• as user data for input variables for each sub-module as PROFINET IO device	240 byte
• as user data for input variables for each sub-module as PROFINET IO device	240 byte
• as user data for the consistency area for each sub-module	240 byte
Number of submodules per PROFINET IO-Device	32
<b>Performance data telecontrol</b>	
Protocol is supported	
• TCP/IP	Yes
<b>Product functions management, configuration</b>	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 V5.4 or higher / STEP 7 Professional V11 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher-level designation/location designation	Yes

Article number	<b>6GK7343-1CX10-0XE0</b>
Product type designation	CP 343-1 Lean
<b>Product functions Diagnosis</b>	
Product function Web-based diagnostics	Yes
<b>Product functions switch</b>	
Product feature Switch	Yes
Product function	
• switch-managed	No
• with IRT PROFINET IO switch	No
• Configuration with STEP 7	Yes
<b>Product functions Redundancy</b>	
Product function	
• Ring redundancy	Yes
• Redundancy manager	No
Protocol is supported Media Redundancy Protocol (MRP)	Yes
<b>Product functions Security</b>	
Product function	
• password protection for Web applications	No
• ACL - IP-based	Yes
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	Yes
• log file for unauthorized access	No
<b>Product functions Time</b>	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported NTP	Yes

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Ordering data	Article No.	Article No.	
<p><b>CP 343-1 Lean communications processor</b></p> <p>For connecting SIMATIC S7-300 to Industrial Ethernet through TCP/IP and UDP, Multicast, S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, PROFINET IO Device, MRP, integrated 2-port switch ERTEC, comprehensive diagnostics facilities, module replacement without PG, SNMP, initial commissioning over LAN; with electronic manual on CD-ROM</p>	<b>6GK7343-1CX10-0XE0</b>	<p><b>IE FC TP Standard Cable GP 2 x 2 (Type A)</b></p> <p>4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m</p>	<b>6XV1840-2AH10</b>
<p><b>Accessories</b></p>		<p><b>IE FC Stripping Tool</b></p> <p>Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables</p>	<b>6GK1901-1GA00</b>
<p><b>IE FC RJ45 Plug 145</b></p> <p>RJ45 plug connector 2 x 2 for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 145° cable outlet</p> <ul style="list-style-type: none"> <li>• 1 pack = 1 unit</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	<p><b>6GK1901-1BB30-0AA0</b></p> <p><b>6GK1901-1BB30-0AB0</b></p> <p><b>6GK1901-1BB30-0AE0</b></p>	<p><b>Compact Switch Module CSM 377</b></p> <p>Unmanaged switch for connection of a SIMATIC S7-300 CPU, ET 200M, and up to three further nodes to Industrial Ethernet operating at 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module including electronic manual on CD-ROM</p>	<b>6GK7377-1AA00-0AA0</b>

Note:

You can find order information for software for communication with PC systems in Catalog IK PI.

**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**CP 343-1****Overview**

Communications processor for connecting a SIMATIC S7-300/SINUMERIK 840D powerline to Industrial Ethernet networks, also as PROFINET IO Controller or IO Device.

The CP supports:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication

ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●			●	●

**Technical specifications**

Article number	<b>6GK7343-1EX30-0XE0</b>
Product type designation	CP 343-1
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	2
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
• of Industrial Ethernet interface	RJ45 port
• for power supply	2-pole plugable terminal block
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage	24 V
Supply voltage external	24 V
Relative positive tolerance for DC at 24 V	20 %
Relative negative tolerance for DC at 24 V	15 %
Consumed current	
• from backplane bus for DC at 5 V typical	0.2 A
• from external supply voltage for DC at 24 V typical	0.16 A
• from external supply voltage for DC at 24 V maximum	0.2 A
Active power loss	5.8 W

Article number	<b>6GK7343-1EX30-0XE0</b>
Product type designation	CP 343-1
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-300 single width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.22 kg
Mounting type	
• S7-300 rail mounting	Yes
<b>Performance data open communication</b>	
Number of possible connections for open communication by means of SEND/RECEIVE blocks	
• maximum	16
Amount of data	
• as user data per ISO connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per ISO on TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks maximum	2 Kibyte

#### Technical specifications (continued)

Article number	<b>6GK7343-1EX30-0XE0</b>
Product type designation	CP 343-1
Number of Multicast stations	16
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	16
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	32
<b>Performance data PROFINET communication as PN IO-Controller</b>	
Number of PN IO devices on PROFINET IO controller usable total	32
Number of external PN IO lines with PROFINET per rack	1
Amount of data	
• as user data for input variables as PROFINET IO controller maximum	1 Kibyte
• as user data for input variables as PROFINET IO controller maximum	1 Kibyte
• as user data for input variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for output variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for input variables per PN IO device for each sub-module as PROFINET IO controller maximum	240 byte
• as user data for output variables per PN IO device for each sub-module as PROFINET IO controller maximum	240 byte
<b>Performance data PROFINET communication as PN IO-Device</b>	
Product function PROFINET IO device	Yes
Amount of data	
• as user data for input variables as PROFINET IO device maximum	512 byte
• as user data for input variables as PROFINET IO device maximum	512 byte
• as user data for input variables for each sub-module as PROFINET IO device	240 byte
• as user data for input variables for each sub-module as PROFINET IO device	240 byte
• as user data for the consistency area for each sub-module	240 byte
Number of submodules per PROFINET IO-Device	32
<b>Performance data telecontrol</b>	
Protocol is supported	
• TCP/IP	Yes

Article number	<b>6GK7343-1EX30-0XE0</b>
Product type designation	CP 343-1
<b>Product functions management, configuration</b>	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 V5.4 SP2 or higher / STEP 7 Professional V11 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher-level designation/ location designation	Yes
<b>Product functions Diagnosis</b>	
Product function Web-based diagnostics	Yes
<b>Product functions switch</b>	
Product feature Switch	Yes
Product function	
• switch-managed	No
• with IRT PROFINET IO switch	Yes
• Configuration with STEP 7	Yes
<b>Product functions Redundancy</b>	
Product function	
• Ring redundancy	Yes
• Redundancy manager	No
Protocol is supported Media Redundancy Protocol (MRP)	Yes
<b>Product functions Security</b>	
Product function	
• password protection for Web applications	No
• ACL - IP-based	Yes
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	Yes
• log file for unauthorized access	No
<b>Product functions Time</b>	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported NTP	Yes

**SIMATIC S7-300 advanced controller**

I/O modules

Communication

CP 343-1

**Ordering data****Article No.****Article No.****CP 343-1 communications processor****6GK7343-1EX30-0XE0**

For connection of SIMATIC S7-300 to Industrial Ethernet over ISO and TCP/IP; PROFINET IO Controller or PROFINET IO Device, MRP, integrated 2-port switch ERTEC; S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, with and without RFC 1006, multicast, DHCP, CPU clock synchronization via SIMATIC procedure and NTP, diagnostics, SNMP, access protection through IP access list, initialization over LAN 10/100 Mbit/s; with electronic manual on DVD

**Accessories****IE FC RJ45 Plug 180 2 x 2**

RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB10-2AA0**  
**6GK1901-1BB10-2AB0**  
**6GK1901-1BB10-2AE0**

**IE FC RJ45 Plug 145**

RJ45 plug connector 2 x 2 for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 145° cable outlet

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB30-0AA0**  
**6GK1901-1BB30-0AB0**  
**6GK1901-1BB30-0AE0**

**IE FC TP Standard Cable GP 2 x 2 (Type A)****6XV1840-2AH10**

4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m

**IE FC Stripping Tool****6GK1901-1GA00**

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

**Compact Switch Module CSM 377****6GK7377-1AA00-0AA0**

Unmanaged switch for connection of a SIMATIC S7-300 CPU, ET 200M, and up to three further nodes to Industrial Ethernet operating at 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module including electronic manual on CD-ROM

**SCALANCE X204-2 Industrial Ethernet Switch****6GK5204-2BB10-2AA3**

Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports

Note:

You can find order information for software for communication with PC systems in Catalog IK PI.

## Overview



Communications processor for connecting the SIMATIC S7-300/SINUMERIK 840D powerline to Industrial Ethernet networks, also as PROFINET IO controller and IO device.

The CP supports:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication
- IT communication
- Security functionality, firewall and VPN

In addition, the CP 343-1 Advanced provides e-mail functions and allows users to create their own Web pages - ideal support for maintenance and quality assurance. The Internet functions such as FTP even allow connection to the most diverse PC-based systems. This CP is therefore the bridge between the field level and the management level for the S7-300. The CP 343-1 Advanced connects seamlessly to the security structures of the office and IT world.

ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●	●	●	●	●

## Technical specifications

Article number	<b>6GK7343-1GX31-0XE0</b>
Product type designation	CP 343-1 Advanced
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
• at the 2nd interface	10 ... 100 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	3
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
• at the 2nd interface acc. to Industrial Ethernet	2
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
• at the 2nd interface acc. to Industrial Ethernet	RJ45 port
• for power supply	2-pole pluggable terminal block
design of the removable storage C-PLUG	Yes

Article number	<b>6GK7343-1GX31-0XE0</b>
Product type designation	CP 343-1 Advanced
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage external	24 V
Relative positive tolerance for DC at 24 V	20 %
Relative negative tolerance for DC at 24 V	15 %
Consumed current	
• from backplane bus for DC at 5 V typical	0.14 A
• from external supply voltage for DC at 24 V typical	0.48 A
• from external supply voltage for DC at 24 V maximum	0.62 A
Active power loss	14.7 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20

**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**CP 343-1 Advanced****Technical specifications (continued)**

Article number	<b>6GK7343-1GX31-0XE0</b>
Product type designation	CP 343-1 Advanced
<b>Design, dimensions and weight</b>	
Module format	Compact module
Width	80 mm
Height	125 mm
Depth	120 mm
Net weight	0.8 kg
Mounting type	
• S7-300 rail mounting	Yes
<b>Performance data open communication</b>	
Number of possible connections for open communication by means of SEND/RECEIVE blocks	
• maximum	16
Amount of data	
• as user data per ISO connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per ISO on TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks maximum	2 Kibyte
Number of Multicast stations	16
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	16
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	48
<b>Performance data IT functions</b>	
Number of possible connections	
• as client by means of FTP maximum	10
• as server by means of FTP maximum	2
• as server by means of HTTP maximum	4
• as e-mail client maximum	1
Amount of data as user data for email maximum	8 Kibyte
Storage capacity of the user memory	
• as flash memory file system	28 Mibyte
• as RAM	30 Mibyte
Number of possible write cycles of the flash memory cells	100 000

Article number	<b>6GK7343-1GX31-0XE0</b>
Product type designation	CP 343-1 Advanced
<b>Performance data PROFINET communication as PN IO-Controller</b>	
Product function PROFINET IO controller	Yes
Number of PN IO devices on PROFINET IO controller usable total	128
Number of PN IO IRT devices on PROFINET IO controller usable	128
Number of external PN IO lines with PROFINET per rack	1
Amount of data	
• as user data for input variables as PROFINET IO controller maximum	4 Kibyte
• as user data for input variables as PROFINET IO controller maximum	4 Kibyte
• as user data for input variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for output variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for input variables per PN IO device for each sub-module as PROFINET IO controller maximum	240 byte
• as user data for output variables per PN IO device for each sub-module as PROFINET IO controller maximum	240 byte
<b>Performance data PROFINET communication as PN IO-Device</b>	
Product function PROFINET IO device	Yes
Amount of data	
• as user data for input variables as PROFINET IO device maximum	1 024 byte
• as user data for input variables as PROFINET IO device maximum	1 024 byte
• as user data for input variables for each sub-module as PROFINET IO device	240 byte
• as user data for input variables for each sub-module as PROFINET IO device	240 byte
• as user data for the consistency area for each sub-module	240 byte
Number of submodules per PROFINET IO-Device	32

**Technical specifications (continued)**

Article number	<b>6GK7343-1GX31-0XE0</b>	Article number	<b>6GK7343-1GX31-0XE0</b>
Product type designation	CP 343-1 Advanced	Product type designation	CP 343-1 Advanced
<b>Performance data PROFINET CBA</b>		<b>Performance data PROFINET CBA HMI variables via PROFINET acyclic</b>	
Number of remote connection partners with PROFINET CBA	64	Number of connectable HMI stations for HMI variables in the case of acyclic transmission with PROFINET CBA	3
Number of connections with PROFINET CBA total	1 000	Refresh time of the HMI variables in the case of acyclic transmission with PROFINET CBA	500 ms
Amount of data		Number of HMI variables in the case of acyclic transmission with PROFINET CBA maximum	200
• as user data for digital inputs with PROFINET CBA maximum	8 Kibyte	Amount of data as user data for HMI variables in the case of acyclic transmission with PROFINET CBA maximum	8 Kibyte
• as user data for digital outputs with PROFINET CBA maximum	8 Kibyte		
• as user data for arrays and data types in the case of acyclic transmission with PROFINET CBA maximum	8 Kibyte		
• as user data for arrays and data types with PROFINET CBA with cyclical transfer maximum	250 byte		
• as user data for arrays and data types with PROFINET CBA in the case of local interconnection maximum	2 400 byte		
<b>Performance data PROFINET CBA remote connection with acyclic transmission</b>		<b>Performance data PROFINET CBA device-internal connections</b>	
Refresh time of the remote interconnections in the case of acyclic transmission with PROFINET CBA	100 ms	Number of internal connections with PROFINET CBA maximum	256
Number of remote connections to input variables in the case of acyclic transmission with PROFINET CBA maximum	128	Amount of data of the internal connections with PROFINET CBA maximum	2 400 byte
Number of remote connections to output variables in the case of acyclic transmission with PROFINET CBA maximum	128		
Amount of data			
• as user data for remote interconnections with input variables in the case of acyclic transmission with PROFINET CBA	8 Kibyte		
• as user data for remote interconnections with output variables in the case of acyclic transmission with PROFINET CBA	8 Kibyte		
<b>Performance data PROFINET CBA remote connection with cyclic transmission</b>		<b>Performance data PROFINET CBA connections to constants</b>	
Refresh time of the remote interconnections with PROFINET CBA with cyclical transfer	8 ms	Number of connections with constants with PROFINET CBA maximum	200
Number of remote connections to input variables with PROFINET CBA with cyclical transfer maximum	200	Amount of data as user data for interconnections with constants with PROFINET CBA maximum	4 096 byte
Number of remote connections to output variables with PROFINET CBA with cyclical transfer maximum	200		
Amount of data			
• as user data for remote interconnections with input variables with PROFINET CBA with cyclical transfer maximum	2 000 byte		
• as user data for remote interconnections with output variables with PROFINET CBA with cyclical transfer maximum	2 000 byte		
		<b>Performance data PROFINET CBA PROFIBUS proxy functionality</b>	
		Product function with PROFINET CBA PROFIBUS proxy functionality	No
		<b>Performance data telecontrol</b>	
		Protocol is supported	
		• TCP/IP	Yes
		<b>Product functions management, configuration</b>	
		Product function MIB support	Yes
		Protocol is supported	
		• SNMP v1	Yes
		• DCP	Yes
		• LLDP	Yes
		Configuration software	
		• required	STEP7 V5.5 SP2 HF1 or higher / STEP 7 Professional V12 (TIA Portal) or higher
		• for PROFINET CBA required	SIMATIC iMap V3.0 SP4 and higher
		Identification & maintenance function	
		• I&M0 - device-specific information	Yes
		• I&M1 - higher-level designation/ location designation	Yes



**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**CP 343-1 Advanced****Technical specifications** (continued)

Article number	<b>6GK7343-1GX31-0XE0</b>
Product type designation	CP 343-1 Advanced
<b>Product functions Diagnosis</b>	
Product function Web-based diagnostics	Yes
<b>Product functions switch</b>	
Product feature Switch	Yes
Product function	
• switch-managed	No
• with IRT PROFINET IO switch	Yes
• Configuration with STEP 7	Yes
<b>Product functions Redundancy</b>	
Product function	
• Ring redundancy	Yes
• Redundancy manager	Yes
Protocol is supported Media Redundancy Protocol (MRP)	Yes

Article number	<b>6GK7343-1GX31-0XE0</b>
Product type designation	CP 343-1 Advanced
<b>Product functions Security</b>	
Firewall version	stateful inspection
Product function with VPN connection	IPSec
Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
Type of hashing algorithms with VPN connection	MD5, SHA-1
Number of possible connections with VPN connection	32
Product function	
• password protection for Web applications	Yes
• ACL - IP-based	Yes
• ACL - IP-based for PLC/routing	Yes
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	Yes
• log file for unauthorized access	No
<b>Product functions Time</b>	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported NTP	Yes

Ordering data	Article No.	Article No.	
<b>CP 343-1 Advanced communications processor</b> For connecting the SIMATIC S7-300 CPU to Industrial Ethernet; 1 x 10/100/1000 Mbit/s; 2 x 10/100 Mbit/s (IE switch); RJ 45 ports; TCP; UDP; ISO; PROFINET IO-Controller and Device, S7 communication (client + server); open communication (SEND/RECEIVE); S7 routing; IP configuration via DHCP/block; extended Web diagnostics; time synchronization; IP Access Control List; IP routing; FTP; email; PROFINET CBA; C-Plug • With Security (Firewall + VPN) and PROFinergy (Controller + Device)	<b>6GK7343-1GX31-0XE0</b>	<b>IE FC TP Standard Cable GP 2 x 2 (Type A)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m	<b>6XV1840-2AH10</b>
<b>Accessories</b> <b>IE FC RJ45 Plug 180 2 x 2</b> RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface • 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>	<b>IE FC TP Standard Cable GP 4 x 2</b> 8-core, shielded TP installation cable for connection to IE FC RJ45 Modular Outlet for universal applications; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m • AWG22, for connection to IE FC RJ45 Modular Outlet • AWG24, for connection to IE FC RJ45 Plug 4 x 2	<b>6XV1870-2E</b> <b>6XV1878-2A</b>
<b>IE FC RJ45 Plug 145</b> RJ45 plug connector 2 x 2 for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 145° cable outlet • 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units	<b>6GK1901-1BB30-0AA0</b> <b>6GK1901-1BB30-0AB0</b> <b>6GK1901-1BB30-0AE0</b>	<b>IE FC Stripping Tool</b> Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>
<b>IE FC RJ45 Plug 4 x 2</b> RJ45 plug connector for Industrial Ethernet (10/100/1000 Mbit/s) with a sturdy metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface • 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units	<b>6GK1901-1BB11-2AA0</b> <b>6GK1901-1BB11-2AB0</b> <b>6GK1901-1BB11-2AE0</b>	<b>Compact Switch Module CSM 377</b> Unmanaged switch for connection of a SIMATIC S7-300 CPU, ET 200M, and up to three further nodes to Industrial Ethernet operating at 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module including electronic manual on CD-ROM	<b>6GK7377-1AA00-0AA0</b>
		<b>Industrial Ethernet Switch SCALANCE X204-2</b> Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports	<b>6GK5204-2BB10-2AA3</b>
		<b>Industrial Ethernet Switch SCALANCE X308-2</b> 2 x 1000 Mbit/s multimode fiber-optic cable ports (SC sockets), 1 x 10/100/1000 Mbit/s RJ45 port, 7 x 10/100 Mbit/s RJ45 ports; for glass fiber-optic cable (multimode) up to max. 750 m	<b>6GK5308-2FL00-2AA3</b>

Note:

You can find order information for software for communication with PC systems in Catalog IK PI.

**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**CP 343-1 ERPC****Overview**

The CP 343-1 ERPC (Enterprise Connect) communications processor for connecting a SIMATIC S7-300 to Industrial Ethernet networks.

The CP supports:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- ERPC communication

Connection of the SIMATIC S7-300 to various database systems for vertical integration is supported by means of a firmware expansion from ILS-Technology to be ordered separately.

ERPC	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●					●	●

**Technical specifications**

Article number	<b>6GK7343-1FX00-0XE0</b>
Product type designation	CP 343-1 ERPC
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
• for power supply	2-pole plugable terminal block
design of the removable storage C-PLUG	Yes
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage external	24 V
Relative positive tolerance for DC at 24 V	20 %
Relative negative tolerance for DC at 24 V	15 %
Consumed current	
• from backplane bus for DC at 5 V typical	0.3 A
• from external supply voltage for DC at 24 V typical	0.16 A
• from external supply voltage for DC at 24 V maximum	0.6 A
Active power loss	14.7 W

Article number	<b>6GK7343-1FX00-0XE0</b>
Product type designation	CP 343-1 ERPC
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-300 double width
Width	80 mm
Height	125 mm
Depth	120 mm
Net weight	0.8 kg
Mounting type	
• S7-300 rail mounting	Yes

**Technical specifications (continued)**

Article number	<b>6GK7343-1FX00-0XE0</b>
Product type designation	CP 343-1 ERPC
<b>Performance data open communication</b>	
Number of possible connections for open communication by means of SEND/RECEIVE blocks	
• maximum	8
Amount of data	
• as user data per ISO on TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks maximum	2 Kibyte
Number of Multicast stations	8
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	8
• Note	also 2 PG/OP connections and 1 diagnostics connection
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	32
<b>Performance data IT functions</b>	
Number of possible connections	
• as server by means of HTTP maximum	4
Number of possible write cycles of the flash memory cells	100 000
<b>Performance data ERPC functions</b>	
Number of possible connections for communication with ERP or MES stations maximum	8
Number of possible logical triggers per CP maximum	8
Number of configurable ERPC symbols for database access	
• per CPU maximum	2 000
• per logical trigger maximum	255
Amount of data as user data and header information per logical trigger	8 Kibyte

Article number	<b>6GK7343-1FX00-0XE0</b>
Product type designation	CP 343-1 ERPC
<b>Performance data telecontrol</b>	
Protocol is supported	
• TCP/IP	Yes
<b>Product functions management, configuration</b>	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 V5.4 SP5 + HSP or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
<b>Product functions Diagnosis</b>	
Product function Web-based diagnostics	Yes
<b>Product functions switch</b>	
Product feature Switch	No
<b>Product functions Redundancy</b>	
Product function	
• Ring redundancy	No
<b>Product functions Security</b>	
Product function	
• password protection for Web applications	No
• ACL - IP-based	Yes
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	Yes
• log file for unauthorized access	No
<b>Product functions Time</b>	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported NTP	Yes

**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**CP 343-1 ERPC****Ordering data****Article No.****Article No.****Communications processor  
CP 343-1 ERPC  
(Enterprise Connect)****6GK7343-1FX00-0XE0**

For the connection of SIMATIC S7-300 to Industrial Ethernet and for the support of the database connection of the SIMATIC S7-300 to various databases; TCP/UDP, S7 communication, open communication (SEND/RECEIVE), with and without RFC 1006, multicast, web server, setting of CPU's clock using SIMATIC procedures and NTP, access protection via IP access list, SNMP, DHCP, initialization over LAN 10/100/1000 Mbit/s; with electronic manual on DVD, C-PLUG included in scope of delivery

**deviceWISE Embedded Edition for  
SIMATIC S7**

See Catalog IK PI 2015, Partner solutions / deviceWISE Embedded Edition for SIMATIC S7

Firmware expansion for database connection of the SIMATIC S7-300 complete with CP 343-1 ERPC to various ERP or MES systems

**Accessories****IE FC RJ45 Plug 4 x 2**

RJ45 plug connector for Industrial Ethernet (10/100/1000 Mbit/s) with a sturdy metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPU's with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB11-2AA0**  
**6GK1901-1BB11-2AB0**  
**6GK1901-1BB11-2AE0**

**IE FC TP Standard Cable GP 4 x 2**

8-core, shielded TP installation cable for connection to IE FC RJ45 Modular Outlet for universal applications; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m

- AWG22, for connection to IE FC RJ45 Modular Outlet
- AWG24, for connection to IE FC RJ45 Plug 4 x 2

**6XV1870-2E****6XV1878-2A****IE FC Stripping Tool**

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

**6GK1901-1GA00****Industrial Ethernet Switch  
SCALANCE X308-2**

2 x 1000 Mbit/s multimode fiber-optic cable ports (SC sockets), 1 x 10/100/1000 Mbit/s RJ45 port, 7 x 10/100 Mbit/s RJ45 ports; for glass fiber-optic cable (multimode) up to max. 750 m

**6GK5308-2FL00-2AA3**Note:

You can find order information for software for communication with PC systems in Catalog IK PI.

## Overview



- Unmanaged switch for the connection of a SIMATIC S7-300 with integral PROFINET interface or with an Industrial Ethernet CP or ET 200M to an Industrial Ethernet in an electrical linear, tree or star structure
- As many as three additional nodes can be connected
- As an unmanaged switch, the CSM 377 is used for integrating small machines into existing automation networks or for the standalone operation of the machines
- Simple, space-saving attachment to S7-300 mounting rail due to design as single-width module in S7-300 format
- Low-cost solution for implementing small, local Ethernet networks
- Rugged, industry-standard node connections with PROFINET-compliant RJ45 connectors that latch onto the enclosure to offer additional strain and bending relief

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## Technical specifications

Article number	<b>6GK7377-1AA00-0AA0</b>
Product type designation	CSM 377
<b>Transmission rate</b>	
Transfer rate	10 Mbit/s, 100 Mbit/s
<b>Interfaces</b>	
Number of electrical/optical connections	
• for network components or terminal equipment maximum	4
Number of electrical connections	
• for network components or terminal equipment	4
Type of electrical connection	
• for network components or terminal equipment	RJ45 port
<b>Interfaces for communication integrated</b>	
Number of 100 Mbit/s SC ports	
• for multimode	0
Number of 1000 Mbit/s LC ports	
• for multimode	0
<b>Interfaces others</b>	
Number of electrical connections	
• for power supply	1
Type of electrical connection	
• for power supply	2-pole terminal block
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage	
• external	24 V
• external	19.2 ... 28.8 V
Product component fusing at power supply input	Yes
Fuse protection type at input for supply voltage	0.5 A / 60 V
Consumed current maximum	0.07 A
Active power loss	
• for DC at 24 V	1.6 W

Article number	<b>6GK7377-1AA00-0AA0</b>
Product type designation	CSM 377
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity	
• at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Design	SIMATIC S7-300 device design
Width	40 mm
Height	125 mm
Depth	118 mm
Net weight	0.2 kg
Mounting type	
• 35 mm DIN rail mounting	No
• wall mounting	No
• S7-300 rail mounting	Yes
• S7-1500 rail mounting	No
<b>Product functions management, configuration</b>	
Product function	
• multiport mirroring	No
• switch-managed	No

**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**CSM 377 unmanaged****Technical specifications** (continued)

Article number	<b>6GK7377-1AA00-0AA0</b>
Product type designation	CSM 377
<b>Standards, specifications, approvals</b>	
Standard	
• for FM	FM3611: Class 1, Division 2, Group A, B, C, D / T..., CL.1, Zone 2, GP, IIC, T.. Ta
• for hazardous zone	EN 60079-15, II 3 G Ex nA II T..., KEMA 06 ATEX 0021 X
• for safety from CSA and UL	UL 508, CSA C22.2 No. 142
• for hazardous zone from CSA and UL	UL 1604 and UL 2279-15 (Hazardous Location)
• for emitted interference	EN 61000-6-4:2001
• for interference immunity	EN 61000-6-2:2001
Certificate of suitability	EN 61000-6-2:2001, EN 61000-6-4:2001
• CE marking	Yes
• C-Tick	Yes
• KC approval	No
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• Bureau Veritas (BV)	No
• Det Norske Veritas (DNV)	No
• Germanische Lloyd (GL)	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
MTBF at 40 °C	144 y

**Ordering data****Article No.****Compact Switch Module CSM 377**

Unmanaged switch for connecting a SIMATIC S7-300, ET200 M and up to three further nodes to Industrial Ethernet with 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, diagnostics on LEDs, S7-300 module including electronic manual on CD-ROM

**6GK7377-1AA00-0AA0****Accessories****IE FC TP standard cable GP 2 x 2 (Type A)**

4-core, shielded TP installation cable for connection to IE FC outlet RJ45/ IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m

**6XV1840-2AH10****IE FC RJ45 Plug 180 2 x 2**

RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB10-2AA0**  
**6GK1901-1BB10-2AB0**  
**6GK1901-1BB10-2AE0**

**IE FC stripping tool**

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

**6GK1901-1GA00**

## Overview



- SINAUT communications module TIM for SIMATIC S7-300 for use in a wide area network (WAN)
- IP communication via secure VPN (virtual private network) using the Internet
- Wireless communication via GPRS router, GPRS modem, or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for complete recording of data
- Simple configuration and operation without specialist IT knowledge

## Technical specifications

Article number	<b>6NH7800-3BA00</b>
Product type designation	TIM 3V-IE
<b>Transmission rate</b>	
Transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• acc. to RS 232	50 ... 38 400 bit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• for external data transmission acc. to RS 232	1
• for power supply	1
Type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
• at interface 1 for external data transmission	9 pin Sub-D-connector (RS232)
• for power supply	2-pole plugable terminal block
design of the removable storage C-PLUG	No
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	20.4 ... 28.8 V
Relative symmetrical tolerance for DC	
• at 5 V	5 %
Relative positive tolerance for DC at 24 V	5 %
Relative negative tolerance for DC at 24 V	5 %
Consumed current	
• from backplane bus for DC at 24 V maximum	0.2 A
• from external supply voltage for DC at 24 V maximum	0.2 A
Active power loss	5.8 W
Product expansion optional Backup battery	No

Article number	<b>6NH7800-3BA00</b>
Product type designation	TIM 3V-IE
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-300 single width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.25 kg
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	1
• Note	Number of TIMs per S7-300: 1
Cable length	
• with RS 232 interface maximum	6 m
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	8
• with PG connections maximum	2
• with OP connections maximum	8
Service	
• SINAUT ST7 via S7 communication	Yes
• PG/OP communication	Yes
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	12



**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**TIM 3V-IE for WAN and Ethernet****Technical specifications (continued)**

Article number	<b>6NH7800-3BA00</b>	Article number	<b>6NH7800-3BA00</b>
Product type designation	TIM 3V-IE	Product type designation	TIM 3V-IE
<b>Performance data telecontrol</b>		<b>Product functions management, configuration</b>	
Suitability for use		Configuration software	
• Node station	No	• required	SINAUT ST7 ES
• substation	Yes	• for CPU configuring required SINAUT TD7 block library for CPU	Yes
• TIM control center	No	• for PG configuring required SINAUT ST7 configuration software for PG	Yes
• Note	RS232 and Industrial Ethernet can not be operated in parallel	Storage location of TIM configuration data	On the TIM
Protocol is supported		<b>Product functions Security</b>	
• TCP/IP	Yes	Suitability for operation Virtual Private Network	Yes
• DNP3	No	Operating mode Virtual Private Network note	VPN operation as MSC client with MSC protocol and password protection only possible in conjunction with GPRS modem with MSC capability
• SINAUT ST1 protocol	Yes	Type of authentication with Virtual Private Network PSK	Yes
• SINAUT ST7 protocol	Yes	Product function	
Product function data buffering if connection is aborted	Yes	• password protection for VPN	Yes
• Note	16,000 data messages	• MSC client via GPRS modem with MSC capability	Yes
Storage capacity		Protocol	
• of S7 CPU RAM for TD7onCPU mode data blocks on CPU required	20 Kibyte	• is supported MSC protocol	No
• of S7 CPU RAM for TD7onTIM mode data blocks on TIM required	0 Kibyte	Key length for MSC with Virtual Private Network	128 bit
• Note	TD7onCPU: at least 20 KB, actual requirement determined by data volume and functional scope TD7onTIM: 0 bytes in most favorable case	Number of possible connections	
Product property Buffered message frame memory	No	• as MSC client with VPN connection	1
Transmission format		• as MSC server with VPN connection	0
• for SINAUT ST1 protocol with polling 11 bit	Yes		
• for SINAUT ST1 protocol with spontaneous 10-bit or 11-bit	Yes		
• for SINAUT ST7 protocol with multi-master polling 10-bit	Yes		
• for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit	Yes		
Operating mode for scanning of data transmission			
• with dedicated line/radio link with SINAUT ST1 protocol	Polling, polling with time slot procedure		
• with dedicated line/radio link with SINAUT ST7 protocol	Polling, polling with time slot procedure, multi-master polling with time slot procedure		
• with dial-up network with SINAUT ST1 protocol	spontaneous		
• with dial-up network with SINAUT ST7 protocol	spontaneous		
Hamming distance			
• for SINAUT ST1 protocol	4		
• for SINAUT ST7 protocol	4		

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Ordering data	Article No.	Article No.
<b>TIM 3V-IE communications module</b>	<b>6NH7800-3BA00</b>	
With an RS 232 interface for SINAUT communication via a conventional WAN or an IP-based network (WAN or LAN)		
<b>SINAUT Engineering Software V5.4</b>	<b>6NH7997-0CA54-0AA0</b>	
On CD-ROM, comprising		
• SINAUT Engineering Software V5.4 for the PG		
• SINAUT TD7 block library		
• Electronic manual in German and English		
		<b>Accessories</b>
		<b>IE FC TP Standard Cable GP 2 x 2 (Type A)</b>
		4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m
		<b>6XV1840-2AH10</b>
		<b>IE FC RJ45 Plug 180</b>
		RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface
		• 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units
		<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>
		<b>IE FC Stripping Tool</b>
		Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables
		<b>6GK1901-1GA00</b>
		<b>Connecting cable</b>
		For connecting a TIM (RS 232) with a SINAUT ST7 MD2, MD3 or MD4 (RS 232) modem; cable length 1.5 m
		<b>6NH7701-4AL</b>
		<b>Connecting cable</b>
		For connecting a TIM (RS 232) with the GSM modem MD720-3; also suitable for third-party modems or radio equipment with standard RS 232 interface; cable length 2.5 m
		<b>6NH7701-5AN</b>
		<b>Connecting cable</b>
		With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232); cable length 2.5 m
		<b>6NH7701-4BN</b>
		<b>Connecting cable</b>
		For connecting two TIM modules via their RS 232 interface without modems ("null modem"); cable length 6 m
		<b>6NH7701-0AR</b>

**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**TIM 3V-IE Advanced****Overview**

- SINAUT communications module TIM for SIMATIC S7-300 for use in wide area network (WAN) as station, node station, and control center
- IP communication via secure VPN (virtual private network) using the Internet
- Wireless communication via GPRS router, GPRS modem or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for complete recording of data and support of redundant communication paths
- Simple configuration and operation without specialist IT knowledge

**Technical specifications**

Article number	<b>6NH7800-3CA00</b>
Product type designation	TIM 3V-IE Advanced
<b>Transmission rate</b>	
Transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• acc. to RS 232	50 ... 38 400 bit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• for external data transmission acc. to RS 232	1
• for power supply	1
Type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
• at interface 1 for external data transmission	9 pin Sub-D-connector (RS232)
• for power supply	2-pole plugable terminal block
design of the removable storage C-PLUG	No
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	20.4 ... 28.8 V
Relative symmetrical tolerance for DC	
• at 5 V	5 %
Relative positive tolerance for DC at 24 V	5 %
Relative negative tolerance for DC at 24 V	5 %
Consumed current	
• from backplane bus for DC at 24 V maximum	0.2 A
• from external supply voltage for DC at 24 V maximum	0.2 A
Active power loss	5.8 W
Product expansion optional Backup battery	No

Article number	<b>6NH7800-3CA00</b>
Product type designation	TIM 3V-IE Advanced
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-300 single width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.25 kg
<b>Product properties, functions, components general</b>	
Number of units	
• Note	Number of TIMs per S7-300: multiple, number depends on the connection resources of the S7-300 CPU
Cable length	
• with RS 232 interface maximum	6 m
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	24
• with PG connections maximum	4
• with OP connections maximum	20
Service	
• SINAUT ST7 via S7 communication	Yes
• PG/OP communication	Yes
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	24

## Technical specifications (continued)

Article number	<b>6NH7800-3CA00</b>	Article number	<b>6NH7800-3CA00</b>
Product type designation	TIM 3V-IE Advanced	Product type designation	TIM 3V-IE Advanced
<b>Performance data telecontrol</b>		<b>Product functions management, configuration</b>	
Suitability for use		Configuration software	
• Node station	Yes	• required	SINAUT ST7 ES
• substation	Yes	• for CPU configuring required SINAUT TD7 block library for CPU	Yes
• TIM control center	Yes	• for PG configuring required SINAUT ST7 configuration software for PG	Yes
• Note	RS232 and Industrial Ethernet can be operated in parallel	Storage location of TIM configuration data	On the TIM
Protocol is supported		<b>Product functions Security</b>	
• TCP/IP	Yes	Suitability for operation Virtual Private Network	Yes
• DNP3	No	Type of authentication with Virtual Private Network PSK	Yes
• SINAUT ST1 protocol	Yes	Product function	
• SINAUT ST7 protocol	Yes	• password protection for VPN	Yes
Product function data buffering if connection is aborted	Yes	• MSC client via GPRS modem with MSC capability	Yes
• Note	32,000 data messages	Protocol	
Storage capacity		• is supported MSC protocol	Yes
• of S7 CPU RAM for TD7onCPU mode data blocks on CPU required	20 Kibyte	• with Virtual Private Network MSC is supported	TCP/IP
• of S7 CPU RAM for TD7onTIM mode data blocks on TIM required	0 Kibyte	Key length for MSC with Virtual Private Network	128 bit
• Note	TD7onCPU: at least 20 KB, actual requirement determined by data volume and functional scope TD7onTIM: 0 bytes in most favorable case	Number of possible connections	
Product property Buffered message frame memory	No	• as MSC client with VPN connection	1
Transmission format		• as MSC server with VPN connection	0
• for SINAUT ST1 protocol with polling 11 bit	Yes		
• for SINAUT ST1 protocol with spontaneous 10-bit or 11-bit	Yes		
• for SINAUT ST7 protocol with multi-master polling 10-bit	Yes		
• for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit	Yes		
Operating mode for scanning of data transmission			
• with dedicated line/radio link with SINAUT ST1 protocol	Polling, polling with time slot procedure		
• with dedicated line/radio link with SINAUT ST7 protocol	Polling, polling with time slot procedure, multi-master polling with time slot procedure		
• with dial-up network with SINAUT ST1 protocol	spontaneous		
• with dial-up network with SINAUT ST7 protocol	spontaneous		
Hamming distance			
• for SINAUT ST1 protocol	4		
• for SINAUT ST7 protocol	4		

**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**TIM 3V-IE Advanced****Ordering data****Article No.****TIM 3V-IE Advanced communications module****6NH7800-3CA00**

With an RS 232 interface and an RJ45 interface for SINAUT communication via a conventional WAN and an IP-based network (WAN or LAN)

**SINAUT Engineering Software V5.4****6NH7997-0CA54-0AA0**

- On CD-ROM, comprising
- SINAUT ST7 Engineering Software V5.4 for the PG
  - SINAUT TD7 block library
  - Electronic manual in German and English

**Article No.****Accessories****IE FC TP Standard Cable GP 2 x 2 (Type A)****6XV1840-2AH10**

4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m

**IE FC RJ45 Plug 180**

RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB10-2AA0****6GK1901-1BB10-2AB0****6GK1901-1BB10-2AE0****IE FC Stripping Tool****6GK1901-1GA00**

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

**Connecting cable****6NH7701-4AL**

For connecting a TIM (RS 232) with a SINAUT ST7 MD2, MD3 or MD4 (RS 232) modem; cable length 1.5 m

**Connecting cable****6NH7701-5AN**

For connecting a TIM (RS 232) with the GSM modem MD720-3; also suitable for third-party modems or radio equipment with standard RS 232 interface; cable length 2.5 m

**Connecting cable****6NH7701-4BN**

With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232); cable length 2.5 m

**Connecting cable****6NH7701-0AR**

For connecting two TIM modules via their RS 232 interface without modems ("null modem"); cable length 6 m

## Overview



- SINAUT communications module TIM with four interfaces for SIMATIC S7-300 or as self-contained unit for the S7-400 for use in the wide area network (WAN)
- For universal use in a SINAUT station, node station and control center
- Internet communication via integrated MSC-VPN tunnel with direct connection to a DSL router or operation via IPsec VPN with additional SIMATIC NET components
- Wireless communication via GPRS router, GPRS modem, or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for complete recording of data and support of redundant communication paths
- Simple configuration and operation without specialist IT knowledge

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## Technical specifications

Article number	<b>6NH7800-4BA00</b>
Product type designation	TIM 4R-IE
<b>Transmission rate</b>	
Transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• acc. to RS 232	50 ... 38 400 bit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	2
Number of electrical connections	
• for external data transmission acc. to RS 232	2
• for power supply	1
Type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
• at interface 1 for external data transmission	9 pin Sub-D-connector, RS232 switchable to RS485
• at interface 2 for external data transmission	9-pole D-sub connector, RS232 can be switched to RS485
• for power supply	2-pole plugable terminal block
design of the removable storage C-PLUG	Yes
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	20.4 ... 28.8 V
Consumed current	
• from backplane bus for DC at 24 V maximum	0.2 A
• from external supply voltage for DC at 24 V maximum	0.17 A
Active power loss	4.6 W
Product expansion optional Backup battery	Yes
Type of battery	Lithium AA / 3.6 V / 2.3 Ah
Backup current	
• typical	100 µA
• maximum	160 µA

Article number	<b>6NH7800-4BA00</b>
Product type designation	TIM 4R-IE
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-300 double width
Width	80 mm
Height	125 mm
Depth	120 mm
Net weight	0.4 kg
<b>Product properties, functions, components general</b>	
Number of units	
• Note	Number of TIM 4R-IE per S7-300/S7-400: multiple, number depends on the connection resources of the CPU
Cable length	
• with RS 232 interface maximum	6 m
• with RS 485 interface maximum	30 m
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	64
• with PG connections maximum	2
• with OP connections maximum	62
Service	
• SINAUT ST7 via S7 communication	Yes
• PG/OP communication	Yes

**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**TIM 4R-IE for WAN and Ethernet****Technical specifications (continued)**

Article number	<b>6NH7800-4BA00</b>	Article number	<b>6NH7800-4BA00</b>
Product type designation	TIM 4R-IE	Product type designation	TIM 4R-IE
<b>Performance data multi-protocol mode</b>		<b>Product functions management, configuration</b>	
Number of active connections with multi-protocol mode	128	Configuration software	
<b>Performance data telecontrol</b>		<ul style="list-style-type: none"> <li>required</li> </ul>	SINAUT ST7 ES Yes
Suitability for use		<ul style="list-style-type: none"> <li>for CPU configuring required SINAUT TD7 block library for CPU</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Node station</li> </ul>	Yes	<ul style="list-style-type: none"> <li>for PG configuring required SINAUT ST7 configuration software for PG</li> </ul>	Yes
<ul style="list-style-type: none"> <li>substation</li> </ul>	Yes	Storage location of TIM configuration data	On internal TIM flash memory, or on TIM in optional C-PLUG, or on MMC of the S7-300 CPU if TIM installed in S7-300 controller
<ul style="list-style-type: none"> <li>TIM control center</li> </ul>	Yes	<b>Product functions Security</b>	
Protocol is supported		Suitability for operation Virtual Private Network	Yes
<ul style="list-style-type: none"> <li>TCP/IP</li> </ul>	Yes	Type of authentication with Virtual Private Network PSK	Yes
<ul style="list-style-type: none"> <li>DNP3</li> </ul>	No	Product function	
<ul style="list-style-type: none"> <li>SINAUT ST1 protocol</li> </ul>	Yes	<ul style="list-style-type: none"> <li>password protection for VPN</li> </ul>	Yes
<ul style="list-style-type: none"> <li>SINAUT ST7 protocol</li> </ul>	Yes	<ul style="list-style-type: none"> <li>MSC client via GPRS modem with MSC capability</li> </ul>	Yes
Product function data buffering if connection is aborted	Yes	Protocol	
<ul style="list-style-type: none"> <li>Note</li> </ul>	56,000 data messages	<ul style="list-style-type: none"> <li>is supported MSC protocol</li> </ul>	Yes
Storage capacity		<ul style="list-style-type: none"> <li>with Virtual Private Network MSC is supported</li> </ul>	TCP/IP
<ul style="list-style-type: none"> <li>of S7 CPU RAM for TD7onCPU mode data blocks on CPU required</li> </ul>	20 Kibyte	Key length for MSC with Virtual Private Network	128 bit
<ul style="list-style-type: none"> <li>of S7 CPU RAM for TD7onTIM mode data blocks on TIM required</li> </ul>	0 Kibyte	Number of possible connections	
<ul style="list-style-type: none"> <li>Note</li> </ul>	TD7onCPU: at least 20 KB, actual requirement determined by data volume and functional scope TD7onTIM: 0 bytes in most favorable case	<ul style="list-style-type: none"> <li>as MSC client with VPN connection</li> </ul>	1
Product property Buffered message frame memory	Yes	<ul style="list-style-type: none"> <li>as MSC server with VPN connection</li> </ul>	128
Transmission format		<b>Product functions Time</b>	
<ul style="list-style-type: none"> <li>for SINAUT ST1 protocol with polling 11 bit</li> </ul>	Yes	Product component Hardware real-time clock	Yes
<ul style="list-style-type: none"> <li>for SINAUT ST1 protocol with spontaneous 10-bit or 11-bit</li> </ul>	Yes	Product property Hardware real-time clock w. battery backup	Yes
<ul style="list-style-type: none"> <li>for SINAUT ST7 protocol with multi-master polling 10-bit</li> </ul>	Yes	Accuracy of the hardware real-time clock per day maximum	4 s
<ul style="list-style-type: none"> <li>for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit</li> </ul>	Yes	time synchronization	
Operating mode for scanning of data transmission		<ul style="list-style-type: none"> <li>from NTP-server</li> </ul>	Yes
<ul style="list-style-type: none"> <li>with dedicated line/radio link with SINAUT ST1 protocol</li> </ul>	Polling, polling with time slot procedure		
<ul style="list-style-type: none"> <li>with dedicated line/radio link with SINAUT ST7 protocol</li> </ul>	Polling, polling with time slot procedure, multi-master polling with time slot procedure		
<ul style="list-style-type: none"> <li>with dial-up network with SINAUT ST1 protocol</li> </ul>	spontaneous		
<ul style="list-style-type: none"> <li>with dial-up network with SINAUT ST7 protocol</li> </ul>	spontaneous		
Hamming distance			
<ul style="list-style-type: none"> <li>for SINAUT ST1 protocol</li> </ul>	4		
<ul style="list-style-type: none"> <li>for SINAUT ST7 protocol</li> </ul>	4		

Ordering data	Article No.	Ordering data	Article No.
<b>TIM 4R-IE communications module</b>	<b>6NH7800-4BA00</b>	<b>Accessories</b>	
With two combined RS 232/RS 485 interfaces for SINAUT communication via conventional WANs and two RJ45 interfaces for SINAUT communication via IP-based networks (WAN or LAN)		<b>Backup battery</b>	<b>6ES7971-0BA00</b>
		3.6 V/2.3 Ah for TIM 4R-IE	
<b>SINAUT Engineering Software V5.4</b>	<b>6NH7997-0CA54-0AA0</b>	<b>IE FC TP Standard Cable GP 2 x 2 (Type A)</b>	<b>6XV1840-2AH10</b>
On CD-ROM, comprising		4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m	
<ul style="list-style-type: none"> <li>• SINAUT ST7 Engineering Software V5.4 for the PG</li> <li>• SINAUT TD7 block library</li> <li>• Electronic manual in German and English</li> </ul>		<b>IE FC RJ45 Plug 180</b>	
		RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface	
		<ul style="list-style-type: none"> <li>• 1 pack = 1 unit</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>
		<b>IE FC Stripping Tool</b>	<b>6GK1901-1GA00</b>
		Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
		<b>Connecting cable</b>	<b>6NH7701-4AL</b>
		For connecting a TIM (RS 232) with a SINAUT ST7 MD2, MD3 or MD4 (RS 232) modem; cable length 1.5 m	
		<b>Connecting cable</b>	<b>6NH7701-4DL</b>
		For connecting a TIM (RS 485) with a SINAUT ST7 MD2, MD3 or MD4 (RS 485) modem; cable length 1.5 m	
		<b>Connecting cable</b>	<b>6NH7701-5AN</b>
		For connecting a TIM (RS 232) with the GSM modem MD720-3; also suitable for third-party modems or radio equipment with standard RS 232 interface; cable length 2.5 m	
		<b>Connecting cable</b>	<b>6NH7701-4BN</b>
		With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232); cable length 2.5 m	
		<b>Connecting cable</b>	<b>6NH7701-0AR</b>
		For connecting two TIM modules via their RS 232 interface without modems ("null modem"); cable length 6 m	
		<b>SITOP compact 24 V/0.6 A</b>	<b>6EP1331-5BA00</b>
		1-phase power supply with wide-range input 85 ... 264 V AC/110 ... 300 V DC, stabilized output voltage 24 V, rated output current value 0.6 A, slim design	



**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**TIM 3V-IE DNP3****Overview**

In a station for the S7-CPU, the new communication module TIM 3V-IE DNP3 V3.0 (TeleControl Interface Module) handles the data exchange with the assigned master system SIMATIC PCS 7 TeleControl V8.0 using the open DNP3 protocol. In addition, the V3.0 module now also supports master and node functionality.

- With the S7-300 housing, the module can be fully integrated into the S7-300 system
- The module has an RS 232 interface for the connection of an external modem for data transmission via a conventional WAN or the connection of a Modbus RTU slave to an S7-300 system
- The RJ45 port is used for data transmission via IP-based networks

**Technical specifications**

Article number	<b>6NH7803-3BA00-0AA0</b>
Product type designation	TIM 3V-IE DNP3
<b>Transmission rate</b>	
Transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• acc. to RS 232	9 600 ... 38 400 bit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• for external data transmission acc. to RS 232	1
• for power supply	1
Type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
• at interface 1 for external data transmission	9 pin Sub-D-connector (RS232)
• for power supply	2-pole plugable terminal block
design of the removable storage C-PLUG	No
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	20.4 ... 28.8 V
Consumed current	
• from backplane bus for DC at 24 V maximum	0.2 A
• from external supply voltage for DC at 24 V maximum	0.2 A
Active power loss	5.8 W
Product expansion optional Backup battery	No

Article number	<b>6NH7803-3BA00-0AA0</b>
Product type designation	TIM 3V-IE DNP3
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-300 single width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.25 kg
<b>Product properties, functions, components general</b>	
Number of units	
• Note	Number of TIMs per S7-300: 1
Cable length	
• with RS 232 interface maximum	6 m
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	3
• with PG connections maximum	2
• with OP connections maximum	1
• Note	only via LAN
Service	
• PG/OP communication	Yes

## Technical specifications (continued)

Article number	<b>6NH7803-3BA00-0AA0</b>
Product type designation	TIM 3V-IE DNP3
<b>Performance data telecontrol</b>	
Suitability for use	
• Node station	Yes
• substation	Yes
• TIM control center	Yes
Protocol is supported	
• TCP/IP	Yes
• DNP3	Yes
• SINAUT ST1 protocol	No
• SINAUT ST7 protocol	No
• Modbus RTU	Yes
Product function data buffering if connection is aborted	Yes
• Note	64,000 data points with one master
Number of DNP3 masters	
• for Ethernet maximum	8
• with RS 232 interface maximum	1
Number of Modbus RTU slaves maximum	1
<b>Product functions management, configuration</b>	
Configuration software	
• required	SINAUT ST7 ES
Storage location of TIM configuration data	On the CPU or TIM

## Ordering data

## Article No.

<b>TIM 3V-IE DNP3 communications module</b>	<b>6NH7803-3BA00-0AA0</b>
With an RS 232 interface for SINAUT communication via a conventional WAN and an IP-based network (WAN or LAN)	
<b>SINAUT Engineering Software V5.4</b>	<b>6NH7997-0CA54-0AA0</b>
On CD-ROM, comprising	
• SINAUT ST7 Engineering Software V5.4 for the PG	
• SINAUT TD7 block library	
• Electronic manual in German and English	
<b>Accessories</b>	
<b>IE FC TP Standard Cable GP 2 x 2 (Type A)</b>	<b>6XV1840-2AH10</b>
4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m	
<b>IE FC RJ45 Plug 180</b>	
RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface	
• 1 pack = 1 unit	<b>6GK1901-1BB10-2AA0</b>
• 1 pack = 10 units	<b>6GK1901-1BB10-2AB0</b>
• 1 pack = 50 units	<b>6GK1901-1BB10-2AE0</b>
<b>IE FC Stripping Tool</b>	<b>6GK1901-1GA00</b>
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
<b>Connecting cable</b>	<b>6NH7701-4AL</b>
For connecting a TIM (RS 232) with a SINAUT ST7 MD2, MD3 or MD4 (RS 232) modem; cable length 1.5 m	
<b>Connecting cable</b>	<b>6NH7701-5AN</b>
For connecting a TIM (RS 232) with the GSM modem MD720-3; also suitable for third-party modems or radio equipment with standard RS 232 interface; cable length 2.5 m	
<b>Connecting cable</b>	<b>6NH7701-4BN</b>
With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232); cable length 2.5 m	
<b>Connecting cable</b>	<b>6NH7701-0AR</b>
For connecting two TIM modules via their RS 232 interface without modems ("null modem"); cable length 6 m	

# SIMATIC S7-300 advanced controller

I/O modules

Communication

## TIM 4R-IE DNP3

### Overview



In a station for the S7-CPU, the communication module TIM 4R-IE DNP3 (TeleControl Interface Module) handles the data exchange with the assigned SIMATIC PCS7 TeleControl V8.0 master system using the open DNP3 protocol. In addition, the V3.0 module now also supports master and node functionality.

- With the double-width S7-300 housing, the module can be fully integrated into the S7-300 system
- Can be connected as a stand-alone module to a SIMATIC S7-400 and SIMATIC S7-400 H System
- Two RS 232/RS 485 interfaces support connection of an external modem for data transmission via a conventional WAN or of a Modbus RTU slave to an S7-300 system
- The module has two RJ45 interfaces for data transmission via IP-based networks
- By using physically separate connection paths, the module permits media redundancy without loss of data during the switchover

### Technical specifications

Article number	<b>6NH7803-4BA00-0AA0</b>
Product type designation	TIM 4R-IE DNP3
<b>Transmission rate</b>	
Transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• acc. to RS 232	9 600 ... 1 115 200 bit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	2
Number of electrical connections	
• for external data transmission acc. to RS 232	2
• for power supply	1
Type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
• at interface 1 for external data transmission	9 pin Sub-D-connector, RS232 switchable to RS485
• at interface 2 for external data transmission	9-pole D-sub connector, RS232 can be switched to RS485
• for power supply	2-pole plugable terminal block
design of the removable storage C-PLUG	Yes
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	20.4 ... 28.8 V
Consumed current	
• from backplane bus for DC at 24 V maximum	0.2 A
• from external supply voltage for DC at 24 V maximum	0.17 A
Active power loss	4.6 W
Product expansion optional Backup battery	Yes
Type of battery	Lithium AA / 3.6 V / 2.3 Ah
Backup current	
• typical	100 µA
• maximum	160 µA

Article number	<b>6NH7803-4BA00-0AA0</b>
Product type designation	TIM 4R-IE DNP3
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-300 double width
Width	80 mm
Height	125 mm
Depth	120 mm
Net weight	0.4 kg
<b>Product properties, functions, components general</b>	
Number of units	
• Note	Number of TIMs per S7-300 / S7-400: 1
Cable length	
• with RS 232 interface maximum	6 m
• with RS 485 interface maximum	30 m
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	5
• with PG connections maximum	2
• with OP connections maximum	1
• Note	only via LAN
Service	
• PG/OP communication	Yes

**Technical specifications** (continued)

Article number	<b>6NH7803-4BA00-0AA0</b>
Product type designation	TIM 4R-IE DNP3
<b>Performance data telecontrol</b>	
Suitability for use	
• Node station	Yes
• substation	Yes
• TIM control center	Yes
Protocol is supported	
• TCP/IP	Yes
• DNP3	Yes
• SINAUT ST1 protocol	No
• SINAUT ST7 protocol	No
• Modbus RTU	Yes
Product function data buffering if connection is aborted	Yes
• Note	200,000 data points with one master
Number of DNP3 masters	
• for Ethernet maximum	8
• with RS 232 interface maximum	1
Number of Modbus RTU slaves maximum	1

Article number	<b>6NH7803-4BA00-0AA0</b>
Product type designation	TIM 4R-IE DNP3
<b>Product functions management, configuration</b>	
Configuration software	
• required	SINAUT ST7 ES
Storage location of TIM configuration data	On the CPU or TIM
<b>Product functions Time</b>	
Product component Hardware real-time clock	Yes
Product property Hardware real-time clock w. battery backup	Yes
Accuracy of the hardware real-time clock per day maximum time synchronization	4 s
• from NTP-server	Yes

**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**TIM 4R-IE DNP3****Ordering data****Article No.****Article No.****TIM 4R-IE DNP3 communications module****6NH7803-4BA00-0AA0**

With two combined RS 232/RS 485 interfaces for SINAUT communication via conventional WANs and two RJ45 interfaces for SINAUT communication via IP-based networks (WAN or LAN)

**SINAUT Engineering Software V5.4****6NH7997-0CA54-0AA0**

- On CD-ROM, comprising
- SINAUT ST7 Engineering Software V5.4 for the PG
  - SINAUT TD7 block library
  - Electronic manual in German and English

**Accessories****Backup battery**

3.6 V/2.3 Ah for TIM 4R-IE DNP3

**6ES7971-0BA00****IE FC TP Standard Cable GP 2 x 2 (Type A)**

4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m

**6XV1840-2AH10****IE FC RJ45 Plug 180**

RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB10-2AA0**  
**6GK1901-1BB10-2AB0**  
**6GK1901-1BB10-2AE0**

**IE FC Stripping Tool**

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

**6GK1901-1GA00****Connecting cable**

For connecting a TIM (RS 232) with a SINAUT ST7 MD2, MD3 or MD4 (RS 232) modem; cable length 1.5 m

**6NH7701-4AL****Connecting cable**

For connecting a TIM (RS 485) with a SINAUT ST7 MD2, MD3 or MD4 (RS 485) modem; cable length 1.5 m

**6NH7701-4DL****Connecting cable**

For connecting a TIM (RS 232) with the GSM modem MD720-3; also suitable for third-party modems or radio equipment with standard RS 232 interface; cable length 2.5 m

**6NH7701-5AN****Connecting cable**

With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232); cable length 2.5 m

**6NH7701-4BN****Connecting cable**

For connecting two TIM modules via their RS 232 interface without modems ("null modem"); cable length 6 m

**6NH7701-0AR****SITOP compact 24 V/0.6 A**

1-phase power supply with wide-range input 85 to 264 V AC/110 to 300 V DC, stabilized output voltage 24 V, rated output current value 0.6 A, slim design

**6EP1331-5BA00**

## Overview



The ASM 475 is a powerful module for connecting the MOBY D, U, SIMATIC RF200, RF300, RF600 and SIMATIC MV400 identification systems to the S7-300 and ET 200M.

## Technical specifications

<b>Article No.</b>	<b>6GT2002-0GA10</b>
<b>Product-type designation</b>	<b>ASM 475 communication module</b>
<b>Suitability for installation</b>	SIMATIC S7-300, ET200M in conjunction with RF200/300/600, MOBY D/E/I/U, MV
Transmission rate at point-to-point connection serial maximum	115.2 kbit/s
<b>Interfaces</b>	
Design of interface for point-to-point connection	RS422
Number of readers connectable	2
Design of electrical connection	
• of the backplane bus	S7-300 backplane bus
• of the PROFIBUS interface	(according to the head module)
• of the Industrial Ethernet Interface	(according to the head module)
• for supply voltage	Screw-type or spring-loaded terminals
Version of the interface to the reader for communication	Screw-type or spring-loaded terminals
<b>Mechanical data</b>	
Material	Noryl
Color	Anthraxite
<b>Supply voltage, current consumption, power loss</b>	
Supply voltage for DC	
• rated value	24 V
• minimum	20 V
• maximum	30 V
Current consumed at 24 V DC	
• without connected devices typical	0.1 A
• including connected devices maximum	1 A
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operating	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Protection class IP	IP 20
Resistance against shock	According to IEC 61131-2
Resistance against shock	150 m/s <sup>2</sup>
Resistance against vibration	10 m/s <sup>2</sup>

<b>Article No.</b>	<b>6GT2002-0GA10</b>
<b>Product-type designation</b>	<b>ASM 475 communication module</b>
<b>Design, dimensions and weight</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.2 kg
Mounting type	S7-300 rack
Cable length for RS 422 interface maximum	1000 m
<b>Product properties, functions, components general</b>	
Type of display	4 LEDs per reader connection, 2 LEDs for device status
Product function transponder file handler can be addressed	Yes
Protocol is supported S7 communication	Yes
<b>Product functions management, configuration</b>	
Type of parameterization	Object manager, GSD
Type of programming	FB 45, FB 55, FC 56 (FC 45/55 with limited functionality)
Type of computer-mediated communication	acyclic communication
<b>Standards, specifications, approvals</b>	
Verification of suitability	CE, FCC, UL/CSA
<b>Accessories</b>	
Accessories	Front connector with screw-type or spring-loaded terminals

**SIMATIC S7-300 advanced controller**

I/O modules

Communication

**ASM 475****Ordering data****Article No.****Article No.****ASM 475 communication module****6GT2002-0GA10**

For SIMATIC S7-300 and ET 200M, parameterizable

**Accessories****Front connector  
(1 x per ASM 475)**

- with screw terminals
- with spring-loaded terminals

**6ES7392-1AJ00-0AA0****6ES7392-1BJ00-0AA0****SIMATIC RF200 / RF300 / RF600 / MV400 connecting cable**Preassembled, between the ASM 475 and RF200 / RF300 / RF600 / MV400, IP65, straight connector, PUR material, suitable for cable carriers, CMG approval, in the following lengths<sup>1)</sup>:

2 m

**6GT2891-4EH20**

5 m

**6GT2891-4EH50****Extension cable**

SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, CMG approval, suitable for cable carriers, straight connector

2 m

**6GT2891-4FH20**

5 m

**6GT2891-4FH50**

10 m

**6GT2891-4FN10**

20 m

**6GT2891-4FN20**

50 m

**6GT2891-4FN50****MOBY D connecting cable**

Preassembled, between ASM 475 and reader D1xS, 9-pole Sub-D plug, PUR material, CMG approved, suitable for cable carriers, in the following lengths:

5 m

**6GT2491-4EH50**

20 m

**6GT2491-4EN20**

50 m

**6GT2491-4EN50****DVD "RFID Systems Software & Documentation"****6GT2080-2AA20**

<sup>1)</sup> The connecting cables can be extended using RF300 connecting cables of type 6GT2891-4Fxxx. These connecting cables are available in the lengths 2 m, 5 m, 10 m, 20 m and 50 m.

**Overview**

- The low-cost, complete solution for serial communication over a point-to-point connection
- RS 232C (V.24) and RS 422/485 (X.27)
- Implemented protocols:
  - ASCII
  - 3964 (R) (not for RS 485)
  - Printer driver
- Simple parameterization using tool integrated in STEP 7

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	<b>6AG1340-1AH02-2AE0</b>	<b>6AG1340-1AH02-2AY0</b>	<b>6AG1340-1CH02-2AE0</b>
Based on	<b>6ES7340-1AH02-0AE0</b> SIPLUS S7-300 CP340 RS 232	<b>6ES7340-1AH02-0AE0</b> SIPLUS CP340 RS 232 EN 50155	<b>6ES7340-1CH02-0AE0</b> SIPLUS CP340 RS 422/485
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN 50155	60 °C; = Tmax
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>			
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!



**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS S7-300 communication

**SIPLUS S7-300 CP 340**

Ordering data	Article No.		Article No.
<b>SIPLUS S7-300 CP 340 communications processor</b> <u>Extended temperature range and exposure to media</u> with 1 RS 232C interface (V.24) with 1 RS 232C interface (V.24) with 1 RS 422/485 (X.27) interface <u>Conforms to EN 50155</u> with 1 RS 232C interface (V.24)	<b>6AG1340-1AH02-2AE0</b> <b>6AG1340-1AH02-2AY0</b> <b>6AG1340-1CH02-2AE0</b>  <b>6AG1340-1AH02-2AY0</b>	<b>Accessories</b>	See SIMATIC S7-300 CP 340, page 5/188

## Overview



- For fast, high-performance serial data exchange via point-to-point coupling
- Two versions with different physical transmission characteristics:
  - RS 232C (V.24)
  - RS 422/RS 485 (X.27)
- Implemented protocols: ASCII, 3964 (R), RK 512, customized protocols (can be reloaded)
- Simple parameter assignment using tool integrated in STEP 7

### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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## Technical specifications

Article number	6AG1341-1AH02-7AE0	6AG1341-1CH02-7AE0
Based on	6ES7341-1AH02-0AE0 SIPLUS_CP341_RS232C	6ES7341-1CH02-0AE0 SIPLUS_CP341_RS422/485
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

## Ordering data

**SIPLUS S7-300 CP 341 communications processor**  
Extended temperature range and exposure to media  
 With RS 232C interface (V.24)  
 With RS 422/485 (X.27) interface

### Article No.

6AG1341-1AH02-7AE0  
 6AG1341-1CH02-7AE0

### Article No.

### Accessories

See SIMATIC S7-300 CP 341, page 5/190

**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS S7-300 communication

**SIPLUS CP 343-1 Lean****Overview**

ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
	●	●	●			●	●

- Interface for the SIMATIC S7-300 to Industrial Ethernet (not for SINUMERIK)
  - 2 x RJ45 interface for 10/100 Mbit/s full/half duplex connection (with autosensing for automatic switchover and autocrossover function)
  - Integral 2-port real-time switch ERTEC
  - Multi-protocol operation with TCP and UDP transport protocol and PROFINET IO
  - Keep Alive function
- Communication services:
  - Open communication (TCP/IP and UDP)
  - PG/OP communication
  - S7 communication (server)
  - PROFINET IO device
- Multicast for UDP
- Remote programming and initial commissioning is possible over Industrial Ethernet
- IT communication
  - Web function
- Integration into network management through SNMP
- Configuration with STEP 7
- Cross-network PG/OP communication by means of S7 routing
- Diagnostics possibilities in STEP 7 and via Web browser

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**SIPLUS S7-300 CP 343-1 Lean**

Article No.	6AG1 343-1CX10-2XE0	6AG1 343-1CX10-4XE0
Based on Article No.	6GK7 343-1CX10-0XE0	
Ambient temperature range	-25 ... +60 °C	0 ... +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
<b>Ambient conditions</b>		
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.	
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!	
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!	
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!	
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K	

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Ordering data	Article No.		Article No.
<p><b>SIPLUS CP 343-1 Lean communications processor</b></p> <p>For connecting SIMATIC S7-300 to Industrial Ethernet through TCP/IP and UDP, Multicast, S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, PROFINET IO device, integral 2-port switch ERTEC, comprehensive diagnostics facilities, module replacement without PG, SNMP, initial commissioning over LAN; with electronic manual on CD-ROM</p> <p>Extended temperature range and exposure to media</p>	<p><b>6AG1343-1CX10-2XE0</b></p>	<p><b>Accessories</b></p>	<p>See SIMATIC CP 343-1 Lean communications processor, page 5/203</p>

**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS S7-300 communication

**SIPLUS CP 343-1****Overview**

ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●			●	●

- Connection of SIMATIC S7-300/SINUMERIK 840D powerline to Industrial Ethernet
  - 2 x RJ45 interface for 10/100 Mbit/s full/half-duplex connection with auto-sensing/auto-negotiation and auto-crossover function
  - Integrated 2-port real-time switch ERTEC
  - Multi-protocol operation with ISO, TCP, UDP transport protocol and PROFINET IO
  - Adjustable keep-alive function
- Communication services:
  - Open communication (ISO, TCP/IP, and UDP)
  - PROFINET IO-Controller or PROFINET IO-Device
  - PG/OP communication: Cross-network by means of S7 routing
  - S7 communication (client, server, multiplexing)
- Media redundancy (MRP); within an Ethernet network with ring topology, the CP supports the media redundancy procedure MRP (V2.2 or higher)
- Multicast for UDP
- IP address assignment via DHCP, simple PC tool or via the user program (e.g. HMI)
- Access protection via configurable access list
- Remote programming and commissioning via Industrial Ethernet
- Configuration with STEP 7
- Automatic setting of CPU clock setting over Ethernet with NTP or SIMATIC procedure
- Web diagnostics
- Integration in network management systems via SNMP (MIB2 diagnostics information)
- Diagnostics possibilities in STEP 7 and via Web browser

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**SIPLUS CP 343-1****Article No. 6AG1 343-1EX30-7XE0****Based on Article No. 6GK7 343-1EX30-0XE0**

Ambient temperature range	-25 ... +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.

**Ambient conditions**

Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN 60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1000 ... +2000 m) 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5000 m) derating 20 K

For further technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

**Ordering data****Article No.****SIPLUS S7-300 CP 343-1 communications processor****6AG1343-1EX30-7XE0**

For connection of SIMATIC S7-300 to Industrial Ethernet over ISO and TCP/IP; PROFINET IO Controller or PROFINET IO device, MRP, integrated 2-port switch ERTEC; S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, with and without RFC 1006, multicast, DHCP, CPU clock synchronization via SIMATIC procedure and NTP, diagnostics, SNMP, access protection through IP access list, initialization over LAN 10/100 Mbit/s; with electronic manual on DVD

Extended temperature range and exposure to media

**Accessories**

See SIMATIC CP 343-1 communications processor, page 5/206

## Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●	●	●	●	●

- Connection of SIMATIC S7-300/SINUMERIK 840D powerline to Industrial Ethernet
  - Multi-protocol operation with TCP and UDP transport protocol
  - Adjustable keep-alive function
- Two separate interfaces (integrated network separation):
  - Gigabit interface with one RJ45 port with 10/100/1 000 Mbit/s, full/half-duplex with auto-sensing capability
  - PROFINET interface with two RJ45 ports with 10/100 Mbit/s full/half-duplex with auto-sensing and auto-crossover functionality via integrated 2-port switch
- Communication services via both interfaces:
  - Open communication (TCP/IP and UDP): Multicast with UDP, including routing between both interfaces
  - PG/OP communication:
    - Cross-network by means of S7 routing
    - S7 communication (client, server, multiplexing) including routing between both interfaces
  - IT communication:
    - HTTP communication supports access to process data via own Web pages;
    - e-mail client function, sending of e-mails directly from user program;
    - FTP communication supports program-controlled FTP client communication;
    - access to data blocks through FTP server
- Communication services via PROFINET interfaces:
  - PROFINET IO Controller and IO device with real-time properties (RT and IRT)<sup>1)</sup>
  - PROFINET CBA
  - IP address assignment via DHCP, simple PC tool or via program block (e.g. for HMI)
  - Configuration with STEP 7

- Media redundancy (MRP); within an Ethernet network with ring topology, the CP supports the media redundancy procedure MRP (V2.2 or higher)
  - Access protection by means of configurable IP access list
  - Module replacement without programming device; all information is stored on the C-PLUG (including file system for IT functions)
  - Extensive diagnostic functions for all modules in the rack
  - IT communication
    - Web function
    - E-mail function
    - FTP
  - Integration into network management systems through the support of SNMP V1 MIB-II
- <sup>1)</sup> Possible combinations in parallel mode:
- IO Controller with IRT and IO device with RT
  - IO Controller with RT and IO device using IRT

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**SIPLUS S7-300 CP 343-1 Advanced**

<b>Article No.</b>	<b>6AG1343-1GX31-4XE0</b>
<b>Based on Article No.</b>	<b>6GK7343-1GX31-0XE0</b>
Ambient temperature range	0 ... +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies, except for the ambient conditions.
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS S7-300 communication

**SIPLUS CP 343-1 Advanced****Ordering data****Article No.****Article No.****SIPLUS S7-300 CP 343-1  
Advanced communications  
processor****6AG1343-1GX31-4XE0**

For connecting the SIMATIC S7-300 to Industrial Ethernet, PROFINET IO-Controller and IO-Device with RT and IRT, MRP, PROFINET CBA, TCP/IP and UDP, S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE with or without RFC 1006, diagnostics extensions, multicast, Web server, HTML diagnostics, FTP server, FTP client, e-mail client, CPU clock set via SIMATIC procedure and NTP, access control via IP access list, SNMP, DHCP, initialization over LAN 10/100 Mbit/s; with electronic manual on DVD; C-PLUG included in delivery

Exposure to media

**Accessories****C-PLUG****6AG1900-0AB00-7AA0**

Swap medium for simple replacement of devices in the event of a fault; for storing configuration or engineering and application data; can be used for SIMATIC NET products with C-PLUG slot, -40 ... +70 °C, medial exposure

**IE FC RJ45 Plug 180 2 x 2****6AG1901-1BB10-7AA0**

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit  
-40 ... +70 °C, medial exposure

**Additional accessories**

See SIMATIC CP 343-1 Advanced communications processor, page 5/211

# SIMATIC S7-300 advanced controller

## I/O modules

### SIPLUS S7-300 communication

#### SIPLUS TIM 3V-IE for WAN and Ethernet

#### Overview



- SINAUT communication module SIPLUS TIM for SIMATIC S7-300 for use in a wide area network (WAN)
- IP communication via secure VPN (virtual private network) using the Internet
- Wireless communication via GPRS router, GPRS modem, or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for seamless recording of data
- Simple configuration and operation without specialist IT knowledge

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### SIPLUS TIM 3V-IE

<b>Article number</b>	<b>6AG1 800-3BA00-7AA0</b>
<b>Article number based on</b>	<b>6NH7 800-3BA00</b>
Ambient temperature range	-25 ... +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.

#### Ambient conditions

Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold spores, fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

#### Ordering data

#### Article No.

<b>SIPLUS TIM 3V-IE communication module</b>	<b>6AG1800-3BA00-7AA0</b>
With an RS 232 interface for SINAUT communication via a conventional WAN or an IP-based network (WAN or LAN)	
<b>SINAUT Engineering Software V5.3</b>	<b>6NH7997-0CA53-0AA0</b>
On CD-ROM, comprising: <ul style="list-style-type: none"> <li>• SINAUT Engineering Software V5.3 for the PG</li> <li>• SINAUT TD7 block library</li> <li>• Electronic manual in German and English</li> </ul>	
<b>Accessories</b>	
<b>IE FC RJ45 plug 180</b>	
RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU's with Industrial Ethernet interface <ul style="list-style-type: none"> <li>• 1 pack = 1 unit, -40 ... +70 °C, medial exposure</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	<b>6AG1901-1BB10-7AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>
<b>Additional accessories</b>	See TIM 3V-IE communication module, page 5/219



**SIMATIC S7-300 advanced controller**

I/O modules

SIPLUS S7-300 communication

**SIPLUS TIM 4R-IE for WAN and Ethernet****Overview**

- SINAUT communication module SIPLUS TIM with four interfaces for SIMATIC S7-300 or as self-contained unit for the S7-400 for use in a wide area network (WAN)
- For universal use in a SINAUT station, node station and control center
- Internet communication via integrated MSC-VPN tunnel with direct connection to DSL router or operation via IPsec VPN with additional SIMATIC NET components
- Wireless communication via GPRS router, GPRS modem, or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for seamless recording of data and support of redundant communication paths
- Simple configuration and operation without specialist IT knowledge

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**SIPLUS TIM 4R-IE**

<b>Article number</b>	<b>6AG1 800-4BA00-7AA0</b>
<b>Article number based on</b>	<b>6NH7 800-4BA00</b>
Ambient temperature range	-25 ... +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold spores, fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

Ordering data	Article No.	Ordering data	Article No.
<b>SIPLUS TIM 4R-IE communication module</b> With two combined RS 232/RS 485 interfaces for SINAUT communication via conventional WANs and two RJ45 interfaces for SINAUT communication via IP-based networks (WAN or LAN)	<b>6AG1800-4BA00-7AA0</b>	<b>Accessories</b> <b>IE FC RJ45 plug 180</b> RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface <ul style="list-style-type: none"> <li>• 1 pack = 1 unit; -40 ... +70 °C, medial exposure</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	
<b>SINAUT Engineering Software V5.3</b> On CD-ROM, comprising: <ul style="list-style-type: none"> <li>• SINAUT ST7 Engineering Software V5.3 for the PG</li> <li>• SINAUT TD7 block library</li> <li>• Electronic manual in German and English</li> </ul>	<b>6NH7997-0CA53-0AA0</b>	<b>Additional accessories</b> See TIM 4R-IE communication module, page 5/225	<b>6AG1901-1BB10-7AA0</b>  <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>

**SIMATIC S7-300 advanced controller**

I/O modules

Special modules

**SM 374 simulators****Overview**

- Simulator module for program testing during commissioning and ongoing operation
- For the simulation of sensor signals using switches
- For display of signal conditions on the outputs using LED
- Simulation of
  - 16 inputs or
  - 16 outputs or
  - 8 inputs and 8 outputs
- Function can be directly adjusted on the module using a screwdriver

**Technical specifications**

Article number	<b>6ES7374-2XH01-0AA0</b> SIMATIC S7-300, SIMULATOR MODULE
<b>Product type designation</b>	
<b>Input current</b>	
from backplane bus 5 V DC, max.	80 mA
<b>Power losses</b>	
Power loss, typ.	0.35 W
<b>Digital inputs</b>	
Number of digital inputs	16; Switches
<b>Digital outputs</b>	
Number of digital outputs	16; LEDs
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• between the channels and the backplane bus	No
<b>Galvanic isolation digital outputs</b>	
• between the channels and the backplane bus	No

Article number	<b>6ES7374-2XH01-0AA0</b> SIMATIC S7-300, SIMULATOR MODULE
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	190 g

**Ordering data**

Ordering data	Article No.
<b>SM 374 simulator module</b> incl. bus connectors, labeling strips	<b>6ES7374-2XH01-0AA0</b>
<b>Bus connectors</b> 1 unit, spare part	<b>6ES7390-0AA00-0AA0</b>
<b>Labeling strips</b> 10 units (spare part)	<b>6ES7392-2XX00-0AA0</b>
<b>Label cover</b> 10 units (spare part)	<b>6ES7392-2XY00-0AA0</b>

**Article No.**

Labeling sheets for machine inscription	Article No.
for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
petrol	<b>6ES7392-2AX00-0AA0</b>
light-beige	<b>6ES7392-2BX00-0AA0</b>
yellow	<b>6ES7392-2CX00-0AA0</b>
red	<b>6ES7392-2DX00-0AA0</b>

**Overview**

- Dummy module for reserving slots for non-parameterized signal modules
- Structure and address allocation is retained when replaced with a signal module

**Technical specifications**

Article number	<b>6ES7370-0AA01-0AA0</b> SIMATIC S7-300, DUMMY MODULE
<b>Product type designation</b>	
<b>Input current</b>	
from backplane bus 5 V DC, max.	5 mA
<b>Power losses</b>	
Power loss, max.	0.03 W
<b>Digital inputs</b>	
Number of digital inputs	0
<b>Digital outputs</b>	
Number of digital outputs	0

Article number	<b>6ES7370-0AA01-0AA0</b> SIMATIC S7-300, DUMMY MODULE
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	180 g

**Ordering data**

	Article No.
<b>DM 370 dummy module</b>	<b>6ES7370-0AA01-0AA0</b>
incl. bus connectors, labeling strips	
<b>Bus connectors</b>	<b>6ES7390-0AA00-0AA0</b>
1 unit, spare part	
<b>Labeling strips</b>	<b>6ES7392-2XX00-0AA0</b>
10 units (spare part)	
<b>Label cover</b>	<b>6ES7392-2XY00-0AA0</b>
10 units (spare part)	

	Article No.
<b>Labeling sheets for machine inscription</b>	
for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
petrol	<b>6ES7392-2AX00-0AA0</b>
light-beige	<b>6ES7392-2BX00-0AA0</b>
yellow	<b>6ES7392-2CX00-0AA0</b>
red	<b>6ES7392-2DX00-0AA0</b>

**SIMATIC S7-300 advanced controller**

I/O modules

Connection methods

**Front connectors****Overview**

- For the simple and user-friendly connection of sensors and actuators to the S7-300 I/O modules
- For maintaining the wiring when replacing modules ("permanent wiring")
- With mechanical coding to avoid errors when replacing modules

**Ordering data****Article No.****Front connectors**

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0**  
**6ES7392-1AJ00-1AB0**

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0**  
**6ES7392-1BJ00-1AB0**

40-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AM00-0AA0**  
**6ES7392-1AM00-1AB0**

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

**6ES7392-1BM01-0AA0**  
**6ES7392-1BM01-1AB0**

**Front connector 20-pole, crimp version without crimp contacts**

Packaging unit (100 units)

**6ES7921-3AH00-1AA0****Front connector 40-pole, crimp version without crimp contacts**

Packaging unit (100 units)

**6ES7921-3AH20-1AA0****Front door, elevated design****6ES7328-0AA00-7AA0**E.g. for 32 channel modules; enables connection of 1.3 mm<sup>2</sup>/16 AWG wires**Front door, higher version, for F-modules****6ES7328-7AA10-0AA0**For F-modules; for connecting 1.3 mm<sup>2</sup>/16 AWG wires; wiring diagram and labels in yellow**Crimp contacts for front connectors****6XX3070**

Packaging unit (250 units)

**Crimping tool****6XX3071**

For crimping the crimp contacts

**Unlocking tool for crimp contacts****6ES5497-4UC11**

## Overview

Wiring of SIMATIC S7 I/O modules with the sensors/actuators is a significant factor with respect to time/cost overhead, configuring, control cabinet installation, procurement and ease of service.

With the SIMATIC TOP connect system cabling, it is simple and quick to establish a reliable connection for your SIMATIC S7-300 or ET 200M.

With the TIA Selection Tool, a mouse click is all that is required to configure the connection from the SIMATIC S7 module to the I/O. The program automatically checks for plausibility and generates a parts list for the selected connection components that can then be ordered in the Industry Mall.

Further information can be found on the Internet at

<http://www.siemens.com/tia-selection-tool>

## Design

Two cabling variants are available for a wide range of control cabinet concepts:

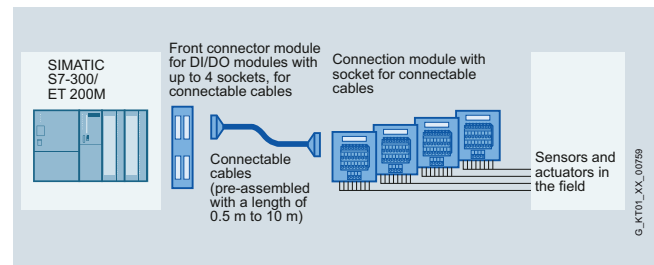
### Fully modular connection

Each component is individually inserted.

The system consists of:

- Front connector module
- Connecting cable
- Terminal modules in the following versions: Basic module, signal module and function module

Connection errors are thus practically excluded and installation overhead is minimized. Systematic connection of the SIMATIC system. The assembly overhead for the connecting cables is drastically reduced thanks to the use of pre-assembled or easily assembled cables sold by the meter.



SIMATIC TOP connect for S7-300/ ET200 M, fully modular connection

### Flexible connection

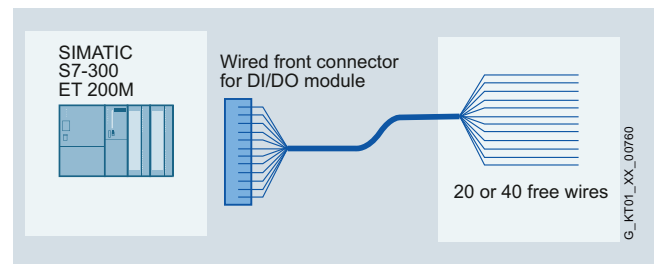
Consisting of:

- Front connector with screw-type or crimp connection
- Front connector with fixed single cores
- Single cores also available with UL/CSA-certified cores

The blue wires are numbered sequentially and can be routed direct to each element in the control cabinet. The numbering of the single cores corresponds to the coding of the front connector contacts.

In comparison to conventional single wiring, there is a cost saving of 50% for assembly, since the single cores that have already been checked on the connector are fixed.

Thus no complex pre-assembly of up to two times 46 single cores per module is necessary.



SIMATIC TOP connect for S7-300/ET 200M, flexible connection

## SIMATIC S7-300 advanced controller

I/O modules

Connection methods

### System cabling for SIMATIC S7-300 and ET 200M - Fully modular connection

#### Overview



The fully modular connection is the standard connection for the SIMATIC S7-300/ET 200M and the fully modular connection allows the peripherals to be conveniently and quickly connected without errors.

#### Benefits

- Easy plugging in of front connector module, connecting cable and connection module
- Fast and low-cost wiring
- Supply voltage connectable to front connector module or connection module for digital and analog signals
- Reduction in wiring errors, clear control cabinet wiring
- Distribution of digital signals by byte or by double-byte
- Each component can be replaced individually.
- Every cable length can be configured without cutting, or pre-assembled cables can be used

#### Design

##### Front connector module

Modified front connectors, called front connector modules, are available for connecting to the module. These are plugged into the module to be wired instead of the front connector. The front connector modules are available in many different digital and analog versions. The connecting cables are plugged into these front connector modules.

##### Connecting cable

The connecting cable is available in two different versions.

As a pre-assembled 16-pole round cable (shielded or unshielded) up to a length of 5 m, or the 16-pole round-sheath ribbon cable (with or without shield), which can be easily assembled by the user, or as 2 x 16-pole round-sheath ribbon cables (without shield).

When assembled, there are one or two insulation displacement connectors (female ribbon connectors) at both ends of the cable.

The round-sheath ribbon cable is assembled by the user with the aid of pliers (can be ordered separately). The cable transmits 8 or 2 x 8 channels over a distance of up to 30 m.

The connecting cable connects the front connector module with the terminal module.

#### Terminal module

The system has digital and analog terminal modules for connecting the I/O signals. These are snapped onto the standard mounting rail.

Terminal modules are available for two different connection methods: with spring-loaded or screw-type terminals

##### Basic module:

Terminal modules with basic functionality for getting the signal from the field to the module or from the module to the field quickly and easily. For digital or analog signals.

##### Signal module:

Expands the digital basic module with LEDs for signaling the active high signal. This makes commissioning easier for you, and you always have an overview of the signal states of your I/O. One LED signals the availability of the supply voltage.

##### Function module:

Digital terminal modules that are fitted with relays or optocouplers.

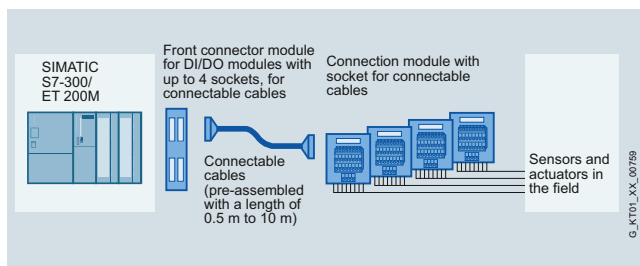
If other voltage or power levels are required in the field, the terminal module for TPRo or TPOo output signals is used. For the TPRo terminal module, relays are used for the implementation. For the TPOo terminal module, optocouplers are used for the implementation. This converts the 24 V DC output signal simply and reliably to another voltage or power level. If 230 V AC input signals have to be transmitted to the controller in the field, a connection module with relay TPRi is available that simply converts the 230 V AC signal to 24 V DC. This means that there is always the same voltage level on the module side.

##### Use with optocouplers for the TPRo relay modules

If higher switching frequencies of the relay terminal module are required for the output signals, the relay can simply be replaced with an optocoupler (note technical specifications) in order to increase the switching frequency here.

#### Shield plate

The shield plate is latched onto the connection module for 3-core initiators or optionally onto the connection module for analog signals and then snapped onto the mounting rail with the connection module. With the terminal elements, optimal shield connection is achieved between the shielded round-sheath ribbon cable or the shielded field cables and the grounded mounting rail.



SIMATIC TOP connect for S7-300/ ET200 M, fully modular connection

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## System cabling for SIMATIC S7-300 and ET 200M - Fully modular connection

## Technical specifications Front connector module

Technical data of front connector module	
Rated operating voltage	24 VDC
Max. permissible operating voltage	60 V DC
Max. permissible continuous current • per connector pin	1 A
Max. permissible summation current	4 A/byte
Permissible ambient temperature	0 to + 60°C
Test voltage	0.5 kV, 50 Hz, 60 sec.
Air gaps and creepage distances	IEC 664 (1980), IEC 664 A (1981), in accordance with DIN VDE 0110 (01.89), overvoltage class II, pollution degree 2

## Wiring rules for the front connector modules

Front connector module SIMATIC TOP connect, connection for potential infeed	
Spring connection Screw connection	
Modules up to 4 connections	
Connectable cable cross-sections • solid cables • flexible cables with/without wire end ferrule	No 0.25 to 1.5 mm <sup>2</sup>
Number of wires per connection	1 or a combination of 2 conductors up to 1.5 mm <sup>2</sup> (total) in a common wire end ferrule
Max. diameter of the cable insulation	3.1 mm
Stripping length of the cables • without insulating collar • with insulating collar	6 mm -
Wire-end ferrules in acc. with DIN 46228 • without insulating collar • with insulating collar 0.25 to 1.0 mm <sup>2</sup> • with insulating collar 1.5 mm <sup>2</sup>	Form A; 5 to 7 mm long - -
Blade width of the screwdriver	3.5 mm (cylindrical shape)
Tightening torque for connecting the cables	- 0.4 to 0.7 Nm

Front connector module SIMATIC TOP connect, connection for potential infeed	
Spring connection Screw connection	
Modules up to 8 connections	
Connectable cable cross-sections • solid cables • flexible cables with/without wire end ferrule	No 0.25 to 0.75 mm <sup>2</sup>
Number of cables per connection	1 or a combination of 2 wires up to 0.75 mm <sup>2</sup> (total) in a common wire end ferrule
Max. diameter of the cable insulation	2.0 mm
Stripping length of the cables • without insulating collar • with insulating collar	6 mm -
Wire-end ferrules in acc. with DIN 46228 • without insulating collar • with insulating collar 0.25 to 1.0 mm <sup>2</sup> • with insulating collar 1.5 mm <sup>2</sup>	Form A; 5 to 7 mm long - -
Blade width of the screwdriver	3.5 mm (cylindrical shape)
Tightening torque for connecting the cables	- 0.4 to 0.7 Nm

## Technical specifications Connecting cable

Technical specifications of connecting cable from SIMATIC S7 to connection module	
Operating voltage	60 V DC
Continuous current per signal con- ductor	1 A
Max. aggregate current	4 A/byte
Operating temperature	0 to +60 °C
Outer diameter of pre-assembled round cable in mm unshielded/ shielded (16-pole)	Approx. 6.5/7.0
Outer diameter of round-sheath rib- bon cable in mm 16-pole/2 x 16-pole	approx. 9.5/11.5



**SIMATIC S7-300 advanced controller**

I/O modules

Connection methods

**System cabling for SIMATIC S7-300 and ET 200M - Fully modular connection****Ordering data**

Article No.

Article No.

**Front connector modules****Front connector module (compact CPU 312C)**Power supply via  
• Screw terminals

6ES7921-3AK20-0AA0

**Front connector module (compact CPU 313C/314C-2PtP/314C-2DP), slot X1**Power supply via  
• Screw terminals

6ES7921-3AM20-0AA0

**Front connector module (digital 2 x 8 I/O)**Power supply via  
• Spring-loaded terminals  
• Screw terminals6ES7921-3AA00-0AA0  
6ES7921-3AB00-0AA0**Front connector module (digital 4 x 8 I/O)**Power supply via  
• Spring-loaded terminals  
• Screw terminals6ES7921-3AA20-0AA0  
6ES7921-3AB20-0AA0**Front connector module (1 x 8 outputs) for 2 ampere digital outputs**Power supply via  
• Spring-loaded terminals  
• Screw terminals6ES7921-3AC00-0AA0  
6ES7921-3AD00-0AA0**Front connector module 20-pin (analog)**Power supply via  
• Spring-loaded terminals  
• Screw terminals6ES7921-3AF00-0AA0  
6ES7921-3AG00-0AA0**Front connector module 40-pin (analog)**Power supply via  
• Spring-loaded terminals  
• Screw terminals6ES7921-3AF20-0AA0  
6ES7921-3AG20-0AA0**Connecting cable****Pre-assembled round cable**16-pole, 0.14 mm<sup>2</sup>

unshielded

- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 2.5 m
- 3.0 m
- 4.0 m
- 5.0 m
- 6.5 m
- 8.0 m
- 10.0 m

6ES7923-0BA50-0CB0  
6ES7923-0BB00-0CB0  
6ES7923-0BB50-0CB0  
6ES7923-0BC00-0CB0  
6ES7923-0BC50-0CB0  
6ES7923-0BD00-0CB0  
6ES7923-0BE00-0CB0  
6ES7923-0BF00-0CB0  
6ES7923-0BG50-0CB0  
6ES7923-0BJ00-0CB0  
6ES7923-0CB00-0CB0

shielded

- 1.0 m
- 2.0 m
- 2.5 m
- 3.0 m
- 4.0 m
- 5.0 m
- 6.5 m
- 8.0 m
- 10.0 m

6ES7923-0BB00-0DB0  
6ES7923-0BC00-0DB0  
6ES7923-0BC50-0DB0  
6ES7923-0BD00-0DB0  
6ES7923-0BE00-0DB0  
6ES7923-0BF00-0DB0  
6ES7923-0BG50-0DB0  
6ES7923-0BJ00-0DB0  
6ES7923-0CB00-0DB0**Round-sheath ribbon cable**16-pole, 0.14 mm<sup>2</sup>

Unshielded

- 30 m
- 60 m

6ES7923-0CD00-0AA0  
6ES7923-0CG00-0AA0

Shielded

- 30 m
- 60 m

6ES7923-0CD00-0BA0  
6ES7923-0CG00-0BA0**Round-sheath ribbon cable**2 x 16-pole, 0.14 mm<sup>2</sup>

Unshielded

- 30 m
- 60 m

6ES7923-2CD00-0AA0  
6ES7923-2CG00-0AA0**Connector (female ribbon connector)**

16-pole, insulation displacement system, with strain relief devices; packing unit: 8 connectors and 8 cable grips

6ES7921-3BE10-0AA0

**Accessories****Manual pliers**

For preparing the connectors (female ribbon connector)

6ES7928-0AA00-0AA0

Ordering data	Article No.	Article No.
<b>Terminal modules (for 16-pin connecting cables)</b>		
<b>Terminal module TP1</b> for 1-wire connection <ul style="list-style-type: none"> <li>• Push-in terminals without LEDs</li> <li>• Screw-type terminals without LEDs</li> <li>• Push-in terminals with LEDs</li> <li>• Screw-type terminals with LEDs</li> </ul>	<b>6ES7924-0AA20-0AC0</b> <b>6ES7924-0AA20-0AA0</b> <b>6ES7924-0AA20-0BC0</b> <b>6ES7924-0AA20-0BA0</b>	<b>Terminal module TPOo</b> Optocoupler module for 8 outputs (max. 24 V DC/4 A) <ul style="list-style-type: none"> <li>• Push-in terminals with LEDs</li> <li>• Screw-type terminals with LEDs</li> </ul>
<b>Terminal module TP3</b> for 3-wire connection <ul style="list-style-type: none"> <li>• Push-in terminals without LEDs</li> <li>• Screw-type terminals without LEDs</li> <li>• Push-in terminals with LEDs</li> <li>• Screw-type terminals with LEDs</li> <li>• Push-in terminals with LEDs and one isolating terminal per channel</li> <li>• Screw-type terminals with LEDs and one isolating terminal per channel</li> <li>• Push-in terminals with LED and fuse per channel</li> <li>• Push-in terminals with LED and fuse per channel</li> </ul>	<b>6ES7924-0CA20-0AC0</b> <b>6ES7924-0CA20-0AA0</b> <b>6ES7924-0CA20-0BC0</b> <b>6ES7924-0CA20-0BA0</b> <b>6ES7924-0CH20-0BC0</b> <b>6ES7924-0CH20-0BA0</b> <b>6ES7924-0CL20-0BC0</b> <b>6ES7924-0CL20-0BA0</b>	<b>Connection modules for digital output modules 2 A</b> Terminal module TP2 <ul style="list-style-type: none"> <li>• Push-in terminals without LEDs</li> <li>• Screw-type terminals without LEDs</li> </ul>
<b>Terminal module TPRo</b> Relay module for 8 outputs, relay as normally open contact <ul style="list-style-type: none"> <li>• Push-in terminals with LEDs</li> <li>• Screw-type terminals with LEDs</li> </ul>	<b>6ES7924-0BD20-0BC0</b> <b>6ES7924-0BD20-0BA0</b>	<b>Terminal module for analog modules (for S7-300 only)</b> Terminal module TPA <ul style="list-style-type: none"> <li>• Push-in terminals without LEDs</li> <li>• Screw-type terminals without LEDs</li> </ul>
<b>Terminal module TPRI</b> Relay module for 8 outputs (110 V AC), relay as normally open contact <ul style="list-style-type: none"> <li>• Push-in terminals with LEDs</li> <li>• Screw-type terminals with LEDs</li> </ul>	<b>6ES7924-0BG20-0BC0</b> <b>6ES7924-0BG20-0BA0</b>	<b>Accessories</b> <b>ID labels for terminal modules in S7-1500 design</b> ID labels, insertable PU = 340 units
<b>Terminal module TPRI</b> Relay module for 8 outputs (230 V AC), relay as normally open contact <ul style="list-style-type: none"> <li>• Push-in terminals with LEDs</li> <li>• Screw-type terminals with LEDs</li> </ul>	<b>6ES7924-0BE20-0BC0</b> <b>6ES7924-0BE20-0BA0</b>	<b>Shield for analog terminal module</b> PU = 4 units (for connection of 16-pin connecting cable)
		<b>Shield connection clamp</b> for shield plate at SIMATIC end, PU = 10 units for shield plate at field end, 2 x 2 ... 6 mm for shield plate at field end, 3 ... 8 mm for shield plate at field end, 4 ... 13 mm

**SIMATIC S7-300 advanced controller**

I/O modules

Connection methods

**System cabling for SIMATIC S7-300 and ET 200M - Flexible connection****Overview**

Flexible connection enables fast, direct connection of the SIMATIC S7-300/ET 200M input/output modules to the individual elements in the control cabinet.

Attached single cores reduce the wiring outlay.

Wire cross-sections of 0.5 mm<sup>2</sup> allow higher currents, too.

**Technical specifications**

<b>Front connector with single cores for 16 channels</b>	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all wires, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K or with UL 1007/1569; CSA TR64
Number of single cores	20
Core cross-section	0.5 mm <sup>2</sup> ; Cu
Bundle diameter in mm	approx. 15
Core color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 20 (front connector contact = core number)
Assembly	Screw-type or crimp contacts
<b>Front connector with single cores for 32 channels</b>	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all wires, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K or with UL 1007/1569; CSA TR64
Number of single cores	40
Core cross-section	0.5 mm <sup>2</sup> ; Cu
Bundle diameter in mm	approx. 17
Core color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 40 (front connector contact = core number)
Assembly	Screw-type or crimp contacts

**Ordering data****Article No.****Front connector with single cores for 16-channel digital modules SIMATIC S7-300, 20 x 0.5 mm<sup>2</sup>****Core type H05V-K**Screw-type version

Packaging unit: 1 unit

Length:

- 2.5 m
- 3.2 m
- 5 m
- Custom lengths

**6ES7922-3BC50-0AB0****6ES7922-3BD20-0AB0****6ES7922-3BF00-0AB0**

On request

Packaging unit: 5 units

Length:

- 2.5 m
- 3.2 m
- 5.0 m

**6ES7922-3BC50-5AB0****6ES7922-3BD20-5AB0****6ES7922-3BF00-5AB0**Crimp version

Packaging unit: 1 unit

Length:

- 2.5 m
- 3.2 m
- 5.0 m
- Custom lengths

**6ES7922-3BC50-0AF0****6ES7922-3BD20-0AF0****6ES7922-3BF00-0AF0**

On request

**Core type UL/CSA-certified**Screw-type version

Packaging unit: 1 unit

Length:

- 3.2 m
- 5.0 m

**6ES7922-3BD20-0UB0****6ES7922-3BF00-0UB0****Front connector with single cores for 32-channel digital modules SIMATIC S7-300, 40 x 0.5 mm<sup>2</sup>****Core type H05V-K**Screw-type version

Packaging unit: 1 unit

Length:

- 2.5 m
- 3.2 m
- 5.0 m
- Custom lengths

**6ES7922-3BC50-0AC0****6ES7922-3BD20-0AC0****6ES7922-3BF00-0AC0**

On request

Packaging unit: 5 units

Length:

- 2.5 m
- 3.2 m
- 5.0 m

**6ES7922-3BC50-5AC0****6ES7922-3BD20-5AC0****6ES7922-3BF00-5AC0**Crimp version

Packaging unit: 1 unit

Length:

- 2.5 m
- 3.2 m
- 5.0 m
- Custom lengths

**6ES7922-3BC50-0AG0****6ES7922-3BD20-0AG0****6ES7922-3BF00-0AG0**

On request

**Core type UL/CSA-certified**Screw version

Packaging unit: 1 unit

Length:

- 3.2 m
- 5.0 m

**6ES7922-3BD20-0UC0****6ES7922-3BF00-0UC0**

# SIMATIC S7-300 advanced controller

## Power supplies

1-phase, 24 V DC (for S7-300 and ET 200M)

### Overview



The design and functionality of the SIMATIC PS 307 single-phase load power supply (system and load current supply) with automatic range switchover of the input voltage is an optimal match to the SIMATIC S7-300 PLC. By means of the connecting comb that is supplied with the system and load current supply, the supply to the CPU is quickly established. It is also possible to provide a 24 V supply to other S7-300 system components, input/output circuits of the input/output modules and, if necessary, the sensors and actuators. Comprehensive certifications, such as UL, ATEX or GL facilitate universal use (does not apply to outdoor use).

### Technical specifications

Article number	6ES7307-1BA01-0AA0	6ES7305-1BA80-0AA0	6ES7307-1EA01-0AA0	6ES7307-1EA80-0AA0	6ES7307-1KA02-0AA0
Product	PS 307	PS 305 Outdoor	PS 307	PS 307 Outdoor	PS 307
Power supply, type	24 V/2 A	24 V/2 A	24 V/5 A	24 V/5 A	24 V/10 A
<b>Input</b>					
Input	1-phase AC	DC voltage	1-phase AC	1-phase AC	1-phase AC
Supply voltage					
• 1 with AC Rated value	120 V		120 V	120 V	120 V
• 2 with AC Rated value	230 V		230 V	230 V	230 V
• for DC		24 ... 110 V			
• Note	Automatic range selection		Automatic range selection	Set by means of selector switch on the device	Automatic range selection
Input voltage					
• 1 with AC	85 ... 132 V		85 ... 132 V	93 ... 132 V	85 ... 132 V
• 2 with AC	170 ... 264 V		170 ... 264 V	187 ... 264 V	170 ... 264 V
• for DC		16.8 ... 138 V			
Wide-range input	No	Yes	No	No	No
Overvoltage resistance	$2.3 \times V_{in \text{ rated}}, 1.3 \text{ ms}$	154 V; 0.1 s	$2.3 \times V_{in \text{ rated}}, 1.3 \text{ ms}$	$2.3 \times V_{in \text{ rated}}, 1.3 \text{ ms}$	$2.3 \times V_{in \text{ rated}}, 1.3 \text{ ms}$
Mains buffering at $I_{out \text{ rated}}$ , min.	20 ms; at $V_{in} = 93/187 \text{ V}$	10 ms; at $V_{in \text{ rated}}$	20 ms; at $V_{in} = 93/187 \text{ V}$	20 ms; at $V_{in} = 93/187 \text{ V}$	20 ms; at $V_{in} = 93/187 \text{ V}$
Rated line frequency	50 ... 60 Hz		50 ... 60 Hz	50 ... 60 Hz	50 ... 60 Hz
Rated line range	47 ... 63 Hz		47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
Input current					
• at rated input voltage 120 V	0.9 A		2.3 A	2.1 A	4.2 A
• at rated input voltage 230 V	0.5 A		1.2 A	1.2 A	1.9 A
• at rated input voltage 24 V		2.4 A			
• at rated input voltage 110 V		0.6 A			
Switch-on current limiting (+25 °C), max.	22 A	20 A	20 A	45 A	55 A
Duration of inrush current limiting at 25 °C					
• maximum	3 ms	10 ms	3 ms	3 ms	3 ms
$I^2t$ , max.	1 A <sup>2</sup> ·s	5 A <sup>2</sup> ·s	1.2 A <sup>2</sup> ·s	1.8 A <sup>2</sup> ·s	3.3 A <sup>2</sup> ·s
Built-in incoming fuse	T 1.6 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)	T 3,15 A/250 V (not accessible)	T 3,15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 3 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic C, suitable for DC	Recommended miniature circuit breaker: from 6 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic C or from 6 A characteristic D	Recommended miniature circuit breaker: from 10 A characteristic C

# SIMATIC S7-300 advanced controller

## Power supplies

### 1-phase, 24 V DC (for S7-300 and ET 200M)

#### Technical specifications (continued)

Article number	6ES7307-1BA01-0AA0	6ES7305-1BA80-0AA0	6ES7307-1EA01-0AA0	6ES7307-1EA80-0AA0	6ES7307-1KA02-0AA0
Product	PS 307	PS 305 Outdoor	PS 307	PS 307 Outdoor	PS 307
Power supply, type	24 V/2 A	24 V/2 A	24 V/5 A	24 V/5 A	24 V/10 A
<b>Output</b>					
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $V_{out}$ DC	24 V	24 V	24 V	24 V	24 V
Total tolerance, static $\pm$	3 %	3 %	3 %	3 %	3 %
Static mains compensation, approx.	0.1 %	0.2 %	0.1 %	0.2 %	0.1 %
Static load balancing, approx.	0.2 %	0.4 %	0.5 %	0.4 %	0.5 %
Residual ripple peak-peak, max.	50 mV	150 mV	50 mV	150 mV	50 mV
Residual ripple peak-peak, typ.	5 mV	30 mV	10 mV	40 mV	15 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	150 mV	240 mV	150 mV	240 mV	150 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	20 mV	150 mV	20 mV	90 mV	60 mV
Product function	No	No	No	No	No
Output voltage adjustable	-	-	-	-	-
Output voltage setting	-	-	-	-	-
Status display	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK
On/off behavior	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)	No overshoot of $V_{out}$ (soft start)
Startup delay, max.	2 s	3 s	2 s	3 s	2 s
Voltage rise, typ.	10 ms	5 ms	10 ms	100 ms	10 ms
Rated current value $I_{out\ rated}$	2 A	2 A	5 A	5 A	10 A
Current range	0 ... 2 A	0 ... 3 A	0 ... 5 A	0 ... 5 A	0 ... 10 A
• Note		3 A up to +60°C at $V_{in} > 24$ V			
Active power supplied typical	48 W	48 W	120 W	120 W	240 W
Short-term overload current					
• on short-circuiting during the start-up typical	9 A	9 A	20 A	20 A	38 A
• at short-circuit during operation typical	9 A	9 A	20 A	20 A	38 A
Duration of overloading capability for excess current					
• on short-circuiting during the start-up	90 ms	270 ms	100 ms	180 ms	80 ms
• at short-circuit during operation	90 ms	270 ms	100 ms	80 ms	80 ms
Parallel switching for enhanced performance	Yes	Yes	Yes	No	Yes
Numbers of parallel switchable units for enhanced performance	2	2			
<b>Efficiency</b>					
Efficiency at $V_{out\ rated}$ , $I_{out\ rated}$ , approx.	84 %	75 %	87 %	84 %	90 %
Power loss at $V_{out\ rated}$ , $I_{out\ rated}$ , approx.	9 W	16 W	18 W	23 W	27 W
<b>Closed-loop control</b>					
Dynamic mains compensation ( $V_{in\ rated} \pm 15\%$ ), max.	0.1 %	0.3 %	0.1 %	0.3 %	0.1 %
Dynamic load smoothing ( $I_{out}$ : 50/100/50 %), $U_{out} \pm$ typ.	0.8 %	2.5 %	1 %	3 %	2 %
Load step setting time 50 to 100%, typ.	0.5 ms	2.5 ms	0.3 ms	0.2 ms	
Load step setting time 100 to 50%, typ.	0.5 ms	2.5 ms	0.3 ms	0.2 ms	
Setting time maximum	1 ms	5 ms		5 ms	0.1 ms

# SIMATIC S7-300 advanced controller

## Power supplies

1-phase, 24 V DC (for S7-300 and ET 200M)

**Technical specifications** (continued)

Article number	<b>6ES7307-1BA01-0AA0</b>	<b>6ES7305-1BA80-0AA0</b>	<b>6ES7307-1EA01-0AA0</b>	<b>6ES7307-1EA80-0AA0</b>	<b>6ES7307-1KA02-0AA0</b>
Product	PS 307	PS 305 Outdoor	PS 307	PS 307 Outdoor	PS 307
Power supply, type	24 V/2 A	24 V/2 A	24 V/5 A	24 V/5 A	24 V/10 A
<b>Protection and monitoring</b>					
Output overvoltage protection	Additional control loop, shutdown at < 28.8 V, automatic restart	Additional control loop, shutdown at approx. 30 V, automatic restart	Additional control loop, shutdown at < 28.8 V, automatic restart	Additional control loop, shutdown at approx. 30 V, automatic restart	Additional control loop, shutdown at < 28.8 V, automatic restart
Current limitation	2.2 ... 2.6 A	3.3 ... 3.9 A	5.5 ... 6.5 A	5.5 ... 6.5 A	11 ... 12 A
Property of the output	Yes	Yes	Yes	Yes	Yes
Short-circuit proof					
Short-circuit protection	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart
Enduring short circuit current RMS value					
• maximum	2 A	2 A	7 A	5 A	12 A
Overload/short-circuit indicator	-	-			-
<b>Safety</b>					
Primary/secondary isolation	Yes	Yes	Yes	Yes	Yes
Galvanic isolation	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178	Safety extra low output voltage $V_{out}$ according to EN 60950-1 and EN 50178, creepage distances and clearances > 5 mm	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178	Safety extra low output voltage $V_{out}$ according to EN 60950-1 and EN 50178, creepage distances and clearances > 5 mm	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178
Protection class	Class I	Class I	Class I	Class I	Class I
Leakage current					
• maximum	3.5 mA		3.5 mA	3.5 mA	3.5 mA
• typical	0.5 mA		0.5 mA	0.3 mA	0.6 mA
CE mark	Yes	Yes	Yes	Yes	Yes
UL/CSA approval	Yes	Yes	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	UL-Listed (UL 508), File E143289, CSA (CSA C22.2 No. 142)	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	UL-Listed (UL 508), File E143289, CSA (CSA C22.2 No. 142)	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289
Explosion protection	ATEX (EX) II 3G Ex nA II T4; cULus (ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455	-	ATEX (EX) II 3G Ex nA II T4; cULus (ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455	-	ATEX (EX) II 3G Ex nA II T4; cULus (ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455
Certificate of suitability IECEx	No	No	No	No	No
Certificate of suitability NEC Class 2	No	No	No	No	No
FM approval	Class I, Div. 2, Group ABCD, T4	-	Class I, Div. 2, Group ABCD, T4	-	Class I, Div. 2, Group ABCD, T4
CB approval	No	No	No	No	No
Marine approval	In S7-300 system	-	In S7-300 system	-	In S7-300 system
Degree of protection (EN 60529)	IP20	IP20	IP20	IP20	IP20
<b>EMC</b>					
Emitted interference	EN 55022 Class B	EN 55011 Class A	EN 55022 Class B	EN 55011 Class A	EN 55022 Class B
Supply harmonics limitation	not applicable	not applicable	EN 61000-3-2	-	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
<b>Operating data</b>					
Ambient temperature					
• during operation	0 ... 60 °C	-25 ... +70 °C	0 ... 60 °C	-25 ... +70 °C	0 ... 60 °C
- Note	with natural convection	with natural convection	with natural convection	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K5, transient condensation permitted	Climate class 3K3, no condensation	Climate class 3K5, transient condensation permitted	Climate class 3K3, no condensation

# SIMATIC S7-300 advanced controller

## Power supplies

### 1-phase, 24 V DC (for S7-300 and ET 200M)

#### Technical specifications (continued)

Article number	6ES7307-1BA01-0AA0	6ES7305-1BA80-0AA0	6ES7307-1EA01-0AA0	6ES7307-1EA80-0AA0	6ES7307-1KA02-0AA0
Product	PS 307	PS 305 Outdoor	PS 307	PS 307 Outdoor	PS 307
Power supply, type	24 V/2 A	24 V/2 A	24 V/5 A	24 V/5 A	24 V/10 A
<b>Mechanics</b>					
Connection technology	screw-type terminals	screw-type terminals	screw-type terminals	screw-type terminals	screw-type terminals
Connections					
• Supply input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L+1, M1, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded
• Output	L+, M: 2 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>	L+, M: 3 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>	L+, M: 3 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>	L+, M: 3 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>	L+, M: 4 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>
• Auxiliary	-	-	-	-	-
Width of the enclosure	40 mm	80 mm	60 mm	80 mm	80 mm
Height of the enclosure	125 mm	125 mm	125 mm	125 mm	125 mm
Depth of the enclosure	120 mm	120 mm	120 mm	120 mm	120 mm
Weight, approx.	0.4 kg	0.57 kg	0.6 kg	0.57 kg	0.8 kg
Product property of the enclosure housing for side-by-side mounting	Yes	Yes	Yes	Yes	Yes
Installation	Can be mounted onto S7 rail	Can be mounted onto S7 rail	Can be mounted onto S7 rail	Can be mounted onto S7 rail	Can be mounted onto S7 rail
Mechanical accessories	Mounting adapter for standard mounting rail (6EP1971-1BA00)	Mounting adapter for standard mounting rail (6ES7390-6BA00-0AA0)	Mounting adapter for standard mounting rail (6EP1971-1BA00)	Mounting adapter for standard mounting rail (6ES7390-6BA00-0AA0)	Mounting adapter for standard mounting rail (6EP1971-1BA00)
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

#### Ordering data

Ordering data	Article No.
<b>Load current supply PS 307, 2A</b> incl. connecting comb 120/230 V AC; 24 V DC Output current 2 A (dimensions 40 x 125 x 120)	<b>6ES7307-1BA01-0AA0</b>
<b>SIMATIC S7-300 Outdoor, 2A</b> Stabilized power supply PS305 Input: 24 ... 110 V DC Output: 24 V DC/2 A	<b>6ES7305-1BA80-0AA0</b>
<b>PS 307 load power supply, 5 A</b> incl. connecting comb 120/230 V AC; 24 V DC Output current 5 A (dimensions 60 x 125 x 120)	<b>6ES7307-1EA01-0AA0</b>
<b>SIMATIC S7-300 Outdoor, 5A</b> Stabilized power supply PS307 Input: 120/230 V AC Output: 24 V DC/5 A	<b>6ES7307-1EA80-0AA0</b>
<b>PS 307 load power supply, 10 A</b> incl. connecting comb 120/230 V AC; 24 V DC Output current 10 A (dimensions 80 x 125 x 120)	<b>6ES7307-1KA02-0AA0</b>

#### Article No.

Accessories	Article No.
<b>SIMATIC S7-300 mounting adapter</b> For snapping the new PS 307 onto a 35 mm DIN rail (EN 60715) Spare part	<b>6EP1971-1BA00</b>
<b>SIMATIC S7-300 mounting adapter</b> for snapping the PS307 onto 35 mm DIN rails	<b>6ES7390-6BA00-0AA0</b>



**Overview**

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**SIPLUS S7-300 PS 305**

<b>Article No.</b>	<b>6AG1 305-1BA80-2AA0</b>
<b>Based on Article No.</b>	<b>6ES7 305-1BA80-0AA0</b>
Conformal coating	Coating of the printed circuit boards and the electronic components
Ambient temperature range	-25 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. chlorine sulfur atmosphere)
Technical data	The technical data of the standard product applies except for the ambient conditions.
Compliant with the standards for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	yes
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

For further technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

**Ordering data**
**Article No.**
**SIPLUS S7-300 PS 305  
load power supply**

Stabilized power supply PS305  
 Input: 24 ... 110 V DC  
 Output: 24 V DC/2 A

Extended temperature range and  
 exposure to media  
 conforms to EN 50155

**Accessories**
**6AG1305-1BA80-2AA0**

See PS 307, page 5/256



**SIMATIC S7-300 advanced controller**

SIPLUS power supplies

**SIPLUS S7-300 PS 307, 5 A****Overview**Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**SIPLUS S7-300 PS 307, 5 A**

<b>Article No.</b>	<b>6AG1 307-1EA01-7AA0</b>
<b>Based on Article No.</b>	<b>6ES7 307-1EA01-0AA0</b>
Conformal coating	Coating of the printed circuit boards and the electronic components
Ambient temperature range	-25 ... +70 °C
Technical data	The technical data of the standard product applies except for the ambient conditions.
Compliant with the standards for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	yes
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

For further technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

**Ordering data****Article No.****SIPLUS S7-300 PS 307  
load power supply, 5 A****6AG1307-1EA01-7AA0**

Input: 120/230 V AC  
 Output: 24 V DC/5 A

Extended temperature range and  
 exposure to media

**Accessories**

See PS 307, page 5/256

**Overview**

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

<b>SIPLUS S7-300 PS 307 10 A</b>	
<b>Article No.</b>	<b>6AG1 307-1KA02-7AA0</b>
<b>Based on Article No.</b>	<b>6ES7 307-1KA02-0AA0</b>
Conformal coating	Coating of the printed circuit boards and the electronic components
Ambient temperature range	-25 ... +70 °C
Technical data	The technical data of the standard product applies except for the ambient conditions.
Compliant with the standards for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	No
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

For further technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

**Ordering data**
**Article No.**
**SIPLUS S7-300 PS 307  
 load power supply, 10 A**
**6AG1307-1KA02-7AA0**

 Input: 120/230 V AC  
 Output: 24 V DC/10 A

 Extended temperature range and  
 exposure to media

**Accessories**

See PS 307, page 5/256

## SIMATIC S7-300 advanced controller

### Interface modules

#### IM 360/361/365 interface modules

##### Overview



- For connecting mounting racks in multi-tier SIMATIC S7-300 configurations
- IM 365:  
For design of central controller and max. 1 expansion unit.  
Limited use of modules in the expansion unit  
(e.g. no CPs or FMs)
- IM 360/IM 361:  
For design of central controller and max. 3 expansion units.  
No limitation in selection of modules in the expansion unit

##### Technical specifications

Article number	6ES7360-3AA01-0AA0	6ES7361-3CA01-0AA0	6ES7365-0BA01-0AA0
	SIMATIC S7-300, INTERFACE MODULE	IM 361 INTERFACE MODULE IN ER, WITH K-BUS	SIMATIC S7-300, INTERFACE MODULE
<b>Product type designation</b>			
<b>Supply voltage</b>			
Rated value (DC)		Yes	
• 24 V DC			
<b>Input current</b>			
from backplane bus 5 V DC, max.	350 mA		100 mA
from supply voltage L+, max.		500 mA	
<b>Power losses</b>			
Power loss, typ.	2 W	5 W	0.5 W
<b>Hardware configuration</b>			
Number of interfaces per CPU, max.	1	3	1; 1 pair
<b>Dimensions</b>			
Width	40 mm	80 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
<b>Weights</b>			
Weight, approx.	225 g	505 g	580 g

##### Ordering data

Ordering data	Article No.	Article No.
<b>IM 360 interface module</b> for expanding the S7-300 with max. 3 EUs; can be plugged into CC	6ES7360-3AA01-0AA0	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC
<b>IM 361 interface module</b> for expanding the S7-300 with max. 3 EUs; can be plugged into EU	6ES7361-3CA01-0AA0	
<b>Connecting cable</b> between IM 360 and IM 361 or IM 361 and IM 361		
1 m	6ES7368-3BB01-0AA0	
2.5 m	6ES7368-3BC51-0AA0	
5 m	6ES7368-3BF01-0AA0	<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates
10 m	6ES7368-3CB01-0AA0	
<b>IM 365 interface module</b> for expanding the S7-300 with max. 1 EU; 2 modules with permanent connecting cable (1 m)	6ES7365-0BA01-0AA0	

## SIMATIC S7-300 advanced controller SIPLUS interface modules

### SIPLUS S7-300 IM 365 interface modules

#### Overview



- SIPLUS IM 365: For configuration of 1 central controller and max. 1 expansion unit

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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#### Technical specifications

Article number	<b>6AG1365-0BA01-2AA0</b>
Based on	<b>6ES7365-0BA01-0AA0</b> SIPLUS IM365
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, max.	100 %; condensation/frost permissible (no commissioning if condensation present)

Article number	<b>6AG1365-0BA01-2AA0</b>
Based on	<b>6ES7365-0BA01-0AA0</b> SIPLUS IM365
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

#### Ordering data

#### Article No.

<b>SIPLUS S7-300 IM 365 interface module</b>	<b>6AG1365-0BA01-2AA0</b>
for expanding the S7-300 with max. 1 EU; 2 modules with permanent connecting cable (1 m)	
Extended temperature range and exposure to media	

## SIMATIC S7-300 advanced controller

### Accessories

#### DIN rail

##### Overview



##### Ordering data

##### Article No.

DIN rail	Article No.
160 mm	6ES7390-1AB60-0AA0
482 mm	6ES7390-1AE80-0AA0
530 mm	6ES7390-1AF30-0AA0
830 mm	6ES7390-1AJ30-0AA0
2000 mm	6ES7390-1BC00-0AA0

- The mechanical SIMATIC S7-300 rack
- For accommodating the modules
- Can be attached to walls

**Overview**
**Labeling sheets**

- Film sheets for the application-specific labeling of I/O modules of the SIMATIC S7-300 using standard laser printers
- Plain color films, tear-resistant, dirt-repellent
- Simple handling:
  - perforated label sheets in DIN A4 format for easy separation of the labeling strips.
  - the separated strips can be attached directly onto the I/O modules.
- Different colors to distinguish between different module types or preferred applications:  
The label sheets are available in the following colors: petrol, light-beige, red, and yellow. Yellow is reserved for fail-safe systems.

**Label cover**

- Petrol-colored film
- For sealing and fixing of custom labeling strips on normal paper
- Accessories, 10 units

**Technical specifications**
**Labeling sheets for S7-300**

Dimensions	DIN A4
Labeling strips per sheet, pre-perforated	10
Weight, approx.	0.1 kg

**Ordering data**
**Article No.**
**Labeling sheets**

for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units

petrol

**6ES7392-2AX00-0AA0**

light-beige

**6ES7392-2BX00-0AA0**

yellow

**6ES7392-2CX00-0AA0**

red

**6ES7392-2DX00-0AA0**

for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units

petrol

**6ES7392-2AX10-0AA0**

light-beige

**6ES7392-2BX10-0AA0**

yellow

**6ES7392-2CX10-0AA0**

red

**6ES7392-2DX10-0AA0**

## SIMATIC S7-300 advanced controller

### Notes

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## SIMATIC S7-400 advanced controller



<b>6/2</b>	<b>Introduction</b>	<b>6/91</b>	<b>SIPLUS S7-400 function modules</b>
<b>6/4</b>	<b>Central processing units</b>	<b>6/92</b>	<b>Communication</b>
6/4	<u>Standard CPUs</u>	6/92	CP 440
6/4	CPU 412	6/93	CP 441-1, CP 441-2
6/8	CPU 414	6/95	Loadable drivers for CP 441-2 and CP 341
6/13	CPU 416	6/96	CP 443-5 Basic
6/18	CPU 417	6/98	CP 443-5 Extended
6/21	<u>SIPLUS Standard CPUs</u>	6/100	CP 443-1
6/21	SIPLUS S7-400 CPU 412	6/103	CP 443-1 Advanced
6/22	SIPLUS S7-400 CPU 414	6/107	CP 443-1 RNA
6/23	SIPLUS S7-400 CPU 416	6/109	TIM 4R-IE for WAN and Ethernet, TIM 4R-IE DNP3
6/24	SIPLUS S7-400 CPU 417		
6/25	<u>Fail-safe CPUs</u>	<b>6/110</b>	<b>SIPLUS S7-400 communication</b>
6/25	CPU 414F	6/110	SIPLUS S7-400 CP 443-5 Extended
6/29	CPU 416F	6/111	SIPLUS S7-400 CP 443-1
6/34	<u>High-availability CPUs</u>	6/113	SIPLUS S7-400 CP 443-1 Advanced
6/34	CPU 412-5H, CPU 414-5H, CPU 416-5H, CPU 417-5H		
6/39	Sync-module for coupling the CPU 41xH	<b>6/115</b>	<b>Connection methods</b>
6/40	Y-link for S7-400H	<b>6/118</b>	<b>Racks</b>
6/42	<u>SIPLUS high-availability CPUs</u>	<b>6/120</b>	<b>SIPLUS module racks</b>
6/42	SIPLUS S7-400 CPU 412H	<b>6/121</b>	<b>Interface modules</b>
6/43	SIPLUS S7-400 CPU 414H	6/121	IM 460-0
6/44	SIPLUS S7-400 CPU 416H	6/122	IM 461-0
6/45	SIPLUS S7-400 CPU 417H	6/123	IM 460-1
6/46	SIPLUS sync module for connecting the CPU 41xH	6/124	IM 461-1
6/47	SIPLUS Y-Link for S7-400H	6/125	IM 460-3
6/48	<u>Interface modules</u>	6/126	IM 461-3
6/49	<u>SIPLUS S7-400 interface modules</u>	6/127	IM 463-2
<b>6/50</b>	<b>Digital modules</b>	<b>6/128</b>	<b>SIPLUS S7-400 interface modules</b>
<b>6/56</b>	<b>SIPLUS S7-400 digital modules</b>	<b>6/130</b>	<b>Power supplies</b>
<b>6/58</b>	<b>Analog modules</b>	<b>6/134</b>	<b>SIPLUS power supplies</b>
<b>6/68</b>	<b>SIPLUS S7-400 analog modules</b>	<b>6/136</b>	<b>Accessories</b>
<b>6/70</b>	<b>Function modules</b>	6/136	Labeling sheets
6/70	FM 450-1 counter module	6/136	Spare parts
6/72	FM 451 positioning module	<b>6/137</b>	<b>CPUs for SIMATIC S7-400H and SIMATIC S7-400F/FH</b>
6/74	FM 452 cam controller	<b>6/138</b>	<b>Modules for SIMATIC S7-400F/FH</b>
6/76	FM 453 positioning module		
6/78	FM 455 controller module		
6/81	<u>FM 458-1 DP application module</u>		
6/82	FM 458-1 DP basic module		
6/84	EXM 438-1 input/output expansion		
6/86	EXM 448 universal communications expansion module		
6/87	D7-SYS		
6/88	Accessories		

**Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

[www.siemens.com/simatic/  
printmaterial](http://www.siemens.com/simatic/printmaterial)



## SIMATIC S7-400 advanced controller

### Introduction

#### S7-400/S7-400H/S7-400F/FH

#### Overview

The S7-400 is the most powerful PLC in the family of SIMATIC controllers. It enables successful automation solutions with Totally Integrated Automation (TIA). The S7-400 is an automation platform for system solutions in production and process engineering, and it is characterized primarily by its modularity and performance reserves.



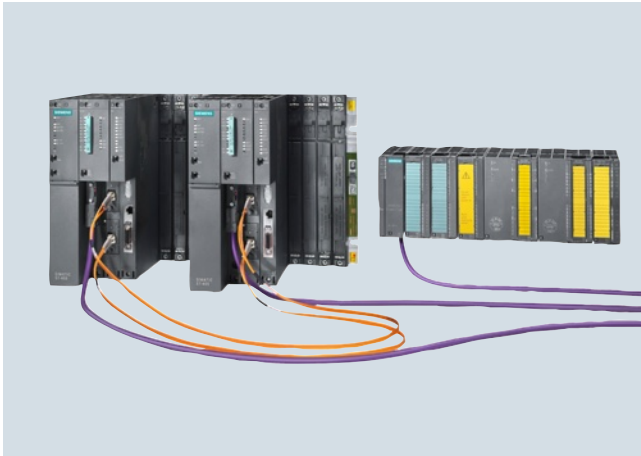
#### S7-400H

#### S7-400

- The power PLC for the mid to high-end performance ranges.
- The solution for even the most demanding tasks.
- With a comprehensive range of modules and performance-graded CPUs for optimal adaptation to the automation task.
- Flexible in use through simple implementation of distributed structures.
- User-friendly connections.
- Optimal communication and networking options.
- User-friendly handling and uncomplicated design without a fan.
- Can be expanded without problems when the tasks increase.
- Multicomputing:  
Simultaneous operation of several CPUs in one S7-400 central controller.  
Multicomputing distributes the overall performance power of an S7-400. For example, complex tasks can be divided into technologies such as open-loop control, computing or communication, and assigned to different CPUs. And every CPU can be assigned its own local I/O.
- Modularity:  
The powerful backplane bus of the S7-400 and the communication interfaces that can be connected direct to the CPU enable high-performance operation of a host of communication lines. This enables, for example, division into one communication path for HMI and programming tasks, one for high-performance and equidistant motion control components, and one for a "normal" I/O fieldbus. Additionally required connections to MES/ERP systems or the Internet can also be implemented.
- Engineering and diagnostics:  
The S7-400 is configured and programmed extremely efficiently together with the SIMATIC Engineering Tools particularly in the case of extensive automation solutions with a high engineering component. For this purpose, high-level languages such as SCL and graphical engineering tools for sequential controls, state graph programs and technology-oriented diagrams are available, for example.

- Fault-tolerant automation system with redundant design.
- For applications with high fail-safety requirements. Processes with high restart costs, expensive downtimes, little supervision, and few maintenance options.
- Redundant central functions.
- Increases availability of I/O: switched I/O configuration.
- Also possible to use I/Os with standard availability: single-sided configuration.
- Hot stand-by: automatic reaction-free switching to the standby unit in the event of a fault.
- Configuration with two separate or one divided central rack.
- Connection of switched I/O via redundant PROFIBUS DP or via system redundant PROFINET IO.

### Overview (continued)



#### S7-400F/FH

- Failsafe automation system for plants with increased safety requirements
- Complies with safety requirements to SIL 3 in accordance with IEC 61508, AK6 in accordance with DIN V 19250 and Cat. 4 in accordance with EN 954-1
- If required, also fault tolerant through redundant design
- Without additional wiring of the safety-related I/O
- Safety-relevant communication via PROFIBUS DP with PROFIsafe profile
- Based on S7-400H and distributed IOs ET 200M with fail-safe modules
- Standard modules for non-safety-related applications can also be used in the automation system
- Isolation module for joint use of fail-safe and standard modules in safety mode in one ET 200M

### Technical specifications

#### General technical data SIMATIC S7-400

Degree of protection	IP20
Ambient temperature	0 to 60 °C
Relative humidity	5 to 95 %, no condensation
Atmospheric pressure	1080 to 795 hPa (corresponds to an altitude of -1000 m to +2,000 m)
Electromagnetic compatibility	
• Interference immunity	According to EN 61000-6-2
• Emitted interference	According to EN 61000-6-4
Mechanical load	
• Vibration, test according to / tested with	IEC 60068-2-6 (sine) 10 to 58 Hz; constant amplitude 0.075 mm; 58 to 500 Hz; constant acceleration 1 g; duration of oscillation: 10 frequency sweeps per axis in each direction of the three mutually perpendicular axes
• Shock, test according to / tested with	IEC 60068-2-27 Type of shock: Half-sine; strength of the shock 10 g (peak value), duration 6 ms direction of shock: 100 shocks in each of the 3 mutually perpendicular axes.

#### General technical data SIPLUS S7-400

Ambient temperature range	-25/0 ... +60/70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.

#### Ambient conditions

Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
• With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance	
• against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation in corrosive atmospheres!
• against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
• against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

## SIMATIC S7-400 advanced controller

Central processing units  
Standard CPUs

### CPU 412

#### Overview



- The low-cost starter solution for the medium performance range
- Can be used in small and medium-sized systems with requirements of the medium performance range

#### Technical specifications

Article number	6ES7412-1XJ05-0AB0	6ES7412-2XJ05-0AB0	6ES7412-2EK06-0AB0
	CPU412-1, MPI/DP, 288 KB	CPU412-2, MPI/DP, 512 KB	CPU412-2 PN, 1 MB, 2 INTERFACES
<b>Product type designation</b>			
<b>General information</b>			
<b>Engineering with</b>			
• Programming package	STEP7 V 5.3 SP2 or higher with HW update	STEP7 V 5.3 SP2 or higher with HW update	STEP7 V5.5 or higher / iMap V3.0 + iMap STEP7 Add-on V3.0 SP5
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC			No; Power supply via system power supply
<b>Power losses</b>			
Power loss, typ.	2.5 W	4 W	5.5 W
<b>Memory</b>			
<b>Work memory</b>			
• Integrated	288 kbyte	512 kbyte	1 Mbyte
• Integrated (for program)	144 kbyte	256 kbyte	0.5 Mbyte
• Integrated (for data)	144 kbyte	256 kbyte	0.5 Mbyte
<b>Load memory</b>			
• Expandable FEPRAM, max.	64 Mbyte	64 Mbyte	64 Mbyte
• Integrated RAM, max.	512 kbyte	512 kbyte	512 kbyte
• Expandable RAM, max.	64 Mbyte	64 Mbyte	64 Mbyte
<b>CPU processing times</b>			
for bit operations, typ.	75 ns	75 ns	75 ns
for word operations, typ.	75 ns	75 ns	75 ns
for fixed point arithmetic, typ.	75 ns	75 ns	75 ns
for floating point arithmetic, typ.	225 ns	225 ns	225 ns
<b>Counters, timers and their retentivity</b>			
<b>S7 counter</b>			
• Number	2 048	2 048	2 048
<b>IEC counter</b>			
• present	Yes	Yes	Yes
<b>S7 times</b>			
• Number	2 048	2 048	2 048
<b>IEC timer</b>			
• present	Yes	Yes	Yes
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Number, max.	4 kbyte	4 kbyte	4 kbyte; Size of bit memory address area

## Technical specifications (continued)

Article number	6ES7412-1XJ05-0AB0	6ES7412-2XJ05-0AB0	6ES7412-2EK06-0AB0
	CPU412-1, MPI/DP, 288 KB	CPU412-2, MPI/DP, 512 KB	CPU412-2 PN, 1 MB, 2 INTERFACES
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	4 kbyte	4 kbyte	4 kbyte
• Outputs	4 kbyte	4 kbyte	4 kbyte
<b>Process image</b>			
• Inputs, adjustable	4 kbyte	4 kbyte	4 kbyte
• Outputs, adjustable	4 kbyte	4 kbyte	4 kbyte
<b>Hardware configuration</b>			
<b>Slots</b>			
• Required slots	1	1	1
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time clock)	Yes	Yes	Yes
<b>Operating hours counter</b>			
• Number	8	8	16
<b>Interfaces</b>			
Interface/bus type			1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports)
Number of RS 485 interfaces	2	2	1
Number of other interfaces	0	0	0
<b>1st interface</b>			
Interface type	Integrated	Integrated	Integrated
Physics	RS 485 / PROFIBUS	RS 485 / PROFIBUS	RS 485 / PROFIBUS + MPI
<b>Functionality</b>			
• MPI	Yes	Yes	Yes
• DP master	Yes	Yes	Yes
• DP slave	Yes	Yes	Yes
<b>DP master</b>			
• Number of DP slaves, max.	32; Max. 544 slots	32	32
<b>2nd interface</b>			
Interface type		Integrated	PROFINET
Physics		RS 485 / PROFIBUS	Ethernet RJ45
Number of ports			2
<b>Functionality</b>			
• DP master		Yes	No
• DP slave		Yes	No
• PROFINET IO Controller			Yes
• PROFINET IO Device			Yes
• PROFINET CBA			Yes
<b>DP master</b>			
• Number of DP slaves, max.		64	
<b>PROFINET IO Controller</b>			
• Max. number of connectable IO devices for RT			256
• Number of IO devices with IRT and the option "high flexibility"			256
• Number of IO Devices with IRT and the option "high performance", max.			64
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)	Yes	Yes	Yes; Via PROFIBUS DP or PROFINET interface

**SIMATIC S7-400 advanced controller**

Central processing units  
Standard CPUs

**CPU 412****Technical specifications (continued)**

Article number	<b>6ES7412-1XJ05-0AB0</b> CPU412-1, MPI/DP, 288 KB	<b>6ES7412-2XJ05-0AB0</b> CPU412-2, MPI/DP, 512 KB	<b>6ES7412-2EK06-0AB0</b> CPU412-2 PN, 1 MB, 2 INTERFACES
<b>Communication functions</b>			
PG/OP communication	Yes	Yes	Yes
Data record routing			Yes
<b>Global data communication</b>			
• supported	Yes	Yes	Yes
<b>S7 basic communication</b>			
• supported	Yes	Yes	Yes
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>S5-compatible communication</b>			
• supported	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5	Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV)	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
<b>Standard communication (FMS)</b>			
• supported	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB
<b>Open IE communication</b>			
• TCP/IP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			46
• ISO-on-TCP (RFC1006)	Via CP 443-1 Adv. and loadable FB	Via CP 443-1 Adv. and loadable FB	Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs
- Number of connections, max.	30		46
• UDP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			46
<b>Web server</b>			
• supported	No; Via CP	No; Via CP	Yes
<b>Number of connections</b>			
• overall	32	32	48
<b>Configuration</b>			
<b>Programming</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- CFC	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes
<b>Know-how protection</b>			
• User program protection/password protection	Yes	Yes	Yes
• Block encryption			Yes; With S7 block Privacy
<b>Dimensions</b>			
Width	25 mm	25 mm	25 mm
Height	290 mm	290 mm	290 mm
Depth	219 mm	219 mm	219 mm
<b>Weights</b>			
Weight, approx.	720 g	720 g	750 g

Ordering data	Article No.	Article No.
<b>CPU 412-1</b> Main memory 288 KB, power supply 24 V DC, MPI/PROFIBUS DP master interface, slot for memory card, incl. slot number labels	6ES7412-1XJ05-0AB0	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC
<b>CPU 412-2</b> Main memory 512 KB, power supply 24 V DC, MPI/PROFIBUS DP master interface, slot for memory card, incl. slot number labels	6ES7412-2XJ05-0AB0	<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates
<b>CPU 412-2 PN</b> Main memory 1 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFINET interface, slot for memory card, incl. slot number labels	6ES7412-2EK06-0AB0	<b>RS 485 bus connector with 90° cable outlet</b> Max. transfer rate 12 Mbit/s • Without PG interface • With PG interface
<b>Memory card RAM</b>		<b>RS 485 bus connector with angled cable outlet</b> Max. transfer rate 12 Mbit/s • Without PG interface • With PG interface
64 KB	6ES7952-0AF00-0AA0	
256 KB	6ES7952-1AH00-0AA0	
1 MB	6ES7952-1AK00-0AA0	
2 MB	6ES7952-1AL00-0AA0	
4 MB	6ES7952-1AM00-0AA0	
8 MB	6ES7952-1AP00-0AA0	
16 MB	6ES7952-1AS00-0AA0	
64 MB	6ES7952-1AY00-0AA0	
<b>FEPROM memory card</b>		<b>RS 485 bus connector with 90° cable outlet for FastConnect connection system</b> Max. transfer rate 12 Mbit/s • without PG interface - 1 unit - 100 units • with PG interface - 1 unit - 100 units
64 KB	6ES7952-0KF00-0AA0	
256 KB	6ES7952-0KH00-0AA0	
1 MB	6ES7952-1KK00-0AA0	
2 MB	6ES7952-1KL00-0AA0	
4 MB	6ES7952-1KM00-0AA0	
8 MB	6ES7952-1KP00-0AA0	
16 MB	6ES7952-1KS00-0AA0	
32 MB	6ES7952-1KT00-0AA0	
64 MB	6ES7952-1KY00-0AA0	
<b>MPI cable</b> for connection of SIMATIC S7 and PG via MPI; 5 m in length	6ES7901-0BF00-0AA0	<b>RS 485 bus connector with axial cable outlet</b> For SIMATIC OP, for connection to PPI, MPI, PROFIBUS
<b>Slot number plates</b> 1 set (spare part)	6ES7912-0AA00-0AA0	<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for fast mounting, 2-core, shielded, sold by the meter; max. delivery unit 1 000 m, minimum ordering quantity 20 m
		6ES7998-8XC01-8YE0
		6ES7998-8XC01-8YE2
		6ES7972-0BA12-0XA0 6ES7972-0BB12-0XA0
		6ES7972-0BA42-0XA0 6ES7972-0BB42-0XA0
		6ES7972-0BA52-0XA0 6ES7972-0BA52-0XB0
		6ES7972-0BB52-0XA0 6ES7972-0BB52-0XB0
		6GK1500-0EA02
		6XV1830-0EH10

**SIMATIC S7-400 advanced controller**

Central processing units  
Standard CPUs

**CPU 414****Overview**

- CPUs for high demands in the mid-level performance range
- Applicable for plants with additional demands on programming scope and processing speed
- Integrated PROFINET functions in CPU 414-3 PN/DP

**Technical specifications**

Article number	<b>6ES7414-2XK05-0AB0</b> CPU414-2, MPI/DP, 1 MB	<b>6ES7414-3XM05-0AB0</b> CPU414-3, 2.8 MB, 3 INTERFACES	<b>6ES7414-3EM06-0AB0</b> CPU414-3 PN/DP, 4 MB, 3 INTERFACES
<b>Product type designation</b>			
<b>General information</b>			
<b>Engineering with</b>			
• Programming package	STEP7 V 5.3 SP2 or higher with HW update	STEP7 V 5.3 SP2 or higher with HW update	STEP7 V5.5 or higher / iMap V3.0 + iMap STEP7 Add-on V3.0 SP5
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC		No; Power supply via system power supply	No; Power supply via system power supply
<b>Power losses</b>			
Power loss, typ.	4 W	5.5 W	6.5 W
<b>Memory</b>			
<b>Work memory</b>			
• Integrated	1 Mbyte	2.8 Mbyte	4 Mbyte
• integrated (for program)	0.5 Mbyte	1.4 Mbyte	2 Mbyte
• integrated (for data)	0.5 Mbyte	1.4 Mbyte	2 Mbyte
<b>Load memory</b>			
• expandable FEPRAM, max.	64 Mbyte	64 Mbyte	64 Mbyte
• integrated RAM, max.	512 kbyte	512 kbyte	512 kbyte
• expandable RAM, max.	64 Mbyte	64 Mbyte	64 Mbyte
<b>CPU processing times</b>			
for bit operations, typ.	45 ns	45 ns	45 ns
for word operations, typ.	45 ns	45 ns	45 ns
for fixed point arithmetic, typ.	45 ns	45 ns	45 ns
for floating point arithmetic, typ.	135 ns	135 ns	135 ns
<b>Counters, timers and their retentivity</b>			
<b>S7 counter</b>			
• Number	2 048	2 048	2 048
<b>IEC counter</b>			
• present	Yes	Yes	Yes
<b>S7 times</b>			
• Number	2 048	2 048	2 048
<b>IEC timer</b>			
• present	Yes	Yes	Yes
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Number, max.	8 kbyte	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area

## Technical specifications (continued)

Article number	<b>6ES7414-2XK05-0AB0</b> CPU414-2, MPI/DP, 1 MB	<b>6ES7414-3XM05-0AB0</b> CPU414-3, 2.8 MB, 3 INTERFACES	<b>6ES7414-3EM06-0AB0</b> CPU414-3 PN/DP, 4 MB, 3 INTERFACES
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	8 kbyte	8 kbyte	8 kbyte
• Outputs	8 kbyte	8 kbyte	8 kbyte
<b>Process image</b>			
• Inputs, adjustable	8 kbyte	8 kbyte	8 kbyte
• Outputs, adjustable	8 kbyte	8 kbyte	8 kbyte
<b>Hardware configuration</b>			
<b>Slots</b>			
• Required slots	1	2	2
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time clock)	Yes	Yes	Yes
<b>Operating hours counter</b>			
• Number	8	16	16
<b>Interfaces</b>			
Interface/bus type		1 x MPI/PROFIBUS DP, 1 x PROFIBUS DP, 1 x PROFIBUS DP (optionally pluggable)	1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally pluggable)
Number of RS 485 interfaces	2	2	2
Number of other interfaces	0	0	0
<b>1st interface</b>			
Interface type	Integrated	Integrated	Integrated
Physics	RS 485 / PROFIBUS	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI
<b>Functionality</b>			
• MPI	Yes	Yes	Yes
• DP master	Yes	Yes	Yes
• DP slave	Yes	Yes	Yes
<b>DP master</b>			
• Number of DP slaves, max.	32	32	32
<b>2nd interface</b>			
Interface type	Integrated	Integrated	PROFINET
Physics	RS 485 / PROFIBUS	RS 485 / PROFIBUS	Ethernet RJ45
Number of ports			2
<b>Functionality</b>			
• DP master	Yes	Yes	No
• DP slave	Yes	Yes	No
• PROFINET IO Controller			Yes
• PROFINET IO Device			Yes
• PROFINET CBA			Yes
<b>DP master</b>			
• Number of DP slaves, max.	96	96	
<b>PROFINET IO Controller</b>			
• Max. number of connectable IO devices for RT			256
• Number of IO devices with IRT and the option "high flexibility"			256
• Number of IO Devices with IRT and the option "high performance", max.			64
<b>3rd interface</b>			
Interface type		Pluggable interface module (IF), technical data as for 2nd interface	Pluggable interface module (IF)
Plug-in interface modules		IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)	IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
Physics		RS 485 / PROFIBUS	RS 485 / PROFIBUS



**SIMATIC S7-400 advanced controller**

Central processing units

Standard CPUs

**CPU 414****Technical specifications** (continued)

Article number	<b>6ES7414-2XK05-0AB0</b> CPU414-2, MPI/DP, 1 MB	<b>6ES7414-3XM05-0AB0</b> CPU414-3, 2.8 MB, 3 INTERFACES	<b>6ES7414-3EM06-0AB0</b> CPU414-3 PN/DP, 4 MB, 3 INTERFACES
<b>Functionality</b>			
• MPI		No	No
• DP master		Yes	Yes
• DP slave		Yes	Yes
<b>DP master</b>			
• Number of DP slaves, max.		96	96
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)	Yes	Yes; For PROFIBUS only	Yes; Via PROFIBUS DP or PROFINET interface
<b>Communication functions</b>			
PG/OP communication	Yes	Yes	Yes
Data record routing		Yes	Yes
<b>Global data communication</b>			
• supported	Yes	Yes	Yes
<b>S7 basic communication</b>			
• supported	Yes	Yes	Yes
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>S5-compatible communication</b>			
• supported	Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV)	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
<b>Standard communication (FMS)</b>			
• supported	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB
<b>Open IE communication</b>			
• TCP/IP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			62
• ISO-on-TCP (RFC1006)	Via CP 443-1 Adv. and loadable FB	Via CP 443-1 and loadable FB	Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs
- Number of connections, max.			62
• UDP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			62
<b>Web server</b>			
• supported	No; Via CP	No	Yes
<b>Number of connections</b>			
• overall	32	32	64
<b>Configuration</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- CFC	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes
<b>Know-how protection</b>			
• User program protection/password protection	Yes	Yes	Yes
• Block encryption			Yes; With S7 block Privacy
<b>Dimensions</b>			
Width	25 mm	50 mm	50 mm
Height	290 mm	290 mm	290 mm
Depth	219 mm	219 mm	219 mm
<b>Weights</b>			
Weight, approx.	720 g	0.9 kg	900 g

Ordering data	Article No.	Article No.
<b>CPU 414-2</b> Main memory 1 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, slot for memory card, incl. slot number labels	6ES7414-2XK05-0AB0	<b>Slot number plates</b> 1 set (spare part)
<b>CPU 414-3</b> Main memory 2.8 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFIBUS DP master interface, slot for memory card, module slots for 1 IF module, incl. slot number labels	6ES7414-3XM05-0AB0	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC
<b>CPU 414-3 PN/DP</b> Main memory 4 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFINET interface, slot for memory card, module slot for 1 IF module, incl. slot number labels	6ES7414-3EM06-0AB0	<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates
<b>Memory card RAM</b>		<b>PROFIBUS bus components</b>
64 KB	6ES7952-0AF00-0AA0	<b>RS 485 bus connector with 90° cable outlet</b> Max. transfer rate 12 Mbit/s
256 KB	6ES7952-1AH00-0AA0	• Without PG interface
1 MB	6ES7952-1AK00-0AA0	• With PG interface
2 MB	6ES7952-1AL00-0AA0	<b>RS 485 bus connector with angled cable outlet</b> Max. transfer rate 12 Mbit/s
4 MB	6ES7952-1AM00-0AA0	• Without PG interface
8 MB	6ES7952-1AP00-0AA0	• With PG interface
16 MB	6ES7952-1AS00-0AA0	<b>RS 485 bus connector with 90° cable outlet for FastConnect connection system</b> Max. transfer rate 12 Mbit/s
64 MB	6ES7952-1AY00-0AA0	• without PG interface
<b>FEPRAM memory card</b>		- 1 unit
64 KB	6ES7952-0KF00-0AA0	- 100 units
256 KB	6ES7952-0KH00-0AA0	• with PG interface
1 MB	6ES7952-1KK00-0AA0	- 1 unit
2 MB	6ES7952-1KL00-0AA0	- 100 units
4 MB	6ES7952-1KM00-0AA0	<b>RS 485 bus connector with axial cable outlet</b> For SIMATIC OP, for connection to PPI, MPI, PROFIBUS
8 MB	6ES7952-1KP00-0AA0	<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for fast mounting, 2-core, shielded, sold by the meter; max. delivery unit 1 000 m, minimum ordering quantity 20 m
16 MB	6ES7952-1KS00-0AA0	
32 MB	6ES7952-1KT00-0AA0	
64 MB	6ES7952-1KY00-0AA0	
<b>MPI cable</b> for connection of SIMATIC S7 and PG via MPI; 5 m in length	6ES7901-0BF00-0AA0	<b>RS 485 repeater for PROFIBUS</b> Transmission rate up to 12 Mbit/s; 24 V DC; IP20 enclosure
<b>IF 964-DP interface module</b> To connect an additional DP line; for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4	6ES7964-2AA04-0AB0	

**SIMATIC S7-400 advanced controller**

Central processing units

Standard CPUs

**CPU 414**

Ordering data	Article No.	Ordering data	Article No.
<b>PROFINET bus components</b>		<b>IE FC RJ45 plugs</b>	
<b>IE FC TP standard cable GP 2x2</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; Sold by the meter	<b>6XV1840-2AH10</b>	RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
<b>FO Standard Cable GP (50/125)</b> Standard cable, splittable, UL approval, sold by the meter	<b>6XV1873-2A</b>	<b>IE FC RJ45 plug 180</b> 180° cable outlet • 1 unit • 10 units • 50 units	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>
<b>SCALANCE X204-2 Industrial Ethernet switch</b> Industrial Ethernet Switches with integral SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports	<b>6GK5204-2BB10-2AA3</b>	<b>PROFIBUS/PROFINET bus components</b> For establishing MPI/PROFIBUS/PROFINET communication	See IK PI, CA 01 catalogs

**Overview**

- High-performance CPUs in the high-end performance range
- Applicable for plants with high requirements in the high-end performance range
- Integrated PROFINET functions in CPU 416-3 PN/DP

**Technical specifications**

Article number	<b>6ES7416-2XN05-0AB0</b> CPU 416-2, MPI, PROFIBUS, 5.6 MB	<b>6ES7416-3XR05-0AB0</b> CPU 416-3, 11.2 MB, 3 INTERFACES	<b>6ES7416-3ES06-0AB0</b> CPU416-3 PN/DP, 16 MB, 3 INTERFACES
<b>Product type designation</b>			
<b>General information</b>			
<b>Engineering with</b>			
• Programming package	STEP7 V 5.3 SP2 or higher with HW update	STEP7 V 5.3 SP2 or higher with HW update	STEP7 V5.5 or higher / iMap V3.0 + iMap STEP7 Add-on V3.0 SP5 or higher
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC		No; Power supply via system power supply	No; Power supply via system power supply
<b>Power losses</b>			
Power loss, typ.	4 W	5.5 W	6.5 W
<b>Memory</b>			
<b>Work memory</b>			
• Integrated	5.6 Mbyte	11.2 Mbyte	16 Mbyte
• integrated (for program)	2.8 Mbyte	5.6 Mbyte	8 Mbyte
• integrated (for data)	2.8 Mbyte	5.6 Mbyte	8 Mbyte
<b>Load memory</b>			
• expandable FEPRAM, max.	64 Mbyte	64 Mbyte	64 Mbyte
• integrated RAM, max.	1 Mbyte	1 Mbyte	1 Mbyte
• expandable RAM, max.	64 Mbyte	64 Mbyte	64 Mbyte
<b>CPU processing times</b>			
for bit operations, typ.	30 ns	30 ns	30 ns
for word operations, typ.	30 ns	30 ns	30 ns
for fixed point arithmetic, typ.	30 ns	30 ns	30 ns
for floating point arithmetic, typ.	90 ns	90 ns	90 ns
<b>Counters, timers and their retentivity</b>			
<b>S7 counter</b>			
• Number	2 048	2 048	2 048
<b>IEC counter</b>			
• present	Yes	Yes	Yes
<b>S7 times</b>			
• Number	2 048	2 048	2 048
<b>IEC timer</b>			
• present	Yes	Yes	Yes
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Number, max.	16 kbyte	16 kbyte; Size of bit memory address area	16 kbyte; Size of bit memory address area

**SIMATIC S7-400 advanced controller**

Central processing units  
Standard CPUs

**CPU 416****Technical specifications (continued)**

Article number	<b>6ES7416-2XN05-0AB0</b> CPU 416-2, MPI, PROFIBUS, 5.6 MB	<b>6ES7416-3XR05-0AB0</b> CPU 416-3, 11.2 MB, 3 INTERFACES	<b>6ES7416-3ES06-0AB0</b> CPU416-3 PN/DP, 16 MB, 3 INTERFACES
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	16 kbyte	16 kbyte	16 kbyte
• Outputs	16 kbyte	16 kbyte	16 kbyte
<b>Process image</b>			
• Inputs, adjustable	16 kbyte	16 kbyte	16 kbyte
• Outputs, adjustable	16 kbyte	16 kbyte	16 kbyte
<b>Hardware configuration</b>			
<b>Slots</b>			
• Required slots	1	2	2
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time clock)	Yes	Yes	Yes
<b>Operating hours counter</b>			
• Number	8	16	16
<b>Interfaces</b>			
Interface/bus type		1 x MPI/PROFIBUS DP, 1 x PROFIBUS DP, 1 x PROFIBUS DP (optionally pluggable)	1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally pluggable)
Number of RS 485 interfaces	2	2	1
Number of other interfaces	0	0	0
<b>1st interface</b>			
Interface type	Integrated	Integrated	Integrated
Physics	RS 485 / PROFIBUS	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI
<b>Functionality</b>			
• MPI	Yes	Yes	Yes
• DP master	Yes	Yes	Yes
• DP slave	Yes	Yes	Yes
<b>DP master</b>			
• Number of DP slaves, max.	32	32	32
<b>2nd interface</b>			
Interface type	Integrated	Integrated	PROFINET
Physics	RS 485 / PROFIBUS	RS 485 / PROFIBUS	Ethernet RJ45
Number of ports			2
<b>Functionality</b>			
• DP master	Yes	Yes	No
• DP slave	Yes	Yes	No
• PROFINET IO Controller			Yes
• PROFINET IO Device			Yes
• PROFINET CBA			Yes
<b>DP master</b>			
• Number of DP slaves, max.	125	125	
<b>PROFINET IO Controller</b>			
• Max. number of connectable IO devices for RT			256
• Number of IO devices with IRT and the option "high flexibility"			256
• Number of IO Devices with IRT and the option "high performance", max.			64
<b>3rd interface</b>			
Interface type		Pluggable interface module (IF), technical data as for 2nd interface	Pluggable interface module (IF)
Plug-in interface modules		IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)	IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
Physics		RS 485 / PROFIBUS	RS 485 / PROFIBUS

**Technical specifications** (continued)

Article number	<b>6ES7416-2XN05-0AB0</b> CPU 416-2, MPI, PROFIBUS, 5.6 MB	<b>6ES7416-3XR05-0AB0</b> CPU 416-3, 11.2 MB, 3 INTERFACES	<b>6ES7416-3ES06-0AB0</b> CPU416-3 PN/DP, 16 MB, 3 INTERFACES
<b>Functionality</b>			
• MPI		No	No
• DP master		Yes	Yes
• DP slave		Yes	Yes
<b>DP master</b>			
• Number of DP slaves, max.		125	125
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)	Yes	Yes; For PROFIBUS only	Yes; Via PROFIBUS DP or PROFINET interface
<b>Communication functions</b>			
PG/OP communication	Yes	Yes	Yes
Data record routing		Yes	Yes
<b>Global data communication</b>			
• supported	Yes	Yes	Yes
<b>S7 basic communication</b>			
• supported	Yes	Yes	Yes
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>S5-compatible communication</b>			
• supported	Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV)	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
<b>Standard communication (FMS)</b>			
• supported	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB
<b>Open IE communication</b>			
• TCP/IP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			94
• ISO-on-TCP (RFC1006)	Via CP 443-1 Adv. and loadable FB	Via CP 443-1 and loadable FB	Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs
- Number of connections, max.			94
• UDP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			94
<b>Web server</b>			
• supported	No; Via CP	No	Yes
<b>Number of connections</b>			
• overall	64	64	96
<b>Configuration</b>			
<b>Programming language</b>			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- CFC	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes
<b>Know-how protection</b>			
• User program protection/password protection	Yes	Yes	Yes
• Block encryption			Yes; With S7 block Privacy
<b>Dimensions</b>			
Width	25 mm	50 mm	50 mm
Height	290 mm	290 mm	290 mm
Depth	219 mm	219 mm	219 mm
<b>Weights</b>			
Weight, approx.	720 g	0.9 kg	900 g

**SIMATIC S7-400 advanced controller**

Central processing units

Standard CPUs

**CPU 416****Ordering data****Article No.****CPU 416-2**

Main memory 5.6 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFIBUS DP master interface, slot for memory card, incl. slot number labels

**6ES7416-2XN05-0AB0****CPU 416-3**

Main memory 11.2 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFIBUS DP master interface, module slot for 1 IF module, slot for memory card, incl. slot number labels

**6ES7416-3XR05-0AB0****CPU 416-3 PN/DP**

Main memory 16 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFINET interface, module slot for 1 IF submodule, slot for memory card, incl. slot number labels

**6ES7416-3ES06-0AB0****Memory card RAM**

64 KB

**6ES7952-0AF00-0AA0**

256 KB

**6ES7952-1AH00-0AA0**

1 MB

**6ES7952-1AK00-0AA0**

2 MB

**6ES7952-1AL00-0AA0**

4 MB

**6ES7952-1AM00-0AA0**

8 MB

**6ES7952-1AP00-0AA0**

16 MB

**6ES7952-1AS00-0AA0**

64 MB

**6ES7952-1AY00-0AA0****FEPROM memory card**

64 KB

**6ES7952-0KF00-0AA0**

256 KB

**6ES7952-0KH00-0AA0**

1 MB

**6ES7952-1KK00-0AA0**

2 MB

**6ES7952-1KL00-0AA0**

4 MB

**6ES7952-1KM00-0AA0**

8 MB

**6ES7952-1KP00-0AA0**

16 MB

**6ES7952-1KS00-0AA0**

32 MB

**6ES7952-1KT00-0AA0**

64 MB

**6ES7952-1KY00-0AA0****MPI cable**

for connection of SIMATIC S7 and PG via MPI; 5 m in length

**6ES7901-0BF00-0AA0****IF 964-DP interface module**

To connect an additional DP line; for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4

**6ES7964-2AA04-0AB0****Article No.****Slot number plates**

1 set (spare part)

**6ES7912-0AA00-0AA0****SIMATIC Manual Collection**

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**6ES7998-8XC01-8YE0****SIMATIC Manual Collection update service for 1 year**

Current "Manual Collection" DVD and the three subsequent updates

**6ES7998-8XC01-8YE2****PROFIBUS bus components****RS 485 bus connector with 90° cable outlet**

Max. transfer rate 12 Mbit/s

- Without PG interface
- With PG interface

**6ES7972-0BA12-0XA0****6ES7972-0BB12-0XA0****RS 485 bus connector with angled cable outlet**

Max. transfer rate 12 Mbit/s

- Without PG interface
- With PG interface

**6ES7972-0BA42-0XA0****6ES7972-0BB42-0XA0****RS 485 bus connector with 90° cable outlet for FastConnect connection system**

Max. transfer rate 12 Mbit/s

- Without PG interface

- 1 unit
- 100 units

**6ES7972-0BA52-0XA0****6ES7972-0BA52-0XB0**

- With PG interface

- 1 unit
- 100 units

**6ES7972-0BB52-0XA0****6ES7972-0BB52-0XB0****RS 485 bus connector with axial cable outlet**

For SIMATIC OP, for connection to PPI, MPI, PROFIBUS

**6GK1500-0EA02****PROFIBUS FastConnect bus cable**

Standard type with special design for fast mounting, 2-core, shielded, sold by the meter; max. delivery unit 1 000 m, minimum ordering quantity 20 m

**6XV1830-0EH10****RS 485 repeater for PROFIBUS**

Transfer rate up to 12 Mbps; 24 V DC; IP20 enclosure

**6ES7972-0AA02-0XA0**

Ordering data	Article No.		Article No.
<b>PROFINET bus components</b>			
<b>IE FC TP standard cable GP 2x2</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; Sold by the meter	<b>6XV1840-2AH10</b>	<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
<b>FO Standard Cable GP (50/125)</b> Standard cable, splittable, UL approval, sold by the meter	<b>6XV1873-2A</b>	<b>IE FC RJ45 plug 180</b> 180° cable outlet • 1 unit • 10 units • 50 units	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>
<b>SCALANCE X204-2 Industrial Ethernet switch</b> Industrial Ethernet Switches with integral SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports	<b>6GK5204-2BB10-2AA3</b>	<b>PROFIBUS/PROFINET bus components</b> For establishing MPI/PROFIBUS/PROFINET communication	See IK PI, CA 01 catalogs



**SIMATIC S7-400 advanced controller**

Central processing units  
Standard CPUs

**CPU 417****Overview**

- The most powerful SIMATIC S7-400 CPU
- Can be used in the most sophisticated installations in the upper performance range
- With two slots for IF modules

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**Technical specifications**

Article number	<b>6ES7417-4XT05-0AB0</b> CPU 417-4, 30 MB, 4 INTERFACES
<b>Product type designation</b>	
<b>General information</b>	
<b>Engineering with</b>	
• Programming package	STEP7 V 5.3 SP2 or higher with HW update
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	No; Power supply via system power supply
<b>Power losses</b>	
Power loss, typ.	7.5 W
<b>Memory</b>	
<b>Work memory</b>	
• Integrated	30 Mbyte
• integrated (for program)	15 Mbyte
• integrated (for data)	15 Mbyte
<b>Load memory</b>	
• expandable FEPRAM, max.	64 Mbyte
• integrated RAM, max.	1 Mbyte
• expandable RAM, max.	64 Mbyte
<b>CPU processing times</b>	
for bit operations, typ.	18 ns
for word operations, typ.	18 ns
for fixed point arithmetic, typ.	18 ns
for floating point arithmetic, typ.	54 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• present	Yes
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• present	Yes
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Number, max.	16 kbyte; Size of bit memory address area

Article number	<b>6ES7417-4XT05-0AB0</b> CPU 417-4, 30 MB, 4 INTERFACES
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	16 kbyte
• Outputs	16 kbyte
<b>Process image</b>	
• Inputs, adjustable	16 kbyte
• Outputs, adjustable	16 kbyte
<b>Hardware configuration</b>	
<b>Slots</b>	
• Required slots	2
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time clock)	Yes
<b>Operating hours counter</b>	
• Number	16
<b>Interfaces</b>	
Interface/bus type	1 x MPI/PROFIBUS DP, 1 x PROFIBUS DP, 2 x PROFIBUS DP (optionally pluggable)
Number of RS 485 interfaces	2
Number of other interfaces	0
<b>1st interface</b>	
Interface type	Integrated
Physics	RS 485 / PROFIBUS + MPI
<b>Functionality</b>	
• MPI	Yes
• DP master	Yes
• DP slave	Yes
<b>DP master</b>	
• Number of DP slaves, max.	32
<b>2nd interface</b>	
Interface type	Integrated
Physics	RS 485 / PROFIBUS
<b>Functionality</b>	
• DP master	Yes
• DP slave	Yes

## Technical specifications (continued)

Article number	<b>6ES7417-4XT05-0AB0</b> CPU 417-4, 30 MB, 4 INTERFACES
<b>DP master</b>	
• Number of DP slaves, max.	125
<b>3rd interface</b>	
Interface type	Pluggable interface module (IF), technical data as for 2nd interface
Plug-in interface modules	IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
Physics	RS 485 / PROFIBUS
<b>Functionality</b>	
• MPI	No
• DP master	Yes
• DP slave	Yes
<b>DP master</b>	
• Number of DP slaves, max.	125
<b>4th interface</b>	
Interface type	Pluggable interface module (IF), technical data as for 2nd interface
Plug-in interface modules	IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes; For PROFIBUS only
<b>Communication functions</b>	
PG/OP communication	Yes
Data record routing	Yes
<b>Global data communication</b>	
• supported	Yes
<b>S7 basic communication</b>	
• supported	Yes
<b>S7 communication</b>	
• supported	Yes
<b>S5-compatible communication</b>	
• supported	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
<b>Standard communication (FMS)</b>	
• supported	Yes; Via CP and loadable FB
<b>Open IE communication</b>	
• ISO-on-TCP (RFC1006)	Via CP 443-1 and loadable FB
<b>Web server</b>	
• supported	No
<b>Number of connections</b>	
• overall	64

Article number	<b>6ES7417-4XT05-0AB0</b> CPU 417-4, 30 MB, 4 INTERFACES
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes
- HiGraph®	Yes
<b>Know-how protection</b>	
• User program protection/ password protection	Yes
<b>Dimensions</b>	
Width	50 mm
Height	290 mm
Depth	219 mm
<b>Weights</b>	
Weight, approx.	0.9 kg

**SIMATIC S7-400 advanced controller**

Central processing units  
Standard CPUs

**CPU 417****Ordering data****Article No.****Article No.****CPU 417-4**

Main memory 30 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFIBUS DP master interface, module slots for up to 2 additional IF modules, slot for memory card, incl. slot number labels

**6ES7417-4XT05-0AB0****Memory card RAM**

64 KB

**6ES7952-0AF00-0AA0**

256 KB

**6ES7952-1AH00-0AA0**

1 MB

**6ES7952-1AK00-0AA0**

2 MB

**6ES7952-1AL00-0AA0**

4 MB

**6ES7952-1AM00-0AA0**

8 MB

**6ES7952-1AP00-0AA0**

16 MB

**6ES7952-1AS00-0AA0**

64 MB

**6ES7952-1AY00-0AA0****FEPRAM memory card**

64 KB

**6ES7952-0KF00-0AA0**

256 KB

**6ES7952-0KH00-0AA0**

1 MB

**6ES7952-1KK00-0AA0**

2 MB

**6ES7952-1KL00-0AA0**

4 MB

**6ES7952-1KM00-0AA0**

8 MB

**6ES7952-1KP00-0AA0**

16 MB

**6ES7952-1KS00-0AA0**

32 MB

**6ES7952-1KT00-0AA0**

64 MB

**6ES7952-1KY00-0AA0****MPI cable**

for connection of SIMATIC S7 and PG via MPI; 5 m in length

**6ES7901-0BF00-0AA0****IF 964-DP interface module**

To connect an additional DP line; for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4

**6ES7964-2AA04-0AB0****Slot number plates**

1 set (spare part)

**6ES7912-0AA00-0AA0****SIMATIC Manual Collection**

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**6ES7998-8XC01-8YE0****SIMATIC Manual Collection update service for 1 year**

Current "Manual Collection" DVD and the three subsequent updates

**6ES7998-8XC01-8YE2****RS 485 bus connector with 90° cable outlet**

Max. transfer rate 12 Mbit/s

- Without PG interface
- With PG interface

**6ES7972-0BA12-0XA0****6ES7972-0BB12-0XA0****RS 485 bus connector with angled cable outlet**

Max. transfer rate 12 Mbit/s

- Without PG interface
- With PG interface

**6ES7972-0BA42-0XA0****6ES7972-0BB42-0XA0****RS 485 bus connector with 90° cable outlet for FastConnect connection system**

Max. transfer rate 12 Mbit/s

- without PG interface
  - 1 unit
  - 100 units
- with PG interface
  - 1 unit
  - 100 units

**6ES7972-0BA52-0XA0****6ES7972-0BA52-0XB0****6ES7972-0BB52-0XA0****6ES7972-0BB52-0XB0****RS 485 bus connector with axial cable outlet**

For SIMATIC OP, for connection to PPI, MPI, PROFIBUS

**6GK1500-0EA02****PROFIBUS FastConnect bus cable**

Standard type with special design for fast mounting, 2-core, shielded, sold by the meter; max. delivery unit 1 000 m, minimum ordering quantity 20 m

**6XV1830-0EH10**

**SIMATIC S7-400 advanced controller**Central processing units  
SIPLUS S7-400 Standard CPUs

SIPLUS S7-400 CPU 412

**Overview**

- The low-cost introduction to the mid performance range
- Can be used in small and medium-sized plants with requirements in the mid performance range

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For further technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

**Technical specifications**

Article number	<b>6AG1412-2EK06-2AB0</b>
Based on	<b>6ES7412-2EK06-0AB0</b> SIPLUS S7-400 CPU 412-2 PN V6
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• Max.	70 °C; = Tmax; @ 60°C for UL/ATEX/FM use
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-33, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****SIPLUS S7-400 CPU 412-2 PN**

CPU with main memory 1 MB  
(0.5 MB code and 0.5 MB data),  
2 interfaces: 1x MPI/DP and PN each

Extended temperature range and  
exposure to media

**6AG1412-2EK06-2AB0****Accessories****Memory Card RAM**

Exposure to media

- 2 MB

Extended temperature range and  
exposure to media

- 4 MB
- 8 MB
- 16 MB
- 64 MB

**6AG1952-1AL00-4AA0****6AG1952-1AM00-7AA0****6AG1952-1AP00-7AA0****6AG1952-1AS00-7AA0****6AG1952-1AY00-7AA0****Article No.****RS 485 bus connector  
with 90° cable outlet**

Max. transfer rate 12 Mbit/s

Extended temperature range  
and exposure to media

- without PG interface
- With PG interface

**6AG1972-0BA12-2XA0****6AG1972-0BB12-2XA0****RS 485 bus connector  
with angled cable outlet**

Max. transmission rate 12 Mbit/s

Extended temperature range and  
exposure to media

- Without PG interface
- With PG interface

**6AG1972-0BA42-7XA0****6AG1972-0BB42-7XA0****RS 485 bus connector  
with axial cable outlet**

For SIPLUS OP, for connection to  
PPI, MPI, PROFIBUS

Extended temperature range and  
exposure to media

**6AG1500-0EA02-2AA0****Further accessories**

see SIMATIC S7-400  
CPU 412, page 6/7

**SIMATIC S7-400 advanced controller**

Central processing units

SIPLUS S7-400 Standard CPUs

**SIPLUS S7-400 CPU 414****Overview**

- CPUs for high demands in the mid-level performance range
- Applicable for plants with additional demands on programming scope and processing speed
- Integrated PROFINET functions in CPU 414-3 PN/DP

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For further technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

**Technical specifications**

Article number	<b>6AG1414-3EM06-7AB0</b>
Based on	<b>6ES7414-3EM06-0AB0</b> SIPLUS S7-400 CPU 414-3 PN/DP V6
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	70 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.**

<b>SIPLUS S7-400 CPU 414-3 PN/DP</b> CPU with main memory 4 MB (1 MB code and 1 MB data), 3 interfaces: 1x MPI/DP, PN each and for IF964-DP (plug-in) Extended temperature range and exposure to media	<b>6AG1414-3EM06-7AB0</b>
<b>Accessories</b>	
<b>Memory Card RAM</b>	see SIPLUS S7-400 CPU 412, page 6/21
<b>IF 964-DP interface module</b> For connecting an additional DP line; for SIPLUS CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4	<b>6AG1964-2AA04-7AB0</b>
<b>RS 485 bus connector with 90° cable outlet</b>	see SIPLUS S7-400 CPU 412, page 6/21
<b>RS 485 bus connector with angled cable outlet</b>	see SIPLUS S7-400 CPU 412, page 6/21
<b>RS 485 bus connector with axial cable outlet</b>	see SIPLUS S7-400 CPU 412, page 6/21

**Article No.**

<b>RS 485 repeater for PROFIBUS</b> Transfer rate up to 12 Mbit/s; 24 V DC; IP20 enclosure Extended temperature range and exposure to media	<b>6AG1972-0AA02-7XA0</b>
<b>SIPLUS SCALANCE X204-2 Industrial Ethernet Switch</b> with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports Extended temperature range and exposure to media	<b>6AG1204-2BB10-4AA3</b>
<b>IE FC RJ45 Plug 180</b> 180° cable outlet; 1 unit Extended temperature range and exposure to media	<b>6AG1901-1BB10-7AA0</b>
<b>Further accessories</b>	see SIMATIC S7-400 CPU 414, page 6/11

**Overview**

High-performance CPUs in the high-end performance range

- Applicable for plants with high requirements in the high-end performance range
- Integrated PROFINET functions in CPU 416-3 PN/DP

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

**Technical specifications**

Article number	<b>6AG1416-3XR05-4AB0</b>	<b>6AG1416-3ES06-7AB0</b>
Based on	<b>6ES7416-3XR05-0AB0</b> SIPLUS S7-400 CPU416-3	<b>6ES7416-3ES06-0AB0</b> SIPLUS S7-400 CPU 416-3 PN/DP V6
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	0 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax	70 °C; = Tmax
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data**

Ordering data	Article No.	Article No.
<b>SIPLUS S7-400 CPU 416-3</b> CPU with main memory 11.2 MB (5.6 MB code and 5.6 MB data), 3 interfaces: 1x MPI/DP, DP each and module slot for 1 IF module Exposure to media	<b>6AG1416-3XR05-4AB0</b>	<b>SIPLUS accessories</b> see SIPLUS S7-400 CPU 414, page 6/22
<b>SIPLUS S7-400 CPU 416-3 PN/DP</b> CPU with main memory 16 MB (8 MB code and 8 MB data), 3 interfaces: 1x MPI/DP, PN each and module slot for 1 IF module Extended temperature range and exposure to media	<b>6AG1416-3ES06-7AB0</b>	<b>Further accessories</b> see SIMATIC S7-400 CPU 416, page 6/16

**SIMATIC S7-400 advanced controller**

Central processing units

SIPLUS S7-400 Standard CPUs

**SIPLUS S7-400 CPU 417****Overview**

The most powerful SIMATIC S7-400 CPU

- Applicable for plants with maximum requirements in the high-end performance range
- With 2 plug-in slots for IF modules

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

**Technical specifications**

Article number	<b>6AG1417-4XT05-4AB0</b>
Based on	<b>6ES7417-4XT05-0AB0</b> SIPLUS S7-400 CPU417-4
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	0 °C; = Tmin
• max.	60 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****SIPLUS CPU 417-4**

CPU with main memory 30 MB (15 MB code and 15 MB data), 3 interfaces: 1x MPI/DP, DP each and 2x for IFM modules (plug-in)

Exposure to media

**Article No.****6AG1417-4XT05-4AB0****Accessories****Memory card RAM**

See SIPLUS S7-400 CPU 412, page 6/21

**FEPRAM memory card**

Exposure to media

- 32 MB

**6AG1952-1KT00-4AA0****Article No.****RS 485 bus connector with 90° cable outlet**

See SIPLUS S7-400 CPU 412, page 6/21

**RS 485 bus connector with angled cable outlet**

See SIPLUS S7-400 CPU 412, page 6/21

**RS 485 bus connector with axial cable outlet**

See SIPLUS S7-400 CPU 412, page 6/21

**RS 485 repeater for PROFIBUS**

Transfer rate up to 12 Mbit/s; 24 V DC; IP20 enclosure

Extended temperature range and exposure to media

**6AG1972-0AA02-7XA0****Further accessories**

See SIMATIC CPU 417, page 6/20



**Overview**

- For constructing a fail-safe automation system for plants with increased safety requirements
- CPUs for high demands in the mid-level performance range
- Applicable for plants with additional demands on programming scope and processing speed
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- Standard and safety-related tasks can be performed with a single CPU
- Integrated PROFINET functions in CPU 414F-3 PN/DP
- Multi-processor mode is possible
- Safety-related communication with distributed I/O devices over PROFIBUS DP or PROFINET IO with PROFIsafe profile
- Fail-safe I/O modules can be connected in a distributed manner via the integrated interfaces (DP and PN with CPU 416F-3 PN/DP) and/or through communication modules (CP 443-5 Extended and CP 443-1 Adv.)
- Central and distributed use of standard modules for non-safety-oriented applications

**Technical specifications**

Article number	<b>6ES7414-3FM06-0AB0</b> CPU414F-3 PN/DP, 4 MB, 3 INTERFACES
<b>Product type designation</b>	
<b>General information</b>	
<b>Engineering with</b>	
• Programming package	STEP7 V5.5 or higher / iMap V3.0 + iMap STEP7 Add-on V3.0 SP5
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	No; Power supply via system power supply
<b>Power losses</b>	
Power loss, typ.	6.5 W
<b>Memory</b>	
<b>Work memory</b>	
• Integrated	4 Mbyte
• integrated (for program)	2 Mbyte
• integrated (for data)	2 Mbyte
<b>Load memory</b>	
• expandable FEPRM, max.	64 Mbyte
• integrated RAM, max.	512 kbyte
• expandable RAM, max.	64 Mbyte
<b>CPU processing times</b>	
for bit operations, typ.	45 ns
for word operations, typ.	45 ns
for fixed point arithmetic, typ.	45 ns
for floating point arithmetic, typ.	135 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• present	Yes
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• present	Yes

Article number	<b>6ES7414-3FM06-0AB0</b> CPU414F-3 PN/DP, 4 MB, 3 INTERFACES
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Number, max.	8 kbyte; Size of bit memory address area
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	8 kbyte
• Outputs	8 kbyte
<b>Process image</b>	
• Inputs, adjustable	8 kbyte
• Outputs, adjustable	8 kbyte
<b>Hardware configuration</b>	
<b>Slots</b>	
• Required slots	2
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time clock)	Yes
<b>Operating hours counter</b>	
• Number	16
<b>Interfaces</b>	
Number of RS 485 interfaces	2
Number of other interfaces	0
<b>1st interface</b>	
Interface type	Integrated
Physics	RS 485 / PROFIBUS + MPI
<b>Functionality</b>	
• MPI	Yes
• DP master	Yes
• DP slave	Yes



**SIMATIC S7-400 advanced controller**

Central processing units

Fail-safe CPUs

**CPU 414F****Technical specifications (continued)**

Article number	<b>6ES7414-3FM06-0AB0</b> CPU414F-3 PN/DP, 4 MB, 3 INTERFACES
<b>DP master</b>	
• Number of DP slaves, max.	32
<b>2nd interface</b>	
Interface type	PROFINET
Physics	Ethernet RJ45
Number of ports	2
<b>Functionality</b>	
• DP master	No
• DP slave	No
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• PROFINET CBA	Yes
<b>PROFINET IO Controller</b>	
• Max. number of connectable IO devices for RT	256
• Number of IO devices with IRT and the option "high flexibility"	256
• Number of IO Devices with IRT and the option "high performance", max.	64
<b>3rd interface</b>	
Interface type	Pluggable interface module (IF)
Plug-in interface modules	IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
Physics	RS 485 / PROFIBUS
<b>Functionality</b>	
• MPI	No
• DP master	Yes
• DP slave	Yes
<b>DP master</b>	
• Number of DP slaves, max.	96
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes; Via PROFIBUS DP or PROFINET interface
<b>Communication functions</b>	
PG/OP communication	Yes
Data record routing	Yes
<b>Global data communication</b>	
• supported	Yes
<b>S7 basic communication</b>	
• supported	Yes
<b>S7 communication</b>	
• supported	Yes
<b>S5-compatible communication</b>	
• supported	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
<b>Standard communication (FMS)</b>	
• supported	Yes; Via CP and loadable FB
<b>Open IE communication</b>	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	62
• ISO-on-TCP (RFC1006)	Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs
- Number of connections, max.	62
• UDP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	62

Article number	<b>6ES7414-3FM06-0AB0</b> CPU414F-3 PN/DP, 4 MB, 3 INTERFACES
<b>Web server</b>	
• supported	Yes
<b>Number of connections</b>	
• overall	64
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes
- HiGraph®	Yes
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Block encryption	Yes; With S7 block Privacy
<b>Dimensions</b>	
Width	50 mm
Height	290 mm
Depth	219 mm
<b>Weights</b>	
Weight, approx.	900 g

Ordering data	Article No.	Article No.
<b>CPU 414F-3 PN/DP</b> For setting up safety-related automation system; main memory 4 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFINET interface, slot for memory card, module slot for 1 IF module, incl. slot number labels	<b>6ES7414-3FM06-0AB0</b>	
<b>Distributed Safety V5.4 programming tool</b> Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 and higher • Floating license • Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FC02-0YA5</b> <b>6ES7833-1FC02-0YH5</b>	
<b>Distributed Safety Upgrade</b> From V5.x to V5.4; Floating license for 1 user	<b>6ES7833-1FC02-0YE5</b>	
<b>STEP 7 Safety Advanced V13</b> Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 • Floating license for 1 user • Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FA13-0YA5</b> <b>6ES7833-1FA13-0YH5</b>	
<b>Memory Card RAM</b> 64 KB 256 KB 1 MB 2 MB 4 MB 8 MB 16 MB 64 MB	<b>6ES7952-0AF00-0AA0</b> <b>6ES7952-1AH00-0AA0</b> <b>6ES7952-1AK00-0AA0</b> <b>6ES7952-1AL00-0AA0</b> <b>6ES7952-1AM00-0AA0</b> <b>6ES7952-1AP00-0AA0</b> <b>6ES7952-1AS00-0AA0</b> <b>6ES7952-1AY00-0AA0</b>	
<b>FEPROM memory card</b> 64 KB 256 KB 1 MB 2 MB 4 MB 8 MB 16 MB 32 MB 64 MB		<b>6ES7952-0KF00-0AA0</b> <b>6ES7952-0KH00-0AA0</b> <b>6ES7952-1KK00-0AA0</b> <b>6ES7952-1KL00-0AA0</b> <b>6ES7952-1KM00-0AA0</b> <b>6ES7952-1KP00-0AA0</b> <b>6ES7952-1KS00-0AA0</b> <b>6ES7952-1KT00-0AA0</b> <b>6ES7952-1KY00-0AA0</b>
<b>MPI cable</b> for connection of SIMATIC S7 and PG via MPI; 5 m in length		<b>6ES7901-0BF00-0AA0</b>
<b>IF 964-DP interface module</b> For connecting an additional DP line		<b>6ES7964-2AA04-0AB0</b>
<b>Slot number plates</b> 1 set (spare part)		<b>6ES7912-0AA00-0AA0</b>
<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC		<b>6ES7998-8XC01-8YE0</b>
<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates		<b>6ES7998-8XC01-8YE2</b>
<b>PROFIBUS bus components</b>		
<b>RS 485 bus connector with 90° cable outlet</b> Max. transfer rate 12 Mbit/s • Without PG interface • With PG interface		<b>6ES7972-0BA12-0XA0</b> <b>6ES7972-0BB12-0XA0</b>
<b>RS 485 bus connector with angled cable outlet</b> Max. transfer rate 12 Mbit/s • Without PG interface • With PG interface		<b>6ES7972-0BA42-0XA0</b> <b>6ES7972-0BB42-0XA0</b>
<b>RS 485 bus connector with 90° cable outlet for FastConnect system</b> Max. transfer rate 12 Mbit/s • Without PG interface - 1 unit - 100 units • With PG interface - 1 unit - 100 units		<b>6ES7972-0BA52-0XA0</b> <b>6ES7972-0BA52-0XB0</b> <b>6ES7972-0BB52-0XA0</b> <b>6ES7972-0BB52-0XB0</b>

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

**SIMATIC S7-400 advanced controller**

Central processing units

Fail-safe CPUs

**CPU 414F****Ordering data****Article No.****RS 485 bus connector with axial cable outlet**

For SIMATIC OP, for connection to PPI, MPI, PROFIBUS

**6GK1500-0EA02****PROFIBUS FastConnect bus cable**

Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m

**6XV1830-0EH10****RS 485 repeater for PROFIBUS**

Transmission rate up to 12 Mbit/s; 24 V DC; IP20 enclosure

**6ES7972-0AA02-0XA0****PROFINET bus components****IE FC TP standard cable GP 2x2**

4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; Sold by the meter

**6XV1840-2AH10****FO Standard Cable GP (50/125)**

Standard cable, splittable, UL approval, sold by the meter

**6XV1873-2A****SCALANCE X204-2 Industrial Ethernet Switch**

Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports

**Article No.****6GK5204-2BB10-2AA3****IE FC RJ45 plugs**

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables

**IE FC RJ45 plug 180**

180° cable outlet

- 1 unit
- 10 units
- 50 units

**6GK1901-1BB10-2AA0****6GK1901-1BB10-2AB0****6GK1901-1BB10-2AE0****PROFIBUS/PROFINET bus components**

For establishing MPI/PROFIBUS/PROFINET communication

See IK PI, CA 01 catalogs

**Overview**

- For constructing a fail-safe automation system for plants with increased safety requirements
- High-performance CPU in the top-end performance range
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- Standard and safety-related tasks can be performed with a single CPU
- Multi-processor mode is possible
- Safety-related communication with distributed I/O devices over PROFIBUS DP with the *PROFIsafe* profile
- Fail-safe I/O modules can be connected decentralized over the integrated interfaces (DP and PN with CPU416F-3 PN/DP) and/or through communication modules (CP443-5 Ext. and CP443-1 Adv.)
- Standard modules for non-safety-related applications can be operated centrally and decentralized

**Technical specifications**

Article number	<b>6ES7416-2FN05-0AB0</b> CPU 416F-2, MPI, PROFIBUS, 5.6 MB	<b>6ES7416-3FS06-0AB0</b> CPU416F-3 PN/DP, 16 MB, 3 INTERFACES
<b>Product type designation</b>		
<b>General information</b>		
<b>Engineering with</b>		
• Programming package	STEP 7 V5.3 SP2 or higher with hardware update, Distributed Safety V5.2 SP2 or higher	STEP7 V5.5 or higher / iMap V3.0 + iMap STEP7 Add-on V3.0 SP5 or higher
<b>Supply voltage</b>		
Rated value (DC)		
• 24 V DC	No; Power supply via system power supply	No; Power supply via system power supply
<b>Power losses</b>		
Power loss, typ.	4.5 W	6.5 W
<b>Memory</b>		
<b>Work memory</b>		
• Integrated	5.6 Mbyte	16 Mbyte
• integrated (for program)	2.8 Mbyte	8 Mbyte
• integrated (for data)	2.8 Mbyte	8 Mbyte
<b>Load memory</b>		
• expandable FEPRAM, max.	64 Mbyte	64 Mbyte
• integrated RAM, max.	1 Mbyte	1 Mbyte
• expandable RAM, max.	64 Mbyte	64 Mbyte
<b>CPU processing times</b>		
for bit operations, typ.	30 ns	30 ns
for word operations, typ.	30 ns	30 ns
for fixed point arithmetic, typ.	30 ns	30 ns
for floating point arithmetic, typ.	90 ns	90 ns
<b>Counters, timers and their retentivity</b>		
<b>S7 counter</b>		
• Number	2 048	2 048
<b>IEC counter</b>		
• present	Yes	Yes
<b>S7 times</b>		
• Number	2 048	2 048
<b>IEC timer</b>		
• present	Yes	Yes
<b>Data areas and their retentivity</b>		
<b>Flag</b>		
• Number, max.	16 kbyte; Size of bit memory address area	16 kbyte; Size of bit memory address area

**SIMATIC S7-400 advanced controller**

Central processing units

Fail-safe CPUs

**CPU 416F****Technical specifications** (continued)

Article number	<b>6ES7416-2FN05-0AB0</b>	<b>6ES7416-3FS06-0AB0</b>
	CPU 416F-2, MPI, PROFIBUS, 5.6 MB	CPU416F-3 PN/DP, 16 MB, 3 INTERFACES
<b>Address area</b>		
<b>I/O address area</b>		
• Inputs	16 kbyte	16 kbyte
• Outputs	16 kbyte	16 kbyte
<b>Process image</b>		
• Inputs, adjustable	16 kbyte	16 kbyte
• Outputs, adjustable	16 kbyte	16 kbyte
<b>Hardware configuration</b>		
<b>Slots</b>		
• Required slots	1	2
<b>Time of day</b>		
<b>Clock</b>		
• Hardware clock (real-time clock)	Yes	Yes
<b>Operating hours counter</b>		
• Number	16	16
<b>Interfaces</b>		
Number of RS 485 interfaces	2	2
Number of other interfaces	0	0
<b>1st interface</b>		
Interface type	Integrated	Integrated
Physics	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI
<b>Functionality</b>		
• MPI	Yes	Yes
• DP master	Yes	Yes
• DP slave	Yes	Yes
<b>DP master</b>		
• Number of DP slaves, max.	32	32
<b>2nd interface</b>		
Interface type	Integrated	PROFINET
Physics	RS 485 / PROFIBUS	Ethernet RJ45
Number of ports		2
<b>Functionality</b>		
• DP master	Yes	No
• DP slave	Yes	No
• PROFINET IO Controller		Yes
• PROFINET IO Device		Yes
• PROFINET CBA		Yes
<b>DP master</b>		
• Number of DP slaves, max.	125	
<b>PROFINET IO Controller</b>		
• Max. number of connectable IO devices for RT		256
• Number of IO devices with IRT and the option "high flexibility"		256
• Number of IO Devices with IRT and the option "high performance", max.		64
<b>3rd interface</b>		
Interface type		Pluggable interface module (IF)
Plug-in interface modules		IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
Physics		RS 485 / PROFIBUS
<b>Functionality</b>		
• MPI		No
• DP master		Yes
• DP slave		Yes
<b>DP master</b>		
• Number of DP slaves, max.		125

**Technical specifications (continued)**

Article number	<b>6ES7416-2FN05-0AB0</b> CPU 416F-2, MPI, PROFIBUS, 5.6 MB	<b>6ES7416-3FS06-0AB0</b> CPU416F-3 PN/DP, 16 MB, 3 INTERFACES
<b>Isochronous mode</b>		
Isochronous operation (application synchronized up to terminal)	Yes; For PROFIBUS only	Yes; Via PROFIBUS DP or PROFINET interface
<b>Communication functions</b>		
PG/OP communication	Yes	Yes
Data record routing	Yes	Yes
<b>Global data communication</b>		
• supported	Yes	Yes
<b>S7 basic communication</b>		
• supported	Yes	Yes
<b>S7 communication</b>		
• supported	Yes	Yes
<b>S5-compatible communication</b>		
• supported	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
<b>Standard communication (FMS)</b>		
• supported	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB
<b>Open IE communication</b>		
• TCP/IP		Yes; via integrated PROFINET interface and loadable FBs 94
- Number of connections, max.		94
• ISO-on-TCP (RFC1006)	Via CP 443-1 and loadable FB	Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs 94
- Number of connections, max.		94
• UDP		Yes; via integrated PROFINET interface and loadable FBs 94
- Number of connections, max.		94
<b>Web server</b>		
• supported	No	Yes
<b>Number of connections</b>		
• overall	64	96
<b>Configuration</b>		
<b>Programming</b>		
<b>Programming language</b>		
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes
- CFC	Yes	Yes
- GRAPH	Yes	Yes
- HiGraph®	Yes	Yes
<b>Know-how protection</b>		
• User program protection/password protection	Yes	Yes
• Block encryption		Yes; With S7 block Privacy
<b>Dimensions</b>		
Width	25 mm	50 mm
Height	290 mm	290 mm
Depth	219 mm	219 mm
<b>Weights</b>		
Weight, approx.	0.7 kg	900 g

**SIMATIC S7-400 advanced controller**

Central processing units

Fail-safe CPUs

**CPU 416F****Ordering data****Article No.****Article No.****CPU 416F-2**

For configuring safety-related automation systems;  
5.6 MB RAM, 24 V DC power supply, MPI/PROFIBUS DP master interface, PROFIBUS DP master interface, slot for memory card, incl. slot number labels

**6ES7416-2FN05-0AB0****CPU 416F-3 PN/DP**

For configuring safety-related automation systems;  
main memory 16 MB, 24 V DC power supply, MPI/PROFIBUS DP master interface, PROFINET interface, PROFIBUS DP master interface, receptacle for 1 IF module, slot for memory card, incl. slot number labels

**6ES7416-3FS06-0AB0****S7 Distributed Safety V5.4 programming tool****Task:**

Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco

**Requirement:**

STEP 7 V5.3 SP3 and higher

- Floating license
- Floating license for 1 user, license key download without software or documentation<sup>1)</sup>; email address required for delivery

**6ES7833-1FC02-0YA5**  
**6ES7833-1FC02-0YH5****S7 Distributed Safety upgrade**

From V5.x to V5.4; Floating license for 1 user

**6ES7833-1FC02-0YE5****STEP 7 Safety Advanced V13****Task:**

Engineering tool for configuring fail-safe user programs for SIMATIC S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco

**Requirement:**

STEP 7 Professional V13

- Floating license for 1 user
- Floating license for 1 user, license key download without software or documentation<sup>1)</sup>; email address required for delivery

**6ES7833-1FA13-0YA5**  
**6ES7833-1FA13-0YH5****Memory card RAM**

64 KB

**6ES7952-0AF00-0AA0**

256 KB

**6ES7952-1AH00-0AA0**

1 MB

**6ES7952-1AK00-0AA0**

2 MB

**6ES7952-1AL00-0AA0**

4 MB

**6ES7952-1AM00-0AA0**

8 MB

**6ES7952-1AP00-0AA0**

16 MB

**6ES7952-1AS00-0AA0**

64 MB

**6ES7952-1AY00-0AA0****FEPRAM memory card**

64 KB

**6ES7952-0KF00-0AA0**

256 KB

**6ES7952-0KH00-0AA0**

1 MB

**6ES7952-1KK00-0AA0**

2 MB

**6ES7952-1KL00-0AA0**

4 MB

**6ES7952-1KM00-0AA0**

8 MB

**6ES7952-1KP00-0AA0**

16 MB

**6ES7952-1KS00-0AA0**

32 MB

**6ES7952-1KT00-0AA0**

64 MB

**6ES7952-1KY00-0AA0****MPI cable**

For connection of SIMATIC S7 and PG via MPI; 5 m in length

**6ES7901-0BF00-0AA0****IF 964-DP interface module**

For connecting an additional DP line

**6ES7964-2AA04-0AB0****Slot number plates**

1 set (spare part)

**6ES7912-0AA00-0AA0****SIMATIC Manual Collection**

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**6ES7998-8XC01-8YE0****SIMATIC Manual Collection update service for 1 year**

Current "Manual Collection" DVD and the three subsequent updates

**6ES7998-8XC01-8YE2****PROFIBUS bus components****RS 485 bus connector with 90° cable outlet**

Max. transfer rate 12 Mbit/s

- without PG interface
- with PG interface

**6ES7972-0BA12-0XA0**  
**6ES7972-0BB12-0XA0****RS 485 bus connector with angled cable outlet**

Max. transfer rate 12 Mbit/s

- without PG interface
- with PG interface

**6ES7972-0BA42-0XA0**  
**6ES7972-0BB42-0XA0****RS 485 bus connector with 90° cable outlet for FastConnect system**

Max. transfer rate 12 Mbit/s

- without PG interface
  - 1 unit
  - 100 units
- with PG interface
  - 1 unit
  - 100 units

**6ES7972-0BA52-0XA0**  
**6ES7972-0BA52-0XB0****6ES7972-0BB52-0XA0**  
**6ES7972-0BB52-0XB0****RS 485 bus connector with axial cable outlet**

For SIMATIC OP, for connection to PPI, MPI, PROFIBUS

**6GK1500-0EA02**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

Ordering data	Article No.	Ordering data	Article No.
<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for fast mounting, 2-core, shielded, sold by the meter; max. delivery unit 1 000 m, minimum ordering quantity 20 m	6XV1830-0EH10	<b>SCALANCE X204-2 Industrial Ethernet Switch</b> Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports	6GK5204-2BB10-2AA3
<b>RS 485 repeater for PROFIBUS</b> Transfer rate up to 12 Mbps; 24 V DC; IP20 enclosure	6ES7972-0AA02-0XA0	<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
<b>PROFINET bus components</b>		<b>IE FC RJ45 plug 180</b> 180° cable outlet <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> <li>• 50 units</li> </ul>	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>
<b>IE FC TP standard cable GP 2x2</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; Sold by the meter	6XV1840-2AH10	<b>PROFIBUS/PROFINET bus components</b> For establishing MPI/PROFIBUS/PROFINET communication	See IK PI, CA 01 catalogs
<b>FO Standard Cable GP (50/125)</b> Standard cable, splittable, UL approval, sold by the meter	6XV1873-2A		



**SIMATIC S7-400 advanced controller**

Central processing units

High-availability CPUs

CPU 412-5H, CPU 414-5H, CPU 416-5H, CPU 417-5H

**Overview**

- CPU for SIMATIC S7-400H and S7-400F/FH
- Can be used in S7-400H high-availability systems
- Can be used with F runtime license as F-capable CPU in S7-400F/FH safety-related systems
- With integrated PROFIBUS DP master and combined MPI/PROFIBUS DP master interface
- With integrated PROFINET interface (2-port switch)
- Features 2 slots for sync modules

**Technical specifications**

Article number	6ES7412-5HK06-0AB0	6ES7414-5HM06-0AB0	6ES7416-5HS06-0AB0	6ES7417-5HT06-0AB0
	CPU412-5H PN/DP, 1MB F. S7-400H/F/FH	CPU414-5H PN/DP, 4MB F. S7-400H/F/FH	CPU416-5H PN/DP, 16MB F. S7-400H/F/FH	CPU417-5H PN/DP, 32MB F. S7-400H/F/FH
<b>Product type designation</b>				
<b>General information</b>				
<b>Engineering with</b>				
• Programming package	As of STEP 7 V5.5 SP2 with HF1	As of STEP 7 V5.5 SP2 with HF1	As of STEP 7 V5.5 SP2 with HF1	As of STEP 7 V5.5 SP2 with HF1
<b>Supply voltage</b>				
Rated value (DC)				
• 24 V DC	No; Power supply via system power supply	No; Power supply via system power supply	No; Power supply via system power supply	No; Power supply via system power supply
<b>Power losses</b>				
Power loss, typ.	7.5 W	7.5 W	7.5 W	7.5 W
<b>Memory</b>				
<b>Work memory</b>				
• Integrated	1 Mbyte	4 Mbyte	16 Mbyte	32 Mbyte
• integrated (for program)	512 kbyte	2 Mbyte	6 Mbyte	16 Mbyte
• integrated (for data)	512 kbyte	2 Mbyte	10 Mbyte	16 Mbyte
<b>Load memory</b>				
• expandable FEPRAM, max.	64 Mbyte	64 Mbyte	64 Mbyte	64 Mbyte
• integrated RAM, max.	512 kbyte	512 kbyte	1 Mbyte	1 Mbyte
• expandable RAM, max.	64 Mbyte	64 Mbyte	64 Mbyte	64 Mbyte
<b>CPU processing times</b>				
for bit operations, typ.	31.25 ns	18.75 ns	12.5 ns	7.5 ns
for word operations, typ.	31.25 ns	18.75 ns	12.5 ns	7.5 ns
for fixed point arithmetic, typ.	31.25 ns	18.75 ns	12.5 ns	7.5 ns
for floating point arithmetic, typ.	62.5 ns	37.5 ns	25 ns	15 ns
<b>Counters, timers and their retentivity</b>				
<b>S7 counter</b>				
• Number	2 048	2 048	2 048	2 048
<b>IEC counter</b>				
• present	Yes	Yes	Yes	Yes
<b>S7 times</b>				
• Number	2 048	2 048	2 048	2 048
<b>IEC timer</b>				
• present	Yes	Yes	Yes	Yes
<b>Data areas and their retentivity</b>				
<b>Flag</b>				
• Number, max.	8 192 byte	8 192 byte	16 384 byte	16 384 byte

## Technical specifications (continued)

Article number	6ES7412-5HK06-0AB0 CPU412-5H PN/DP, 1MB F. S7-400H/F/FH	6ES7414-5HM06-0AB0 CPU414-5H PN/DP, 4MB F. S7-400H/F/FH	6ES7416-5HS06-0AB0 CPU416-5H PN/DP, 16MB F. S7-400H/F/FH	6ES7417-5HT06-0AB0 CPU417-5H PN/DP, 32MB F. S7-400H/F/FH
<b>Address area</b>				
<b>I/O address area</b>				
• Inputs	8 kbyte	8 kbyte	16 kbyte	16 kbyte
• Outputs	8 kbyte	8 kbyte	16 kbyte	16 kbyte
<b>Process image</b>				
• Inputs, adjustable	8 kbyte	8 kbyte	16 kbyte	16 kbyte
• Outputs, adjustable	8 kbyte	8 kbyte	16 kbyte	16 kbyte
<b>Hardware configuration</b>				
<b>Slots</b>				
• Required slots	2	2	2	2
<b>Time of day</b>				
<b>Clock</b>				
• Hardware clock (real-time clock)	Yes	Yes	Yes	Yes
<b>Operating hours counter</b>				
• Number	16	16	16	16
<b>Interfaces</b>				
Number of RS 485 interfaces	2	2	2	2
Number of other interfaces	2; Fiber-optic interface	2; Fiber-optic interface	2; Fiber-optic interface	2; Fiber-optic interface
<b>1st interface</b>				
Interface type	Integrated	Integrated	Integrated	Integrated
Physics	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI
<b>Functionality</b>				
• MPI	Yes	Yes	Yes	Yes
• DP master	Yes	Yes	Yes	Yes
• DP slave	No	No	No	No
<b>DP master</b>				
• Number of DP slaves, max.	32	32	32	32
<b>2nd interface</b>				
Interface type	PROFINET	PROFINET	PROFINET	PROFINET
Physics	Ethernet RJ45	Ethernet RJ45	Ethernet RJ45	Ethernet RJ45
Number of ports	2	2	2	2
<b>Functionality</b>				
• DP master	No	No	No	No
• DP slave	No	No	No	No
• PROFINET IO Controller	Yes	Yes	Yes	Yes
• PROFINET IO Device	No	No	No	No
• PROFINET CBA	No	No	No	No
<b>PROFINET IO Controller</b>				
• Max. number of connectable IO devices for RT	256	256	256	256
<b>3rd interface</b>				
Interface type	Integrated	Integrated	Integrated	Integrated
Physics	RS 485 / PROFIBUS	RS 485 / PROFIBUS	RS 485 / PROFIBUS	RS 485 / PROFIBUS
<b>Functionality</b>				
• DP master	Yes	Yes	Yes	Yes
• DP slave	No	No	No	No
<b>DP master</b>				
• Number of DP slaves, max.	64	96	125	125
<b>4th interface</b>				
Interface type	Pluggable synchronization submodule (FO)	Pluggable synchronization submodule (FO)	Pluggable synchronization submodule (FO)	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization modules 6ES7960-1AA06-0XA0 or 6ES7960-1AB06-0XA0	Synchronization modules 6ES7960-1AA06-0XA0 or 6ES7960-1AB06-0XA0	Synchronization modules 6ES7960-1AA06-0XA0 or 6ES7960-1AB06-0XA0	Synchronization modules 6ES7960-1AA06-0XA0 or 6ES7960-1AB06-0XA0

**SIMATIC S7-400 advanced controller**

Central processing units

High-availability CPUs

CPU 412-5H, CPU 414-5H, CPU 416-5H, CPU 417-5H

**Technical specifications (continued)**

Article number	<b>6ES7412-5HK06-0AB0</b> CPU412-5H PN/DP, 1MB F. S7-400H/F/FH	<b>6ES7414-5HM06-0AB0</b> CPU414-5H PN/DP, 4MB F. S7-400H/F/FH	<b>6ES7416-5HS06-0AB0</b> CPU416-5H PN/DP, 16MB F. S7-400H/F/FH	<b>6ES7417-5HT06-0AB0</b> CPU417-5H PN/DP, 32MB F. S7-400H/F/FH
<b>5. Interface</b>				
Interface type	Pluggable synchronization submodule (FO)	Pluggable synchronization submodule (FO)	Pluggable synchronization submodule (FO)	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization modules 6ES7960-1AA06-0XA0 or 6ES7960-1AB06-0XA0	Synchronization modules 6ES7960-1AA06-0XA0 or 6ES7960-1AB06-0XA0	Synchronization modules 6ES7960-1AA06-0XA0 or 6ES7960-1AB06-0XA0	Synchronization modules 6ES7960-1AA06-0XA0 or 6ES7960-1AB06-0XA0
<b>Isochronous mode</b>				
Isochronous operation (application synchronized up to terminal)	No	No	No	No
<b>Communication functions</b>				
PG/OP communication	Yes	Yes	Yes	Yes
Data record routing	Yes	Yes	Yes	Yes
S7 routing	Yes	Yes	Yes	Yes
<b>Global data communication</b>				
• supported	No	No	No	No
<b>S7 basic communication</b>				
• supported	No	No	No	No
<b>S7 communication</b>				
• supported	Yes	Yes	Yes	Yes
<b>S5-compatible communication</b>				
• supported	Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV)	Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV)	Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV)	Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV)
<b>Standard communication (FMS)</b>				
• supported	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB
<b>Open IE communication</b>				
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	46	62	94	118
• ISO-on-TCP (RFC1006)	Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs	Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs	Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs	Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs
- Number of connections, max.	46	62	94	118
• UDP	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	46	62	94	118
<b>Web server</b>				
• supported	No	No	No	No
<b>Number of connections</b>				
• overall	48	64	96	120
<b>Configuration</b>				
<b>Programming</b>				
<b>Programming language</b>				
- LAD	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- CFC	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes	Yes
<b>Know-how protection</b>				
• User program protection/password protection	Yes	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>				
Width	50 mm	50 mm	50 mm	50 mm
Height	290 mm	290 mm	290 mm	290 mm
Depth	219 mm	219 mm	219 mm	219 mm
<b>Weights</b>				
Weight, approx.	995 g	995 g	995 g	995 g

**SIMATIC S7-400 advanced controller**

Central processing units

High-availability CPUs

CPU 412-5H, CPU 414-5H, CPU 416-5H, CPU 417-5H

Ordering data	Article No.	Ordering data	Article No.
<b>CPU 412-5H</b> For S7-400H and S7-400F/FH; 1 MB RAM, 1 combined MPI/ PROFIBUS DP master interface, 1 PROFIBUS DP interface, 2 PROFINET interfaces (switches), 2 slots for sync modules, slot for memory card, incl. slot number labels	<b>6ES7412-5HK06-0AB0</b>	<b>CPU 417-5H</b> For S7-400H and S7-400F/FH; 32 MB RAM, 1 combined MPI/ PROFIBUS DP master interface, 1 PROFIBUS DP interface, 2 PROFINET interfaces (switches), 2 slots for sync modules, slot for memory card, incl. slot number labels	<b>6ES7417-5HT06-0AB0</b>
<b>CPU 412-5H system bundle</b> Not assembled, consisting of: UR2-H rack, 2 x PS 405/407 power supply units, 2 x CPU 412-5H, 4 x sync modules (for max. 10 m), 2 x fiber optic cables for sync modules (1 m), 4 x backup batteries; two additional memory cards required (to be ordered separately) • CPU 412-5H system bundle, 120/230 V AC, 10 A • CPU 412-5H system bundle, 24/48/60 V DC, 10 A	<b>6ES7400-0HR01-4AB0</b>  <b>6ES7400-0HR51-4AB0</b>	<b>CPU 417-5H system bundle</b> Not assembled, consisting of: UR2-H rack, 2 x PS 405/407 power supply units, 2 x CPU 417-5H, 4 x sync modules (for max. 10 m), 2 x fiber optic cables for sync mod- ules (1 m), 4 x backup batteries; two additional memory cards required (to be ordered separately) • CPU 417-5H system bundle, 120/230 V AC, 10 A • CPU 417-5H system bundle, 24/48/60 V DC, 10 A	<b>6ES7400-0HR04-4AB0</b>  <b>6ES7400-0HR54-4AB0</b>
<b>CPU 414-5H</b> For S7-400H and S7-400F/FH; 4 MB RAM, 1 combined MPI/ PROFIBUS DP master interface, 1 PROFIBUS DP interface, 2 PROFINET interfaces (switches), 2 slots for sync modules, slot for memory card, incl. slot number labels	<b>6ES7414-5HM06-0AB0</b>	<b>Memory card RAM</b> 1 MB 2 MB 4 MB 8 MB 16 MB 64 MB	<b>6ES7952-1AK00-0AA0</b> <b>6ES7952-1AL00-0AA0</b> <b>6ES7952-1AM00-0AA0</b> <b>6ES7952-1AP00-0AA0</b> <b>6ES7952-1AS00-0AA0</b> <b>6ES7952-1AY00-0AA0</b>
<b>CPU 414-5H system bundle</b> Not assembled, consisting of: UR2-H rack, 2 x PS 405/407 power supply units, 2 x CPU 414-5H, 4 x sync modules (for max. 10 m), 2 x fiber optic cables for sync mod- ules (1 m), 4 x backup batteries; additional two memory cards required (to be ordered separately) • CPU 414-5H system bundle, 120/230 V AC, 10 A • CPU 414-5H system bundle, 24/48/60 V DC, 10 A	<b>6ES7400-0HR02-4AB0</b>  <b>6ES7400-0HR52-4AB0</b>	<b>FEPROM memory card</b> 1 MB 2 MB 4 MB 8 MB 16 MB 32 MB 64 MB	<b>6ES7952-1KK00-0AA0</b> <b>6ES7952-1KL00-0AA0</b> <b>6ES7952-1KM00-0AA0</b> <b>6ES7952-1KP00-0AA0</b> <b>6ES7952-1KS00-0AA0</b> <b>6ES7952-1KT00-0AA0</b> <b>6ES7952-1KY00-0AA0</b>
<b>CPU 416-5H</b> For S7-400H and S7-400F/FH; 16 MB RAM, 1 combined MPI/ PROFIBUS DP master interface, 1 PROFIBUS DP interface, 2 PROFINET interfaces (switches), 2 slots for sync modules, slot for memory card, incl. slot number labels	<b>6ES7416-5HS06-0AB0</b>	<b>MPI cable</b> For connection of SIMATIC S7 and PG via MPI; 5 m in length	<b>6ES7901-0BF00-0AA0</b>
<b>CPU 416-5H system bundle</b> Not assembled, consisting of: UR2-H rack, 2 x PS 405/407 power supply units, 2 x CPU 416-5H, 4 x sync modules (for max. 10 m), 2 x fiber optic cables for sync mod- ules (1 m), 4 x backup batteries; two additional memory cards required (to be ordered separately) • CPU 416-5H system bundle, 120/230 V AC, 10 A • CPU 416-5H system bundle, 24/48/60 V DC, 10 A	<b>6ES7400-0HR03-4AB0</b>  <b>6ES7400-0HR53-4AB0</b>	<b>Slot number plates</b> 1 set (spare part)	<b>6ES7912-0AA00-0AA0</b>
		<b>S7 F Systems RT License</b> For processing safety-related user programs, for one S7-400H-based system each with CPU 412-5H, CPU 414-5H, CPU 416-5H or CPU 417-5H	<b>6ES7833-1CC00-6YX0</b>
		<b>S7 F Systems V6.1</b> Programming and configuring envi- ronment for creating and operating safety-related STEP 7 programs for an S7-400H-based target system, floating license for 1 user, runs with Windows XP Prof SP2, Windows XP Prof SP2/SP3, Windows Server 2003 SP2 2 languages (English, German) Type of delivery: Certificate of License as well as software and electronic documenta- tion on CD	<b>6ES7833-1CC02-0YA5</b>

**SIMATIC S7-400 advanced controller**

Central processing units

High-availability CPUs

CPU 412-5H, CPU 414-5H, CPU 416-5H, CPU 417-5H

**Ordering data****Article No.****Article No.****S7 F systems upgrade from V5.x/V6.0 to V6.1**

2 languages (English, German), floating license for 1 user

Type of delivery:

Certificate of License as well as software and electronic documentation on CD

**6ES7833-1CC02-0YE5****SIMATIC Manual Collection**

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**6ES7998-8XC01-8YE0****SIMATIC Manual Collection update service for 1 year**

Current "Manual Collection" DVD and the three subsequent updates

**6ES7998-8XC01-8YE2****RS 485 bus connector with 90° cable outlet**

Max. transfer rate 12 Mbit/s

- Without PG interface
- With PG interface

**6ES7972-0BA12-0XA0****6ES7972-0BB12-0XA0****RS 485 bus connector with angled cable outlet**

- Max. transfer rate 12 Mbit/s

- Without PG interface
- With PG interface

**6ES7972-0BA42-0XA0****6ES7972-0BB42-0XA0**

- Max. transfer rate 1.5 Mbit/s

- Without PG interface

**6ES7972-0BA30-0XA0****Bus connector RS 485 with 90° cable outlet for FastConnect connection technology**

Max. transfer rate 12 Mbit/s

- Without PG interface

- 1 unit
- 100 units

**6ES7972-0BA52-0XA0****6ES7972-0BA52-0XB0**

- With PG interface

- 1 unit
- 100 units

**6ES7972-0BB52-0XA0****6ES7972-0BB52-0XB0****RS 485 bus connector with axial cable outlet**

For SIMATIC OP, for connection to PPI, MPI, PROFIBUS

**6GK1500-0EA02****PROFIBUS FastConnect bus cable**

Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m

**6XV1830-0EH10**

**Overview**

- For coupling the two CPU 41xH in the S7-400H subunits.
- Can be plugged direct into the CPU

**Technical specifications**

Article number	<b>6ES7960-1AA06-0XA0</b> S7 SYNC-MOD. V6 F. S7-400H/F/FH	<b>6ES7960-1AB06-0XA0</b> S7 SYNC-MOD. V6 F. S7-400H/F/FH
<b>Product type designation</b>		
<b>Input current</b> from CPU, max.	220 mA	240 mA
<b>Power losses</b> Power loss, typ.	0.77 W	0.83 W
<b>Dimensions</b>		
Width	13 mm	13 mm
Height	14 mm	14 mm
Depth	58 mm	58 mm
<b>Weights</b> Weight, approx.	14 g	14 g

**Ordering data**

	<b>Article No.</b>		<b>Article No.</b>
<b>Sync module</b> For coupling the CPU 41xH for S7-400H/F/FH; 2 modules required per CPU		<b>Fiber-optic connecting cable</b> For sync module 6ES7960-1AA06-0XA0	
<ul style="list-style-type: none"> <li>• For patch cable, can be used with fiber-optic cables up to 10 m</li> <li>• For patch and installation cables, can be used with fiber-optic cables up to 10 km</li> </ul>	<b>6ES7960-1AA06-0XA0</b>  <b>6ES7960-1AB06-0XA0</b>	<ul style="list-style-type: none"> <li>• 1 m</li> <li>• 2 m</li> <li>• 10 m</li> </ul> For Sync module 6ES7960-1AB06-0XA0; fiber-optic monomode LC/LC duplex crossed 9/125 μ (max. 10 km)	<b>6ES7960-1AA04-5AA0</b> <b>6ES7960-1AA04-5BA0</b> <b>6ES7960-1AA04-5KA0</b>  On request

## SIMATIC S7-400 advanced controller

Central processing units

High-availability CPUs

### Y-link for S7-400H

#### Overview



- Transceiver for the transition from a redundant PROFIBUS DP master system to a single-channel PROFIBUS DP master system
- To connect devices with a single PROFIBUS DP interface to the redundant PROFIBUS DP master system of the SIMATIC S7-400H

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#### Technical specifications

Article number	<b>6ES7153-2BA02-0XB0</b> ET200M, INTERFACE IM153-2 HF
<b>Product type designation</b>	
<b>General information</b>	
Vendor identification (VendorID)	801Eh
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
permissible range (ripple included), lower limit (DC)	20.4 V
permissible range (ripple included), upper limit (DC)	28.8 V
External protection for supply cables (recommendation)	2,5 A
<b>Mains buffering</b>	
• Mains/voltage failure stored energy time	5 ms
<b>Input current</b>	
Current consumption, max.	600 mA
Inrush current, typ.	3 A
$I^2t$	0.1 A <sup>2</sup> ·s
<b>Output voltage</b>	
Rated value (DC)	5 V
<b>Output current</b>	
for backplane bus (5 V DC), max.	1.5 A
<b>Power losses</b>	
Power loss, typ.	5.5 W
<b>Address area</b>	
<b>Addressing volume</b>	
• Inputs	244 byte
• Outputs	244 byte
<b>Hardware configuration</b>	
Number of modules per DP slave interface, max.	12

Article number	<b>6ES7153-2BA02-0XB0</b> ET200M, INTERFACE IM153-2 HF
<b>Time stamping</b>	
Accuracy	1 ms; 1ms at up to 8 modules; 10ms at up to 12 modules
Number of message buffers	15
Messages per message buffer	20
Number of stampable digital inputs, max.	128; Max. 128 signals / station; max. 32 signals / slot
Time format	RFC 1119
Time resolution	0.466 ns
Time interval for transmitting the message buffer if a message is present	1 000 ms
Time stamp on signal change	rising / falling edge as signal entering or exiting
<b>Interfaces</b>	
Interface physics, RS 485	Yes
Interface physics, FOC	No
<b>PROFIBUS DP</b>	
• Node addresses	1 to 125 permitted
• Automatic detection of transmission speed	Yes
• Output current, max.	70 mA
• Transmission rate, max.	12 Mbit/s
• Transmission procedure	RS 485
• SYNC capability	Yes
• FREEZE capability	Yes
• Direct data exchange (slave-to-slave communication)	Yes; Sender
• Connector type	9-pin sub D
<b>1st interface</b>	
<b>DP slave</b>	
• GSD file	SI04801.GSG
• Automatic baud rate search	Yes
<b>Protocols</b>	
Bus protocol/transmission protocol	PROFIBUS DP to EN 50170
<b>Isolation</b>	
Isolation checked with	Isolation voltage 500 V
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP20	Yes

## Technical specifications (continued)

Article number	<b>6ES7153-2BA02-0XB0</b> ET200M, INTERFACE IM153-2 HF
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	0 °C
• max.	60 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Operating altitude above sea level, max.	3 000 m
<b>Configuration</b>	
<b>Configuration software</b>	
• STEP 7	Yes; STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	117 mm
<b>Weights</b>	
Weight, approx.	360 g

Article number	<b>6ES7197-1LB00-0XA0</b> Y-COUPLER F. BUILDING Y-LINK, REDUNDANT
<b>Product type designation</b>	
<b>General information</b>	
<b>Requirements for DP master system</b>	
• Length of parameter assignment message	244 byte
<b>Supply voltage</b>	
Description	via bus module
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Interfaces</b>	
<b>PROFIBUS DP</b>	
<b>Properties of the lower-level DP master systems</b>	
- Transmission rate, max.	12 Mbit/s; 45.45 kbit/s to 12 Mbit/s
- Termination of lower-level DP master system	Active terminating resistor (Bus Terminator)
- Use of OLM/OBT	Yes
- Use of RS 485 repeaters, max.	9
- Number of DP slaves, max.	31; 64 when using RS 485 repeaters or OLM/OBT
<b>Protocols</b>	
PROFIBUS DP	Yes
AS-Interface	No
<b>Interrupts/diagnostics/status information</b>	
Status indicator	No
<b>Alarms</b>	
• Alarms	No
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
<b>Galvanic isolation</b>	
to lower-level DP master system	Yes
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	130 mm
<b>Weights</b>	
Weight, approx.	200 g

## Ordering data

## Article No.

## Article No.

For use with STEP 7 from V5.4 or SIMATIC PCS 7 from V7.0

**Y link****6ES7197-1LA04-0XA0**

For connecting single-channel DP slaves to SIMATIC S7-400H; consisting of:  
2 IM 153 interface modules (6ES7153-2BA02-0XB0),  
1 Y-coupler (6ES7197-1LB00-0XA0),  
1 BM IM/IM bus module (6ES7195-7HD80-0XA0),  
1 BM Y-coupler bus module (6ES7654-7HY00-0XA0)

For use with SIMATIC PCS 7 V6.0 or higher

**Y link****6ES7197-1LA11-0XA0**

For connecting single-channel DP slaves to SIMATIC S7-400H; consisting of:  
2 IM 153 interface modules (6ES7153-2BA82-0XB0),  
1 Y-coupler (6ES7197-1LB00-0XA0),  
1 BM IM/IM bus module (6ES7195-7HD80-0XA0),  
1 BM Y-coupler bus module (6ES7654-7HY00-0XA0)

**Accessories****Mounting rail**

For assembling the Y link with active bus modules

- Length 483 mm
- Length 530 mm

**6ES7195-1GA00-0XA0**  
**6ES7195-1GF30-0XA0**



**SIMATIC S7-400 advanced controller**

Central processing units

SIPLUS S7-400 high-availability CPUs

**SIPLUS S7-400 CPU 412H****Overview**

- CPU for SIMATIC S7-400H and S7-400F/FH
- Usable in high-availability systems such as the S7-400H
- Usable with F runtime license as F-capable CPU in S7-400F/FH safety-related systems
- Features a combined MPI/PROFIBUS DP master interface
- Features 2 slots for sync modules

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	<b>6AG1412-5HK06-7AB0</b>
Based on	<b>6ES7412-5HK06-0AB0</b> SIPLUS S7-400 CPU 412-5H
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	70 °C
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m). For "F-Systems" applications max. +2000 m above sea level permissible
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.****SIPLUS S7-400 CPU 412-5H**

CPU for S7-400H with 1 MB RAM (0.5 MB code and 0.5 MB data); 5 interfaces: 1x MPI/DP, DP, PN each and 2 slots for sync modules

Extended temperature range and exposure to media

**6AG1412-5HK06-7AB0****Accessories****Memory card RAM**

(medial exposure)

- 2 MB

**6AG1952-1AL00-4AA0**

Extended temperature range and exposure to media

- 4 MB
- 8 MB
- 16 MB
- 64 MB

**6AG1952-1AM00-7AA0****6AG1952-1AP00-7AA0****6AG1952-1AS00-7AA0****6AG1952-1AY00-7AA0****FEPRAM memory card**

Exposure to media

32 MB

**6AG1952-1KT00-4AA0****RS 485 bus connector with 90° cable outlet**

Max. transfer rate 12 Mbit/s

Extended temperature range and exposure to media

- Without PG interface
- With PG interface

**6AG1972-0BA12-2XA0****6AG1972-0BB12-2XA0****RS 485 bus connector with angled cable outlet**

Max. transmission rate 12 Mbit/s

Extended temperature range and exposure to media

- Without PG interface
- With PG interface

**6AG1972-0BA42-7XA0****6AG1972-0BB42-7XA0****RS 485 bus connector with axial cable outlet**

For SIPLUS OP, for connection to PPI, MPI, PROFIBUS

Extended temperature range and exposure to media

**6AG1500-0EA02-2AA0****RS 485 repeater for PROFIBUS**

Transfer rate up to 12 Mbit/s; 24 V DC; IP20 enclosure

Extended temperature range and exposure to media

**6AG1972-0AA02-7XA0****Additional accessories**

See SIMATIC CPU 412-5H, page 6/37

# SIMATIC S7-400 advanced controller

## Central processing units

### SIPLUS S7-400 high-availability CPUs

SIPLUS S7-400 CPU 414H

## Overview



CPU for SIMATIC S7-400H and S7-400F/FH

- Usable in high-availability systems such as the S7-400H
- Usable with F runtime license as F-capable CPU in S7-400F/FH safety-related systems
- With integral PROFIBUS DP master interface
- Features 2 slots for sync modules

### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

## Technical specifications

Article number	<b>6AG1414-5HM06-7AB0</b>
Based on	<b>6ES7414-5HM06-0AB0</b> SIPLUS S7-400 CPU 414-5H
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C
• max.	70 °C; For "F-Systems" applications max. +60 °C permissible
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m). For "F-Systems" applications max. +2000 m above sea level permissible
<b>Relative humidity</b>	
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

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## Ordering data

Article No.	Article No.
<b>SIPLUS S7-400 CPU 414-5H</b> CPU for S7-400H with 4 MB RAM (2 MB code and 2 MB data); 5 interfaces: 1x MPI/DP, DP, PN each and 2 slots for sync modules Extended temperature range and exposure to media <b>6AG1414-5HM06-7AB0</b>	<b>RS 485 bus connector with angled cable outlet</b> Max. transmission rate 12 Mbit/s Extended temperature range and exposure to media • Without PG interface • With PG interface <b>6AG1972-0BA42-7XA0</b> <b>6AG1972-0BB42-7XA0</b>
<b>Accessories</b>	<b>RS 485 bus connector with axial cable outlet</b> For SIPLUS OP, for connection to PPI, MPI, PROFIBUS Extended temperature range and exposure to media <b>6AG1500-0EA02-2AA0</b>
<b>Memory Card RAM</b> Exposure to media • 2 MB <b>6AG1952-1AL00-4AA0</b> Extended temperature range and exposure to media • 4 MB <b>6AG1952-1AM00-7AA0</b> • 8 MB <b>6AG1952-1AP00-7AA0</b> • 16 MB <b>6AG1952-1AS00-7AA0</b> • 64 MB <b>6AG1952-1AY00-7AA0</b>	<b>RS 485 repeater for PROFIBUS</b> Transfer rate up to 12 Mbit/s; 24 V DC; IP20 enclosure Extended temperature range and exposure to media <b>6AG1972-0AA02-7XA0</b>
<b>FEPROM memory card</b> Exposure to media • 32 MB <b>6AG1952-1KT00-4AA0</b>	<b>Additional accessories</b> see SIMATIC S7-400 CPU 414-5H, page 6/37
<b>RS 485 bus connector with 90° cable outlet</b> Max. transfer rate 12 Mbit/s Extended temperature range and exposure to media • Without PG interface • With PG interface <b>6AG1972-0BA12-2XA0</b> <b>6AG1972-0BB12-2XA0</b>	

# SIMATIC S7-400 advanced controller

Central processing units

SIPLUS S7-400 high-availability CPUs

## SIPLUS S7-400 CPU 416H

### Overview

- CPU for SIMATIC S7-400H and S7-400F/FH
- Usable in high-availability systems such as the S7-400H
- Usable with F runtime license as F-capable CPU in S7-400F/FH safety-related systems
- With integrated PROFIBUS DP master and combined MPI/PROFIBUS DP master interface
- With integrated PROFINET interface (2-port switch)
- Features 2 slots for sync modules

### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

### Technical specifications

Article number	<b>6AG1416-5HS06-7AB0</b>
Based on	<b>6ES7416-5HS06-0AB0</b> SIPLUS S7-400 CPU 416-5H
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	70 °C; For "F-Systems" applications max. +60 °C permissible
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m). For "F-Systems" applications max. +2000 m above sea level permissible
<b>Relative humidity</b>	
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

### Ordering data

### Article No.

#### SIPLUS S7-400 CPU 416-5H

**6AG1416-5HS06-7AB0**

(medial exposure)

CPU for S7-400H with 16 MB RAM (6 MB code and 10 MB data); 5 interfaces: 1x MPI/DP, DP, PN each and 2 slots for sync modules

#### Accessories

#### Memory card RAM

Exposure to media

- 2 MB

**6AG1952-1AL00-4AA0**

Extended temperature range and exposure to media

- 4 MB
- 8 MB
- 16 MB
- 64 MB

**6AG1952-1AM00-7AA0**  
**6AG1952-1AP00-7AA0**  
**6AG1952-1AS00-7AA0**  
**6AG1952-1AY00-7AA0**

#### FEPRAM memory card

Exposure to media

- 32 MB

**6AG1952-1KT00-4AA0**

#### RS 485 bus connector with 90° cable outlet

Max. transmission rate 12 Mbit/s

Extended temperature range and exposure to media

- Without PG interface
- With PG interface

**6AG1972-0BA12-2XAA0**  
**6AG1972-0BB12-2XAA0**

#### RS 485 bus connector with angled cable outlet

Max. transmission rate 12 Mbit/s

Extended temperature range and exposure to media

- Without PG interface
- With PG interface

**6AG1972-0BA42-7XAA0**  
**6AG1972-0BB42-7XAA0**

#### RS 485 bus connector with axial cable outlet

For SIPLUS OP, for connection to PPI, MPI, PROFIBUS

Extended temperature range and exposure to media

**6AG1500-0EA02-2AA0**

#### RS 485 repeater for PROFIBUS

Transfer rate up to 12 Mbit/s; 24 V DC; IP20 enclosure

Extended temperature range and exposure to media

**6AG1972-0AA02-7XAA0**

#### Additional accessories

see SIMATIC S7-400 CPU 416-5H, page 6/37

**SIMATIC S7-400 advanced controller**

Central processing units

SIPLUS S7-400 high-availability CPUs

**SIPLUS S7-400 CPU 417H****Overview**

CPU for SIMATIC S7-400H and S7-400F/FH

- Usable in high-availability systems such as the S7-400H
- Usable with F runtime license as F-capable CPU in S7-400F/FH safety-related systems
- With integral PROFIBUS DP master interface
- Features 2 slots for sync modules

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	<b>6AG1417-5HT06-7AB0</b>
Based on	<b>6ES7417-5HT06-0AB0</b> SIPLUS S7-400 CPU 417-5H
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C
• max.	70 °C; For "F-Systems" applications max. +60 °C permissible
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m). For "F-Systems" applications max. +2000 m above sea level permissible
<b>Relative humidity</b>	
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.**

<b>SIPLUS S7-400 CPU 417-5H</b>	
CPU for S7-400H with 32 MB RAM (16 MB code and 16 MB data); 5 interfaces: 1x MPI/DP, DP, PN each and 2 slots for sync modules	
Extended temperature range and exposure to media	<b>6AG1417-5HT06-7AB0</b>
<b>SIPLUS accessories</b>	see SIPLUS S7-400 CPU 416H, page 6/45
<b>Additional accessories</b>	see SIMATIC S7-400 CPU 417-5H, page 6/37

**SIMATIC S7-400 advanced controller**

Central processing units

SIPLUS S7-400 high-availability CPUs

**SIPLUS sync module for connecting the CPU 41xH****Overview**

- For linking the two CPUs 414-4H/417-4H in the subunits of the S7-400H
- Can be plugged directly into the CPU

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**Technical specifications**

Article number	<b>6AG1960-1AA06-7XA0</b>	<b>6AG1960-1AB06-7XA0</b>
Based on	<b>6ES7960-1AA06-0XA0</b> SIPLUS S7-400H IF960-H 10M	<b>6ES7960-1AB06-0XA0</b> SIPLUS S7-400H IF960-H 10KM
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C	-25 °C
• max.	70 °C	70 °C
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75 %) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****SIPLUS sync module V6**

Extended temperature range and exposure to media

- for patch cable, can be used with fiber-optic cables up to 10 m
- for patch and installation cables, can be used with fiber-optic cables up to 10 km

**Article No.****6AG1960-1AA06-7XA0****6AG1960-1AB06-7XA0****Article No.****SIPLUS S7-400 FO CABLE**

- 1 m long
- 2 m long
- 10 m long

**6AG1960-1AA04-7AA0****6AG1960-1AA04-7BA0****6AG1960-1AA04-7KA0**

**SIMATIC S7-400 advanced controller**

Central processing units

SIPLUS S7-400 high-availability CPUs

SIPLUS Y-Link for S7-400H

**Overview**

- Bus coupler for transition from a redundant PROFIBUS DP master system to a single-channel PROFIBUS DP master system
- For connection of devices with only one PROFIBUS DP interface to the redundant PROFIBUS DP master system of the SIMATIC S7-400H

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

**Technical specifications**

Article number	<b>6AG1197-1LA11-4XA0</b>
Based on	<b>6ES7197-1LA11-0XA0</b> SIPLUS S7-400 Y-LINK FOR S7-400H
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	0 °C; = Tmin
• max.	60 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.**

For use with STEP 7 from V5.4 or  
PCS 7 from V7.0:

**SIPLUS Y-Link for S7-400H**

for connecting single-channel  
DP slaves to SIMATIC S7-400H;  
consisting of  
2 IM 153 interface modules,  
1 Y-coupler,  
1 BM IM/IM bus module,  
1 BM Y-coupler bus module

Exposure to media

**6AG1197-1LA11-4XA0**

**Article No.****Accessories****SIPLUS S7 BUS MODULE  
BM Y-coupler**

to accommodate a Y-coupler  
incl. bus module cover

Extended temperature range  
and exposure to media

**6AG1654-7HY00-7XA0**

**Further accessories**

See SIMATIC Y-Link,  
page 6/41



**SIMATIC S7-400 advanced controller**

Central processing units  
Interface modules

**PROFIBUS module IF-964 DP****Overview**

- To connect distributed I/Os over PROFIBUS DP
- Max. transmission rate 12 Mbit/s
- Electrically isolated RS 485 interface
- Connection via 9-pin sub-D connector
- The following connection options are available for each S7-400 CPU:
  - A PROFIBUS module in the CPUs 414-3, 414(F)-3 PN/DP, 416-3, 416(F)-3 PN/DP
  - Two PROFIBUS modules in the CPU 417-4

**Note:**

Can only be used with CPUs 6ES7414-3XM05-0AB0, 6ES7414-3EM05-0AB0, 6ES7414-3EM06-0AB0, 6ES7414-3FM06-0AB0, 6ES7416-3XR05-0AB0, 6ES7416-3ER05-0AB0, 6ES7416-3ES06-0AB0, 6ES7416-3FS06-0AB0 and 6ES7417-4XT05-0AB0.

**Technical specifications**

Article number	<b>6ES7964-2AA04-0AB0</b> INTERFACE MOD. DP-MASTER F. S7-400
<b>Product type designation</b>	
<b>Input current</b>	
from CPU, max.	150 mA; Current consumption from S7-400 bus: The module uses no current at 24 V, it provides this voltage only at the DP interface. Total current consumption of the components connected to the DP interface, but maximum 150 mA. Current carrying capacity of the isolated 5 V (P5ext) maximum 90 mA, current carrying capacity of the 24 V maximum 150 mA.
<b>Power losses</b>	
Power loss, typ.	1 W
<b>Interfaces</b>	
<b>PROFIBUS DP</b>	
<b>Cable length</b>	
- Cable length, max.	1 200 m; At 9.6 kbit/s: max. 1200 m; at 12 Mbit/s: max. 100 m
<b>1st interface</b>	
Physics	RS 485
Isolated	Yes
<b>Functionality</b>	
• DP master	Yes; Default setting
• DP slave	Yes
<b>DP master</b>	
• Transmission rate, min.	9.6 kbit/s
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	125; depending on the CPU used
<b>Services</b>	
- PG/OP communication	Yes
- Equidistance mode support	Yes
- SYNC/FREEZE	Yes
- Direct data exchange (slave-to-slave communication)	Yes
<b>Address area</b>	
- Inputs, max.	device-dependent
- Outputs, max.	device-dependent
<b>User data per DP slave</b>	
- Inputs, max.	244 byte
- Outputs, max.	244 byte
<b>Communication functions</b>	
<b>Number of connections</b>	
• overall	device-dependent
<b>Dimensions</b>	
Width	26 mm
Height	54 mm
Depth	130 mm
<b>Weights</b>	
Weight, approx.	65 g

**Ordering data****Article No.**

**IF 964-DP interface module**  
Interface module with integrated PROFIBUS DP master interface

**6ES7964-2AA04-0AB0**

**SIMATIC S7-400 advanced controller**Central processing units  
SIPLUS S7-400 interface modules**SIPLUS S7-400 interface modules****Overview**

- To connect distributed I/O via PROFIBUS DP
- Max. transmission rate 12 Mbit/s
- Electrically isolated RS 485 interface
- Connection via 9-pin Sub-D socket
- One or two PROFIBUS modules can be plugged in for each S7-400 CPU:
  - CPU 414-3/416-3: 1 module
  - CPU 417-4: 2 modules

**Notes:**

Can only be used with the CPUs 6AG1416-3XR05-4AB0, 6AG1416-3ER05-4AB0 and 6AG1417-4XT05-4AB0.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For further technical documentation on SIPLUS, see: <http://www.siemens.com/siplus-extreme>

**Technical specifications**

Article number	<b>6AG1964-2AA04-7AB0</b>
Based on	<b>6ES7964-2AA04-0AB0</b> SIPLUS S7-400 IF964-DP
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	70 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.****SIPLUS interface module  
IF-964 DP**

Interface module with integrated PROFIBUS DP master interface

Extended temperature range and exposure to media

**6AG1964-2AA04-7AB0**



# SIMATIC S7-400 advanced controller

## Digital modules

### SM 421 digital input module

#### Overview



- Digital inputs for the SIMATIC S7-400
- For connecting standard switches and two-wire proximity switches (BERO)

#### Technical specifications

Article number	6ES7421-7BH01-0AB0	6ES7421-1BL01-0AA0	6ES7421-1EL00-0AA0	6ES7421-1FH20-0AA0	6ES7421-7DH00-0AB0
	SM421, 16DI, DC24V, 0.05MS INPUT DELAY	SM421, 32DI, DC24V	SM421, 32DI, DC/AC 120V	SM421, 16DE, UC120/230V	SM421, 16DE, UC24-60V
<b>Product type designation</b>					
<b>Supply voltage</b>					
<b>Load voltage L+</b>					
• Rated value (DC)	24 V				
• permissible range, lower limit (DC)	20.4 V				
• permissible range, upper limit (DC)	28.8 V				
<b>Input current</b>					
from backplane bus 5 V DC, max.	130 mA	20 mA	200 mA	80 mA	150 mA
from supply voltage L+, max.	120 mA				
<b>Power losses</b>					
Power loss, max.	5 W	6 W	16 W	12 W	8 W; 3.5 W (24 V DC); 6.5 W (48 V DC); 8.0 W (60 V DC)
<b>Digital inputs</b>					
Number of digital inputs	16	32	32	16	16
<b>Number of simultaneously controllable inputs</b>					
<b>all mounting positions</b>					
- up to 40 °C, max.	16	32	32	16	16
- up to 60 °C, max.	16	32	32	16	16
<b>Input voltage</b>					
• Type of input voltage	DC	DC	AC/DC	AC/DC	AC/DC
• Rated value (DC)	24 V	24 V			
• Rated value (UC)			120 V	230 V; 120/230 V UC	24 V; 24 to 60 V UC
• for signal "0"	-30 V DC to +5 V DC	-30 V DC to +5 V DC	0 to 20 V UC	0 to 40 V AC/ -40 to +40 V DC	-6 to +6 V DC/ 0 to 5 V AC
• for signal "1"	11 V DC to 30 V DC	13 V DC to 30 V DC	79 to 132 V AC; 80 to 132 V DC	74 to 264 V AC; 80 to 264 V DC, -80 to -264 V	15 to 72 V DC; -15 to -72 V DC; 15 to 60 V AC
• Frequency range			47 ... 63 Hz	47 ... 63 Hz	47 to 63 Hz AC / DC

**Technical specifications (continued)**

Article number	<b>6ES7421-7BH01-0AB0</b> SM421, 16DI, DC24V, 0.05MS INPUT DELAY	<b>6ES7421-1BL01-0AA0</b> SM421, 32DI, DC24V	<b>6ES7421-1EL00-0AA0</b> SM421, 32DI, DC/AC 120V	<b>6ES7421-1FH20-0AA0</b> SM421, 16DE, UC120/230V	<b>6ES7421-7DH00-0AB0</b> SM421, 16DE, UC24-60V
<b>Input current</b> • for signal "0", max. (permissible quiescent current) • for signal "1", typ.	6 mA; 6 ... 8 mA	1.3 mA 7 mA	1 mA 2 mA; 2 ... 5 mA	6 mA; AC: 6 mA; DC: 2 mA 10 mA; at 120 V: 10 mA AC, 1.8 mA DC; at 230 V: 14 mA AC, 2 mA DC	4 mA; 4 ... 10 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b> - Parameterizable - nominal	Yes				Yes 0.5 ms; 0.5 / 3 / 10 / 20 ms
<b>Cable length</b> • shielded, max.  • Unshielded, max.	1 000 m; 1000 m/3 ms; 70 m/0.5 ms; 30 m/0.1 ms; 30 m/0.05 ms  600 m; 600 m: 3 ms; 50 m: 0.5 ms; 20 m: 0.1 ms; 20 m: 0.05 ms	1 000 m  600 m	1 000 m  600 m	1 000 m  600 m	1 000 m  600 m; 600 m: 3, 10, 20 ms; 100 m: 0.5 ms
<b>Encoder</b> <b>Connectable encoders</b> • 2-wire sensor - Permissible quiescent current (2-wire sensor), max.	Yes 3 mA	Yes 1.5 mA	Yes 1 mA	Yes 5 mA; AC: 5 mA	Yes 0.5 mA; 0.5 to 2 mA
<b>Interrupts/diagnostics/status information</b> <b>Alarms</b> • Diagnostic alarm • Hardware interrupt	Yes; Parameterizable Yes; Parameterizable				Yes; Parameterizable Yes; Parameterizable
<b>Diagnostic messages</b> • Diagnostics	Yes; internal/ external fault				Yes; internal/ external fault
<b>Galvanic isolation</b> <b>Galvanic isolation digital inputs</b> • between the channels, in groups of • between the channels and the backplane bus	8 Yes	32 Yes	8 Yes	4 Yes	1 Yes
<b>Isolation</b> Isolation checked with	500 V DC	500 V DC	1500 V AC	1500 V AC	1500 V AC
<b>Dimensions</b> Width Height Depth	25 mm 290 mm 210 mm	25 mm 290 mm 210 mm	25 mm 290 mm 210 mm	25 mm 290 mm 210 mm	25 mm 290 mm 210 mm
<b>Weights</b> Weight, approx.	600 g	500 g	600 g	650 g	600 g

**SIMATIC S7-400 advanced controller**

## Digital modules

**SM 421 digital input module**

Ordering data	Article No.	Ordering data	Article No.
<b>SM 421 digital input modules</b>		<b>Labeling sheets for machine inscription</b>	
16 inputs, 24 V DC, with process/diagnostics interrupt	<b>6ES7421-7BH01-0AB0</b>	DIN A4, for printing using laser printer; pack of 10	
32 inputs, 24 V DC	<b>6ES7421-1BL01-0AA0</b>	petrol	<b>6ES7492-2AX00-0AA0</b>
32 inputs, 120 V AC/DC	<b>6ES7421-1EL00-0AA0</b>	light-beige	<b>6ES7492-2BX00-0AA0</b>
16 inputs, 120/230 V AC/DC, inputs according to IEC 1131-2 Type 2	<b>6ES7421-1FH20-0AA0</b>	yellow	<b>6ES7492-2CX00-0AA0</b>
16 inputs, 24 to 60 V AC/DC, with process/diagnostics interrupt	<b>6ES7421-7DH00-0AB0</b>	red	<b>6ES7492-2DX00-0AA0</b>
<b>Front connector</b>		<b>SIMATIC Manual Collection</b>	<b>6ES7998-8XC01-8YE0</b>
48-pin		Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
• with screw contacts, 1 unit	<b>6ES7492-1AL00-0AA0</b>		
• with screw contacts, 84 units	<b>6ES7492-1AL00-1AB0</b>		
• with spring-loaded terminals, 1 unit	<b>6ES7492-1BL00-0AA0</b>		
• with crimp contacts, 1 unit	<b>6ES7492-1CL00-0AA0</b>		
• with crimp contacts, 84 units	<b>6ES7492-1CL00-1AB0</b>		
<b>Cover film for labeling strips</b>	<b>6ES7492-2XX00-0AA0</b>	<b>SIMATIC Manual Collection update service for 1 year</b>	<b>6ES7998-8XC01-8YE2</b>
Spare part		Current "Manual Collection" DVD and the three subsequent updates	

**Overview**


- Digital outputs for the SIMATIC S7-400
- For connecting solenoid valves, contactors, low-power motors, lamps and motor starters

**Technical specifications**

Article number	6ES7422-1FH00-0AA0	6ES7422-1HH00-0AA0	6ES7422-1BH11-0AA0	6ES7422-1BL00-0AA0	6ES7422-7BL00-0AB0
	SM422, 16DO, AC120/230V, 2A	SM422, 16DO, AC5-230V, 5A RELAY	SM422, 16DO, DC24V, 2A	SM422, 32DO, DC24V, 0,5A	SM422, 32DO, DC24V, 0,5A
<b>Product type designation</b>					
<b>Supply voltage</b>					
<b>Load voltage L+</b>					
• Rated value (DC)		60 V	24 V	24 V	24 V
• permissible range, lower limit (DC)		1 V	20.4 V	20.4 V	20.4 V
• permissible range, upper limit (DC)		60 V	28.8 V	28.8 V	28.8 V
<b>Load voltage L1</b>					
• Rated value (AC)	230 V; 120/230V AC	230 V			
• permissible range, lower limit (AC)	79 V	2 V			20.4 V
• permissible range, upper limit (AC)	264 V	264 V			28.8 V
<b>Input current</b>					
from load voltage L+ (without load), max.	1.5 mA		30 mA	30 mA	120 mA
from load voltage L1 (without load), max.	6 mA				
from backplane bus 5 V DC, max.	400 mA	1 A	160 mA	200 mA	200 mA
<b>Power losses</b>					
Power loss, max.	16 W	25 W	7 W	4 W	8 W
<b>Digital outputs</b>					
Number of digital outputs	16	16; Relays	16	32	32
Limitation of inductive shutdown voltage to			-30 V	-27 V	L+ (-45 V)
<b>Switching capacity of the outputs</b>					
• on lamp load, max.	50 W	60 W	10 W	5 W	5 W
<b>Output voltage</b>					
• for signal "1", min.	L1 (-18.1 V)		L+ (-0.5 V)	L+ (-0.3 V)	L+ (-0.8 V)

# SIMATIC S7-400 advanced controller

## Digital modules

### SM 422 digital output module

#### Technical specifications (continued)

Article number	6ES7422-1FH00-0AA0 SM422, 16DO, AC120/230V, 2A	6ES7422-1HH00-0AA0 SM422, 16DO, AC5-230V, 5A RELAY	6ES7422-1BH11-0AA0 SM422, 16DO, DC24V, 2A	6ES7422-1BL00-0AA0 SM422, 32DO, DC24V, 0,5A	6ES7422-7BL00-0AB0 SM422, 32DO, DC24V, 0,5A
<b>Output current</b>					
• for signal "1" rated value	2 A	5 A	2 A	0.5 A	0.5 A
• for signal "1" permissible range for 0 to 60 °C, min.	10 mA		5 mA	5 mA	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.			2.4 A	0.6 A	0.6 A
• for signal "0" residual current, max.	2.6 mA		0.5 mA	0.3 mA	0.5 mA
<b>Switching frequency</b>					
• with resistive load, max.	10 Hz	10 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz		0.1 Hz	0.5 Hz	2 Hz
<b>Aggregate current of outputs (per group)</b>					
<b>all mounting positions</b>					
- up to 60 °C, max.	2 A; 5 A with fan subassembly; per 4 adjacent outputs	5 mA; 10 A with fan subassembly	2 A; 2 adjacent outputs each	2 A; 8 adjacent outputs each	2 A
<b>Relay outputs</b>					
• Number of operating cycles, max.		100 000; 100 000 (AC 15 / DC 13); 3 000 000 mechanical			
<b>Switching capacity of contacts</b>					
- with inductive load, max.		5 A; 5 A (30 V DC); 5 A (230 V AC)			
- with resistive load, max.		5 A; 5 A (30 V DC); 5 A (230 V AC); 1.2 A (60 V DC); 0.2 A (125 V DC)			
<b>Cable length</b>					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m
<b>Interrupts/diagnostics/ status information</b>					
<b>Alarms</b>					
• Diagnostic alarm					Yes; Parameterizable
<b>Diagnostic messages</b>					
• Diagnostics					Yes; internal/ external fault
<b>Galvanic isolation</b>					
<b>Galvanic isolation digital outputs</b>					
• between the channels, in groups of	4	2	8	32	8
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes
<b>Isolation</b>					
Isolation checked with	1500 V AC	1500 V AC	500 V DC	500 V DC	500 V DC
<b>Dimensions</b>					
Width	25 mm	25 mm	25 mm	25 mm	25 mm
Height	290 mm	290 mm	290 mm	290 mm	290 mm
Depth	210 mm	210 mm	210 mm	210 mm	210 mm
<b>Weights</b>					
Weight, approx.	800 g	700 g	600 g	600 g	600 g

# SIMATIC S7-400 advanced controller

## Digital modules

### SM 422 digital output module

Ordering data	Article No.	Ordering data	Article No.
<b>SM 422 digital output modules</b>		<b>Labeling sheets for machine inscription</b>	
16 outputs, 24 V DC; 2 A	<b>6ES7422-1BH11-0AA0</b>	DIN A4, for printing using laser printer; pack of 10	
32 outputs, 24 V DC; 0.5 A	<b>6ES7422-1BL00-0AA0</b>	petrol	<b>6ES7492-2AX00-0AA0</b>
32 outputs, 24 V DC, 0.5 A; with diagnostics	<b>6ES7422-7BL00-0AB0</b>	light-beige	<b>6ES7492-2BX00-0AA0</b>
16 outputs, 120/230 V AC; 2 A	<b>6ES7422-1FH00-0AA0</b>	yellow	<b>6ES7492-2CX00-0AA0</b>
16 outputs, relay contacts	<b>6ES7422-1HH00-0AA0</b>	red	<b>6ES7492-2DX00-0AA0</b>
<b>Front connector</b>		<b>SIMATIC Manual Collection</b>	<b>6ES7998-8XC01-8YE0</b>
48-pin		Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
• with screw contacts, 1 unit	<b>6ES7492-1AL00-0AA0</b>		
• with screw contacts, 84 units	<b>6ES7492-1AL00-1AB0</b>		
• with spring-loaded terminals, 1 unit	<b>6ES7492-1BL00-0AA0</b>		
• with crimp contacts, 1 unit	<b>6ES7492-1CL00-0AA0</b>		
• with crimp contacts, 84 units	<b>6ES7492-1CL00-1AB0</b>		
<b>Cover film for labeling strips</b>	<b>6ES7492-2XX00-0AA0</b>	<b>SIMATIC Manual Collection update service for 1 year</b>	<b>6ES7998-8XC01-8YE2</b>
Spare part		Current "Manual Collection" DVD and the three subsequent updates	

**SIMATIC S7-400 advanced controller**

## SIPLUS S7-400 digital modules

## SIPLUS S7-400 SM 421 digital input modules

**Overview**

- Digital inputs for SIMATIC S7-400
- For connection of switches and 2-wire proximity switches (BEROs)

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

**Technical specifications**

Article number	<b>6AG1421-1BL01-2AA0</b>
Based on	<b>6ES7421-1BL01-0AA0</b> SIPLUS S7-400 SM421 32DE
<b>Product type designation</b>	
<b>Input current</b>	
from backplane bus 5 V DC, max.	20 mA
<b>Power losses</b>	
Power loss, max.	6 W
<b>Digital inputs</b>	
Number of digital inputs	32
<b>Number of simultaneously controllable inputs</b>	
<b>all mounting positions</b>	
- up to 40 °C, max.	32
- up to 60 °C, max.	32
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 V DC to +5 V DC
• for signal "1"	13 V DC to 30 V DC
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	1.3 mA
• for signal "1", typ.	7 mA
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
<b>Encoder</b>	
<b>Connectable encoders</b>	
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• between the channels, in groups of	32
• between the channels and the backplane bus	Yes
<b>Isolation</b>	
Isolation checked with	500 V DC
<b>Dimensions</b>	
Width	25 mm
Height	290 mm
Depth	210 mm
<b>Weights</b>	
Weight, approx.	500 g

**Ordering data****Article No.**

<b>SIPLUS S7-400 SM 421 digital input module</b>	
32 inputs, 24 V DC	
Extended temperature range and exposure to media	<b>6AG1421-1BL01-2AA0</b>
<b>Accessories</b>	See SIMATIC S7-400 digital input modules, page 6/52

## SIMATIC S7-400 advanced controller

### SIPLUS S7-400 digital modules

#### SIPLUS S7-400 SM 422 digital output modules

#### Overview



- Digital outputs for SIMATIC S7-400
- For connecting solenoid valves, contactors, small-power motors, lamps and motor starters

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

#### Technical specifications

Article number	<b>6AG1422-1BL00-2AA0</b>
Based on	<b>6ES7422-1BL00-0AA0</b> SIPLUS S7-400 SM422 32DA
<b>Product type designation</b>	
<b>Digital outputs</b>	
Number of digital outputs	32
Limitation of inductive shutdown voltage to	-27 V
<b>Output voltage</b>	
• for signal "1", min.	L+ (-0.3 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.	0.6 A
<b>Aggregate current of outputs (per group)</b>	
<b>all mounting positions</b>	
- up to 60 °C, max.	2 A; 8 adjacent outputs each
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital outputs</b>	
• between the channels, in groups of	32
• between the channels and the backplane bus	Yes
<b>Dimensions</b>	
Width	25 mm
Height	290 mm
Depth	210 mm
<b>Weights</b>	
Weight, approx.	600 g

#### Ordering data

#### Article No.

<b>SIPLUS S7-400 SM 422 digital output module</b>	
32 outputs, 24 V DC	
Extended temperature range and exposure to media	<b>6AG1422-1BL00-2AA0</b>
<b>Accessories</b>	See SIMATIC S7-400 digital output modules, page 6/55



## SIMATIC S7-400 advanced controller

### Analog modules

#### SM 431 analog input module

#### Overview



- Analog inputs for the SIMATIC S7-400
- For connection of voltage and current sensors, thermocouples, resistors and resistance thermometers
- Resolution from 13 to 16 bit

#### Technical specifications

Article number	6ES7431-0HH0-0AB0	6ES7431-1KF20-0AB0	6ES7431-1KF00-0AB0	6ES7431-1KF10-0AB0
	SM431, 16AE, +/-10V, +/-20mA, 4-20mA	SM431, 8AE, U/I/R, 14BIT, 0,416MS ZYKL	SM431, 8AE, U/I/R, 13BIT	SM431, 8AE, U/I/R, 14BIT
<b>Product type designation</b>				
<b>Supply voltage</b>				
<b>Load voltage L+</b>				
• Rated value (DC)	24 V; Only required for supplying 2-wire transmitters	24 V; Only required for supplying 2-wire transmitters	not necessary	24 V; Only required for supplying 2-wire transmitters
• Reverse polarity protection	Yes	Yes		Yes
<b>Input current</b>				
from load voltage L+ (without load), max.	400 mA; for 16 connected, fully controlled 2-wire transmitters	200 mA; for 8 connected, fully controlled 2-wire transmitters		200 mA; for 8 connected, fully controlled 2-wire transmitters
from backplane bus 5 V DC, max.	100 mA	1 000 mA	350 mA	600 mA
<b>Power losses</b>				
Power loss, typ.	2 W	4.9 W	1.8 W	3.5 W
<b>Hardware configuration</b>				
<b>Slots</b>				
• Required slots	1	1	1	1
<b>Analog inputs</b>				
Number of analog inputs	16	8	8	8
• For voltage/current measurement	16	8	8	8
• For resistance measurement		4	4	4
permissible input voltage for voltage input (destruction limit), max.	20 V; 20 V DC permanent, 75 V DC for max. 1 s (duty factor 1:20)	18 V; 18 V continuous, 75 V for 1 ms (mark to space ratio 1:20)	50 V	18 V; 18 V continuous, 75 V for 1 ms (mark to space ratio 1:20)
permissible input current for current input (destruction limit), max.	40 mA	40 mA; Permanent	50 mA; 40 mA continuous	40 mA; Permanent
<b>Input ranges (rated values), voltages</b>				
• 1 V to 5 V	Yes	Yes	Yes	Yes
• -1 V to +1 V	Yes	Yes	Yes	Yes
• -10 V to +10 V	Yes	Yes	Yes	Yes
• -2.5 V to +2.5 V				Yes
• -250 mV to +250 mV				Yes
• -5 V to +5 V				Yes
• -500 mV to +500 mV				Yes
• -80 mV to +80 mV				Yes

**Technical specifications (continued)**

Article number	<b>6ES7431-0HH00-0AB0</b> SM431, 16AE, +/-10V, +/-20MA, 4-20MA	<b>6ES7431-1KF20-0AB0</b> SM431, 8AE, U/I/R, 14BIT, 0,416MS ZYKL	<b>6ES7431-1KF00-0AB0</b> SM431, 8AE, U/I/R, 13BIT	<b>6ES7431-1KF10-0AB0</b> SM431, 8AE, U/I/R, 14BIT
<b>Input ranges (rated values), currents</b>				
• 0 to 20 mA				Yes
• -20 mA to +20 mA	Yes	Yes	Yes	
• 4 mA to 20 mA	Yes	Yes	Yes	Yes
<b>Input ranges (rated values), thermoelements</b>				
• Type B				Yes
• Type E				Yes
• Type J				Yes
• Type K				Yes
• Type L				Yes
• Type N				Yes
• Type R				Yes
• Type S				Yes
• Type T				Yes
• Type U				Yes
<b>Input ranges (rated values), resistance thermometer</b>				
• Ni 100				Yes
• Ni 1000				Yes
• Pt 100				Yes
• Pt 1000				Yes
• Pt 10000				Yes
• Pt 200				Yes
• Pt 500				Yes
<b>Input ranges (rated values), resistors</b>				
• 0 to 150 ohms				Yes
• 0 to 300 ohms				Yes
• 0 to 48 ohms				Yes
• 0 to 600 ohms		Yes	Yes	Yes
• 0 to 6000 ohms				Yes; Usable up to 5000 ohms
<b>Thermocouple (TC)</b>				
<b>Temperature compensation</b>				
- internal temperature compensation				No
- external temperature compensation with compensations socket				Yes
- external temperature compensation with Pt100				Yes
- dynamic reference temperature value				Yes
<b>Characteristic linearization</b>				
• Parameterizable				Yes
- for thermocouples				Type B, E, J, K, L, N, R, S, T, U
- for resistance thermometer				Pt100, Pt200, Pt500, Pt1000, Ni100, Ni1000
<b>Cable length</b>				
• shielded, max.	200 m	200 m	200 m	200 m; 50 m with thermocouples and input ranges <= 80 mV

# SIMATIC S7-400 advanced controller

## Analog modules

### SM 431 analog input module

#### Technical specifications (continued)

Article number	6ES7431-0HH0-0AB0 SM431, 16AE, +/-10V, +/-20mA, 4-20mA	6ES7431-1KF20-0AB0 SM431, 8AE, U/I/R, 14BIT, 0,416MS ZYKL	6ES7431-1KF00-0AB0 SM431, 8AE, U/I/R, 13BIT	6ES7431-1KF10-0AB0 SM431, 8AE, U/I/R, 14BIT
<b>Analog value creation</b>				
<b>Integration and conversion time/ resolution per channel</b>				
• Resolution with overrange (bit including sign), max.	13 bit	14 bit; 14 / 14 / 14	13 bit	14 bit; with activated filtering: 16 bits
• Integration time, parameterizable	Yes	Yes	Yes	Yes
• Basic conversion time (ms)	55 / 65 ms	52 µs	23 / 25 ms	20.1 / 23.5 ms
• Integration time (ms)	50 / 60 ms		16,7 / 20 ms	16,7 / 20 ms
• Basic conversion time, including integration time (ms)				
- additional conversion time for wire break monitoring				4,3 ms
- additional conversion time for resistance measurement				40.2 / 47 ms
- additional conversion time for wire break monitoring and resistance measurement				5,5 ms
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz	none / 400 / 60 / 50 Hz	50 / 60 Hz	50 / 60 Hz
<b>Encoder</b>				
<b>Connection of signal encoders</b>				
• for current measurement as 2-wire transducer		Yes	Yes; with external transmitter supply	Yes
• for current measurement as 4-wire transducer	Yes	Yes	Yes	Yes
• for resistance measurement with two-wire connection		Yes; Line resistances are also measured	Yes; Line resistances are also measured	Yes; Line resistances are also measured
• for resistance measurement with three-wire connection		Yes; Line resistances are also measured	Yes; Line resistances are also measured	Yes
• for resistance measurement with four-wire connection		Yes	Yes	Yes
<b>Errors/accuracies</b>				
<b>Operational limit in overall temperature range</b>				
• Voltage, relative to input area, (+/-)	0.65 %; 1.0 % at 1 to 5 V; 0.65 % at +/-1 V, +/-10 V	0.7 %; +/-0.7 % at +/-1 V; +/-0.9 % at +/-10 V, 1 to 5 V	1 %; +/-1.0 % at +/-1 V; +/-0.6 % at +/-10 V; +/-0.7 % at 1 to 5 V	0.38 %; +/-0.38 % at +/-80 mV; +/-0.35 % at +/-250 mV, +/-500mV, +/-1 V, +/-2,5 V, +/-5 V, 1 to 5 V, +/-10 V
• Current, relative to input area, (+/-)	0.65 %	0.8 %; at +/-20 mA, 4 to 20 mA	1 %; at +/-20 mA, 4 to 20 mA	0.35 %; +/-20 mA, 0 to 20 mA, 4 to 20 mA
• Resistance, relative to input area, (+/-)		1 %	1.25 %; 0 to 500 ohms (4-conductor measurement, in range of 600 ohms)	0.5 %
• Resistance thermometer, relative to input area, (+/-)				0.5 %
<b>Basic error limit (operational limit at 25 °C)</b>				
• Voltage, relative to input area, (+/-)	0.25 %; 0.5 % at 1 to 5 V; 0.25 % at +/-1 V, +/-10 V	0.6 %; 0.6 % at +/-1 V; 0.75 % at +/-10 V, 1 to 5 V	0.7 %; 0.7 % at +/-1 V; 0.4 % at +/-10 V; 0.5 % at 1 to 5 V	0.15 %; +/-0.15 % (+/-250 mV, +/-500 mV, +/-1 V, +/-2.5 V, +/-5 V, 1 to 5 V, +/- 10 V); +/-0.17 % (+/- 80 mV);
• Current, relative to input area, (+/-)	0.25 %; at +/-20 mA, 4 to 20 mA	0.7 %; at +/-20 mA, 4 to 20 mA	0.7 %; at +/-20 mA, 4 to 20 mA	0.15 %; +/-20 mA, 0 to 20 mA, 4 to 20 mA

**Technical specifications (continued)**

Article number	<b>6ES7431-0HH00-0AB0</b> SM431, 16AE, +/-10V, +/-20MA, 4-20MA	<b>6ES7431-1KF20-0AB0</b> SM431, 8AE, U/I/R, 14BIT, 0,416MS ZYKL	<b>6ES7431-1KF00-0AB0</b> SM431, 8AE, U/I/R, 13BIT	<b>6ES7431-1KF10-0AB0</b> SM431, 8AE, U/I/R, 14BIT
• Resistance, relative to input area, (+/-)		0.7 %; 0 to 600 ohms	0.8 %; 0 to 500 ohms (4-conductor measurement, in range of 600 ohms)	0.15 %; +/-0.15 % at 0 to 48 ohms (4-conductor measurement), 0 to 150 ohms (4-conductor measurement), 0 to 300 ohms (4-conductor measurement), 0 to 600 ohms (4-conductor measurement), 0 to 5000 ohms (4-conductor measurement, in range of 6000 ohms); +/-0.3 % at 0 to 300 ohms (3-conductor measurement), 0 to 600 ohms (3-conductor measurement), 0 to 5000 ohms (3-conductor measurement, in range of 6000 ohms)
• Resistance thermometer, relative to input area, (+/-)				0.3 %
<b>Galvanic isolation</b>				
<b>Galvanic isolation analog inputs</b>				
• Galvanic isolation analog inputs	No	Yes; internal / external	Yes; internal / external	Yes; internal / external
• between the channels	No	No	No	No
<b>Permissible potential difference</b>				
between the inputs (UCM)	2 V DC / 2 Vpp AC	8 V AC	30 V AC	120 V AC
<b>Isolation</b>				
Isolation checked with	500 V DC between bus and local ground	2120 V DC between bus and analog part; 500 V DC between bus and local ground; 707 V DC between analog part and L+/M; 2120 V DC between analog part and local ground; 2120 V DC between L+/M and local ground	2120 V DC between bus and analog part; 500 V DC between bus and local ground; 2120 V DC between analog part and local ground	2120 V DC between bus and L+/M; 2120 V DC between bus and analog part; 500 V DC between bus and local ground; 707 V DC between analog part and L+/M; 2120 V DC between analog part and local ground; 2120 V DC between L+/M and local ground
<b>Dimensions</b>				
Width	25 mm	25 mm	25 mm	25 mm
Height	290 mm	290 mm	290 mm	290 mm
Depth	210 mm	210 mm	210 mm	210 mm
<b>Weights</b>				
Weight, approx.	500 g	500 g	500 g	500 g
Article number	<b>6ES7431-7QH00-0AB0</b> SM 431, 16AE, U/I/R/PT100, 16BIT	<b>6ES7431-7KF00-0AB0</b> SM 431, 8AI, U/I/THERMO, 16BIT	<b>6ES7431-7KF10-0AB0</b> SM 431, 8AI, RESIST./PT100, 16BIT	
<b>Product type designation</b>				
<b>Supply voltage</b>				
<b>Load voltage L+</b>				
• Rated value (DC)	24 V; Only required for supplying 2-wire transmitters			
• Reverse polarity protection	Yes			
<b>Input current</b>				
from load voltage L+ (without load), max.	400 mA; for 16 connected, fully controlled 2-wire transmitters	400 mA		400 mA
from backplane bus 5 V DC, max.	700 mA	1 200 mA		650 mA
<b>Power losses</b>				
Power loss, typ.	4.5 W	4.6 W		3.3 W
<b>Hardware configuration</b>				
<b>Slots</b>				
• Required slots	1	1		1

# SIMATIC S7-400 advanced controller

## Analog modules

### SM 431 analog input module

#### Technical specifications (continued)

Article number	<b>6ES7431-7QH00-0AB0</b> SM 431, 16AE, U/I/R/PT100, 16BIT	<b>6ES7431-7KF00-0AB0</b> SM 431, 8AI, U/I/THERMO, 16BIT	<b>6ES7431-7KF10-0AB0</b> SM 431, 8AI, RESIST./PT100, 16BIT
<b>Analog inputs</b>			
Number of analog inputs	16	8	8
• For voltage/current measurement	16	8	
• For resistance measurement	8		8
permissible input voltage for voltage input (destruction limit), max.	18 V; 18 V continuous, 75 V for 1 ms (mark to space ratio 1:20)	35 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)	35 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)
permissible input current for current input (destruction limit), max.	40 mA	32 mA	
<b>Input ranges (rated values), voltages</b>			
• 1 V to 5 V	Yes	Yes	
• -1 V to +1 V	Yes	Yes	
• -10 V to +10 V	Yes	Yes	
• -100 mV to +100 mV		Yes	
• -2.5 V to +2.5 V	Yes	Yes	
• -20 mV to +20 mV		Yes	
• -25 mV to +25 mV	Yes		
• -250 mV to +250 mV	Yes	Yes	
• -5 V to +5 V	Yes	Yes	
• -50 mV to +50 mV	Yes	Yes	
• -500 mV to +500 mV	Yes	Yes	
• -80 mV to +80 mV	Yes	Yes	
<b>Input ranges (rated values), currents</b>			
• 0 to 20 mA	Yes	Yes	
• -10 mA to +10 mA	Yes	Yes	
• -20 mA to +20 mA	Yes	Yes	
• -3.2 mA to +3.2 mA		Yes	
• 4 mA to 20 mA	Yes	Yes	
• -5 mA to +5 mA	Yes	Yes	
<b>Input ranges (rated values), thermoelements</b>			
• Type B	Yes	Yes	
• Type E	Yes	Yes	
• Type J	Yes	Yes	
• Type K	Yes	Yes	
• Type L	Yes	Yes	
• Type N	Yes	Yes	
• Type R	Yes	Yes	
• Type S	Yes	Yes	
• Type T	Yes	Yes	
• Type U	Yes	Yes	
<b>Input ranges (rated values), resistance thermometer</b>			
• Ni 100	Yes		Yes
• Ni 1000	Yes		Yes; Different characteristics selectable: Europe/U.S.
• Pt 100	Yes		Yes
• Pt 1000	Yes		Yes
• Pt 200	Yes		Yes
• Pt 500	Yes		Yes

**Technical specifications (continued)**

Article number	<b>6ES7431-7QH00-0AB0</b> SM 431, 16AE, U/I/R/PT100, 16BIT	<b>6ES7431-7KF00-0AB0</b> SM 431, 8AI, U/I/THERMO, 16BIT	<b>6ES7431-7KF10-0AB0</b> SM 431, 8AI, RESIST./PT100, 16BIT
<b>Input ranges (rated values), resistors</b>			
• 0 to 150 ohms	Yes		
• 0 to 300 ohms	Yes		
• 0 to 48 ohms	Yes		
• 0 to 600 ohms	Yes		
• 0 to 6000 ohms	Yes; Usable up to 5000 ohms		
<b>Thermocouple (TC)</b>			
<b>Temperature compensation</b>			
- internal temperature compensation		Yes	
- external temperature compensation with compensations socket	Yes	Yes	
- external temperature compensation with Pt100	Yes		
- dynamic reference temperature value	Yes	Yes	
<b>Characteristic linearization</b>			
• Parameterizable	Yes	Yes	Yes
- for thermocouples	Type B, E, J, K, L, N, R, S, T, U	Type B, E, J, K, L, N, R, S, T, U	
- for resistance thermometer	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni1000		Pt100, Pt200, Pt500, Pt1000, Ni100, Ni1000; different characteristics selectable (Europe/U.S.)
<b>Cable length</b>			
• shielded, max.	200 m; 50 m with thermocouples and input ranges <= 80 mV	200 m	200 m; 50 m with thermocouples and input ranges +/- 80 mV
<b>Analog value creation</b>			
<b>Integration and conversion time/ resolution per channel</b>			
• Resolution with overrange (bit including sign), max.	16 bit; 16 / 16 / 16	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes
• Basic conversion time (ms)	6 / 20,1 / 23,5 ms	10 / 16,7 / 20 / 100	8 / 23 / 25 ms
• Integration time (ms)	2,5 / 16,7 / 20 ms	2,5 / 16,7 / 20 / 100	20 ms at 50 Hz (entire module incl. wire break)
• Basic conversion time, including integration time (ms)			
- additional conversion time for wire break monitoring	4.3 / 4.3 / 4.3 ms		110 ms / 4 ms
- additional conversion time for resistance measurement	12 / 40,2 / 47 ms		
- additional conversion time for wire break monitoring and resistance measurement	5,5 ms	1 ms (module)	none
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 Hz		none/ 60 / 50 Hz
<b>Encoder</b>			
<b>Connection of signal encoders</b>			
• for current measurement as 2-wire transducer	Yes		
• for current measurement as 4-wire transducer	Yes	Yes	
• for resistance measurement with two-wire connection	Yes; Line resistances are also measured		
• for resistance measurement with three-wire connection	Yes		Yes
• for resistance measurement with four-wire connection	Yes	Yes	Yes

# SIMATIC S7-400 advanced controller

## Analog modules

### SM 431 analog input module

#### Technical specifications (continued)

Article number	6ES7431-7QH00-0AB0 SM 431, 16AE, U/I/R/PT100, 16BIT	6ES7431-7KF00-0AB0 SM 431, 8AI, U/I/THERMO, 16BIT	6ES7431-7KF10-0AB0 SM 431, 8AI, RESIST./PT100, 16BIT
<b>Errors/accuracies</b>			
<b>Operational limit in overall temperature range</b>			
• Voltage, relative to input area, (+/-)	0.3 %; +/-0.3 % at +/-250 mV, +/-500 mV, +/-1 V, +/-2.5 V, +/-5 V, 1 to 5 V, +/- 10 V; +/-0.31 % at +/-80 mV; +/-0.32 % at +/-50 mV; +/-0.35 % at +/-25 mV;	0.3 %	
• Current, relative to input area, (+/-)	0.3 %; at 0 to 20 mA, +/-5 mA, +/-10 mA, +/- 20 mA, 4 to 20 mA	0.5 %	
• Resistance, relative to input area, (+/-)	0.3 %; +/-0.3 % at 0 to 48 Ohm (4-conductor measurement), 0 to 150 Ohm (4-conductor measurement), 0 to 300 Ohm (4-conductor measurement), 0 to 600 Ohm (4-conductor measurement), 0 to 5000 Ohm (4-conductor measurement, in range of 6000 Ohm); +/-0.4 % at 0 to 300 Ohm (3-conductor measurement), 0 to 600 Ohm (3-conductor measurement), 0 to 5000 Ohm (3-conductor measurement, in range of 6000 Ohm);		
• Resistance thermometer, relative to input area, (+/-)	0.4 %		+/-1 °C
<b>Basic error limit (operational limit at 25 °C)</b>			
• Voltage, relative to input area, (+/-)	0.15 %; +/-0.15 % at +/-250 mV, +/-500 mV, +/-1 V, +/-2.5 V, +/-5 V, 1 to 5 V, +/-10 V; +/-0.17 % at +/-80 mV; +/-0.19 % at +/-50 mV; +/-0.23 % at +/-25 mV;	0.1 %	
• Current, relative to input area, (+/-)	0.15 %; at 0 to 20 mA, +/-5 mA, +/-10 mA, +/- 20 mA, 4 to 20 mA	0.17 %	
• Resistance, relative to input area, (+/-)	0.15 %; +/-0.15 % at 0 to 48 ohms (4-conductor measurement), 0 to 150 ohms (4-conductor measurement), 0 to 300 ohms (4-conductor measurement), 0 to 5000 ohms (4-conductor measurement, in range of 6000 ohms); +/-0.3 % at 0 to 300 ohms (3-conductor measurement), 0 to 600 ohms (3-conductor measurement), 0 to 5000 ohms (3-conductor measurement, in range of 6000 ohms)		
• Resistance thermometer, relative to input area, (+/-)	0.3 %		+/-0,2 °C
<b>Interrupts/diagnostics/status information</b>			
<b>Alarms</b>			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable	Yes	Yes
<b>Diagnostic messages</b>			
• Diagnostics	Yes; Parameterizable	Yes	Yes
<b>Galvanic isolation</b>			
<b>Galvanic isolation analog inputs</b>			
• Galvanic isolation analog inputs	Yes; internal / external	Yes; internal / external	Yes; internal / external
• between the channels	No	Yes	No
<b>Permissible potential difference between the inputs (UCM)</b>			
	120 V AC	120 V AC	none

**Technical specifications** (continued)

Article number	<b>6ES7431-7QH00-0AB0</b> SM 431, 16AE, U/I/R/PT100, 16BIT	<b>6ES7431-7KF00-0AB0</b> SM 431, 8AI, U/I/THERMO, 16BIT	<b>6ES7431-7KF10-0AB0</b> SM 431, 8AI, RESIST./PT100, 16BIT
<b>Isolation</b>			
Isolation checked with	2120 V DC between bus and L+/M; 2120 V DC between bus and analog part; 500 V DC between bus and local ground; 707 V DC between analog part and L+/M; 2120 V DC between analog part and local ground; 2120 V DC between L+/M and local ground	1500 V DC	1500 V DC
<b>Dimensions</b>			
Width	25 mm	25 mm	25 mm
Height	290 mm	290 mm	290 mm
Depth	210 mm	210 mm	210 mm
<b>Weights</b>			
Weight, approx.	500 g	650 g	650 g

**Ordering data**

Ordering data	Article No.	Article No.
<b>SM 431 analog output modules</b>		<b>Cover film for labeling strips</b> <b>6ES7492-2XX00-0AA0</b>
16 inputs, non-isolated, 13 bit	<b>6ES7431-0HH00-0AB0</b>	Spare part
8 inputs, isolated, 13 bit	<b>6ES7431-1KF00-0AB0</b>	<b>Labeling sheets for machine inscription</b>
8 inputs, isolated, 14 bit, with linearization	<b>6ES7431-1KF10-0AB0</b>	DIN A4, for printing using laser printer; pack of 10
8 inputs, isolated, 14 bit	<b>6ES7431-1KF20-0AB0</b>	petrol
16 inputs, isolated, 16 bit, process interrupt capability	<b>6ES7431-7QH00-0AB0</b>	light-beige
8 inputs, isolated, 16 bit, process interrupt capability, for thermocouples (I, U)	<b>6ES7431-7KF00-0AB0</b>	yellow
8 inputs, isolated, 16 bit, process interrupt capability, for thermal resistors	<b>6ES7431-7KF10-0AB0</b>	red
<b>Front connector</b>		<b>SIMATIC Manual Collection</b> <b>6ES7998-8XC01-8YE0</b>
48-pin		Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC
• with screw contacts, 1 unit	<b>6ES7492-1AL00-0AA0</b>	<b>SIMATIC Manual Collection update service for 1 year</b> <b>6ES7998-8XC01-8YE2</b>
• with screw contacts, 84 units	<b>6ES7492-1AL00-1AB0</b>	Current "Manual Collection" DVD and the three subsequent updates
• with spring-loaded terminals, 1 unit	<b>6ES7492-1BL00-0AA0</b>	
• with crimp contacts, 1 unit	<b>6ES7492-1CL00-0AA0</b>	
• with crimp contacts, 84 units	<b>6ES7492-1CL00-1AB0</b>	
1 unit; for 6ES7431-7KF00-0AB0; spare part, included in scope of delivery	<b>6ES7431-7KF00-6AA0</b>	
<b>Measuring range module for analog inputs</b>	<b>6ES7974-0AA00-0AA0</b>	
1 module for 2 inputs (spare part)		



## SIMATIC S7-400 advanced controller

### Analog modules

#### SM 432 analog output module

##### Overview



- Analog outputs for the SIMATIC S7-400
- For the connection of analog actuators

##### Technical specifications

Article number	<b>6ES7432-1HF00-0AB0</b> SM 432, 8AO, U/I, 13BIT
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
from backplane bus 5 V DC, max.	150 mA
from supply voltage L+, max.	400 mA
<b>Power losses</b>	
Power loss, max.	9 W
<b>Hardware configuration</b>	
<b>Slots</b>	
• Required slots	1
<b>Analog outputs</b>	
Number of analog outputs	8
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	30 mA
Current output, no-load voltage, max.	19 V
<b>Output ranges, voltage</b>	
• 0 to 10 V	Yes
• 1 V to 5 V	Yes
• -10 V to +10 V	Yes
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes

Article number	<b>6ES7432-1HF00-0AB0</b> SM 432, 8AO, U/I, 13BIT
<b>Load impedance (in rated range of output)</b>	
• with voltage outputs, min.	1 k $\Omega$
• with voltage outputs, capacitive load, max.	1 $\mu$ F
• with current outputs, max.	500 $\Omega$ ; 600 ohms if common-mode-voltage reduced to <1 V
<b>Cable length</b>	
• shielded, max.	200 m
<b>Analog value creation</b>	
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	13 bit
• Conversion time (per channel)	420 $\mu$ s; 420 $\mu$ s in the ranges 1 to 5 V and 4 to 20 mA; 300 $\mu$ s in all ranges
<b>Settling time</b>	
• for resistive load	0.1 ms
• for capacitive load	3.5 ms
• for inductive load	0.5 ms
<b>Errors/accuracies</b>	
<b>Operational limit in overall temperature range</b>	
• Voltage, relative to output area, (+/-)	0.5 %; +/-10 V, 0 to 10 V, 1 to 5 V
• Current, relative to output area, (+/-)	1 %; +/-20 mA, 4 to 20 mV
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to output area, (+/-)	0.5 %; +/-10 V, 0 to 10 V, 1 to 5 V
• Current, relative to output area, (+/-)	0.5 %; +/-20 mA, 0 to 20 mA
<b>Interrupts/diagnostics/ status information</b>	
Substitute values connectable	No
<b>Galvanic isolation</b>	
<b>Galvanic isolation analog outputs</b>	
• between the channels and the backplane bus	Yes
<b>Isolation</b>	
Isolation checked with	2120 V DC between bus and L+/M; 2120 V DC between bus and analog part; 500 V DC between bus and local ground; 707 V DC between analog part and L+/M; 2120 V DC between analog part and local ground; 2120 V DC between L+/M and local ground
<b>Dimensions</b>	
Width	25 mm
Height	290 mm
Depth	210 mm
<b>Weights</b>	
Weight, approx.	650 g

# SIMATIC S7-400 advanced controller

## Analog modules

### SM 432 analog output module

Ordering data	Article No.		Article No.
<b>SM 432 analog output module</b> 8 outputs, isolated, 13 bit	<b>6ES7432-1HF00-0AB0</b>		
<b>Front connector</b> 48-pin			
• with screw contacts, 1 unit	<b>6ES7492-1AL00-0AA0</b>		
• with screw contacts, 84 units	<b>6ES7492-1AL00-1AB0</b>		
• with spring-loaded terminals, 1 unit	<b>6ES7492-1BL00-0AA0</b>		
• with crimp contacts, 1 unit	<b>6ES7492-1CL00-0AA0</b>		
• with crimp contacts, 84 units	<b>6ES7492-1CL00-1AB0</b>		
<b>Cover film for labeling strips</b> Spare part	<b>6ES7492-2XX00-0AA0</b>		
<b>Labeling sheets for machine inscription</b> DIN A4, for printing using laser printer; pack of 10			
petrol	<b>6ES7492-2AX00-0AA0</b>		
light-beige	<b>6ES7492-2BX00-0AA0</b>		
yellow	<b>6ES7492-2CX00-0AA0</b>		
red	<b>6ES7492-2DX00-0AA0</b>		
		<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
		<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>

**SIMATIC S7-400 advanced controller**

## SIPLUS S7-400 analog modules

## SIPLUS S7-400 SM 431 analog input modules

**Overview**

- Analog inputs for SIMATIC S7-400
- For connecting voltage sensors and current sensors, thermocouples, resistors and resistance thermometers
- Resolution 13 to 16 bit

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

**Technical specifications**

Article number	<b>6AG1431-0HH00-4AB0</b>
Based on	<b>6ES7431-0HH00-0AB0</b> SIPLUS S7-400 SM431 16AI
<b>Ambient conditions</b>	
<b>Extended ambient conditions</b>	
<ul style="list-style-type: none"> <li>• Relative to ambient temperature-atmospheric pressure-installation altitude</li> </ul>	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
<ul style="list-style-type: none"> <li>- With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>	
<ul style="list-style-type: none"> <li>- against biologically active substances / conformity with EN 60721-3-3</li> <li>- against chemically active substances / conformity with EN 60721-3-3</li> <li>- against mechanically active substances / conformity with EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!  Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!  Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.**

<b>SIPLUS S7-400 SM 431 analog input module</b>	
16 inputs, non-floating, 13 bit	
Exposure to media	<b>6AG1431-0HH00-4AB0</b>
<b>Accessories</b>	See SIMATIC S7-400 analog input modules, page 6/65

## SIMATIC S7-400 advanced controller

### SIPLUS S7-400 analog modules

#### SIPLUS S7-400 SM 432 analog output modules

#### Overview



- Analog outputs for SIMATIC S7-400
- For connection of analog actuators

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

#### Technical specifications

Article number	<b>6AG1432-1HF00-4AB0</b>
Based on	<b>6ES7432-1HF00-4AB0</b> SIPLUS_SM432_8AA
<b>Ambient conditions</b>	
<b>Extended ambient conditions</b>	
<ul style="list-style-type: none"> <li>• Relative to ambient temperature-atmospheric pressure-installation altitude</li> </ul>	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
<ul style="list-style-type: none"> <li>- With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>	
<ul style="list-style-type: none"> <li>- against biologically active substances / conformity with EN 60721-3-3</li> <li>- against chemically active substances / conformity with EN 60721-3-3</li> <li>- against mechanically active substances / conformity with EN 60721-3-3</li> </ul>	<p>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!</p> <p>Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!</p> <p>Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!</p>

#### Ordering data

#### Article No.

#### SIPLUS S7-400 SM 432 analog output module

8 outputs, floating, 13 bit

Exposure to media

**6AG1432-1HF00-4AB0**

#### Accessories

See SIMATIC S7-400 analog output modules, page 6/67

# SIMATIC S7-400 advanced controller

## Function modules

### FM 450-1 counter module

#### Overview



- Two-channel intelligent counter module for simple counting tasks
- For direct connection of incremental encoders
- Comparison function with 2 specifiable comparison values
- Integrated digital outputs for outputting the response when the comparison values are reached

#### Note

SIMODRIVE Sensor/Motion Connect 500 feature incremental encoders and preassembled connecting cables for counting and positioning functions.

<http://www.siemens.com/simatic-technology>

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#### Technical specifications

Article number	<b>6ES7450-1AP01-0AE0</b> FM 450-1, COUNTER MODULE, 2 CHANNELS
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage 1L+</b>	
• Reverse polarity protection	Yes
<b>Load voltage 2L+</b>	
• Reverse polarity protection	Yes
<b>Aux. voltage 1L+, load voltage 2L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V; Dynamic 18.5 V
• permissible range, upper limit (DC)	28.8 V; dynamic 30.2 V
<b>non-periodic skip</b>	
- Duration	500 ms
- Recovery time	50 s
- Value	35 V
<b>Input current</b>	
from load voltage 1L+ (without load), max.	50 mA
from load voltage 2L+ (without load), max.	60 µA
from backplane bus 5 V DC, max.	300 mA
<b>Encoder supply</b>	
<b>5 V encoder supply</b>	
• 5 V	Yes; 5.2 V +/- 2 %
• short-circuit protection	Yes
• Output current, max.	300 mA
<b>24 V encoder supply</b>	
• 24 V	Yes; 1L+ (-3 V)
• short-circuit protection	Yes
• Output current, max.	300 mA
<b>Power losses</b>	
Power loss, typ.	6 W

Article number	<b>6ES7450-1AP01-0AE0</b> FM 450-1, COUNTER MODULE, 2 CHANNELS
<b>Digital inputs</b>	
Number of digital inputs	6
Functions	1 for gate start, 1 for gate stop, 1 for setting the counter
<b>Input voltage</b>	
• for signal "0"	-28.8 ... +5V
• for signal "1"	+11 to +28.8V
<b>Input current</b>	
• for signal "1", typ.	9 mA
<b>Input delay (for rated value of input voltage)</b>	
• Input frequency (with a time delay of 0.1 ms), max.	200 kHz
<b>for standard inputs</b>	
- Parameterizable	Yes
- at "0" to "1", max.	2.5 µs; >= 2.5 µs (200 kHz); <= 25 µs (20 kHz)
<b>Digital outputs</b>	
Number of digital outputs	4
short-circuit protection	Yes; Clocked electronically
Limitation of inductive shutdown voltage to	2L+ (-39 V)
<b>Output voltage</b>	
• for signal "0", max.	3 V
• for signal "1", min.	2L+ (-1,5 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A; Res. / P.D. 5 W tungsten 24 V DC
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.	0.6 A
<b>Output delay with resistive load</b>	
• "0" to "1", max.	300 µs

### Technical specifications (continued)

Article number	<b>6ES7450-1AP01-0AE0</b> FM 450-1, COUNTER MODULE, 2 CHANNELS
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes; With 2 pulse trains offset by 90°
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 24 V directional element	Yes; 1 pulse train, 1 direction level
<b>Counter</b>	
Number of counter inputs	2; 32 bit or +/-31 bit
<b>Counter input 5 V</b>	
• Type	RS 422
• Terminating resistor	220 Ω
• Differential input voltage	min. 0.5 V
• Counting frequency, max.	500 kHz
<b>Counter input 24 V</b>	
• Input voltage, for signal "0"	-30 to +5V
• Input voltage, for signal "1"	+11 to +30V
• Input current, for signal "1", typ.	9 mA
• Counting frequency, max.	200 kHz
• Minimum pulse width	>= 2.5 μs (200 kHz); >= 25 μs (20 kHz) (parameterizable)
<b>Parameter</b>	
Remark	Assigned binary addresses: 64 bytes / 64 bytes
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• between the channels and the backplane bus	Yes; Optocoupler
<b>Galvanic isolation digital outputs</b>	
• between the channels and the backplane bus	Yes; Optocoupler
<b>Galvanic isolation counter</b>	
• between the channels and the backplane bus	Yes; Optocoupler
<b>Permissible potential difference</b>	
between different circuits	75V DC/60V AC
<b>Isolation</b>	
Isolation checked with	500 V
<b>Connection method</b>	
required front connector	1x 48-pin
<b>Dimensions</b>	
Width	25 mm
Height	290 mm
Depth	210 mm
<b>Weights</b>	
Weight, approx.	650 g

### Ordering data

**FM 450-1 counter module**  
with 2 channels, max. 500 kHz;  
for incremental encoder

#### Front connectors

- 48-pin
- with screw contacts, 1 item
  - with screw contacts, 84 items
  - with spring-loaded terminals, 1 item
  - with crimp contacts, 1 item
  - with crimp contacts, 84 items

#### Front covers for CPU and function modules

Spare part

### Article No.

**6ES7450-1AP01-0AE0**

**6ES7492-1AL00-0AA0**  
**6ES7492-1AL00-1AB0**  
**6ES7492-1BL00-0AA0**

**6ES7492-1CL00-0AA0**  
**6ES7492-1CL00-1AB0**

**6ES7492-1XL00-0AA0**

# SIMATIC S7-400 advanced controller

## Function modules

### FM 451 positioning module

#### Overview



- Three-channel positioning module for rapid/slow-action drives
- 4 digital outputs per channel for motor control
- Displacement measurement incremental or synchronous-serial

#### Note

Displacement measuring systems and precut/preassembled cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

<http://www.siemens.com/simatic-technology>

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#### Technical specifications

Article number	<b>6ES7451-3AL00-0AE0</b> FM 451 positioning module
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
<b>Input current</b>	
Current consumption, max.	550 mA
<b>Encoder supply</b>	
<b>5 V encoder supply</b>	
• 5 V	Yes
• Output current, max.	210 mA
• Cable length, max.	35 m; at max. 210 mA
<b>24 V encoder supply</b>	
• 24 V	Yes
• Output current, max.	300 mA
• Cable length, max.	100 m; at max. 300 mA
<b>Absolute encoder (SSI) encoder supply</b>	
• Absolute encoder (SSI)	Yes
• Type of output voltage	24 V DC
• Output current, max.	300 mA
• Cable length, max.	300 m; At max. 156 kbit/s
<b>Digital inputs</b>	
Number of digital inputs	12; 4 per axis
Functions	Reference cams, reversing cams, flying actual value setting, start/stop positioning
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "1", typ.	6 mA
<b>for 2-wire sensor</b>	
- for signal "1", typ.	30 mA

Article number	<b>6ES7451-3AL00-0AE0</b> FM 451 positioning module
<b>Digital outputs</b>	
Number of digital outputs	12; 4 per axis
Functions	Rapid traverse, creep, run right, run left
short-circuit protection	Yes
<b>Output voltage</b>	
• for signal "1", min.	UP - 3 V
<b>Output current</b>	
• for signal "1" permissible range for 0 to 55 °C, max.	600 mA; with UPmax
• for signal "0" residual current, max.	0.5 mA
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input signal	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Trace mark signals	A, B
• Zero mark signal	N
• Input voltage	24 V
• Input frequency, max.	50 kHz; for 25 m cable length, 25 kHz for 100 m cable length
• Cable length, shielded, max.	100 m
<b>Encoder signals, absolute encoder (SSI)</b>	
• Input signal	5 V difference signal (phys. RS 422)
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Message frame length, parameterizable	13 or 25 bit serial
• Clock frequency, max.	1.25 MHz
• Gray code	1
• Cable length, shielded, max.	300 m; At max. 156 kbit/s

### Technical specifications (continued)

Article number	<b>6ES7451-3AL00-0AE0</b> FM 451 positioning module
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• Galvanic isolation digital inputs	Yes
<b>Galvanic isolation digital outputs</b>	
• Galvanic isolation digital outputs	Yes
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP20	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	0 °C
• max.	55 °C
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Relative humidity</b>	
• Humidity class F	Yes
<b>Connection method</b>	
required front connector	1x 48-pin
<b>Dimensions</b>	
Width	50 mm
Height	290 mm
Depth	210 mm
<b>Weights</b>	
Weight, approx.	1 300 g

### Ordering data

Ordering data	Article No.
<b>FM 451 positioning module</b>	<b>6ES7451-3AL00-0AE0</b>
for rapid traverse and creep speed drives	
<b>Front connector</b>	
48-pin	
• with screw contacts, 1 item	<b>6ES7492-1AL00-0AA0</b>
• with screw contacts, 84 items	<b>6ES7492-1AL00-1AB0</b>
• with spring-loaded terminals, 1 item	<b>6ES7492-1BL00-0AA0</b>
• with crimp contacts, 1 item	<b>6ES7492-1CL00-0AA0</b>
• with crimp contacts, 84 items	<b>6ES7492-1CL00-1AB0</b>
<b>Front covers for CPU and function modules</b>	
Spare part	<b>6ES7492-1XL00-0AA0</b>

### Ordering data

#### Signal cable

Pre-assembled for HTL encoder, UL/DESINA	<b>6FX50</b>	<b>2-2AL00-</b>			
Pre-assembled for SSI absolute encoder, UL/DESINA	<b>6FX50</b>	<b>2-2CC11-</b>			
Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA	<b>6FX50</b>	<b>2-2CD01-</b>			
Pre-assembled for TTL encoder 24 V, UL/DESINA	<b>6FX50</b>	<b>2-2CD24-</b>			
Not crimped			<b>0</b>		
Module end crimped, connector case supplied			<b>1</b>		
Motor end crimped, connector case supplied			<b>4</b>		

0 m				<b>1</b>
100 m				<b>2</b>
200 m				<b>3</b>
0 m				<b>A</b>
10 m				<b>B</b>
20 m				<b>C</b>
30 m				<b>D</b>
40 m				<b>E</b>
50 m				<b>F</b>
60 m				<b>G</b>
70 m				<b>H</b>
80 m				<b>J</b>
90 m				<b>K</b>
0 m				<b>A</b>
1 m				<b>B</b>
2 m				<b>C</b>
3 m				<b>D</b>
4 m				<b>E</b>
5 m				<b>F</b>
6 m				<b>G</b>
7 m				<b>H</b>
8 m				<b>J</b>
0 m				<b>K</b>
0.0 m				<b>0</b>
0.1 m				<b>1</b>
0.2 m				<b>2</b>
0.3 m				<b>3</b>
0.4 m				<b>4</b>
0.5 m				<b>5</b>
0.6 m				<b>6</b>
0.7 m				<b>7</b>
0.8 m				<b>8</b>



# SIMATIC S7-400 advanced controller

## Function modules

### FM 452 cam controller

#### Overview



- Very high speed electronic cam controller
- Low-cost alternative to mechanical cam controllers
- 32 cam tracks, 16 onboard digital outputs for direct output of actions
- Incremental or synchronous-serial position feedback

#### Note:

We offer position measuring systems and preassembled connecting cables for counting and positioning functions under SIMODRIVE Sensor or Motion Connect 500.

<http://www.siemens.com/simatic-technology>

#### Technical specifications

Article number	<b>6ES7452-1AH00-0AE0</b> FM 452 electronic cam controller
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
<b>Input current</b>	
Current consumption, max.	500 mA
<b>Encoder supply</b>	
<b>5 V encoder supply</b>	
• 5 V	Yes
• Output current, max.	300 mA
• Cable length, max.	32 m
<b>24 V encoder supply</b>	
• 24 V	Yes
• Output current, max.	300 mA
• Cable length, max.	100 m
<b>Digital inputs</b>	
Number of digital inputs	11
Functions	Reference point switch, flying actual value setting/length measurement, brake release, enable track output nos. 3 to 10

Article number	<b>6ES7452-1AH00-0AE0</b> FM 452 electronic cam controller
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-28.8 ... +5V
• for signal "1"	+11 to +28.8V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	2 mA
<b>for 2-wire sensor</b>	
- for signal "1", typ.	9 mA
<b>Digital outputs</b>	
Number of digital outputs	16
Functions	Cam track
short-circuit protection	Yes
<b>Output voltage</b>	
• Rated value (DC)	24 V
• for signal "1", min.	UP - 0.8 V
<b>Output current</b>	
• for signal "1" permissible range for 0 to 55 °C, max.	600 mA; with UPmax
• for signal "0" residual current, max.	0.5 mA
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes
• 2-wire sensor	Yes
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input signal	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Trace mark signals	A, B
• Zero mark signal	N
• Input voltage	24 V
• Input frequency, max.	50 kHz; 50 kHz for 25 m cable length; 25 kHz for 100 m cable length
<b>Encoder signals, absolute encoder (SSI)</b>	
• Input signal	5 V difference signal (phys. RS 422)
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Message frame length, parameterizable	13 or 25 bit serial
• Clock frequency, max.	1 MHz
• Gray code	1
• Cable length, shielded, max.	300 m; at max. 125 kHz
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• Galvanic isolation digital inputs	No
<b>Galvanic isolation digital outputs</b>	
• Galvanic isolation digital outputs	No
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP20	Yes

### Technical specifications (continued)

Article number	<b>6ES7452-1AH00-0AE0</b> FM 452 electronic cam controller
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	0 °C
• max.	55 °C
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Relative humidity</b>	
• Humidity class F	Yes
<b>Connection method</b>	
required front connector	1x 48-pin
<b>Dimensions</b>	
Width	25 mm
Height	290 mm
Depth	210 mm
<b>Weights</b>	
Weight, approx.	650 g

### Ordering data

	Article No.
<b>FM 452 electronic cam controller</b>	<b>6ES7452-1AH00-0AE0</b>
<b>Front covers for CPU and function modules</b>	<b>6ES7492-1XL00-0AA0</b>
Spare part	
<b>Front connector</b>	
48-pin	
• with screw contacts, 1 item	<b>6ES7492-1AL00-0AA0</b>
• with screw contacts, 84 items	<b>6ES7492-1AL00-1AB0</b>
• with spring-loaded terminals, 1 item	<b>6ES7492-1BL00-0AA0</b>
• with crimp contacts, 1 item	<b>6ES7492-1CL00-0AA0</b>
• with crimp contacts, 84 items	<b>6ES7492-1CL00-1AB0</b>
<b>Signal cable</b>	
Pre-assembled for HTL and TTL encoder, without Sub-D connector, UL/DESINA	<b>6FX5002-2CA12-■ ■ ■ ■</b>
Pre-assembled for SSI absolute encoder 6FX2001-5, without Sub-D connector, UL/DESINA	<b>6FX5002-2CC12-■ ■ ■ ■</b>
Length code	see FM 451, page 6/73

# SIMATIC S7-400 advanced controller

## Function modules

### FM 453 positioning module

#### Overview



- Positioning module for servo and/or stepper motors in machines with high clock-pulse rates
- Can be used for simple point-to-point positioning and for complex traversing profiles
- Up to 3 independent motors can be controlled

#### Note:

We offer position measuring systems and preassembled connecting cables for counting and positioning functions under SIMODRIVE Sensor or Motion Connect 500.

Further information can be found on the Internet at:

<http://www.siemens.com/simatic-technology>

#### Technical specifications

Article number	<b>6ES7453-3AH00-0AEO</b> FM 453 positioning module
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Auxiliary voltage</b>	
• Rated value (DC)	24 V
• dynamic range	18.5 to 30.2 V
• static area	20.4 to 28.8V
<b>Input current</b>	
from load voltage 1L+, max.	1 A; with 24 V position encoder; 1 A for 5 V position encoder
from load voltage 2L+ to 4L+, max.	2 A; Per channel
from backplane bus 5 V DC, max.	1.6 A; Rated current
<b>Encoder supply</b>	
<b>5 V encoder supply</b>	
• 5 V	Yes
• Output current, max.	300 mA
• Cable length, max.	35 m; at max. 210 mA; 25 m at max. 300 mA
<b>24 V encoder supply</b>	
• 24 V	Yes
• Cable length, max.	100 m; at max. 300 mA
<b>Power losses</b>	
Power loss, max.	8 W
<b>Digital inputs</b>	
Number of digital inputs	6; for each channel / axis
Functions	configurable
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5 V (max. 3 mA)
• for signal "1"	11 to 30 V (max. 7 mA)
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
- at "0" to "1", max.	15 µs; via input voltage range, 8 µs at 24 V DC
- at "1" to "0", max.	45 µs; via input voltage range

Article number	<b>6ES7453-3AH00-0AEO</b> FM 453 positioning module
<b>Digital outputs</b>	
Number of digital outputs	4; for each channel / axis
Functions	configurable
short-circuit protection	Yes
<b>Output voltage</b>	
• Rated value (DC)	24 V
• for signal "1", min.	UP - 0,3 V
<b>Output current</b>	
• for signal "1" rated value	0.5 A; at 40 °C; 0.1 A at 60 °C
• for signal "1" permissible range for 0 to 40 °C, min.	5 mA
• for signal "1" permissible range for 0 to 40 °C, max.	0.6 A
• for signal "1" permissible range for 40 to 60 °C, min.	5 mA
• for signal "1" permissible range for 40 to 60 °C, max.	0.12 A
• for signal "0" residual current, max.	2 mA
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.25 Hz
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes
• Absolute encoder (SSI)	Yes
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Input signal	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz; for 10 m cable length; 0.5 MHz for 35 m cable length
<b>Encoder signals, absolute encoder (SSI)</b>	
• Input signal	5 V difference signal (phys. RS 422)
• Clock frequency, max.	1.25 Mbit/s at 10 cable length (2.5 Mbit/s available soon)
• Cable length, shielded, max.	250 m; At max. 156 kbit/s

### Technical specifications (continued)

Article number	<b>6ES7453-3AH00-0AE0</b> FM 453 positioning module
<b>Drive interface</b>	
<b>Signal input I</b>	
• Type	Drive interface step, signal input "READY 1"
• Function	"Power section ready" where $U_i < 1\text{ V}$ , $I_i = 2\text{ mA}$
<b>Signal output I</b>	
• Type	5 V (phys. RS 422)
• Function	Clock pulse, direction, enable, current control
• Differential output voltage, min.	2 V; $R_L = 100\ \Omega$
• Differential output voltage for signal "0", max.	1.1 V; $I_o = 30\ \text{mA}$
• Differential output voltage, for signal "1", min.	3.7 V; $I_o = -30\ \text{mA}$
• Load impedance	55 $\Omega$
• Pulse frequency	200 kHz; 500 kHz available soon
• Cable length, max.	35 m; 35 m with symm. transmission; 10 m with asymm. transmission
<b>Signal output II</b>	
• Type	Contact relay
• Function	Drive disconnection for operation
• Load	1 A/50 V / 30 VA DC
<b>Signal output III</b>	
• Type	Analog output
• Function	Drive interface Servo: Setpoint output for drive
• Output current	-3 to +3 mA
• Cable length, max.	30 m
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• Galvanic isolation digital inputs	Yes; Optocoupler
<b>Galvanic isolation digital outputs</b>	
• Galvanic isolation digital outputs	Yes; Optocoupler
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP20	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	0 °C
• max.	55 °C
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Relative humidity</b>	
• Humidity class F	No
<b>Connection method</b>	
required front connector	1x 48-pin
<b>Dimensions</b>	
Width	50 mm
Height	290 mm
Depth	210 mm
<b>Weights</b>	
Weight, approx.	1 620 g

### Ordering data

Ordering data	Article No.
<b>FM 453 positioning module</b>	<b>6ES7453-3AH00-0AE0</b>
with 3 channels/axes	
<b>Setpoint connecting cable</b>	
for 3 servo motors	<b>6FX2002-3AD01-■■■■■</b>
for 3 stepper motors	<b>6FX2002-3AB04-■■■■■</b>
for 2 servo motors / 1 stepper motor	<b>6FX2002-3AB02-■■■■■</b>
for 1 servo motor / 2 stepper motors	<b>6FX2002-3AB03-■■■■■</b>
Length code	See page 6/73
<b>Front connector</b>	
48-pin	
• with screw contacts, 1 item	<b>6ES7492-1AL00-0AA0</b>
• with screw contacts, 84 items	<b>6ES7492-1AL00-1AB0</b>
• with spring-loaded terminals, 1 item	<b>6ES7492-1BL00-0AA0</b>
• with crimp contacts, 1 item	<b>6ES7492-1CL00-0AA0</b>
• with crimp contacts, 84 items	<b>6ES7492-1CL00-1AB0</b>
<b>Front covers for CPU and function modules</b>	
	<b>6ES7492-1XL00-0AA0</b>
Spare part	
<b>Signal cable</b>	
Pre-assembled for SSI absolute encoder, UL/DESINA	<b>6FX50 2-2CC11-■■■■■</b>
Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA	<b>6FX50 2-2CD01-■■■■■</b>
Pre-assembled for TTL encoder 24 V, UL/DESINA	<b>6FX50 2-2CD24-■■■■■</b>
Length code	See page 6/73

# SIMATIC S7-400 advanced controller

## Function modules

### FM 455 controller module

#### Overview



- 16-channel closed-loop control module for universal control tasks
- Can be used for temperature, pressure and flow controls
- Convenient online self-optimization for temperature controls
- Predefined controller structures
- 2 control algorithms
- 2 versions:
  - FM 455 C as continuous controller
  - FM 455 S as step or pulse controller
- With 16 analog outputs (FM 455 C) or 32 digital outputs (FM 455 S) for actuators

#### Technical specifications

Article number	6ES7455-0VS00-0AE0 FM 455 C controller module	6ES7455-1VS00-0AE0 FM 455 S controller module
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V
<b>Input current</b>		
from load voltage L+ (without load), max.	440 mA; typ. 370 mA	400 mA; typ. 330 mA
<b>Power losses</b>		
Power loss, typ.	12 W	10.7 W
Power loss, max.	17.3 W	16.2 W
<b>Digital inputs</b>		
Number of digital inputs	16	16
Input characteristic curve in accordance with IEC 61131, type 2	Yes	Yes
<b>Input voltage</b>		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	13 to 30V	13 to 30V
<b>Input current</b>		
• for signal "1", typ.	7 mA	7 mA
<b>Cable length</b>		
• shielded, max.	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m
<b>Digital outputs</b>		
Number of digital outputs		32
short-circuit protection		Yes; Electronic
Limitation of inductive shutdown voltage to		L+ (-1.5 V)
Controlling a digital input		Yes
<b>Switching capacity of the outputs</b>		
• on lamp load, max.		5 W

Article number	6ES7455-0VS00-0AE0 FM 455 C controller module	6ES7455-1VS00-0AE0 FM 455 S controller module
<b>Load resistance range</b>		
• lower limit		240 Ω
• upper limit		4 kΩ
<b>Output voltage</b>		
• for signal "1", min.		L+ (-2.5 V)
<b>Output current</b>		
• for signal "1" rated value		0.1 A
• for signal "1" permissible range for 0 to 60 °C, min.		5 mA
• for signal "1" permissible range for 0 to 60 °C, max.		150 mA
• for signal "0" residual current, max.		0.5 mA
<b>Parallel switching of 2 outputs</b>		
• for logic links		Yes
<b>Switching frequency</b>		
• with resistive load, max.		100 Hz
• with inductive load, max.		0.5 Hz
• on lamp load, max.		100 Hz
<b>Cable length</b>		
• shielded, max.		1 000 m
• Unshielded, max.		600 m
<b>Analog inputs</b>		
Number of analog inputs	16; With thermo- couples or 2-wire connection; 8 with Pt 100 or 4-wire connection	16; With thermo- couples or 2-wire connection; 8 with Pt 100 or 4-wire connection
permissible input voltage for voltage input (destruction limit), max.	20 V	20 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA

## Technical specifications (continued)

Article number	6ES7455-0VS00-0AE0 FM 455 C controller module	6ES7455-1VS00-0AE0 FM 455 S controller module
<b>Input ranges (rated values), voltages</b>		
• 0 to +10 V	Yes	Yes
• -1.75 V to +11.75 V	Yes	Yes
• -80 mV to +80 mV	Yes	Yes
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes	Yes
• 0 to 23.5 mA	Yes	Yes
• -3.5 mA to +23.5 mA	Yes	Yes
• 4 mA to 20 mA	Yes	Yes
<b>Input ranges (rated values), thermoelements</b>		
• Type B	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
<b>Input ranges (rated values), resistance thermometer</b>		
• Pt 100	Yes	Yes
<b>Thermocouple (TC)</b>		
<b>Temperature compensation</b>		
- internal temperature compensation	Yes; Parameterizable	Yes; Parameterizable
- external temperature compensation with Pt100	Yes; Parameterizable	Yes; Parameterizable
<b>Characteristic linearization</b>		
• Parameterizable	Yes	Yes
- for thermocouples	Type B, J, K, R, S	Type B, J, K, R, S
- for resistance thermometer	Pt100 (standard)	Pt100 (standard)
<b>Cable length</b>		
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m; 50 m at 80 mV and thermocouples
<b>Analog outputs</b>		
Number of analog outputs	16	
Voltage output, short-circuit protection	Yes	
Voltage output, short-circuit current, max.	25 mA	
Current output, no-load voltage, max.	18 V	
<b>Output ranges, voltage</b>		
• 0 to 10 V	Yes	
• -10 V to +10 V	Yes	
<b>Output ranges, current</b>		
• 0 to 20 mA	Yes	
• -20 mA to +20 mA	Yes	
• 4 mA to 20 mA	Yes	
<b>Connection of actuators</b>		
• for voltage output two-wire connection	Yes	
• for current output two-wire connection	Yes	

Article number	6ES7455-0VS00-0AE0 FM 455 C controller module	6ES7455-1VS00-0AE0 FM 455 S controller module
<b>Load impedance (in rated range of output)</b>		
• with voltage outputs, min.	1 kΩ	
• with voltage outputs, capacitive load, max.	1 μF	
• with current outputs, max.	500 Ω	
• with current outputs, inductive load, max.	1 mH	
<b>Cable length</b>		
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	
<b>Analog value creation</b>		
Measurement principle	integrating	integrating
<b>Integration and conversion time/resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	14 bit; 12 or 14 bit, parameterizable	14 bit; 12 or 14 bit, parameterizable
• Conversion time (per channel)	16.67 ms; for 12 bit: 16 2/3 ms for 60 Hz, 20 ms for 50 Hz; for 14 bit: 100 ms for 50 and 60 Hz	16.67 ms; for 12 bit: 16 2/3 ms for 60 Hz, 20 ms for 50 Hz; for 14 bit: 100 ms for 50 and 60 Hz
<b>Settling time</b>		
• for resistive load	0.2 ms	0.1 ms
• for capacitive load	3.3 ms	3.3 ms
• for inductive load	0.5 ms	0.5 ms
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
• for voltage measurement	Yes	Yes
• for current measurement as 4-wire transducer	Yes	Yes
<b>Connectable encoders</b>		
• 2-wire sensor	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
<b>Errors/accuracies</b>		
Linearity error (relative to input range), (+/-)	0.05 %	0.05 %
Temperature error (relative to input range), (+/-)	0.005 %/K	0.005 %/K
Linearity error (relative to output range), (+/-)	0.05 %	
Temperature error (relative to output range), (+/-)	0.02 %/K	
<b>Operational limit in overall temperature range</b>		
• Voltage, relative to input area, (+/-)	+/-0.6 to +/-1 %	+/-0.6 to +/-1 %
• Current, relative to input area, (+/-)	+/-0.6 to +/-1 %	+/-0.6 to +/-1 %
• Resistance thermometer, relative to input area, (+/-)	+/-0.6 to +/-1 %	+/-0.6 to +/-1 %
• Voltage, relative to output area, (+/-)	0.5 %	
• Current, relative to output area, (+/-)	0.6 %	

# SIMATIC S7-400 advanced controller

## Function modules

### FM 455 controller module

#### Technical specifications (continued)

Article number	6ES7455-0VS00-0AE0 FM 455 C controller module	6ES7455-1VS00-0AE0 FM 455 S controller module
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to input area, (+/-)	+/-0.4 to +/-0.6 %	+/-0.4 to +/-0.6 %
• Current, relative to input area, (+/-)	+/-0.4 to +/-0.6 %	+/-0.4 to +/-0.6 %
• Resistance thermometer, relative to input area, (+/-)	+/-0.4 to +/-0.6 %	+/-0.4 to +/-0.6 %
• Voltage, relative to output area, (+/-)	0.4 %	
• Current, relative to output area, (+/-)	0.5 %	
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>		
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB
• common mode voltage (USS < 2.5 V), min.	70 dB	70 dB
<b>Interrupts/diagnostics/status information</b>		
Substitute values connectable	Yes; Parameterizable	Yes; Parameterizable
<b>Control technology</b>		
Number of closed-loop controllers	16; With thermocouples or 2-wire connection; 8 with Pt 100 or 4-wire connection	16; With thermocouples or 2-wire connection; 8 with Pt 100 or 4-wire connection
<b>Galvanic isolation</b>		
<b>Galvanic isolation controller</b>		
• between the channels	No	No
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler
<b>Permissible potential difference</b>		
between inputs and MANA (UCM)	2.5 V DC	2.5 V DC
between M internally and the inputs	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>		
Isolation checked with	500 V DC	500 V DC
<b>Connection method</b>		
required front connector	2x 48-pin	2x 48-pin
<b>Dimensions</b>		
Width	50 mm	50 mm
Height	290 mm	290 mm
Depth	210 mm	210 mm
<b>Weights</b>		
Weight, approx.	1 400 g	1 400 g

#### Ordering data

#### Article No.

**FM 455 C controller module**  
with 16 analog outputs  
for 16 continuous controllers

**6ES7455-0VS00-0AE0**

**FM 455 S controller module**  
with 32 digital outputs  
for 16 step or pulse controllers

**6ES7455-1VS00-0AE0**

#### Front connectors

48-pin

- with screw contacts, 1 item
- with screw contacts, 84 items
- with spring-loaded terminals, 1 item
- with crimp contacts, 1 item
- with crimp contacts, 84 items

**6ES7492-1AL00-0AA0**

**6ES7492-1AL00-1AB0**

**6ES7492-1BL00-0AA0**

**6ES7492-1CL00-0AA0**

**6ES7492-1CL00-1AB0**

**Overview*****SIMATIC FM 458-1 DP integrated in SIMATIC S7-400***

- Designed for high-performance and user-configurable closed-loop control tasks in the SIMATIC S7-400.
- Can be adapted to individual requirements as required, such as:  
Controlling, computing, closed-loop control as well as motion control. Can therefore be used flexibly for a wide variety of applications.
- Extensive library with approx. 300 function blocks:  
E.g. simple functions such as AND, ADD and OR through to complex GMC (general motion control) blocks as virtual master or gear functions.
- User-friendly graphical configuration with the SIMATIC engineering tool CFC (Continuous Function Chart) and the D7-SYS add-on software package:  
Optimum code generation by the compiler, therefore SCL is not required.
- PROFIBUS DP interface onboard.

SIMATIC FM 458-1 DP is based on more than 15 years experience with high-performance control systems and combines this know-how with the advantages of SIMATIC – the leading automation system for decades. In contrast to other function modules with static structures/functions, the FM 458-1 DP application module can be configured flexibly and adapted to individual requirements.



**SIMATIC S7-400 advanced controller**

Function modules

FM 458-1 DP application module

**FM 458-1 DP basic module****Overview**

- Basic module for handling arithmetic, closed-loop control and open-loop control tasks
- PROFIBUS DP interface for connection of distributed I/O and drives
- Modular design with expansion modules for I/O and communication

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**Technical specifications**

Article number	<b>6DD1607-0AA2</b> FM458-1 DP APPLICATION MODULE
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 5 V DC	Yes
• 24 V DC	Yes
permissible range (ripple included), lower limit (DC)	4.8 V
permissible range (ripple included), upper limit (DC)	5.25 V
<b>Input current</b>	
Current consumption, typ.	1.5 A
Current consumption, max.	3 A
<b>Memory</b>	
<b>Backup</b>	
• present	Yes; SRAM
<b>Battery</b>	
<b>Backup battery</b>	
• Battery operation	Yes
• Backup current, max.	15 µA
<b>Hardware configuration</b>	
<b>Slots</b>	
• Required slots	1
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time clock)	Yes
• Resolution	500 ms
<b>Digital inputs</b>	
Number of digital inputs	8; Connector X2
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-1 to +6 V
• for signal "1"	13.5 V to 33 V

Article number	<b>6DD1607-0AA2</b> FM458-1 DP APPLICATION MODULE
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	0 mA
• for signal "1", typ.	3 mA; at 24 V
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at "0" to "1", max.	5 µs
<b>Interfaces</b>	
<b>PROFIBUS DP</b>	
• equidistance	Yes; With connection to interrupt tasks
• Direct data exchange (slave-to-slave communication)	Yes
<b>Interrupts/diagnostics/ status information</b>	
<b>Alarms</b>	
• Alarms	Yes
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• Galvanic isolation digital inputs	No; only via optional interface modules
<b>Weights</b>	
Weight, approx.	1 000 g

Ordering data	Article No.	Ordering data	Article No.
<b>FM 458-1 DP application module</b> Basic module for computing, closed-loop control and open-loop control tasks; with PROFIBUS DP interface	<b>6DD1607-0AA2</b>	<b>RS 485 bus connector with 90° cable outlet</b> Max. transfer rate 12 Mbit/s Without PG interface With PG interface	<b>6ES7972-0BA12-0XA0</b> <b>6ES7972-0BB12-0XA0</b>
<b>Micro Memory Card</b> for FM 458-1 DP basic module 2 MB 4 MB 8 MB	<b>6ES7953-8LL31-0AA0</b> <b>6ES7953-8LM31-0AA0</b> <b>6ES7953-8LP31-0AA0</b>	<b>RS 485 bus connector with angled cable outlet</b> Max. transfer rate 12 Mbit/s Without PG interface With PG interface	<b>6ES7972-0BA42-0XA0</b> <b>6ES7972-0BB42-0XA0</b>
<b>FM 458-1 DP Know-How-Protect</b> for protection of technological application modules against unauthorized copying	<b>6DD1607-0GA0</b>	<b>RS 485 bus connector with 90° cable outlet for FastConnect connection system</b> Max. transfer rate 12 Mbit/s Without PG interface • 1 unit • 100 units With PG interface • 1 unit • 100 units	<b>6ES7972-0BA52-0XA0</b> <b>6ES7972-0BA52-0XB0</b> <b>6ES7972-0BB52-0XA0</b> <b>6ES7972-0BB52-0XB0</b>
<b>SC 64 interface cable</b> To connect FM 458-1 to the serial port of a programming device/ PC	<b>6DD1684-0GE0</b>	<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m Preferred lengths: 20 m 50 m 100 m	<b>6XV1830-0EH10</b> <b>6XV1830-0EN20</b> <b>6XV1830-0EN50</b> <b>6XV1830-0ET10</b>
<b>SB10 interface module</b> To connect 8 binary I/Os to FM 458-1 DP	<b>6DD1681-0AE2</b>		
<b>SB61 interface module</b> To connect 8 binary I/Os to FM 458-1 DP, input voltage: 24/48 V DC	<b>6DD1681-0EB3</b>		
<b>SU12 interface module</b> To connect 10 signals to FM 458-1 DP	<b>6DD1681-0AJ1</b>		

**SIMATIC S7-400 advanced controller**

Function modules

FM 458-1 DP application module

**EXM 438-1 input/output expansion****Overview**

- Optional plug-in expansion module for the FM 458-1 DP basic module
- For input and output of time-critical signals
- With digital and analog inputs/outputs
- Incremental and absolute value encoders can be connected
- 4 high-resolution analog outputs
- Fan-free operation up to 40°C

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**Technical specifications**

Article number	<b>6DD1607-0CA1</b> EXM 438-1 I/O EXPANSION
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	Yes
• 5 V DC	Yes
• 24 V DC	Yes; to be set up externally
<b>Input current</b>	
Current consumption, typ.	1.5 A
<b>Encoder supply</b>	
Output voltage	about 14 V (non-isolated)
short-circuit protection	Yes; Electronic
<b>Output current</b>	
• Rated value	100 mA
<b>Hardware configuration</b>	
<b>Slots</b>	
• Required slots	1
<b>Digital inputs</b>	
Number of digital inputs	16
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-1 to +6 V or input open
• for signal "1"	+13 to +33 V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	0 mA
• for signal "1", typ.	3 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at "0" to "1", max.	200 µs
<b>Digital outputs</b>	
Number of digital outputs	8
short-circuit protection	Yes; electronic/thermal
• Response threshold, typ.	250 mA
Limitation of inductive shutdown voltage to	Supply voltage +1 V

Article number	<b>6DD1607-0CA1</b> EXM 438-1 I/O EXPANSION
<b>Output voltage</b>	
• for signal "0", max.	3 V
• for signal "1", max.	Supply voltage -2.5 V
<b>Output current</b>	
• for signal "1" rated value	50 mA
• for signal "1" permissible range for 0 to 40 °C, min.	100 mA
• for signal "0" residual current, max.	20 µA
• Total switching current	80 % at 50 °C all outputs 50 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	15 µs
<b>Analog inputs</b>	
Number of analog inputs	5; Differential inputs
<b>Input ranges (rated values), voltages</b>	
• -10 V to +10 V	Yes; -10 V: +/-4 LSB; to +10 V: +/-4 LSB (1 LSB = 4.88 mV)
• Input resistance (-10 V to +10 V)	470 kΩ
<b>Analog outputs</b>	
Number of analog outputs	8; 4 outputs 16 bit; 4 outputs 12 bit
Voltage output, short-circuit protection	Yes; relative to frame
Voltage output, short-circuit current, max.	16 bits: 27 mA; 12 bits: 100 mA
<b>Output ranges, voltage</b>	
• -10 to +10 V	Yes
<b>Analog value creation</b>	
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	4 AO: 16 bits, 4 AO: 12 bits, 5 AI: 12 bits
• Conversion time (per channel)	4 AO (16 bits): 2 µs; 4 AO (12 bits): 4 µs; 5 AI: 45 µs
<b>Encoder</b>	
Number of connectable encoders, max.	12; 8 incremental encoders (synchronizable), 4 absolute encoders

**Technical specifications (continued)**

Article number	<b>6DD1607-0CA1</b> EXM 438-1 I/O EXPANSION
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes; Single or multturn encoder with SSI (synchronous serial) or EnDat interface
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Trace mark signals	1) for tracks A and B (90° out of phase), poss. with zero pulse N; 2) for separate forward and backward track
• Input signal	With 0 signal: -5 to 0 V; with 1 signal: +3 to +5 V; permissible input voltage range: differential voltage -5 to +5 V; max. input current: 15 mA (important: not limited on module side!)
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Trace mark signals	Track A and B (phase-shifted by 90 degrees), possibly with zero pulse N
• Input voltage	with 0 signal: -30 to +4 V (at 15 mA load); with 1 signal: +8 to 30 V (at 15 mA load); permissible input voltage range: differential voltage -30 to +30 V
<b>Encoder signals, absolute encoder (SSI)</b>	
• Input signal	5 V acc. to RS 422
• Data signal	Dual-, Gray-, Gray-Excess-Code
• Clock frequency, max.	2 MHz; 100 kHz to 2 MHz (depending on cable length)
<b>Errors/accuracies</b>	
Linearity error (relative to output range), (+/-)	(+/- 1 LSB)
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• Galvanic isolation digital inputs	No
<b>Galvanic isolation digital outputs</b>	
• Galvanic isolation digital outputs	No
<b>Galvanic isolation analog inputs</b>	
• Galvanic isolation analog inputs	No
<b>Galvanic isolation analog outputs</b>	
• Galvanic isolation analog outputs	No
<b>Weights</b>	
Weight, approx.	1 kg

**Ordering data****Article No.**

<b>EXM 438-1 input/output expansion</b>	<b>6DD1607-0CA1</b>
for direct exchange of digital and analog signals between FM 458-1 DP and the plant	
<b>SB10 interface module</b>	<b>6DD1681-0AE2</b>
To connect 8 binary inputs or outputs to FM 458-1 DP	
<b>SB61 interface module</b>	<b>6DD1681-0EB3</b>
To connect 8 binary inputs to FM 458-1 DP, input voltage: 24/48 V DC	
<b>SB71 interface module</b>	<b>6DD1681-0DH1</b>
To connect 8 binary outputs to FM 458-1 DP, output voltage: 24/48 V DC	
<b>SU12 interface module</b>	<b>6DD1681-0AJ1</b>
To connect 10 signals to FM 458-1 DP	
<b>SU13 interface module</b>	<b>6DD1681-0GK0</b>
To connect 50 signals to FM 458-1 DP	
<b>SC 62 interface cable</b>	<b>6DD1684-0GC0</b>
To connect EXM 438-1 with up to 5 SBxx or SU12	
<b>SC 63 interface cable</b>	<b>6DD1684-0GD0</b>
To connect EXM 438-1 with an SU13	

**SIMATIC S7-400 advanced controller**

Function modules

FM 458-1 DP application module

**EXM 448 universal communications expansion module****Overview**

- Optional expansion module for the FM 458-1 DP basic module
- For fast communication over PROFIBUS DP or SIMOLINK
- EXM 448: With vacant slot for a MASTERDRIVES option module

**Technical specifications**

Article number	<b>6DD1607-0EA0</b> S7-400, EXM 448 F. FM458
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 5 V DC	Yes
<b>Hardware configuration</b>	
<b>Slots</b>	
• Required slots	1
<b>Weights</b>	
Weight, approx.	0.8 kg

**Ordering data****Article No.****EXM 448 universal communications expansion module****6DD1607-0EA0**

For fast communication, for example, with drives; with free slot for MASTERDRIVES option module

**EXM 448-2 universal communications expansion module****Overview**

- Optional plug-in expansion module for the FM 458-1 DP basic module
- For high-speed communication over up to 2 SIMOLINK interfaces
- For coupling several FM 458-1 DP application modules in synchronism with the sampling time

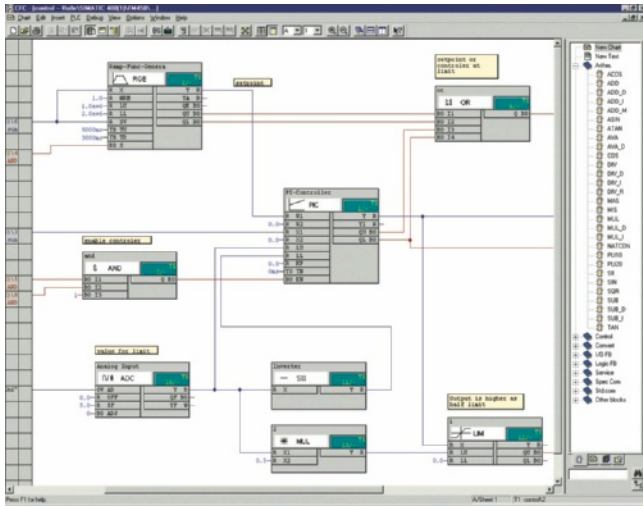
**Technical specifications**

Article number	<b>6DD1607-0EA2</b> SIMATIC S7-400 EXM 448-2 COMM.-EXPANS.
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 5 V DC	Yes
<b>Hardware configuration</b>	
<b>Slots</b>	
• Required slots	1
<b>Weights</b>	
Weight, approx.	0.9 kg

**Ordering data****Article No.****EXM 448-2 universal communications expansion****6DD1607-0EA2**

For high-speed communication with drives; for establishing two SIMOLINK fiber optic connections

## Overview



- Add-on for STEP 7/CFC/SFC for configuration of control and automation tasks with T400, FM 458, SIMADYN D or SIMATIC TDC
- Contains function blocks for every application
- Scope of delivery: Software packages D7-SYS, CFC, SFC, TH-PO
- Optional:  
D7-FB-Gen, function block generator for the creation of customized function blocks

## Ordering data

## Article No.

**SIMATIC D7-SYS V8.0**

## Task:

Function block library for configuring closed-loop control and automation tasks

## Target system:

SIMATIC S7-400/FM 458/  
SIMATIC TDC/T400/  
SIMADYN

## Requirement:

Windows XP, Windows 7 32/64-bit,  
Windows Server 2003/2008

## Type of delivery:

on CD, German, English,  
with electronic documentation

Floating license

**6ES7852-0CC03-0YA5**

Upgrade License V7.x and higher

**6ES7852-0CC03-0YE5**

Software Update Service<sup>1)</sup>

**6ES7852-0CC01-0YL5**

**SIMATIC D7 FB Gen V2.1**

**6DD1805-5DA0**

Function block generator

**SIMATIC Manual Collection**

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD,  
multilingual: LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC Based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC

**SIMATIC Manual Collection  
update service for 1 year**

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD  
and the three subsequent updates

<sup>1)</sup> For more information on the software update service, see Section 11,  
page 11/3.

**SIMATIC S7-400 advanced controller**

Function modules

FM 458-1 DP application module

**Accessories****Overview SC64 interface cable**

(Similar to figure)

Interface cable for FM 458-1 DP basic module and SB10, SB60, SB61 and SU12 interface modules.

**Overview SC63 interface cable**

This cable is used to connect the SIMATIC TDC SM500 peripheral (I/O) module or the SIMATIC S7-400 EXM 438-1 expansion module to a SU13 interface module.

**Overview SC62 interface cable**

This cable is used to connect the SIMATIC TDC SM500 peripheral module (I/O) or the SIMATIC S7-400 EXM 438-1 expansion module to up to 5 interface modules SB10, SB60, SB70, SB61 SB71 and/ or SU12.

**Overview SB10 interface module**

(Similar to figure)

The interface module is used to connect 8 digital inputs or outputs.

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**Overview SB61 interface module**

It is used to connect 8 digital inputs with conversion from 24/48 V DC to 24 V DC.

**Overview SU12 interface module**

The interface module is used to connect 10 signals; there is no electronic conversion.

**Overview SB71 interface module**

The interface module is used to connect 8 digital outputs with conversion of the 24 V DC voltage on the module side to a max. of 24/48 V DC/AC on the plant side using transistors.

**Overview SU13 interface module**

This interface module can be used to connect 50 signals; there is no electronic conversion.



**SIMATIC S7-400 advanced controller**

Function modules

FM 458-1 DP application module

**Accessories****Technical specifications****Technical specifications SB10 interface module**

Number of digital inputs or outputs	8
Electrical isolation	No
Max. cable cross-section	1.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.3 kg

**Technical specifications SB61 interface module**

Number of digital inputs for	8
• Input voltage	24/48 V DC
Electrical isolation	Yes, via optocoupler
Max. cable cross-section	1.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.32 kg

**Technical specifications SB71 interface module**

Number of digital outputs	8
• Output voltage, max	24/48 V DC
Output current, max.	40 mA, short-circuit proof
Electrical isolation	Yes, via optocoupler
Max. cable cross-section	1.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.32 kg

**Technical specifications SU12 interface module**

Number of signal cables which can be connected	10
Signal amplitude per signal, max.	60 V, 0.5 A
Electrical isolation	No
Max. cable cross-section	1.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.28 kg

**Technical data S312 interface module**

Number of signal cables which can be connected	50
Signal amplitude per signal, max.	60 V, 0.5 A
Electrical isolation	No
Max. cable cross-section	1.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.3 kg

**Ordering data****Article No.**

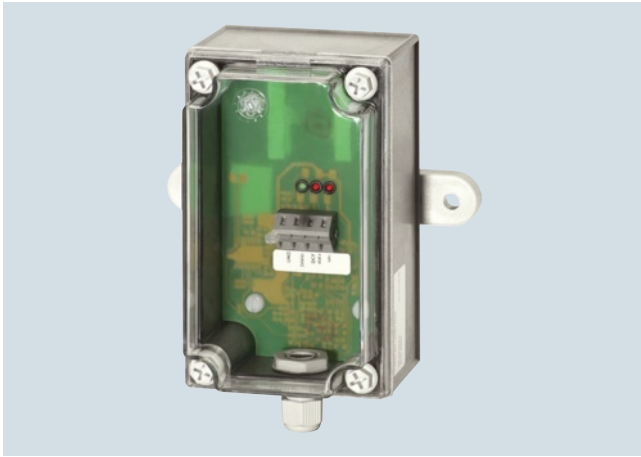
<b>SC64 interface cable</b> between FM 458-1 DP (X2) module with SBxx or SU12 interface module, 2 m long	<b>6DD1684-0GE0</b>
<b>SC62 interface cable</b> between SM500 or EXM 438-1 module and max. 5 SB10, SB60, SB70, SB61 SB71 interface modules and/or SU12, 2 m long	<b>6DD1684-0GC0</b>
<b>SC63 interface cable</b> between SM500 or EXM 438-1 module and SU13 interface module, 2 m long	<b>6DD1684-0GD0</b>
<b>SB10 interface module</b> 8 digital inputs/outputs 24 V DC	<b>6DD1681-0AE2</b>
<b>SB61 interface module</b> 8 digital inputs 24/48 V DC	<b>6DD1681-0EB3</b>
<b>SB71 interface module</b> 8 digital outputs with transistors, 24/48 V DC	<b>6DD1681-0DH1</b>
<b>SU12 interface module</b> with plug-in connector, 10-pole	<b>6DD1681-0AJ1</b>
<b>SU13 interface module</b> with screw-type plug-in connector	<b>6DD1681-0GK0</b>

## SIMATIC S7-400 advanced controller

### SIPLUS S7-400 function modules

#### SIPLUS DCF 77 radio clock module

#### Overview



This module can be used to synchronize the real-time clock of the SIMATIC/SIPLUS S7-200, S7-300 and S7-400 automation systems with the official time of the DCF 77 time signal transmitter of the Physikalisch-Technische Bundesanstalt Braunschweig, Germany.

The time is received by means of a DCF receiver (antenna with electronics) which is connected via two digital inputs on the SIMATIC PLC and SIPLUS together with a software driver available as a download (function block FB):

<http://www.siemens.com/siplus> - Support - Tools and Downloads!

#### Technical specifications

##### Radio clock module SIPLUS DCF 77

Radio frequency	77.5 Hz
Power supply	24 V DC (20.4 to 28.8 DC)
Power consumption, typ.	50 mA
Dimensions (W x H x D)	75 mm x 125 mm <sup>1)</sup> x 75 mm

<sup>1)</sup> Additionally 25 mm (0.98 in) for heavy duty threaded joint and bending radius for cables

#### Ordering data

#### Article No.

##### SIPLUS DCF 77 radio clock module

For synchronizing SIMATIC S7-200, S7-300 and S7-400 with the official time of the DCF 77 time signal transmitter of the Physikalisch-Technische Bundesanstalt Braunschweig, Germany

**6AG1057-1AA03-0AA0**

**SIMATIC S7-400 advanced controller**

## Communication

**CP 440****Overview**

6

- For high-performance transmission of messages via point-to-point connections (high message rate)
- Physical interface: RS 422/RS 485 (X.27)
- Up to 32 nodes
- Protocol implemented: ASCII, 3964 (R)
- Simple parameterization via a parameterization tool integrated into STEP 7

**Technical specifications**

Article number	<b>6ES7440-1CS00-0YE0</b> CP 440-1, PTP-CONNECTIONS, 1 CHANNEL
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 5 V DC	Yes
• 24 V DC	Yes
<b>Input current</b>	
from backplane bus 5 V DC, max.	360 mA
<b>Power losses</b>	
Power loss, typ.	1.7 W
<b>Memory</b>	
Memory requirements per interface in memory card of S7-CPU	1 to 5 Kbytes for parameters
<b>Interfaces</b>	
Number of interfaces	1
Interface physics, RS 422/RS 485 (X.27)	Yes
RS 422/485, cable length, shielded, max.	1 200 m
<b>Point-to-point</b>	
<b>Integrated protocol driver</b>	
- 3964 (R)	Yes
- ASCII	Yes
<b>Transmission speed, RS 422/485</b>	
- with 3964 (R) protocol, max.	115.2 kbit/s
- with ASCII protocol, max.	115.2 kbit/s
<b>Configuration</b>	
<b>Configuration software</b>	
• STEP 7	Yes; own parameter assignment forms
<b>Dimensions</b>	
Width	25 mm
Height	290 mm
Depth	210 mm
<b>Weights</b>	
Weight, approx.	600 g

**Ordering data****Article No.**

<b>CP 440 communications processor</b> with one RS 422/485 (X.27) interface	<b>6ES7440-1CS00-0YE0</b>
<b>RS 422/485 connecting cable</b> for linking to SIMATIC S7	
5 m	<b>6ES7902-3AB00-0AA0</b>
10 m	<b>6ES7902-3AC00-0AA0</b>
50 m	<b>6ES7902-3AG00-0AA0</b>

**Overview**


- For fast, high-performance serial data exchange via point-to-point connection
- 2 versions:
  - CP 441-1 with 1 variable interface for easy point-to-point coupling.
  - CP 441-2 with 2 variable interfaces for high-performance point-to-point connection.
- Plug-in interface modules for different physical transmission properties: RS 232C (V.24), 20 mA (TTY) or RS 422/RS 485 (X.27)
- Implemented protocols: ASCII, 3964 (R), printer driver; for CP 441-2 additional RK 512 and Modbus RTU (reloadable)
- Simple parameter assignment using tool integrated in STEP 7

**Technical specifications**

Article number	<b>6ES7441-1AA05-0AE0</b> CP 441-1, PTP-CONN., 1 CHANNEL	<b>6ES7441-2AA05-0AE0</b> CP 441-2, PTP-CONN., 2 CHANNELS
<b>Product type designation</b>		
<b>Supply voltage</b>		
Rated value (DC)		
• 5 V DC	Yes	Yes
• 24 V DC	Yes	Yes
<b>Input current</b>		
from backplane bus 5 V DC, max.	300 mA	300 mA
<b>Power losses</b>		
Power loss, typ.	2.1 W; incl. 1x20 mA TTY module	2.7 W; incl. 2x20mA TTY module
<b>Memory</b>		
Memory requirements per interface in memory card of S7-CPU	1 to 5 KB for parameters; 0 to 55 KB for message texts	1 to 5 KB for parameters; 0 to 55 KB for message texts; 0 to 64 KB for loadable drivers
<b>Interfaces</b>		
Number of interfaces	1; variable	2; variable
Interface physics, 20 mA (TTY)	Yes	Yes
Interface physics, RS 232C (V.24)	Yes	Yes
Interface physics, RS 422/RS 485 (X.27)	Yes	Yes
20 mA (TTY), cable length, shielded, max.	1 000 m; At 9600 bps	1 000 m; At 9600 bps
RS 232, cable length, shielded, max.	15 m; At 115200 bps	15 m; At 115200 bps
RS 422/485, cable length, shielded, max.	1 200 m; At 19200 bps	1 200 m; At 19200 bps
<b>Point-to-point</b>		
• Transmission rate, max.	115.2 kbit/s; Min. 300 bps	115.2 kbit/s; Min. 300 bps
• supported printers	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user-defined	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user-defined
<b>Integrated protocol driver</b>		
- 3964 (R)	Yes	Yes
- ASCII	Yes	Yes
- RK512	No	Yes
- Printer	Yes	Yes
- customer-specific drivers reloadable	No	No
<b>Transmission speed, 20 mA (TTY)</b>		
- with 3964 (R) protocol, max.	19.2 kbit/s	19.2 kbit/s
- with ASCII protocol, max.	19.2 kbit/s	19.2 kbit/s
- with printer driver, max.,	19.2 kbit/s	19.2 kbit/s
- with RK 512 protocol, max.	19.2 kbit/s	19.2 kbit/s

# SIMATIC S7-400 advanced controller

## Communication

### CP 441-1, CP 441-2

#### Technical specifications (continued)

Article number	<b>6ES7441-1AA05-0AE0</b> CP 441-1, PTP-CONN., 1 CHANNEL	<b>6ES7441-2AA05-0AE0</b> CP 441-2, PTP-CONN., 2 CHANNELS
<b>Transmission speed, RS 422/485</b>		
- with 3964 (R) protocol, max.	115.2 kbit/s	115.2 kbit/s
- with ASCII protocol, max.	115.2 kbit/s	115.2 kbit/s
- with printer driver, max.,	115.2 kbit/s	115.2 kbit/s
- with RK 512 protocol, max.		115.2 kbit/s
<b>Transmission speed, RS232</b>		
- with 3964 (R) protocol, max.	115.2 kbit/s	115.2 kbit/s
- with ASCII protocol, max.	115.2 kbit/s	115.2 kbit/s
- with printer driver, max.,	115.2 kbit/s	115.2 kbit/s
- with RK 512 protocol, max.		115.2 kbit/s
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	0 °C	0 °C
• max.	60 °C	60 °C
<b>Relative humidity</b>		
• Operation, max.	95 %	95 %
<b>Dimensions</b>		
Width	25 mm	25 mm
Height	290 mm	290 mm
Depth	210 mm	210 mm
<b>Weights</b>		
Weight, approx.	580 g; Interface modules: 80 g	580 g; Interface modules: 80 g

#### Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>Communication module CP 441-1</b>	<b>6ES7441-1AA05-0AE0</b>	<b>TTY connecting cable</b>	
With 1 variable interface for interface submodules; including configuration package on CD		5 m	<b>6ES7902-2AB00-0AA0</b>
<b>Communication module CP 441-2</b>	<b>6ES7441-2AA05-0AE0</b>	10 m	<b>6ES7902-2AC00-0AA0</b>
With 2 variable interfaces for interface submodules; including configuration package on CD		50 m	<b>6ES7902-2AG00-0AA0</b>
<b>Interface submodules</b>		<b>RS 422/485 connecting cable</b>	
RS 232C (V.24)	<b>6ES7963-1AA10-0AA0</b>	5 m	<b>6ES7902-3AB00-0AA0</b>
20 mA (TTY)	<b>6ES7963-2AA10-0AA0</b>	10 m	<b>6ES7902-3AC00-0AA0</b>
RS 422/485 (X.27)	<b>6ES7963-3AA10-0AA0</b>	50 m	<b>6ES7902-3AG00-0AA0</b>
<b>RS 232 connecting cable</b>		<b>Loadable drivers for CP 441-2</b>	
5 m	<b>6ES7902-1AB00-0AA0</b>	Modbus master (RTU format)	
10 m	<b>6ES7902-1AC00-0AA0</b>	• Single license	<b>6ES7870-1AA01-0YA0</b>
15 m	<b>6ES7902-1AD00-0AA0</b>	• Single license, without software or documentation	<b>6ES7870-1AA01-0YA1</b>
		Modbus slave (RTU format)	
		• Single license	<b>6ES7870-1AB01-0YA0</b>
		• Single license, without software or documentation	<b>6ES7870-1AB01-0YA1</b>

#### Overview

- Drivers for Modbus protocol with RTU message format; communication as master or slave
- Downloadable onto CP 341 and CP 441-2 (6ES7441-2AA04-0AE0)

#### Technical specifications

Parameterization software	Loadable drivers for CP 441-2 and CP 341
Type of license	Simple license, copy license
Target system	SIMATIC CP 341, SIMATIC CP 441-2

#### Technical specifications

##### Modbus Master

- Modbus protocol with RTU format
- Master/slave coupling: SIMATIC S7 is master
- Function codes implemented: 01, 02, 03, 04, 05, 06, 07, 08, 11, 12, 15, 16
- No V.24 control and signal lines
- CRC polynomial:  $x^{16} + x^{15} + x^2 + 1$
- Interfaces: TTY (20 mA); V.24 (RS 232 C); X.27 (RS 422/485) 2-wire or 4-wire
- Receive mailbox specified on BRCV
- Character delay time 3.5 characters or multiple thereof
- Broadcast message possible
- Transmission rate 300 bit/s up to 76800 bit/s (TTY up to 19200 bit/s)
- Character frame
- With/without RS 485 operation for 2-wire connections
- With/without modem operation (ignore smudge characters)
- Response monitoring time 100 ms to 25.5 s in steps of 100 ms
- Factor for the character delay time 1-10
- Default setting of receive line when using the X.27 interface module

Adjustable parameters

##### Modbus slave

- Modbus protocol with RTU format
- Master/slave coupling: SIMATIC S7 is slave
- Function codes implemented: 01, 02, 03, 04, 05, 06, 08, 15, 16
- No V.24 control and signal line
- CRC polynomial:  $x^{16} + x^{15} + x^2 + 1$
- Interfaces: TTY (20 mA), V.24 (RS 232C), X.27 (RS 422/485) 2-wire or 4-wire
- Communications FB 180, instance DB 180 (use of a multi-instance)
- Conversion of the Modbus data address to S7 data areas. Data areas which can be processed: DB, bit memories, outputs, inputs, timers, counters
- Character delay time 3.5 characters or multiple thereof

Adjustable parameters

- Transmission rate 300 bit/s up to 76800 bit/s (TTY up to 19200 bit/s)
- Character frame
- Slave address of CP (1 to 255)
- With/without RS 485 operation for 2-wire connection
- With/without modem operation (ignore smudge characters)
- Factor for the character delay time 1-10
- Number of work DB (for FB processing)
- Enabling of memory areas for writing by the master
- Default setting of receive line when using the X.27 interface module
- Conversion of Modbus addresses to S7 data areas

#### Ordering data

#### Article No.

##### Modbus Master V3.1

**Task:**  
Communication via Modbus protocol with RTU format, SIMATIC S7 as master

**Requirement:**  
CP 341 or CP 441-2; STEP 7 V4.02 and higher

**Delivery package:**  
Driver program/documentation, English, German, French

Single license

**6ES7870-1AA01-0YA0**

Single license, without software and documentation

**6ES7870-1AA01-0YA1**

##### Modbus Slave V3.1

**Task:**  
Communication via Modbus protocol with RTU format, SIMATIC S7 as slave

**Requirement:**  
CP 341 or CP 441-2; STEP 7 V4.02 and higher

**Delivery package:**  
Driver program/documentation, English, German, French

Single license

**6ES7870-1AB01-0YA0**

Single license, without software and documentation

**6ES7870-1AB01-0YA1**

##### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

##### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

# SIMATIC S7-400 advanced controller

## Communication

### CP 443-5 Basic

#### Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
		●	●	●	

6ES7130-0000

- Connection of the S7-400 to PROFIBUS
- Communication services:
  - PG/OP communication
  - S7 communication
  - Open communication (SEND/RECEIVE)
  - PROFIBUS FMS
- Time synchronization
- Easy programming and configuration over PROFIBUS
- Cross-network programming device communication through S7 routing
- Can be easily integrated into the SIMATIC S7-400 system
- Modules can be replaced without the need for a PG
- SIMATIC H system operation for redundant S7 communication

#### Technical specifications

Article number	<b>6GK7443-5FX02-0XE0</b>
Product type designation	CP 443-5 Basic
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS 485)
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage	5 V
Relative symmetrical tolerance for DC	
• at 5 V	5 %
Consumed current	
• from backplane bus for DC at 5 V typical	1 A
• from external supply voltage for DC at 24 V typical	1.2 A
Active power loss	5 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-400 single width
Width	25 mm
Height	290 mm
Depth	210 mm
Net weight	0.65 kg
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	14
• Note	depending on CPU type
<b>Performance data open communication</b>	
Number of possible connections for open communication by means of SEND/RECEIVE blocks	
• maximum	32
Amount of data	
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte

Technical specifications (continued)		Ordering data	Article No.
Article number	<b>6GK7443-5FX02-0XE0</b>	<b>CP 443-5 Basic communications processor</b> Communications processor for connection of S7-400 to PROFIBUS, FMS, open communication, PG/OP and S7 communication; with electronic manual on CD-ROM  <b>STEP 7 Version 5.5</b> Target system: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC Requirements: Windows XP Prof., Windows 7 Professional/Ultimate Type of delivery: German, English, French, Spanish, Italian; including license key on USB stick, with electronic documentation • Floating License on DVD • Rental license for 50 hours • Software Update Service on DVD (requires current software version) • Floating License upgrade 3.x/4.x/5.x to V5.4; on DVD • Trial License STEP 7 V5.4; on DVD, operational for 14 days  <b>Accessories</b> <b>PROFIBUS FastConnect RS 485 connection plugs</b> With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s • Without PG interface • With PG interface  <b>PROFIBUS IP20 bus connectors</b> With connection to PPI, MPI, PROFIBUS • Without PG interface • With PG interface  <b>PROFIBUS bus terminal 12M</b> Bus terminal for connection of PROFIBUS nodes at up to 12 Mbit/s with connecting cable	<b>6GK7443-5FX02-0XE0</b>
Product type designation	CP 443-5 Basic		
<b>Performance data FMS functions</b>			
Number of possible connections for FMS connection maximum	48		
Amount of data of the variables			
• for READ job maximum	237 byte		
• for WRITE job maximum	233 byte		
Number of variables			
• Configurable from server to FMS partner	512		
• Loadable from server to FMS partner	2 640		
<b>Performance data S7 communication</b>			
Number of possible connections for S7 communication			
• maximum	48		
<b>Performance data multi-protocol mode</b>			
Number of possible connections of which 2 reserved for PG/OP communication with multi-protocol mode maximum	59		
<b>Performance data telecontrol</b>			
Protocol is supported			
• TCP/IP	No		
<b>Product functions management, configuration</b>			
Configuration software			
• required	STEP 7 V5.2 SP1 or higher and NCM S7 for PROFIBUS		



# SIMATIC S7-400 advanced controller

## Communication

### CP 443-5 Extended

#### Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
●			●	●	

- PROFIBUS DP master with electrical interface for connecting the SIMATIC S7-400 to PROFIBUS at up to 12 Mbit/s (including 45.45 Kbit/s)
- For setting up additional PROFIBUS DP lines
- Communication services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication
  - Open communication (SEND/RECEIVE)
- Time synchronization
- Easy programming and configuration over PROFIBUS
- Cross-network programming device communication through S7 routing
- Can be easily integrated into the SIMATIC S7-400 system
- Module replacement without PG
- SIMATIC H system operation for redundant S7 communication or DP master communication
- Data record routing (PROFIBUS DP)
- Adding or modifying distributed I/O during operation

#### Technical specifications

Article number	<b>6GK7443-5DX05-0XE0</b>
Product type designation	CP 443-5 Extended
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS 485)
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Relative symmetrical tolerance for DC	
• at 5 V	5 %
Consumed current	
• from backplane bus for DC at 5 V typical	0.6 A
Active power loss	3 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-400 single width
Width	25 mm
Height	290 mm
Depth	210 mm
Net weight	0.65 kg
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	14
• Note	The number of CPs that can be operated as DP masters depends on the number of CP 443-1 Advanced processors operating in the S7-400 station as PROFINET IO controllers. Up to 10 CPs can be operated in total: up to 4 as PROFINET IO controllers (CP 443-1 Advanced); up to 10 as DP masters (CP 443-5 Extended)

Technical specifications (continued)		Ordering data	Article No.
Article number	<b>6GK7443-5DX05-0XE0</b>	<b>CP 443-5 Extended communications processor</b>	
Product type designation	CP 443-5 Extended	for connection of the SIMATIC S7-400 to PROFIBUS	
<b>Performance data open communication</b>		Extended version for PROFIBUS DP; with electronic manual on CD-ROM	<b>6GK7443-5DX05-0XE0</b>
Number of possible connections for open communication by means of SEND/RECEIVE blocks		<i>Accessories</i>	
• maximum	32	<b>PROFIBUS FastConnect connection plug RS 485</b>	
Amount of data		With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s	
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte	• Without PG interface	<b>6ES7972-0BA52-0XA0</b>
<b>Performance data PROFIBUS DP</b>		• With PG interface	<b>6ES7972-0BB52-0XA0</b>
Service as DP master		<b>PROFIBUS bus connector IP20</b>	
• DPV1	Yes	With connection to PPI, MPI, PROFIBUS	
Number of DP slaves on DP master usable	125	• Without PG interface	<b>6ES7972-0BA12-0XA0</b>
Amount of data		• With PG interface	<b>6ES7972-0BB12-0XA0</b>
• of the address area of the inputs as DP master total	4 096 byte	<b>PROFIBUS FC Standard Cable</b>	
• of the address area of the outputs as DP master total	4 096 byte	2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order 20 m, sold by the meter	<b>6XV1830-0EH10</b>
• of the address area of the inputs per DP slave	244 byte	<b>PROFIBUS bus terminal 12M</b>	
• of the address area of the outputs per DP slave	244 byte	Bus terminal for connection of PROFIBUS nodes up to 12 Mbps with connecting cable	<b>6GK1500-0AA10</b>
<b>Performance data S7 communication</b>			
Number of possible connections for S7 communication			
• maximum	48		
<b>Performance data multi-protocol mode</b>			
Number of active connections with multi-protocol mode			
• without DP maximum	59		
• with DP maximum	54		
<b>Performance data telecontrol</b>			
Protocol is supported			
• TCP/IP	No		
<b>Product functions management, configuration</b>			
Configuration software			
• required	STEP 7 V5.4 SP4 or higher / STEP 7 Professional V12 (TIA Portal) or higher		

Note:

You can find order information for software for communication with PC systems in the IK PI catalog.

**SIMATIC S7-400 advanced controller**

## Communication

**CP 443-1****Overview**

ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●	●		●	●

Communications processor for connecting a SIMATIC S7-400 to Industrial Ethernet networks, also as PROFINET IO controller or in SIMATIC H systems.

The CP supports:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication
- IT communication

The communications processor can also be used for redundant S7 communication in SIMATIC H systems and for fail-safe applications (PROFIsafe) in connection with an S7-400 F-CPU.

**Technical specifications**

Article number	<b>6GK7443-1EX30-0XE0</b>
Product type designation	CP 443-1
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	2
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
design of the removable storage C-PLUG	No
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Relative symmetrical tolerance for DC	
• at 5 V	5 %
Consumed current	
• from backplane bus for DC at 5 V typical	1.4 A
Active power loss	7.25 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-400 single width
Width	25 mm
Height	290 mm
Depth	210 mm
Net weight	0.7 kg
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	14
• Note	max. 4 as PN IO ctrl.

## Technical specifications (continued)

Article number	<b>6GK7443-1EX30-0XE0</b>
Product type designation	CP 443-1
<b>Performance data open communication</b>	
Number of possible connections for open communication by means of SEND/RECEIVE blocks	
• maximum	64
Amount of data	
• as user data per ISO connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per ISO on TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks maximum	2 Kibyte
Number of possible connections for open communication	
• by means of T blocks maximum	64
Amount of data	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	1 452 byte
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	128
• with PG connections maximum	2
• Note	when using several CPUs
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	128
<b>Performance data PROFINET communication as PN IO-Controller</b>	
Product function PROFINET IO controller	Yes
Number of PN IO devices on PROFINET IO controller usable total	128
Number of PN IO IRT devices on PROFINET IO controller usable	64
Number of external PN IO lines with PROFINET per rack	4
Amount of data	
• as user data for input variables as PROFINET IO controller maximum	4 Kibyte
• as user data for input variables as PROFINET IO controller maximum	4 Kibyte
• as user data for input variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for output variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for input variables per PN IO device for each sub-module as PROFINET IO controller maximum	240 byte
• as user data for output variables per PN IO device for each sub-module as PROFINET IO controller maximum	240 byte

Article number	<b>6GK7443-1EX30-0XE0</b>
Product type designation	CP 443-1
<b>Performance data telecontrol</b>	
Protocol is supported	
• TCP/IP	Yes
<b>Product functions management, configuration</b>	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 V5.5 SP3 or higher / STEP 7 Professional V12 (TIA Portal) or higher
<b>Product functions Diagnosis</b>	
Product function Web-based diagnostics	Yes
<b>Product functions switch</b>	
Product feature Switch	Yes
Product function	
• switch-managed	No
• with IRT PROFINET IO switch	Yes
• Configuration with STEP 7	Yes
<b>Product functions Redundancy</b>	
Product function	
• Ring redundancy	Yes
• Redundancy manager	Yes
Protocol is supported Media Redundancy Protocol (MRP)	Yes
<b>Product functions Security</b>	
Product function	
• password protection for Web applications	No
• ACL - IP-based	Yes
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	Yes
• log file for unauthorized access	No
<b>Product functions Time</b>	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported NTP	Yes

# SIMATIC S7-400 advanced controller

## Communication

CP 443-1

### Ordering data

Ordering data	Article No.	Article No.	
<b>CP 443-1 communications processor</b> For connecting SIMATIC S7-400 to Industrial Ethernet through TCP/IP, ISO and UDP; PROFINET IO Controller, MRP; integrated real-time switch ERTEC with two ports; 2 x RJ45 interface; S7 communication, open communication (SEND/RECEIVE) with FETCH/WRITE, with and without RFC 1006, DHCP, SNMP V2, diagnostics, multicast, access protection over IP access list, initialization over LAN 10/100 Mbps with electronic manual on DVD	<b>6GK7443-1EX30-0XE0</b>	<b>IE FC TP Standard Cable GP 2 x 2 (Type A)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. order length 1000 m, minimum order 20 m	<b>6XV1840-2AH10</b>
<b>Accessories</b>		<b>IE FC TP Standard Cable GP 4 x 2</b> 8-core, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. order quantity 1000 m, minimum order 20 m	
<b>IE FC RJ45 Plug 180 2 x 2</b> RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	<ul style="list-style-type: none"> <li>• 1 pack = 1 unit</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	<ul style="list-style-type: none"> <li>• AWG22, for connection to IE FC RJ45 Modular Outlet</li> <li>• AWG24, for connection to IE FC RJ45 Plug 4 x 2</li> </ul>	<b>6XV1870-2E</b>  <b>6XV1878-2A</b>
<b>IE FC RJ45 Plug 4 x 2</b> RJ45 plug connector for Industrial Ethernet (10/100/1000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	<ul style="list-style-type: none"> <li>• 1 pack = 1 unit</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	<b>IE FC Stripping Tool</b> Pre-adjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>
	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>	<b>SCALANCE X204-2 Industrial Ethernet Switch</b> Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports	<b>6GK5204-2BB10-2AA3</b>
	<b>6GK1901-1BB11-2AA0</b> <b>6GK1901-1BB11-2AB0</b> <b>6GK1901-1BB11-2AE0</b>	<b>Industrial Ethernet Switch SCALANCE X308-2</b> 2 x 1000 Mbps multimode fiber-optic cable ports (SC sockets), 1 x 10/100/1000 Mbps RJ45 port, 7 x 10/100 Mbps RJ45 ports; for glass fiber-optic cable (multimode) up to max. 750 m	<b>6GK5308-2FL00-2AA3</b>

Note:

You'll find ordering data for software for communication to PC systems in catalog IK PI.

6

### Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●	●	●	●	●

Communications processor for connecting a SIMATIC S7-400 to Industrial Ethernet networks, also as PROFINET IO controller or in SIMATIC H systems.

The CP supports:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication
- IT communication
- Security functionality, firewall and VPN

The communications processor can also be used for redundant S7 communication in SIMATIC H systems and for fail-safe applications (PROFIsafe) in connection with an S7-400 F-CPU. In addition, the CP 443-1 Advanced provides e-mail functions and user-created Web pages, offering ideal support for maintenance and quality assurance. The Internet functions such as FTP even allow connection to the most diverse PC-based systems. This CP is therefore the bridge between the field level and the management level for the S7-400. The CP 443-1 Advanced connects seamlessly to the security structures of the office and IT worlds.

### Technical specifications

Article number	<b>6GK7443-1GX30-0XE0</b>
Product type designation	CP 443-1 Advanced
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
• at the 2nd interface	10 ... 100 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	5
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
• at the 2nd interface acc. to Industrial Ethernet	4
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
• at the 2nd interface acc. to Industrial Ethernet	RJ45 port
design of the removable storage C-PLUG	Yes
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Relative symmetrical tolerance for DC	
• at 5 V	5 %
Consumed current	
• from backplane bus for DC at 5 V typical	1.8 A
Active power loss	9 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-400 single width
Width	25 mm
Height	290 mm
Depth	210 mm
Net weight	0.7 kg
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	14
• Note	max. 4 as PN IO ctrl.

# SIMATIC S7-400 advanced controller

## Communication

### CP 443-1 Advanced

#### Technical specifications (continued)

Article number	<b>6GK7443-1GX30-0XE0</b>
Product type designation	CP 443-1 Advanced
<b>Performance data open communication</b>	
Number of possible connections for open communication by means of SEND/RECEIVE blocks	
• maximum	64
Amount of data	
• as user data per ISO connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per ISO on TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks maximum	2 Kibyte
Number of possible connections for open communication	
• by means of T blocks maximum	64
Amount of data	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	1 452 byte
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	128
• with PG connections maximum	2
• Note	when using several CPUs
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	128
<b>Performance data IT functions</b>	
Number of possible connections	
• as client by means of FTP maximum	20
• as server by means of FTP maximum	10
• as server by means of HTTP maximum	4
• as e-mail client maximum	1
Amount of data as user data for email maximum	8 Kibyte
Storage capacity of the user memory	
• as flash memory file system	30 Mibyte
• as RAM	16 Mibyte
• additionally buffered as RAM via central backup battery	512 Kibyte
Number of possible write cycles of the flash memory cells	100 000
<b>Performance data PROFINET communication as PN IO-Controller</b>	
Product function PROFINET IO controller	Yes
Number of PN IO devices on PROFINET IO controller usable total	128
Number of PN IO IRT devices on PROFINET IO controller usable	64
Number of external PN IO lines with PROFINET per rack	4

Article number	<b>6GK7443-1GX30-0XE0</b>
Product type designation	CP 443-1 Advanced
Amount of data	
• as user data for input variables as PROFINET IO controller maximum	8 Kibyte
• as user data for input variables as PROFINET IO controller maximum	8 Kibyte
• as user data for input variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for output variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for input variables per PN IO device as PROFINET IO controller maximum	240 byte
• as user data for output variables per PN IO device for each sub-module as PROFINET IO controller maximum	240 byte
<b>Performance data PROFINET CBA</b>	
Number of remote connection partners with PROFINET CBA	64
Number of connections with PROFINET CBA total	600
Amount of data	
• as user data for digital inputs with PROFINET CBA maximum	8 Kibyte
• as user data for digital outputs with PROFINET CBA maximum	8 Kibyte
• as user data for arrays and data types in the case of acyclic transmission with PROFINET CBA maximum	8 Kibyte
• as user data for arrays and data types with PROFINET CBA with cyclical transfer maximum	250 byte
• as user data for arrays and data types with PROFINET CBA in the case of local interconnection maximum	2 400 byte
<b>Performance data PROFINET CBA remote connection with acyclic transmission</b>	
Refresh time of the remote interconnections in the case of acyclic transmission with PROFINET CBA	100 ms
Number of remote connections to input variables in the case of acyclic transmission with PROFINET CBA maximum	150
Number of remote connections to output variables in the case of acyclic transmission with PROFINET CBA maximum	150
Amount of data	
• as user data for remote interconnections with input variables in the case of acyclic transmission with PROFINET CBA	8 Kibyte
• as user data for remote interconnections with output variables in the case of acyclic transmission with PROFINET CBA	8 Kibyte
<b>Performance data PROFINET CBA remote connection with cyclic transmission</b>	
Refresh time of the remote interconnections with PROFINET CBA with cyclical transfer	10 ms

## Technical specifications (continued)

Article number	<b>6GK7443-1GX30-0XE0</b>	Article number	<b>6GK7443-1GX30-0XE0</b>
Product type designation	CP 443-1 Advanced	Product type designation	CP 443-1 Advanced
Number of remote connections to input variables with PROFINET CBA with cyclical transfer maximum	250	<b>Product functions management, configuration</b>	
Number of remote connections to output variables with PROFINET CBA with cyclical transfer maximum	250	Product function MIB support	Yes
Amount of data		Protocol is supported	
• as user data for remote interconnections with input variables with PROFINET CBA with cyclical transfer maximum	2 000 byte	• SNMP v1	Yes
• as user data for remote interconnections with output variables with PROFINET CBA with cyclical transfer maximum	2 000 byte	• SNMP v3	Yes
		• DCP	Yes
		• LLDP	Yes
		Configuration software	
		• required	STEP 7 V5.5 SP3 or higher / STEP 7 Professional V12 (TIA Portal) or higher
		• for PROFINET CBA required	SIMATIC iMap V3.0 SP1 and higher
<b>Performance data PROFINET CBA HMI variables via PROFINET acyclic</b>		<b>Product functions Diagnosis</b>	
Number of connectable HMI stations for HMI variables in the case of acyclic transmission with PROFINET CBA	3	Product function Web-based diagnostics	Yes
Refresh time of the HMI variables in the case of acyclic transmission with PROFINET CBA	500 ms	<b>Product functions switch</b>	
Number of HMI variables in the case of acyclic transmission with PROFINET CBA maximum	200	Product feature Switch	Yes
Amount of data as user data for HMI variables in the case of acyclic transmission with PROFINET CBA maximum	8 Kibyte	Product function	
		• switch-managed	No
		• with IRT PROFINET IO switch	Yes
		• Configuration with STEP 7	Yes
		<b>Product functions Redundancy</b>	
<b>Performance data PROFINET CBA device-internal connections</b>		Product function	
Number of internal connections with PROFINET CBA maximum	300	• Ring redundancy	Yes
Amount of data of the internal connections with PROFINET CBA maximum	2 400 byte	• Redundancy manager	Yes
		Protocol is supported Media Redundancy Protocol (MRP)	Yes
<b>Performance data PROFINET CBA connections to constants</b>		<b>Product functions Security</b>	
Number of connections with constants with PROFINET CBA maximum	500	Firewall version	stateful inspection
Amount of data as user data for interconnections with constants with PROFINET CBA maximum	4 000 byte	Product function with VPN connection	IPSec
		Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
		Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
		Type of hashing algorithms with VPN connection	MD5, SHA-1
		Number of possible connections with VPN connection	32
<b>Performance data PROFINET CBA PROFIBUS proxy functionality</b>		Product function	
Product function with PROFINET CBA PROFIBUS proxy functionality	No	• password protection for Web applications	Yes
<b>Performance data telecontrol</b>		• ACL - IP-based	Yes
Protocol is supported		• ACL - IP-based for PLC/routing	Yes
• TCP/IP	Yes	• switch-off of non-required services	Yes
		• Blocking of communication via physical ports	Yes
		• log file for unauthorized access	No
		<b>Product functions Time</b>	
		Product function SICLOCK support	Yes
		Product function pass on time synchronization	Yes
		Protocol is supported NTP	Yes



**SIMATIC S7-400 advanced controller**

## Communication

**CP 443-1 Advanced****Ordering data****Article No.****Article No.****Communications processor  
CP 443-1 Advanced**

for connecting the SIMATIC S7-400 CPU to Industrial Ethernet:  
1 x 10/100/1000 Mbit/s;  
4 x 10/100 Mbit/s (IE SWITCH);  
RJ45 ports; ISO; TCP; UDP;  
PROFINET IO controller,  
S7 communication;  
open communication  
(SEND/RECEIVE); S7 routing;  
IP configuration via DHCP/block;  
IP Access Control List; time  
synchronization; expanded web  
diagnostics; Fast Startup;  
PROFenergy support;  
IP routing; FTP; web server;  
e-mail; PROFINET CBA

- With security functionality (firewall and VPN)

**6GK7443-1GX30-0XE0****Accessories****IE FC RJ45 Plug 180 2 x 2**

RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPUs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB10-2AA0**  
**6GK1901-1BB10-2AB0**  
**6GK1901-1BB10-2AE0**

**IE FC RJ45 Plug 4 x 2**

RJ45 plug connector for Industrial Ethernet (10/100/1000 Mbit/s) with a sturdy metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPUs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB11-2AA0**  
**6GK1901-1BB11-2AB0**  
**6GK1901-1BB11-2AE0**

**IE FC TP Standard Cable GP 2 x 2  
(Type A)**

4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m

**6XV1840-2AH10****IE FC TP Standard Cable GP 4 x 2**

8-core, shielded TP installation cable for connection to IE FC RJ45 Modular Outlet for universal applications; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m

**6XV1870-2E**

- AWG22, for connection to IE FC RJ45 Modular Outlet
- AWG24, for connection to IE FC RJ45 Plug 4 x 2

**6XV1878-2A****IE FC Stripping Tool**

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

**6GK1901-1GA00****Industrial Ethernet Switch  
SCALANCE X204-2**

Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports

**6GK5204-2BB10-2AA3****Industrial Ethernet Switch  
SCALANCE X308-2**

2 x 1000 Mbit/s multimode fiber-optic cable ports (SC sockets), 1 x 10/100/1000 Mbit/s RJ45 port, 7 x 10/100 Mbit/s RJ45 ports; for glass fiber-optic cable (multimode) up to max. 750 m

**6GK5308-2FL00-2AA3****Note:**

You can find order information for software for communication with PC systems in the IK PI catalog.

### Overview



ISO	TCP/UDP	PN	PRP	IT	IP-R	PG/OP	S7/S5
●	●		●			●	●

Communication processor for connecting a SIMATIC S7-400/S7-400H to Industrial Ethernet networks.

The CP supports:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)

The communications processor can be used in SIMATIC H systems and for fail-safe applications (PROFIsafe) in connection with an S7-400 F-CPU. The CP 443-1 RNA (**R**edundant **N**etwork **A**ccess)<sup>1)</sup> offers the option of using the PRP procedure (**P**arallel **R**edundancy **P**rotocol in accordance with IEC 62439-3) to connect an S7-400 or S7-400H to parallel, separate networks where high availability is required.

The PRP functionality can be deactivated so that standard Industrial Ethernet communication is also possible with the CP.

The PRP redundancy procedure is based on double transmission of message frames over two separate networks (LAN A, LAN B). In the event of a fault in one of the two networks, transmission of the message frame from the second network is ensured without delay. A reconfiguration time (switchover of the communication paths) for the network, such as is required with other redundancy procedures, is thus not necessary.

<sup>1)</sup> At Siemens Industry, RNA stands for hardware and software to implement redundancy solutions. RNA contains the PRP V1 protocol in accordance with the IEC 62439-3 standard (Parallel Redundancy Protocol) as well as the HSR protocol in accordance with IEC 62439-3 (High-availability Seamless Redundancy Protocol).

### Technical specifications

Article number	<b>6GK7443-1RX00-0XE0</b>
Product type designation	CP 443-1 RNA
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
• at the 2nd interface	100 Mbit/s
<b>Interfaces</b>	
Number of interfaces acc. to Industrial Ethernet	3
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
• at the 2nd interface acc. to Industrial Ethernet	2
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
• at the 2nd interface acc. to Industrial Ethernet	RJ45 port
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Relative symmetrical tolerance for DC	
• at 5 V	5 %
Consumed current	
• from backplane bus for DC at 5 V typical	1.8 A
Active power loss	9 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-400 single width
Width	25 mm
Height	290 mm
Depth	210 mm
Net weight	0.7 kg
<b>Product properties, functions, components general</b>	
Number of units	
• per CPU maximum	14
<b>Performance data open communication</b>	
Number of possible connections for open communication by means of SEND/RECEIVE blocks	
• maximum	64
Amount of data	
• as user data per ISO connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per ISO on TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte

# SIMATIC S7-400 advanced controller

## Communication

### CP 443-1 RNA

#### Technical specifications (continued)

Article number	<b>6GK7443-1RX00-0XE0</b>
Product type designation	CP 443-1 RNA
Amount of data (continued)	
• as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks maximum	2 Kibyte
Number of possible connections for open communication	
• by means of T blocks maximum	64
Amount of data	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	1 452 byte
<b>Performance data S7 communication</b>	
Number of possible connections for S7 communication	
• maximum	128
• with PG connections maximum	2
• Note	when using several CPUs
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	128
<b>Performance data telecontrol</b>	
Protocol is supported	
• TCP/IP	Yes
<b>Product functions management, configuration</b>	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
Configuration software	
• required	STEP 7 V5.5 SP2 + HSP or higher
<b>Product functions Diagnosis</b>	
Product function Web-based diagnostics	Yes
<b>Product functions Redundancy</b>	
Product function	
• Ring redundancy	No
• Redundancy manager	No
• Parallel Redundancy Protocol (PRP)	Yes
Protocol is supported Media Redundancy Protocol (MRP)	No
<b>Product functions Security</b>	
Product function	
• ACL - IP-based	Yes
• ACL - IP-based for PLC/routing	Yes
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	Yes
• log file for unauthorized access	No
<b>Product functions Time</b>	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported NTP	Yes

#### Ordering data

#### Article No.

**CP 443-1 RNA communications processor** **6GK7443-1RX00-0XE0**

for connecting the SIMATIC S7-400/ S7-400H CPU to Industrial Ethernet

#### Accessories

#### *SCALANCE X-200RNA Industrial Ethernet network access points*

Industrial Ethernet network access points with integrated SNMP access, web diagnostics and PROFINET diagnostics, for connecting non-PRP-enabled terminal equipment to PRP networks; incl. operating instructions, Industrial Ethernet network manual and configuration software on CD-ROM; with electrical and optical ports for glass multimode fiber optic cables up to 5 km

- **SCALANCE X204RNA** **6GK5204-0BA00-2KB2**  
with four 100 Mbit/s RJ45 ports
- **SCALANCE X204RNA EEC** **6GK5204-0BS00-3LA3**  
with two 100 Mbit/s RJ45 ports and two RJ45/SFP combo ports
- **SCALANCE X204RNA EEC** **6GK5204-0BS00-3PA3**  
with two 100 Mbit/s RJ45 ports and two RJ45/SFP combo ports with PRP or HSR support

#### SOFTNET-IE RNA

Software for connecting PCs to PRP-enabled networks with integrated SNMP, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A

#### SOFTNET-IE RNA V12

for 32/64-bit Windows 7 Professional/Ultimate; for Windows 2008 Server R2; for 32/64-bit Windows 8 Professional/Enterprise; for Windows Server 2012 German/English

- Single license for one installation **6GK1711-1EW12-0AA0**

#### SOFTNET-IE RNA V8.1

for 32-bit Windows XP; German/English

- Single license for one installation **6GK1711-1EW08-1AA0**

#### Software Update Service

for 1 year with automatic extension; requirement: Current software version **6GK1711-1EW00-3AL0**

### Overview TIM 4R-IE for WAN and Ethernet



- SINAUT communications module TIM with four interfaces for SIMATIC S7-300 or as self-contained unit for the S7-400 for use in the wide area network (WAN)
- For universal use in a SINAUT station, node station and control center
- Internet communication via integrated MSC-VPN tunnel with direct connection to DSL router or operation via IPsec VPN with additional SIMATIC NET components
- Wireless communication via GPRS router, GPRS modem, or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for complete recording of data and support of redundant communication paths
- Simple configuration and operation without specialist IT knowledge

For further information, see chapter 5, page 5/223.

### Overview TIM 4R-IE DNP3



In a station for the S7-CPU, the communication module TIM 4R-IE DNP3 (TeleControl Interface Module) handles the data exchange with the assigned SIMATIC PCS7 TeleControl V8.0 master system using the open DNP3 protocol. In addition, the V3.0 module now also supports master and node functionality.

- With the double-width S7-300 housing, the module can be fully integrated into the S7-300 system
- Can be connected as a stand-alone module to a SIMATIC S7-400 and SIMATIC S7-400 H System
- Two RS 232/RS 485 interfaces support connection of an external modem for data transmission via a conventional WAN or of a Modbus RTU slave to an S7-300 system
- The module has two RJ45 interfaces for data transmission via IP-based networks
- By using physically separate connection paths, the module permits media redundancy without loss of data during the switchover

For further information, see chapter 5, page 5/228.

## SIMATIC S7-400 advanced controller

### SIPLUS S7-400 communication

#### SIPLUS S7-400 CP 443-5 Extended

#### Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
●			●	●	

- DP-V1 master connection of the S7-400 to PROFIBUS
- For setting up additional PROFIBUS DP lines
- Communication services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication
  - S5-compatible communication (SEND/RECEIVE)
- Clock synchronization
- Easy programming and configuration over PROFIBUS
- Cross-network programming device communication through S7 routing
- Can be easily integrated into the SIMATIC S7-400 system
- Module replacement without PG
- SIMATIC H system operation for redundant S7 communication or DP master communication
- Data record routing (PROFIBUS DP)
- Adding or modifying distributed I/O during operation

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS CP 443-5-Extended	
<b>Article No.</b>	<b>6AG1 443-5DX05-4XE0</b>
<b>Article No. based on</b>	<b>6GK7 443-5DX05-0XE0</b>
Ambient temperature range	0 ... +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical specifications of the standard product apply, except for the ambient conditions
<b>Ambient conditions</b>	
Relative humidity	100 %, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

#### Ordering data

#### Article No.

#### SIPLUS S7-400 CP 443-5 Extended communications processor

for connecting SIMATIC S7-400 to PROFIBUS; Extended Version for PROFIBUS DP;  
with electronic manual, on CD-ROM

Exposure to media

**6AG1443-5DX05-4XE0**

#### Accessories

See SIMATIC CP 443-5 Extended, page 6/99

### Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●	●		●	●

- Connection of SIMATIC S7-400 to Industrial Ethernet
  - 2 x RJ45 interface for 10/100 Mbit/s full/half-duplex connection with auto-sensing/auto-negotiation and auto-crossover function
  - Integrated real-time switch ERTEC with two ports
  - Multi-protocol operation for ISO, TCP/IP, UDP and PROFINET IO protocols
  - Adjustable Keep Alive function
- Communication services:
  - Open communication (ISO, TCP/IP, and UDP)
  - PROFINET IO Controller with real-time properties RT and IRT
  - PG/OP communication: Cross-network by means of S7 routing
  - S7 communication
- Media redundancy (MRP); the CP supports the media redundancy procedure MRP within an Ethernet network with ring topology.
- Multicast for UDP
- Access protection via configurable access list
- Support for fail-safe programmable controllers together with SIMATIC S7-400 CPU 416F-3PN/DP
- Module replacement without PG
- Operation in the SIMATIC H system for redundant S7-communication
- Configuration with STEP 7
- Diagnostics possibilities in STEP 7 and via web browser
- Automatic CPU-clock setting via Industrial Ethernet with NTP or SIMATIC procedure
- Integration of network management systems via SNMP (MIB II diagnostic information)

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

SIPLUS CP 443-1	
<b>Article No.</b>	<b>6AG1 443-1EX20-4XE0</b>
<b>Article number based on</b>	<b>6GK7 443-1EX20-0XE0</b>
Ambient temperature range	0 ... +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies, except for the ambient conditions
<b>Ambient conditions</b>	
Relative humidity	100 %, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold spores, fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

**SIMATIC S7-400 advanced controller**

SIPLUS S7-400 communication

**SIPLUS S7-400 CP 443-1****Ordering data****Article No.****Article No.****SIPLUS CP 443-1  
communications processor**

For connecting SIMATIC S7-400 to Industrial Ethernet through TCP/IP, ISO and UDP; PROFINET IO Controller, MRP; integrated real-time switch ERTEC with two ports; 2 x RJ-45 interface; S7 communication, open communication (SEND/RECEIVE) with FETCH/WRITE, with and without RFC 1006, DHCP, SNMP V2, diagnostics, multicast, access protection over IP access list, initialization over LAN 10/100 Mbit/s with electronic manual on DVD

Exposure to media

**6AG1443-1EX20-4XE0****Accessories****SIPLUS SCALANCE X204-2  
Industrial Ethernet Switch**

Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports

Extended temperature range and exposure to media

**6AG1204-2BB10-4AA3****IE FC RJ45 Plug 180**

180° cable outlet; 1 unit

Extended temperature range and exposure to media

**6AG1901-1BB10-7AA0****Further accessories**

See SIMATIC CP 443-1, page 6/102



### Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●	●	●	●	●

- Connection of SIMATIC S7-400 to Industrial Ethernet
  - Multi-protocol operation for ISO, TCP/IP, UDP and PROFINET IO protocols
  - Adjustable keep-alive function
- Two separate interfaces (integrated network separation):
  - Gigabit interface with one RJ45 port with 10/100/1 000 Mbit/s, full/half-duplex with auto-sensing capability
  - PROFINET interface with four RJ45 ports with 10/100 Mbit/s, full/half duplex with autosensing and autocrossover functionality via integrated 4-port switch
- Communication services via both interfaces
  - Open communication (ISO, TCP/IP and UDP), multicast with UDP, including routing between both interfaces
  - PG/OP communication:
    - Cross-network by means of S7 routing
  - S7 communication (client, server, multiplexing) including routing between both interfaces
  - IT communication:
    - HTTP communication supports access to process data via own Web pages;
    - e-mail client function, sending of e-mails with authentication directly from user program;
    - FTP communication supports program-controlled FTP client communication;
    - access to data blocks through FTP server
- Communication services via PROFINET interface
  - PROFINET IO controller with real-time properties (RT and IRT)
  - PROFINET CBA
  - IP address assignment via DHCP, simple PC tool or via the user program (e.g. HMI)
  - Support of the prioritized startup of PROFINET IO devices
  - Configuration with STEP 7
- Media redundancy (MRP); the CP supports the media redundancy procedure MRP within an Ethernet network with ring topology.
- Access protection by means of configurable IP access list
- Module replacement without programming device; all information is stored on the C-PLUG (also file system for IT functions)

- Extensive diagnostic functions for all modules in the rack
- Integration into network management systems through the support of SNMP V1 MIB-II
- Operation in the SIMATIC H system for redundant S7-communication
- Operation in fail-safe applications (PROFIsafe) in combination with SIMATIC S7-400 CPU 416F

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

SIPLUS CP 443-1 Advanced	
<b>Article No.</b>	<b>6AG1443-1GX30-4XE0</b>
<b>Article number based on</b>	<b>6GK7443-1GX30-0XE0</b>
Ambient temperature range	0 ... +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies, except for the ambient conditions

#### Ambient conditions

Relative humidity	100 %, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>



**SIMATIC S7-400 advanced controller**

## SIPLUS S7-400 communication

## SIPLUS S7-400 CP 443-1 Advanced

**Ordering data****Article No.****Article No.****SIPLUS S7-400 CP 443-1  
Advanced communications  
processor**

For the connection of SIMATIC S7-400 to Industrial Ethernet; PROFINET IO Controller with RT and IRT, MRP, PROFINET CBA, TCP/IP, ISO and UDP; S7 communication, open communication (SEND/RECEIVE) with FETCH/WRITE, with and without RFC 1006, diagnostic expansions, multicast, clock synchronization via SIMATIC procedure or NTP, access protection via IP access list, FTP client/server, HTTP server, HTML diagnostics, SNMP, DHCP, e-mail, data storage on C-PLUG; PROFINET interface:  
4 x RJ-45 (10/100 Mbit/s) over switch;  
Gigabit interface:  
1 x RJ45 (10/100/1000 Mbit/s)

Exposure to media

**6AG1443-1GX30-4XE0**

**Accessories****SIPLUS SCALANCE X204-2  
Industrial Ethernet Switch**

Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports

Extended temperature range and exposure to media

**6AG1204-2BB10-4AA3**

**SIPLUS SCALANCE X308-2  
Industrial Ethernet Switch**

2 x 1000 Mbit/s multimode fiber-optic ports (SC sockets),  
1 x 10/100/1000 Mbit/s RJ45 port,  
7 x 10/100 Mbit/s RJ45 ports;  
for glass fiber-optic cable (multimode) up to max. 750 m

Exposure to media

**6AG1308-2FL00-4AA3**

**SIPLUS NET RJ45 Plug 180**

180° cable outlet; 1 unit

Extended temperature range and exposure to media

**6AG1901-1BB10-7AA0**

**SIPLUS NET RJ45 Plug 90**

90° cable outlet; 1 unit

Extended temperature range and exposure to media

**6AG1901-1BB20-7AA0**

**Further accessories**

See SIMATIC CP 443-1 Advanced, page 6/106

# SIMATIC S7-400 advanced controller

## Connection methods

### Front connectors

#### Overview



- For simple and user-friendly connection of sensors and actuators
- For retaining the wiring when replacing modules
- With coding to avoid mistakes when replacing modules

#### Ordering data

#### Article No.

##### Front connectors

48-pin for signal modules, function modules; 1 unit

- With screw contacts
- With spring-loaded terminals
- With crimp contacts

**6ES7492-1AL00-0AA0**

**6ES7492-1BL00-0AA0**

**6ES7492-1CL00-0AA0**

48-pin for signal modules, function modules; 84 units per pack

- With screw contacts
- With crimp contacts

**6ES7492-1AL00-1AB0**

**6ES7492-1CL00-1AB0**

for 6ES7 431-7KF00-0AB0; spare part, included in scope of delivery; 1 piece

**6ES7431-7KF00-6AA0**

##### Crimp contacts

**6XX3070**

250 units

##### Crimping tool

**6XX3071**

for crimping the contacts

##### Front cover for front connector

**6ES7492-2XL00-0AA0**

6 units

##### Connection terminal for modules

**6ES7490-1BA00-0AA0**

6 units

##### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

##### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

## SIMATIC S7-400 advanced controller

### Connection methods

#### System cabling for SIMATIC S7-400

##### Overview

Wiring of SIMATIC S7 I/O modules with the sensors/actuators is a significant factor with respect to time/cost overhead, configuring, control cabinet installation, procurement and ease of service.

With SIMATIC TOP connect system cabling, it is simple and quick to establish a reliable connection for your SIMATIC S7-300/400.

With the TIA Selection Tool, a mouse click is all that is required to configure the connection from the SIMATIC S7 module to the I/O. The program automatically checks for plausibility and generates a parts list for the selected connection components that can then be ordered in the Industry Mall.

Further information can be found on the Internet at

<http://www.siemens.com/tia-selection-tool>

##### *Flexible connection*



Flexible connection enables fast, direct connection of the SIMATIC S7-300/400 input/output modules to the individual elements in the control cabinet.

Attached single cores reduce the wiring outlay.

Wire cross-sections of 0.5 mm<sup>2</sup> allow higher currents, too.

# SIMATIC S7-400 advanced controller

## Connection methods

### S7-400 front connector with single cores

#### Overview



- Can be used for modules of the SIMATIC S7-400.
- The front connectors with single wires replace the standard SIMATIC connectors:
  - 6ES7492-1AL00-0AA0
  - 6ES7492-1BL00-0AA0
  - 6ES7492-1CL00-0AA0

#### Technical specifications

Front connector with single cores	
Rated operating voltage	24 V DC
Max. permissible continuous current with simultaneous load on all cores	1.0 A
Permissible ambient temperature	0 to +60 °C
Core type	H05V-K or with UL style 1007/1569 CSA TR64
Number of cores	46
Core cross-section	0.5 mm <sup>2</sup> , Cu
Bundle diameter in mm	approx. 17
Core color	Blue, RAL 5010
Designation of cores	Numbered 3 to 48 (adapter contact = core number)
Assembly	Screw-type or crimp contacts

#### Ordering data

#### Article No.

Ordering data	Article No.
<b>Front connector with single cores for 32-channel module SIMATIC S7-400, 46 x 0.5 mm<sup>2</sup></b>	
<b>Core type H05V-K</b>	
<u>Screw connection</u>	
Packaging unit: 1 unit Length:	
• 2.5 m	<b>6ES7922-4BC50-0AD0</b>
• 3.2 m	<b>6ES7922-4BD20-0AD0</b>
• 5 m	<b>6ES7922-4BF00-0AD0</b>
• Custom lengths	On request
Packaging unit: 5 units Length:	
• 2.5 m	<b>6ES7922-4BC50-5AD0</b>
• 3.2 m	<b>6ES7922-4BD20-5AD0</b>
• 5 m	<b>6ES7922-4BF00-5AD0</b>
<u>Crimp connection</u>	
Packaging unit: 1 unit Length:	
• 2.5 m	<b>6ES7922-4BC50-0AE0</b>
• 3.2 m	<b>6ES7922-4BD20-0AE0</b>
• 5 m	<b>6ES7922-4BF00-0AE0</b>
• Custom lengths	On request
Packaging unit: 5 units Length:	
• 2.5 m	<b>6ES7922-4BC50-5AE0</b>
• 3.2 m	<b>6ES7922-4BD20-5AE0</b>
• 5 m	<b>6ES7922-4BF00-5AE0</b>
<b>Core type UL/CSA-certified</b>	
<u>Screw-type version</u>	
Packaging unit: 1 unit	
• 3.2 m	<b>6ES7922-4BD20-0UD0</b>
• 5 m	<b>6ES7922-4BF00-0UD0</b>
• Custom lengths	On request

# SIMATIC S7-400 advanced controller

## Racks

### Racks

#### Overview



- The basic mechanical framework of the SIMATIC S7-400/S7-400H
- For accommodating the modules, supplying them with operating voltage and connecting them via the backplane bus
- Several versions for configuring central controllers and expansion racks

#### UR1 (Universal Rack)

- For setting up central controllers and expansion units
- For holding up to 18 modules
- Also suitable for S7-400H
- Also available as aluminum rack

#### UR2 (Universal Rack)

- For setting up central controllers and expansion units
- For holding up to 9 modules
- Also suitable for S7-400H
- Also available as aluminum rack

#### CR2 (Central Rack)

- For setting up central controllers
- For holding up to 18 modules
- Segmented rack:  
For operating two mutually independent S7-400 CPUs without S7-400 Multicomputing, but with communication between the CPUs over the backplane bus (C bus). Both CPUs can address their own local I/O modules (segmented P bus).

#### CR3 (Central Rack)

- For configuring central racks
- Optimized for distributed automation solutions due to holding up to 4 modules

#### UR2-H

- For configuring a complete S7-400H system in one subrack
- Also suitable for S7-400:  
Operation of 2 separate CPUs with their own I/O (separate P and C buses)
- Can also be used as an expansion unit
- For holding up to 18 modules
- Also available as aluminum rack

#### ER1 (Extension Rack)

- For setting up expansion units economically
- For holding up to 18 modules with restricted functionality
- Also suitable for S7-400H
- Also available as aluminum rack

#### ER2 (Extension Rack)

- For setting up expansion units economically
- For holding up to 9 modules with restricted functionality
- Also suitable for S7-400H
- Also available as aluminum rack

#### Technical specifications

Article number	6ES7400-1TA01-0AA0	6ES7400-1TA11-0AA0	6ES7400-1JA01-0AA0	6ES7400-1JA11-0AA0	6ES7401-2TA01-0AA0	6ES7401-1DA01-0AA0
	S7-400, UR1 RACK, 18 SLOTS	S7-400, UR1 RACK ALU, 18 SLOTS	S7-400, UR2 RACK, 9 SLOTS	S7-400 RACK ALU UR2, 9 SLOTS	SIMATIC S7-400, CR2 RACK, 18 SLOTS	S7-400 CR3 RACK, 4 SLOTS
<b>Product type designation</b>						
<b>Hardware configuration</b>						
<b>Rack</b>						
• Communication bus	Yes	Yes	Yes	Yes	Yes	Yes
• P bus	Yes	Yes	Yes	Yes	Yes	Yes
<b>Slots</b>						
• Number of single-width slots, max.	18	18	9	9	18; 2 segments with 8 or 10 slots	4
<b>Dimensions</b>						
Width	482.5 mm	482.5 mm	257.5 mm	257.5 mm	482.5 mm	130 mm
Height	290 mm	290 mm	290 mm	290 mm	290 mm	290 mm
Depth	27.5 mm	27.5 mm	27.5 mm	27.5 mm	27.5 mm	27.5 mm
<b>Weights</b>						
Weight, approx.	4 200 g	3 000 g	2 200 g	1 500 g	4 200 g	750 g

## Technical specifications (continued)

Article number	6ES7400-2JA00-0AA0	6ES7400-2JA10-0AA0	6ES7403-1TA01-0AA0	6ES7403-1TA11-0AA0	6ES7403-1JA01-0AA0	6ES7403-1JA11-0AA0
	SIMATIC S7-400H, UR2-H RACK, 18 SLOTS	S7-400 MOD.TR ALU UR2-H, 18 SLOTS	SIMATIC S7-400, ER1 EXP. RACK, 18 SLOTS	S7-400, ER1 EXPANSION RACK ALU, 18 SLOTS	SIMATIC S7-400, ER2 EXP. RACK, 9 SLOTS	S7-400, ER2 EXPANSION RACK ALU, 9 SLOTS
<b>Product type designation</b>						
<b>Hardware configuration</b>						
<b>Rack</b>						
• Communication bus	Yes	Yes				
• P bus	Yes	Yes	Yes	Yes	Yes	Yes
<b>Slots</b>						
• Number of single-width slots, max.	18	18	18	18	9	9
<b>Dimensions</b>						
Width	482.5 mm	482.5 mm	482.5 mm	482.5 mm	257.5 mm	257.5 mm
Height	290 mm	290 mm	290 mm	290 mm	290 mm	290 mm
Depth	27.5 mm	27.5 mm	27.5 mm	27.5 mm	27.5 mm	27.5 mm
<b>Weights</b>						
Weight, approx.	4 200 g	3 000 g	4 200 g	2 500 g	2 200 g	1 250 g

## Ordering data

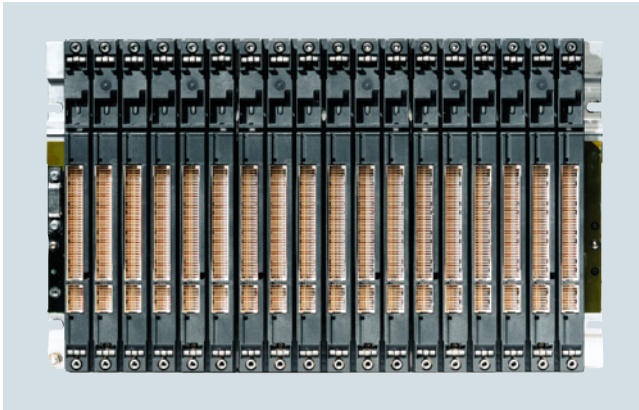
Article No.	Article No.
<b>UR1 rack</b> for central controllers and expansion units, 18 slots	<b>6ES7400-1TA01-0AA0</b>
<b>UR1 aluminum rack</b> for central controllers and expansion units, 18 slots	<b>6ES7400-1TA11-0AA0</b>
<b>UR2 rack</b> for central controllers and expansion units, 9 slots	<b>6ES7400-1JA01-0AA0</b>
<b>UR2 aluminum rack</b> for central controllers and expansion units, 9 slots	<b>6ES7400-1JA11-0AA0</b>
<b>CR2 rack</b> for segmented central controllers, 18 slots, 2 local segments	<b>6ES7401-2TA01-0AA0</b>
<b>CR3 rack</b> for central controllers and expansion units, 4 slots; optimized for distributed automation solutions	<b>6ES7401-1DA01-0AA0</b>
<b>UR2-H rack</b> for split CCs, 18 slots	<b>6ES7400-2JA00-0AA0</b>
<b>UR2-H aluminum rack</b> for split CCs, 18 slots	<b>6ES7400-2JA10-0AA0</b>
<b>ER1 rack</b> for expansion units, P bus only, 18 slots	<b>6ES7403-1TA01-0AA0</b>
<b>ER1 aluminum rack</b> for expansion units, P bus only, 18 slots	<b>6ES7403-1TA11-0AA0</b>
<b>ER2 rack</b> for expansion units, P bus only, 9 slots	<b>6ES7403-1JA01-0AA0</b>
<b>ER2 aluminum rack</b> for expansion units, P bus only, 9 slots	<b>6ES7403-1JA11-0AA0</b>
<b>Slot cover</b> 10 units (spare part)	<b>6ES7490-1AA00-0AA0</b>

# SIMATIC S7-400 advanced controller

## SIPLUS module racks

### SIPLUS S7-400 racks

#### Overview



- The mechanical basic structure of SIPLUS S7-400/S7-400H
- For accommodating the modules, operating voltage supply, and connection of the modules via a backplane bus
- Several versions for setting up central controllers and expansion units
- SIPLUS rack material: Aluminum

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For further technical documentation on SIPLUS, see: <http://www.siemens.com/siplus-extreme>

#### Technical specifications

Article number	6AG1400-1TA11-7AA0	6AG1400-1JA11-7AA0	6AG1400-2JA10-7AA0
Based on	6ES7400-1TA11-0AA0 SIPLUS S7-400 RACK UR1 18SLOT ALU	6ES7400-1JA11-0AA0 SIPLUS S-400 RACK UR2 9SLOT ALU	6ES7400-2JA10-0AA0 SIPLUS S7-400 BGT UR2-H 2X9SLOT ALU
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C
• max.	70 °C; = Tmax	70 °C; = Tmax	70 °C
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)		
<b>Relative humidity</b>			
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)		
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75 %) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

#### Ordering data

Ordering data	Article No.	Article No.
<b>SIPLUS S7-400 rack</b>		
<b>UR1 aluminum rack</b>		
for central controllers and expansion units, 18 slots		
Extended temperature range and exposure to media	<b>6AG1400-1TA11-7AA0</b>	
<b>UR2 aluminum rack</b>		
for central controllers and expansion units, 9 slots		
Extended temperature range and exposure to media	<b>6AG1400-1JA11-7AA0</b>	
		<b>UR2-H aluminum rack</b>
		for central controllers and expansion units, 9 slots
		Extended temperature range and exposure to media
		<b>6AG1400-2JA10-7AA0</b>
		<b>Accessories</b>
		See SIMATIC rack S7-400, page 6/119

### Overview



- Send interface module for central expansion to 5 m
- Transmission of P and K bus
- Can be plugged into the central controller
- Up to 8 expansion racks can be connected (up to 4 per interface)
- Can be used exclusively with IM 461-0

### Technical specifications

Article number	<b>6ES7460-0AA01-0AB0</b> TRANSMITT. INTERF.MOD. IM460-0, W. K BUS
<b>Product type designation</b>	
<b>Input current</b>	
from backplane bus 5 V DC, max.	140 mA
<b>Power losses</b>	
Power loss, max.	700 mW
<b>Hardware configuration</b>	
Cable length between first and last interface module, max.	5 m
<b>Dimensions</b>	
Width	25 mm
Height	290 mm
Depth	217 mm
<b>Weights</b>	
Weight, approx.	600 g

### Ordering data

	Article No.
<b>IM 460-0 interface module</b>	<b>6ES7460-0AA01-0AB0</b>
Send interface module for central connection up to 5 m; with C bus transmission	
<b>468-1 connecting cable</b>	
between IM 460-0 and IM 461-0; IM 460-3 and IM 461-3	
0.75 m	<b>6ES7468-1AH50-0AA0</b>
1.5 m	<b>6ES7468-1BB50-0AA0</b>
5 m	<b>6ES7468-1BF00-0AA0</b>



**SIMATIC S7-400 advanced controller**

## Interface modules

**IM 461-0****Overview**

- Receive interface for centralized expansion up to 5 m
- Transmission of P and K bus
- Can be plugged into expansion rack
- To be used exclusively with IM 460-0

**Technical specifications**

Article number	<b>6ES7461-0AA01-0AA0</b> RECEIVER INTERF. MOD. IM461-0, W. K-BUS
<b>Product type designation</b>	
<b>Input current</b>	
from backplane bus 5 V DC, max.	290 mA
<b>Power losses</b>	
Power loss, max.	1 450 mW
<b>Hardware configuration</b>	
Cable length between first and last interface module, max.	5 m
<b>Dimensions</b>	
Width	25 mm
Height	290 mm
Depth	217 mm
<b>Weights</b>	
Weight, approx.	610 g

**Ordering data****Article No.**

<b>IM 461-0 interface module</b>	<b>6ES7461-0AA01-0AA0</b>
Receive interface module for central connection up to 5 m; with C bus transmission	
<b>468-1 connecting cable</b>	
between IM 460-0 and IM 461-0; IM 460-3 and IM 461-3	
0.75 m	<b>6ES7468-1AH50-0AA0</b>
1.5 m	<b>6ES7468-1BB50-0AA0</b>
5 m	<b>6ES7468-1BF00-0AA0</b>
<b>Terminating connector</b>	<b>6ES7461-0AA00-7AA0</b>
for IM 461-0	

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### Overview



- Send interface module for central expansion to 1.5 m
- Transmission of P bus
- With voltage supply for expansion units
- Can be plugged into the central controller
- Up to 2 expansion racks can be connected (up to 1 per interface)
- Can be used exclusively with IM 461-1

### Technical specifications

Article number	<b>6ES7460-1BA01-0AB0</b> TRANSMITT. INTERF.MOD. IM460-1,W/O K BUS
<b>Product type designation</b>	
<b>Input current</b>	
from backplane bus 5 V DC, max.	85 mA
<b>Power losses</b>	
Power loss, max.	425 mW
<b>Hardware configuration</b>	
Cable length between first and last interface module, max.	1.5 m
<b>Dimensions</b>	
Width	25 mm
Height	290 mm
Depth	217 mm
<b>Weights</b>	
Weight, approx.	600 g

### Ordering data

#### Article No.

<b>IM 460-1 interface module</b>	<b>6ES7460-1BA01-0AB0</b>
Send interface module for central connection up to 1.5 m; with 5 V power supply, without C bus transmission	
<b>468-3 connecting cable</b>	
between IM 460-1 and IM 461-1;	
0.75 m	<b>6ES7468-3AH50-0AA0</b>
1.5 m	<b>6ES7468-3BB50-0AA0</b>

**SIMATIC S7-400 advanced controller**

## Interface modules

**IM 461-1****Overview**

- Receive interface connection for centralized extension up to 1.5 m
- Transmission of P bus
- With voltage supply for expansion units
- Can be plugged into expansion unit
- Can only be used with IM 460-1

**Technical specifications**

Article number	<b>6ES7461-1BA01-0AA0</b> RECEIVER INTERF. MOD. IM461-1, W/O K-BUS
<b>Product type designation</b>	
<b>Input current</b>	
from backplane bus 5 V DC, max.	120 mA
<b>Power losses</b>	
Power loss, max.	600 mW
<b>Hardware configuration</b>	
Cable length between first and last interface module, max.	1.5 m
<b>Dimensions</b>	
Width	25 mm
Height	290 mm
Depth	217 mm
<b>Weights</b>	
Weight, approx.	610 g

**Ordering data****Article No.**

<b>IM 461-1 interface module</b>	<b>6ES7461-1BA01-0AA0</b>
Receive IM for central coupling up to max. 1.5 m; without C bus transfer	
<b>468-3 connecting cable</b>	
For connecting IM 460-1 and IM 461-1	
0.75 m	<b>6ES7468-3AH50-0AA0</b>
1.5 m	<b>6ES7468-3BB50-0AA0</b>

### Overview



- Send interface module for distributed expansion to 102 m
- Transmission of K and P bus
- Can be plugged into the central controller
- Up to 8 expansion racks can be connected (up to 4 per interface)
- Can be used exclusively with IM 461-3

### Technical specifications

Article number	<b>6ES7460-3AA01-0AB0</b> TRANSMITT. INTERF.MOD- IM460-3,UP TO 102M
<b>Product type designation</b>	
<b>Input current</b>	
from backplane bus 5 V DC, max.	1 550 mA
<b>Power losses</b>	
Power loss, max.	7 750 mW
<b>Hardware configuration</b>	
Cable length between first and last interface module, max.	102.25 m
<b>Dimensions</b>	
Width	25 mm
Height	290 mm
Depth	217 mm
<b>Weights</b>	
Weight, approx.	630 g

### Ordering data

	Article No.
<b>IM 460-3 interface module</b>	<b>6ES7460-3AA01-0AB0</b>
Send interface module for distributed connection up to 102 m; with C bus transmission	
<b>468-1 connecting cable</b>	
between IM 460-3 and IM 461-3	
0.75 m	<b>6ES7468-1AH50-0AA0</b>
1.5 m	<b>6ES7468-1BB50-0AA0</b>
5 m	<b>6ES7468-1BF00-0AA0</b>
10 m	<b>6ES7468-1CB00-0AA0</b>
25 m	<b>6ES7468-1CC50-0AA0</b>
50 m	<b>6ES7468-1CF00-0AA0</b>
100 m	<b>6ES7468-1DB00-0AA0</b>

**SIMATIC S7-400 advanced controller**

## Interface modules

**IM 461-3****Overview**

- Receive interface for distributed expansion up to 102 m
- Transmission of data from the P-bus and C-bus
- Can be plugged into expansion rack
- To be used exclusively with IM 460-3

**Technical specifications**

Article number	<b>6ES7461-3AA01-0AA0</b> RECEIVER INTERF. MOD. IM461-3, UP TO 102M
<b>Product type designation</b>	
<b>Input current</b>	
from backplane bus 5 V DC, max.	620 mA
<b>Power losses</b>	
Power loss, max.	3 100 mW
<b>Hardware configuration</b>	
Cable length between first and last interface module, max.	102.25 m
<b>Dimensions</b>	
Width	25 mm
Height	290 mm
Depth	217 mm
<b>Weights</b>	
Weight, approx.	620 g

**Ordering data****Article No.**

<b>IM 461-3 interface module</b>	<b>6ES7461-3AA01-0AA0</b>
Receive interface module for distributed connection up to 102 m; with C bus transmission	
<b>468-1 connecting cable</b>	
between IM 460-3 and IM 461-3	
0.75 m	<b>6ES7468-1AH50-0AA0</b>
1.5 m	<b>6ES7468-1BB50-0AA0</b>
5 m	<b>6ES7468-1BF00-0AA0</b>
10 m	<b>6ES7468-1CB00-0AA0</b>
25 m	<b>6ES7468-1CC50-0AA0</b>
50 m	<b>6ES7468-1CF00-0AA0</b>
100 m	<b>6ES7468-1DB00-0AA0</b>
<b>Terminating connector</b>	<b>6ES7461-3AA00-7AA0</b>
for IM 461-3	

### Overview



- Send interface for distributed expansion with SIMATIC S5 expansion racks up to 600 m
- Can be plugged into the central controller
- Up to 8 SIMATIC S5 expansion racks can be connected (up to 4 per interface)
- Can be used exclusively with IM 314

### Technical specifications

Article number	<b>6ES7463-2AA00-0AA0</b> TRANSMITT. INTERF.MOD- IM463-2, COUPL. M. S5
<b>Product type designation</b>	
<b>Input current</b>	
from backplane bus 5 V DC, max.	1 320 mA
<b>Power losses</b>	
Power loss, max.	6 600 mW
<b>Hardware configuration</b>	
Cable length between first and last interface module, max.	600 m
<b>Dimensions</b>	
Width	25 mm
Height	290 mm
Depth	217 mm
<b>Weights</b>	
Weight, approx.	360 g

### Ordering data

#### Article No.

**IM 463-2 interface module**  
Receiving IM for distributed coupling of SIMATIC S5-EUs up to max. 600 m

**6ES7463-2AA00-0AA0**

**SIMATIC S7-400 advanced controller**

## SIPLUS S7-400 interface modules

**SIPLUS S7-400 IM 460-0****Overview**

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- Send interface module for centralized expansion up to 5 m
- Transfer from P and K Bus
- Plug into central controller
- You may connect up to 8 expansion units (max. 4 per port)
- Usable exclusively with IM 461-0

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

**Technical specifications**

Article number	<b>6AG1460-0AA01-2AB0</b>
Based on	<b>6ES7460-0AA01-0AB0</b> SIPLUS S7-400 IM460-0 TX
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.****SIPLUS S7-400 interface module IM 460-0**

Send IM for central coupling up to 5 m; with K-bus transfer

Extended temperature range and exposure to media

**6AG1460-0AA01-2AB0****Accessories**

See SIMATIC IM 460-0, page 6/122

### Overview



- Receive interface connection for central extension up to 5 m
- Transfer from P and K Bus
- Pluggable in extension device
- Usable exclusively with IM 460-0

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

### Technical specifications

Article number	<b>6AG1461-0AA01-2AA0</b>
Based on	<b>6ES7461-0AA01-0AA0</b> SIPLUS S7-400 IM461-0 RX
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

### Ordering data

### Article No.

<b>SIPLUS S7-400 interface module IM 461-0</b>	
Receiver IM for central coupling up to 5 m; with C-bus transfer	
Extended temperature range and exposure to media	<b>6AG1461-0AA01-2AA0</b>
<b>Accessories</b>	See SIMATIC IM 461-0, page 6/123



# SIMATIC S7-400 advanced controller

## Power supplies

### PS 405/407 power supplies

#### Overview



- Power supplies for SIMATIC S7-400
- For conversion of AC or DC line voltages to the 5 V DC and 24 V DC operating voltages required
- 4 A, 10 A and 20 A output currents
- In addition:
  - SIPLUS power supply 6AG1405-0KA02-2AA0 for temperature range of -25 to +60 °C and use under medium load (e.g. chlorine/sulfur atmosphere). Technical specifications similar to 6ES7405-0KA02-0AA0
  - SIPLUS power supply 6AG1407-0KA02-4AA0 for use under medium load (e.g. chlorine/sulfur atmosphere). Technical specifications similar to 6ES7407-0KA02-0AA0
  - SIPLUS power supply 6AG1407-0KR02-4AA0 for use under medium load (e.g. chlorine/sulfur atmosphere). Technical specifications as for 6ES7407-0KR02-0AA0

#### Technical specifications

Article number	6ES7405-0DA02-0AA0	6ES7405-0KA02-0AA0	6ES7405-0KR02-0AA0	6ES7405-0RA02-0AA0
	PS405 POWER SUPPLY, DC24/48/60V, DC5V/4A	POWER SUPP. PS405, DC24/48/60V, DC5V/10A	POWER SUPP. PS405, DC24/48/60V, DC5V/10A, RED	PS405 POWER SUPPLY, DC24/48/60V, DC5V/20A
<b>Product type designation</b>				
<b>Supply voltage</b>				
Rated value (DC)				
• 24 V DC	Yes	Yes	Yes	Yes
• 48 V DC	Yes	Yes	Yes	Yes
• 60 V DC	Yes	Yes	Yes	Yes
permissible range, lower limit (DC)	19.2 V; Dynamic 18.5 V	19.2 V; Dynamic 18.5 V	19.2 V; Dynamic 18.5 V	19.2 V; Dynamic 18.5 V
permissible range, upper limit (DC)	72 V; dynamic 75.5 V	72 V; dynamic 75.5 V	72 V; dynamic 75.5 V	72 V; dynamic 75.5 V
<b>Mains buffering</b>				
• Mains/voltage failure stored energy time	20 ms	20 ms	20 ms	20 ms
• Mains buffering according to NAMUR recommendation	Yes	Yes	Yes	Yes
<b>Input current</b>				
Rated value at 24 V DC	2 A	4 A	4 A	7 A
Rated value at 48 V DC	1 000 mA	2 A	2 A	3.2 A
Rated value at 60 V DC	800 mA	1.6 A	1.6 A	2.5 A
Inrush current, max.	18 A; Full width at half maximum 20 ms	18 A; Full width at half maximum 20 ms	18 A; Full width at half maximum 20 ms	56 A; Full width at half maximum 1.5 ms
<b>Output voltage</b>				
Type of output voltage	DC	DC	DC	DC
Rated value (DC)				
• 5 V DC	Yes	Yes	Yes	Yes
• 24 V DC	Yes	Yes	Yes	Yes
<b>Output current</b>				
for backplane bus (5 V DC), max.	4 A; no base load required	10 A; no base load required	10 A; no base load required	20 A; no base load required
for backplane bus (24 V DC), max.	0.5 A; idling-proof	1 A; idling-proof	1 A; idling-proof	1 A; idling-proof
short-circuit protection	Yes	Yes	Yes	Yes
<b>Power</b>				
Power consumption, typ.	48 W	95 W	95 W	168 W
<b>Power losses</b>				
Power loss, typ.	16 W	20 W	20 W	44 W
<b>Battery</b>				
<b>Backup battery</b>				
• Backup battery				
- Backup battery (optional)	Yes; 1 x lithium AA; 3.6 V/2.3 Ah	Yes; 2 x lithium AA; 3.6 V/2.3 Ah	Yes; 2 x lithium AA; 3.6 V/2.3 Ah	Yes; 2 x lithium AA; 3.6 V/2.3 Ah

### Technical specifications (continued)

Article number	<b>6ES7405-0DA02-0AA0</b> PS405 POWER SUPPLY, DC24/48/60V, DC5V/4A	<b>6ES7405-0KA02-0AA0</b> POWER SUPP. PS405, DC24/48/60V, DC5V/10A	<b>6ES7405-0KR02-0AA0</b> POWER SUPP. PS405, DC24/48/60V, DC5V/10A, RED	<b>6ES7405-0RA02-0AA0</b> PS405 POWER SUPPLY, DC24/48/60V, DC5V/20A
<b>Hardware configuration</b>				
<b>Slots</b>				
• Required slots	1	2	2	2
<b>Galvanic isolation</b>				
primary/secondary	Yes	Yes	Yes	Yes
<b>Degree and class of protection</b>				
Protection class	1; with protective conductor	1; with protective conductor	1; with protective conductor	1; with protective conductor
<b>Standards, approvals, certificates</b>				
FM approval	Yes; Ta: 0 °C to 60 °C T4	Yes; Ta: 0 °C to 60 °C T4	Yes; Ta: 0 °C to 60 °C T4	Yes; Ta: 0 °C to 60 °C T4
<b>Connection method</b>				
Connecting cables/cross sections	3x 1.5 mm <sup>2</sup> , solid or stranded wire with end sleeve, external diameter 3 mm to 9 mm	3x 1.5 mm <sup>2</sup> , solid or stranded wire with end sleeve, external diameter 3 mm to 9 mm	3x 1.5 mm <sup>2</sup> , solid or stranded wire with end sleeve, external diameter 3 mm to 9 mm	3x 1.5 mm <sup>2</sup> , solid or stranded wire with end sleeve, external diameter 3 mm to 9 mm
<b>Dimensions</b>				
Width	25 mm	50 mm	50 mm	50 mm
Height	290 mm	290 mm	290 mm	290 mm
Depth	217 mm	217 mm	217 mm	217 mm
<b>Weights</b>				
Weight, approx.	760 g	1 200 g	1 200 g	1 300 g
Article number	<b>6ES7407-0DA02-0AA0</b> POWER SUPPLY PS407, 120/230V UC, 5V DC/4A	<b>6ES7407-0KA02-0AA0</b> PS407 POWER SUPPLY, 120/230V UC, 5V DC/10A	<b>6ES7407-0KR02-0AA0</b> POWER SUPP. PS407, UC120/230V, DC5V/10A, RED.	<b>6ES7407-0RA02-0AA0</b> PS407 POWER SUPPLY, 120/230V UC, 5V DC/20A
<b>Product type designation</b>				
<b>Supply voltage</b>				
Rated value (DC)				
• 120 V DC	Yes	Yes	Yes	Yes
• 230 V DC	Yes	Yes	Yes	Yes
permissible range, lower limit (DC)	88 V	88 V	88 V	88 V
permissible range, upper limit (DC)	300 V	300 V	300 V	300 V
Rated value (AC)				
• 120 V AC	Yes	Yes	Yes	Yes
• 230 V AC	Yes	Yes	Yes	Yes
permissible range, lower limit (AC)	85 V	85 V	85 V	85 V
permissible range, upper limit (AC)	264 V	264 V	264 V	264 V
<b>Line frequency</b>				
• Rated value 50 Hz	Yes	Yes	Yes	Yes
• Rated value 60 Hz	Yes	Yes	Yes	Yes
• permissible frequency range, lower limit	47 Hz	47 Hz	47 Hz	47 Hz
• permissible frequency range, upper limit	63 Hz	63 Hz	63 Hz	63 Hz
<b>Mains buffering</b>				
• Mains/voltage failure stored energy time	20 ms	20 ms	20 ms	20 ms
• Mains buffering according to NAMUR recommendation	Yes	Yes	Yes	Yes
<b>Input current</b>				
Rated value at 110 V DC	350 mA; at 120 V DC	1 A; at 120 V DC	1 A; at 120 V DC	1.4 A; at 120 V DC
Rated value at 230 V DC	190 mA	0.5 A	0.5 A	0.7 A
Rated value at 120 V AC	0.42 A	0.9 A	0.9 A	1.4 A
Rated value at 230 V AC	0.22 A	0.5 A	0.5 A	0.7 A
Inrush current, max.	8.25 A; Full width at half maximum 5 ms	63 A; Full width at half maximum 1 ms	63 A; Full width at half maximum 1 ms	88 A; Full width at half maximum 1.1 ms

# SIMATIC S7-400 advanced controller

## Power supplies

### PS 405/407 power supplies

#### Technical specifications (continued)

Article number	<b>6ES7407-0DA02-0AA0</b> POWER SUPPLY PS407, 120/230V UC, 5V DC/4A	<b>6ES7407-0KA02-0AA0</b> PS407 POWER SUPPLY, 120/230V UC, 5V DC/10A	<b>6ES7407-0KR02-0AA0</b> POWER SUPP. PS407, UC120/230V, DC5V/10A, RED.	<b>6ES7407-0RA02-0AA0</b> PS407 POWER SUPPLY, 120/230V UC, 5V DC/20A RED.
<b>Output voltage</b>				
Type of output voltage	DC	DC	DC	DC
Rated value (DC)				
• 5 V DC	Yes	Yes	Yes	Yes
• 24 V DC	Yes	Yes	Yes	Yes
<b>Output current</b>				
for backplane bus (5 V DC), max.	4 A; no base load required	10 A; no base load required	10 A; no base load required	20 A; no base load required
for backplane bus (24 V DC), max.	0.5 A; idling-proof	1 A; idling-proof	1 A; idling-proof	1 A; idling-proof
short-circuit protection	Yes	Yes	Yes	Yes
<b>Power</b>				
Power consumption, typ.	52 W	95 W	95 W	158 W
<b>Power losses</b>				
Power loss, typ.	20 W	20 W	20 W	35 W
<b>Battery</b>				
<b>Backup battery</b>				
• Backup battery				
- Backup battery (optional)	Yes; 1 x lithium AA; 3.6 V/2.3 Ah	Yes; 2 x lithium AA; 3.6 V/2.3 Ah	Yes; 2 x lithium AA; 3.6 V/2.3 Ah	Yes; 2 x lithium AA; 3.6 V/2.3 Ah
<b>Hardware configuration</b>				
<b>Slots</b>				
• Required slots	1	2	2	2
<b>Galvanic isolation</b>				
primary/secondary	Yes	Yes	Yes	Yes
<b>EMC</b>				
<b>Compliance with line harmonic distortion limits</b>				
• Observance of line harmonic distortion acc. to IEC 61000-3-2, IEC 61000-3-3	Yes	Yes	Yes	Yes
<b>Degree and class of protection</b>				
Protection class	1; with protective conductor	1; with protective conductor	1; with protective conductor	1; with protective conductor
<b>Standards, approvals, certificates</b>				
FM approval	Yes; Ta: 0 °C to 60 °C T4	Yes; Ta: 0 °C to 60 °C T4	Yes; Ta: 0 °C to 60 °C T4	Yes; Ta: 0 °C to 60 °C T4
<b>Connection method</b>				
Connecting cables/cross sections	3x 1.5 mm <sup>2</sup> , solid or stranded wire with end sleeve, external diameter 3 mm to 9 mm	3x 1.5 mm <sup>2</sup> , solid or stranded wire with end sleeve, external diameter 3 mm to 9 mm	3x 1.5 mm <sup>2</sup> , solid or stranded wire with end sleeve, external diameter 3 mm to 9 mm	3x 1.5 mm <sup>2</sup> , solid or stranded wire with end sleeve, external diameter 3 mm to 9 mm
<b>Dimensions</b>				
Width	25 mm	50 mm	50 mm	50 mm
Height	290 mm	290 mm	290 mm	290 mm
Depth	217 mm	217 mm	217 mm	217 mm
<b>Weights</b>				
Weight, approx.	760 g	1 200 g	1 200 g	1 300 g

## SIMATIC S7-400 advanced controller

### Power supplies

#### PS 405/407 power supplies

Ordering data	Article No.	Ordering data	Article No.
<b>PS 405 power supply modules</b>		<b>PS 407 power supply modules</b>	
24 V DC; 5 V DC, 24 V DC		120/230 V AC; 5 V DC, 24 V DC	
4 A	<b>6ES7405-0DA02-0AA0</b>	4 A	<b>6ES7407-0DA02-0AA0</b>
10 A, wide range	<b>6ES7405-0KA02-0AA0</b>	10 A	<b>6ES7407-0KA02-0AA0</b>
10 A, redundant, wide range	<b>6ES7405-0KR02-0AA0</b>	10 A, redundant	<b>6ES7407-0KR02-0AA0</b>
20 A, wide range	<b>6ES7405-0RA02-0AA0</b>	20 A	<b>6ES7407-0RA02-0AA0</b>
<b>Power plug for PS 405</b>	<b>6ES7490-0AA00-0AA0</b>	<b>Power plug for PS 407</b>	<b>6ES7490-0AB00-0AA0</b>
Spare part		Spare part	
<b>Backup battery</b>	<b>6ES7971-0BA00</b>	<b>Backup battery</b>	<b>6ES7971-0BA00</b>
Type AA; 3.6 V/2.3 Ah		Type AA; 3.6 V / 2.3 Ah	
		<b>SITOP power supplies</b>	Refer to Catalog KT 10.1
		For the 24 V supply of motors or sensors	
		<b>Add-on modules and DC-UPS</b>	Refer to Catalog KT 10.1
		To increase system availability	

**SIMATIC S7-400 advanced controller**

## SIPLUS power supplies

**SIPLUS S7-400 power supplies****Overview**

- Power supplies for SIPLUS S7-400
- For conversion of AC or DC line voltages to the 5 V DC and 24 V DC operating voltages required
- 4 A, 10 A and 20 A output currents

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

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**Technical specifications**

Article number	<b>6AG1405-0KA02-7AA0</b>	<b>6AG1405-0KR02-7AA0</b>	<b>6AG1407-0KA02-7AA0</b>	<b>6AG1407-0KR02-7AA0</b>
Based on	<b>6ES7405-0KA02-0AA0</b> SIPLUS PS 405 10A	<b>6ES7405-0KR02-0AA0</b> SIPLUS S7-400 PS405 DC 10A RED	<b>6ES7407-0KA02-0AA0</b> SIPLUS S7-400 PS407 UC 10A	<b>6ES7407-0KR02-0AA0</b> SIPLUS S7-400 PS407 UC 10A RED
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	-25 °C; = Tmin	-25 °C; = Tmin; using the external battery box SIPLUS 6AG1971-0AA00-7AA0 for buffer mode	-25 °C; using the external battery box SIPLUS 6AG1971-0AA00-7AA0 for buffer mode	-25 °C; using the external battery box SIPLUS 6AG1971-0AA00-7AA0 for buffer mode
• max.	70 °C; = Tmax	70 °C; = Tmax; using the external battery box SIPLUS 6AG1971-0AA00-7AA0 for buffer mode	70 °C; using the external battery box SIPLUS 6AG1971-0AA00-7AA0 for buffer mode	70 °C; using the external battery box SIPLUS 6AG1971-0AA00-7AA0 for buffer mode
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>				
- With condensation, max.	100 %; RH incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning if there is condensation). In buffer mode, use battery box SIPLUS 6AG1971-0AA00-7AA0 for high humidity	100 %; RH incl. condensation/frost (no commissioning if there is condensation). In buffer mode, use battery box SIPLUS 6AG1971-0AA00-7AA0 for high humidity	100 %; RH incl. condensation/frost (no commissioning if there is condensation). In buffer mode, use battery box SIPLUS 6AG1971-0AA00-7AA0 for high humidity
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation in corrosive atmospheres!			
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!			
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!			

## SIMATIC S7-400 advanced controller

### SIPLUS power supplies

#### SIPLUS S7-400 power supplies

Ordering data	Article No.		Article No.
<p><b>SIPLUS S7-400 PS 405 power supply modules</b></p> <p>In: 24/48/60 V DC - wide range (19.2 ... 72 V DC); Out: 24 V DC/1 A, 5 V DC/10 A</p> <p>Extended temperature range and exposure to media</p> <p>In: 24/48/60 V DC - wide range (19.2 ... 72 V DC); Out: 24 V DC/1 A, 5 V DC/10 A; for redundant use</p> <p>Extended temperature range and exposure to media</p>	<p><b>6AG1405-0KA02-7AA0</b></p> <p><b>6AG1405-0KR02-7AA0</b></p>	<p><b>SIPLUS S7-400 PS 407 power supply modules</b></p> <p>In: 110/230 V DC; 120/230 V AC; Out: 24 V DC/1 A, 5 V DC/10 A</p> <p>Extended temperature range and exposure to media</p> <p>In: 110/230 V DC; 120/230 V AC; Out: 24 V DC/1 A, 5 V DC/10 A; for redundant use</p> <p>Extended temperature range and exposure to media</p> <p><b>Accessories</b></p>	<p><b>6AG1407-0KA02-7AA0</b></p> <p><b>6AG1407-0KR02-7AA0</b></p> <p>See SIMATIC PS 405/407 power supplies, page 6/133</p>

## SIMATIC S7-400 advanced controller

### Accessories

#### Labeling sheets

##### Overview

###### Labeling sheets

- Film sheets for application-specific labeling of SIMATIC S7-400 I/O modules with commercial laser printers
- Single-color films, tear-resistant, dirt-resistant
- Easy handling:
  - Pre-perforated labeling sheets in DIN A4 format to allow easy separation of the labeling strips
  - The separated strips can be inserted directly into the I/O modules
- Different colors for distinction between module types or preferred areas of application:  
The labeling sheets are available in the colors teal, light beige, red and yellow. Yellow is reserved for failsafe systems.

###### Label cover

- Film to cover and hold user-made labeling strips on normal paper
- Accessories, 10 pieces

##### Ordering data

###### Labeling sheets

DIN A4, for printing using laser printer; 10 pieces

Petrol

**6ES7492-2AX00-0AA0**

Light beige

**6ES7492-2BX00-0AA0**

Yellow

**6ES7492-2CX00-0AA0**

Red

**6ES7492-2DX00-0AA0**

###### Cover film for labeling strips

**6ES7492-2XX00-0AA0**

10 pieces (spare part)

#### Spare parts

##### Overview

###### Cover film for labeling strips

- Petrol-colored film for covering and fixing labeling strips created by the user
- On normal paper
- Spare part

###### Measuring range module for analog input modules

- Pluggable module for selecting the input ranges in the case of analog modules
- 1 module for 2 inputs
- Spare part

###### Slot cover

- Cover plates for unused slots in module racks
- Spare part, 10 units

###### Power supply connectors

- Plug for connecting the PS 405 and PS 407 power supply modules to the network
- Spare part

##### Ordering data

###### Cover foil for labeling strip

10 units (spare part)

**6ES7492-2XX00-0AA0**

###### Range card for analog input modules

1 card for 2 inputs; 2 units (spare part)

**6ES7974-0AA00-0AA0**

###### Slot covers

for racks; 10 units (spare part)

**6ES7490-1AA00-0AA0**

###### Power plug for PS 405

Spare part

**6ES7490-0AA00-0AA0**

###### Power plug for PS 407

Spare part

**6ES7490-0AB00-0AA0**

## Overview



- 4 high-availability CPUs (CPU 412-5H, CPU 414-5H, CPU 416-5H, CPU 417-5H)
- Graded performance spectrum for a wide range of different applications

For further information, see pages 6/34 and 6/38.

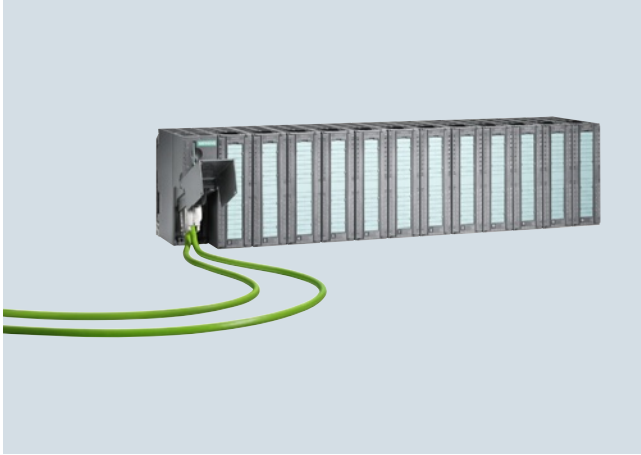


## SIMATIC S7-400 advanced controller

Modules for SIMATIC S7-400F/FH

### ET 200M, Fail-safe I/O modules

#### Overview ET 200M



#### Overview Fail-safe I/O modules



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- Modular I/O system with IP20 degree of protection, particularly suitable for user-specific and complex automation tasks.
- Consists of a PROFIBUS DP or PROFINET interface module IM 153, up to 8 or 12 I/O modules of the S7-300 automation system (structure with bus connection or with active bus modules), and a power supply if applicable
- Can be expanded with S7-300 automation system signal, communication and function modules
- Applicable Ex analog input or output modules with HART optimize the ET 200M for use in process engineering.
- Can be used in redundant systems (S7-400H, S7-400F/FH)
- Modules can be replaced during operation (hot swapping) with the bus modules active
- Transmission rates up to 12 Mbit/s
- Ex approval to Cat. 3 for Zone 2 acc. to ATEX100 a
- Failsafe digital in/outputs as well as analog inputs for safety-oriented signal processing in accordance with PROFIsafe
- Support of modules with expanded user data, e.g. HART modules with HART minor variables

For further information, see chapter 9, page 9/268 ff.

- Failsafe input/output modules for use with the SIMATIC S7-400F/FH
- With integrated safety functions
- Can only be plugged into the ET 200M
- Achievable safety classes in safety operation: SIL 2, SIL 3 to IEC 61508, AK 4, AK 6 to DIN V 19250, Category 3, 4 to EN 954-1
- Use in standard mode with high diagnostics requirements
- Also suitable for redundant operation

For further information, see chapter 5, page 5/108.

## Distributed controllers



### 7/2 **Based on ET 200SP**

#### 7/2 Standard CPUs

7/2 CPU 1510SP-1 PN

7/5 CPU 1512SP-1 PN

#### 7/8 Fail-safe CPUs

7/8 CPU 1510SP F-1 PN

7/11 CPU 1512SP F-1 PN

#### 7/14 ET 200SP Open Controller

7/14 CPU 1515SP PC

7/18 ODK 1500S

### 7/19 **Based on ET 200S**

#### 7/19 Standard CPUs

7/19 IM 151-7 CPU

7/22 IM 151-8 PN/DP CPU

7/25 Master interface module  
for IM 151 CPU interface modules

#### 7/26 SIPLUS Standard CPUs

7/26 SIPLUS IM 151-7 CPU

7/27 SIPLUS IM 151-8 PN/DP CPU

7/28 SIPLUS master interface modules  
for IM 151 CPU

#### 7/29 Fail-safe CPUs

7/29 IM 151-7 F-CPU

7/31 IM 151-8 F PN/DP CPU

#### 7/34 SIPLUS fail-safe CPUs

7/34 SIPLUS IM 151-7 F-CPU

7/35 SIPLUS IM 151-8 F PN/DP CPU

### 7/36 **Based on ET 200Pro**

#### 7/36 Standard CPUs

7/36 IM 154-8 PN/DP CPU

#### 7/40 Fail-safe CPUs

7/40 IM 154-8 F PN/DP CPU

### **Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

[www.siemens.com/simatic/printmaterial](http://www.siemens.com/simatic/printmaterial)

## Distributed controllers

Based on ET 200SP  
Standard CPUs

### CPU 1510SP-1 PN

#### Overview



- CPU 1510SP-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1511-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- PROFINET IO Controller for up to 64 IO devices

- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO Controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), Web server and S7 communication (with loadable FBs)
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders

#### Note

SIMATIC Memory Card required for operation of the CPU. The bus adapter is not included in scope of delivery and is to be ordered separately.

#### Technical specifications

Article number	<b>6ES7510-1DJ00-0AB0</b> CPU 1510SP-1 PN, 100KB PROG./ 750KB DATA
<b>Product type designation</b>	
<b>General information</b>	
<b>Engineering with</b>	V13 SP1
• STEP 7 TIA Portal can be configured/integrated as of version	
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
<b>Power losses</b>	
Power loss, typ.	5.6 W
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	100 kbyte
• integrated (for data)	750 kbyte
<b>Load memory</b>	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
<b>CPU processing times</b>	
for bit operations, typ.	72 ns
for word operations, typ.	86 ns
for fixed point arithmetic, typ.	115 ns
for floating point arithmetic, typ.	461 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)

Article number	<b>6ES7510-1DJ00-0AB0</b> CPU 1510SP-1 PN, 100KB PROG./ 750KB DATA
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Number, max.	16 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
<b>Time of day</b>	
<b>Clock</b>	
• Type	Hardware clock
<b>Interfaces</b>	
<b>1st interface</b>	
<b>Interface types</b>	
- Number of ports	3; 1. integr. + 2. via BusAdapter
- Integrated switch	Yes
- RJ 45 (Ethernet)	Yes; X1
<b>Protocols</b>	
- PROFINET IO Controller	Yes
- PROFINET IO Device	Yes
- SIMATIC communication	Yes
- Open IE communication	Yes
- Web server	Yes
- Media redundancy	Yes
<b>2nd interface</b>	
<b>Interface types</b>	
- Number of ports	1
- RS 485	Yes; Via CM DP module
<b>Protocols</b>	
- SIMATIC communication	Yes
- PROFIBUS DP master	Yes
- PROFIBUS DP slave	Yes

## Technical specifications (continued)

Article number	<b>6ES7510-1DJ00-0AB0</b> CPU 1510SP-1 PN, 100KB PROG./ 750KB DATA
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	64
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Number of connectable IO devices, max.	64; In total, up to 189 distributed I/O devices can be connected via PROFIBUS or PROFINET
- Of which IO devices with IRT and "high performance" option, max.	64
- Max. number of connectable IO devices for RT	64
<b>PROFIBUS DP master</b>	
<b>Services</b>	
- Number of DP slaves	125
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes; Only with PROFINET; with minimum OB 6x cycle of 625 µs
<b>supported technology objects</b>	
Motion	Yes
• Speed-controlled axis	
- Number of speed-controlled axes, max.	6; Max. number of speed-controlled axes (requirement: there must be no other motion technology objects created)
• Positioning axis	
- Number of positioning axes, max.	6; Max. number of positioning axes (requirement: there must be no other motion technology objects created)
• Synchronized axes (relative gear synchronization)	
- Number of axes, max.	3; Max. number of synchronous axes (requirement: there must be no other motion technology objects created)
• External encoders	
- Number of external encoders, max.	6; Max. number of external encoders (requirement: there must be no other motion technology objects created)

Article number	<b>6ES7510-1DJ00-0AB0</b> CPU 1510SP-1 PN, 100KB PROG./ 750KB DATA
<b>Controller</b>	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
<b>Counting and measuring</b>	
• High-speed counter	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
<b>Configuration</b>	
<b>programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Dimensions</b>	
Width	100 mm
Height	117 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	310 g

## Ordering data

Article No.	Article No.
<b>CPU 1510SP-1 PN</b>	<b>6ES7510-1DJ00-0AB0</b>
Work memory 100 KB for program, 750 KB for data, PROFINET IO IRT interface; SIMATIC Memory Card required	
<b>Accessories</b>	
<b>SIMATIC Memory Card</b>	
4 MB	<b>6ES7954-8LC02-0AA0</b>
12 MB	<b>6ES7954-8LE02-0AA0</b>
24 MB	<b>6ES7954-8LF02-0AA0</b>
256 MB	<b>6ES7954-8LL02-0AA0</b>
2 GB	<b>6ES7954-8LP01-0AA0</b>

Article No.	Article No.
<b>DIN rail 35 mm</b>	
• Length: 483 mm for 19" cabinets	<b>6ES7510-8MA11</b>
• Length: 530 mm for 600 mm cabinets	<b>6ES7510-8MA21</b>
• Length: 830 mm for 900 mm cabinets	<b>6ES7510-8MA31</b>
• Length: 2 m	<b>6ES7510-8MA41</b>
<b>PE connection element for mounting rail 2000 mm</b>	<b>6ES7590-5AA00-0AA0</b>
<b>BusAdapter BA 2xRJ45</b>	<b>6ES7193-6AR00-0AA0</b>
<b>BusAdapter BA 2xFC for increased vibration and EMC loads</b>	<b>6ES7193-6AF00-0AA0</b>
<b>Reference identification label</b>	<b>6ES7193-6LF30-0AW0</b>
10 sheets of 16 labels	

## Distributed controllers

Based on ET 200SP  
Standard CPUs

### CPU 1510SP-1 PN

Ordering data	Article No.	Ordering data	Article No.
<b>Shield connection</b> 5 shield supports and 5 shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional ground	<b>6ES7193-6SC00-1AM0</b>	<b>IE FC stripping tool</b> Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>
<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer  500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer  1000 labeling strips DIN A4, light gray, card, for inscription with laser printer  1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	<b>6ES7193-6LR10-0AA0</b>  <b>6ES7193-6LR10-0AG0</b>  <b>6ES7193-6LA10-0AA0</b>  <b>6ES7193-6LA10-0AG0</b>	<b>Manuals for ET 200SP distributed I/O system</b>  ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals  Manuals can be downloaded from the Internet as PDF files: <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a>	
<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
<b>IE FC RJ45 Plug 90</b> 90° cable outlet  1 unit 10 units 50 units	<b>6GK1901-1BB20-2AA0</b>  <b>6GK1901-1BB20-2AB0</b>  <b>6GK1901-1BB20-2AE0</b>	<b>SIMATIC Manual Collection Update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>
<b>IE FC RJ45 Plug 180</b> 180° cable outlet  1 unit 10 units 50 units	<b>6GK1901-1BB10-2AA0</b>  <b>6GK1901-1BB10-2AB0</b>  <b>6GK1901-1BB10-2AE0</b>	<b>STEP 7 Professional V13 SP1</b>  <b>Target system:</b> SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC <b>Requirement:</b> Windows 7 Professional SP1 (64-bit), Windows 7 Enterprise SP1 (64-bit), Windows 7 Ultimate SP1 (64-bit), Windows 8.1 (64-bit), Windows 8.1 Professional (64-bit), Windows 8.1 Enterprise (64-bit), Windows Server 2008 R2 StdE (full installation), Windows Server 2012 StdE (full installation) <b>Available in:</b> German, English, Chinese, Italian, French, Spanish	
<b>IE FC TP standard cable GP 2x2</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1840-2AH10</b>	STEP 7 Professional V13 SP1, floating license  STEP 7 Professional V13 SP1, floating license, software download incl. license key <sup>1)</sup>  Email address required for delivery	<b>6ES7822-1AA03-0YA5</b>  <b>6ES7822-1AE03-0YA5</b>
<b>IE FC TP Trailing Cable 2 x 2 (Type C)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1840-3AH10</b>	<b>Spare parts</b>  <b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage • With push-in terminals	<b>6ES7193-4JB00-0AA0</b>
<b>IE FC TP Marine Cable 2 x 2 (Type B)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 with marine approval, sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1840-4AH10</b>	<b>Server module</b>	<b>6ES7193-6PA00-0AA0</b>

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

## Overview



- CPU 1512SP-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1513-1 PN
- For applications with medium requirements regarding the program scope and processing speed, for distributed setup via PROFINET IO or PROFIBUS DP
- Increase in availability of systems and machines
- PROFINET IO Controller for up to 128 IO devices

- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO Controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), Web server and S7 communication (with loadable FBs)
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders

## Note

SIMATIC Memory Card required for operation of the CPU. BusAdapter is not included in scope of delivery and is to be ordered separately.

## Technical specifications

Article number	<b>6ES7512-1DK00-0AB0</b> CPU 1512SP-1 PN, 200KB PROG./ 1MB DATA
<b>Product type designation</b>	
<b>General information</b>	
<b>Engineering with</b>	V13 SP1
• STEP 7 TIA Portal can be configured/integrated as of version	
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
<b>Power losses</b>	
Power loss, typ.	5.6 W
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	200 kbyte
• integrated (for data)	1 Mbyte
<b>Load memory</b>	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
<b>CPU processing times</b>	
for bit operations, typ.	48 ns
for word operations, typ.	58 ns
for fixed point arithmetic, typ.	77 ns
for floating point arithmetic, typ.	307 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)

Article number	<b>6ES7512-1DK00-0AB0</b> CPU 1512SP-1 PN, 200KB PROG./ 1MB DATA
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Number, max.	16 kbyte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
<b>Time of day</b>	
<b>Clock</b>	
• Type	Hardware clock
<b>Interfaces</b>	
<b>1st interface</b>	
<b>Interface types</b>	
- Number of ports	3; 1. integr. + 2. via BusAdapter
- Integrated switch	Yes
- RJ 45 (Ethernet)	Yes; X1
<b>Protocols</b>	
- PROFINET IO Controller	Yes
- PROFINET IO Device	Yes
- SIMATIC communication	Yes
- Open IE communication	Yes
- Web server	Yes
- Media redundancy	Yes

## Distributed controllers

Based on ET 200SP  
Standard CPUs

### CPU 1512SP-1 PN

#### Technical specifications (continued)

Article number	<b>6ES7512-1DK00-0AB0</b> CPU 1512SP-1 PN, 200KB PROG./ 1MB DATA
<b>2nd interface</b>	
<b>Interface types</b>	
- Number of ports	1
- RS 485	Yes; Via CM DP module
<b>Protocols</b>	
- SIMATIC communication	Yes
- PROFIBUS DP master	Yes
- PROFIBUS DP slave	Yes
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	88
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Number of connectable I/O devices, max.	128; In total, up to 253 distributed I/O devices can be connected via PROFIBUS or PROFINET
- Of which IO devices with IRT and "high performance" option, max.	64
- Max. number of connectable IO devices for RT	128
<b>PROFIBUS DP master</b>	
<b>Services</b>	
- Number of DP slaves	125
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes; Only with PROFINET; with minimum OB 6x cycle of 625 µs
<b>supported technology objects</b>	
Motion	Yes
• Speed-controlled axis	
- Number of speed-controlled axes, max.	6; Max. number of speed-controlled axes (requirement: there must be no other motion technology objects created)
• Positioning axis	
- Number of positioning axes, max.	6; Max. number of positioning axes (requirement: there must be no other motion technology objects created)
• Synchronized axes (relative gear synchronization)	
- Number of axes, max.	3; Max. number of synchronous axes (requirement: there must be no other motion technology objects created)
• External encoders	
- Number of external encoders, max.	6; Max. number of external encoders (requirement: there must be no other motion technology objects created)
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	<b>6ES7512-1DK00-0AB0</b> CPU 1512SP-1 PN, 200KB PROG./ 1MB DATA
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
<b>Configuration</b>	
<b>programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Dimensions</b>	
Width	100 mm
Height	117 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	310 g

<b>Ordering data</b>	<b>Article No.</b>
<b>CPU 1512SP-1 PN</b>	<b>6ES7512-1DK00-0AB0</b>
Work memory 200 KB for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required	
<b>Accessories</b>	
<b>SIMATIC Memory Card</b>	
4 MB	<b>6ES7954-8LC02-0AA0</b>
12 MB	<b>6ES7954-8LE02-0AA0</b>
24 MB	<b>6ES7954-8LF02-0AA0</b>
256 MB	<b>6ES7954-8LL02-0AA0</b>
2 GB	<b>6ES7954-8LP01-0AA0</b>
<b>DIN rail 35 mm</b>	
• Length: 483 mm for 19" cabinets	<b>6ES5710-8MA11</b>
• Length: 530 mm for 600 mm cabinets	<b>6ES5710-8MA21</b>
• Length: 830 mm for 900 mm cabinets	<b>6ES5710-8MA31</b>
• Length: 2 m	<b>6ES5710-8MA41</b>
<b>PE connection element for mounting rail 2000 mm</b>	<b>6ES7590-5AA00-0AA0</b>
<b>BusAdapter BA 2xRJ45</b>	<b>6ES7193-6AR00-0AA0</b>
<b>BusAdapter BA 2xFC for increased vibration and EMC loads</b>	<b>6ES7193-6AF00-0AA0</b>



Ordering data	Article No.	Ordering data	Article No.
<b>Reference identification label</b> 10 sheets of 16 labels	<b>6ES7193-6LF30-0AW0</b>	<b>IE FC TP Marine Cable 2 x 2 (Type B)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 with marine approval, sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1840-4AH10</b>
<b>Shield connection</b> 5 shield supports and 5 shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional ground	<b>6ES7193-6SC00-1AM0</b>	<b>IE FC stripping tool</b> Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>
<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>	<b>Manuals for ET 200SP distributed I/O system</b> ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files: <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a>	
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>	<b>SIMATIC Manual Collection Update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>	<b>STEP 7 Professional V13 SP1</b> See CPU 1510SP-1 PN, page 7/4	
<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		<b>Spare parts</b>	
<b>IE FC RJ45 Plug 90</b> 90° cable outlet		<b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage • With push-in terminals	<b>6ES7193-4JB00-0AA0</b>
1 unit	<b>6GK1901-1BB20-2AA0</b>	<b>Server module</b>	<b>6ES7193-6PA00-0AA0</b>
10 units	<b>6GK1901-1BB20-2AB0</b>		
50 units	<b>6GK1901-1BB20-2AE0</b>		
<b>IE FC RJ45 Plug 180</b> 180° cable outlet			
1 unit	<b>6GK1901-1BB10-2AA0</b>		
10 units	<b>6GK1901-1BB10-2AB0</b>		
50 units	<b>6GK1901-1BB10-2AE0</b>		
<b>IE FC TP standard cable GP 2x2</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1840-2AH10</b>		
<b>IE FC TP Trailing Cable 2 x 2 (Type C)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1840-3AH10</b>		

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>



## Distributed controllers

Based on ET 200SP

Fail-safe CPUs

### CPU 1510SP F-1 PN

#### Overview

- CPU 1510SP F-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1511F-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO Controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), Web server and S7 communication (with loadable FBs)
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders

#### Note

SIMATIC memory card required for operation of the CPU.

The bus adapter is not included in the scope of supply and must be ordered separately.

#### Technical specifications

Article number	<b>6ES7510-1SJ00-0AB0</b> CPU1510SP F-1 PN, 150KB PROG./750KB DATA
<b>Product type designation</b>	
<b>General information</b>	
<b>Engineering with</b>	V13 SP1
• STEP 7 TIA Portal can be configured/integrated as of version	
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
<b>Power losses</b>	
Power loss, typ.	5.6 W
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	150 kbyte
• integrated (for data)	750 kbyte
<b>Load memory</b>	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
<b>CPU processing times</b>	
for bit operations, typ.	72 ns
for word operations, typ.	86 ns
for fixed point arithmetic, typ.	115 ns
for floating point arithmetic, typ.	461 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Number, max.	16 kbyte

Article number	<b>6ES7510-1SJ00-0AB0</b> CPU1510SP F-1 PN, 150KB PROG./750KB DATA
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
<b>Time of day</b>	
<b>Clock</b>	
• Type	Hardware clock
<b>Interfaces</b>	
<b>1st interface</b>	
<b>Interface types</b>	
- Number of ports	3
- Integrated switch	Yes
- RJ 45 (Ethernet)	Yes; 1. integr. + 2. via Bus Adapter BA 2x RJ45
<b>Protocols</b>	
- PROFINET IO Controller	Yes
- PROFINET IO Device	Yes
- SIMATIC communication	Yes
- Open IE communication	Yes
- Web server	Yes
- Media redundancy	Yes
<b>2nd interface</b>	
<b>Interface types</b>	
- Number of ports	1
- RS 485	Yes; Via CM DP module
<b>Protocols</b>	
- SIMATIC communication	Yes
- PROFIBUS DP master	Yes
- PROFIBUS DP slave	Yes
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	64

## Technical specifications (continued)

Article number	<b>6ES7510-1SJ00-0AB0</b> CPU1510SP F-1 PN, 150KB PROG./ 750KB DATA
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Number of connectable IO devices, max.	64; In total, up to 189 distributed I/O devices can be connected via PROFIBUS or PROFINET
- Of which IO devices with IRT and "high performance" option, max.	64
- Max. number of connectable IO devices for RT	64
<b>PROFIBUS DP master</b>	
<b>Services</b>	
- Number of DP slaves	125
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes; Only with PROFINET; with minimum OB 6x cycle of 625 µs
<b>supported technology objects</b>	
Motion	Yes
• Speed-controlled axis	
- Number of speed-controlled axes, max.	6; Max. number of speed-controlled axes (requirement: there must be no other motion technology objects created)
• Positioning axis	
- Number of positioning axes, max.	6; Max. number of positioning axes (requirement: there must be no other motion technology objects created)
• Synchronized axes (relative gear synchronization)	
- Number of axes, max.	3; Max. number of synchronous axes (requirement: there must be no other motion technology objects created)
• External encoders	
- Number of external encoders, max.	6; Max. number of external encoders (requirement: there must be no other motion technology objects created)
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
• Low demand mode: PFDavg	< 2.00E-05
• High demand/continuous mode: PFH	< 1.00E-09
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C

Article number	<b>6ES7510-1SJ00-0AB0</b> CPU1510SP F-1 PN, 150KB PROG./ 750KB DATA
<b>Configuration</b>	
<b>programming</b>	
<b>Programming language</b>	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• Protection level: Write protection	Yes; Specific write protection both for Standard and for Failsafe
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Dimensions</b>	
Width	100 mm
Height	117 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	310 g

## Ordering data

## Article No.

<b>CPU 1510SP F-1 PN</b>	<b>6ES7510-1SJ00-0AB0</b>
Work memory 150 KB for program, 750 KB for data, PROFINET IO IRT interface; SIMATIC Memory Card required	
<b>Accessories</b>	
<b>SIMATIC Memory Card</b>	
4 MB	<b>6ES7954-8LC02-0AA0</b>
12 MB	<b>6ES7954-8LE02-0AA0</b>
24 MB	<b>6ES7954-8LF02-0AA0</b>
256 MB	<b>6ES7954-8LL02-0AA0</b>
2 GB	<b>6ES7954-8LP01-0AA0</b>
<b>DIN rail 35 mm</b>	
• Length: 483 mm for 19" cabinets	<b>6ES5710-8MA11</b>
• Length: 530 mm for 600 mm cabinets	<b>6ES5710-8MA21</b>
• Length: 830 mm for 900 mm cabinets	<b>6ES5710-8MA31</b>
• Length: 2 m	<b>6ES5710-8MA41</b>
<b>PE connection element for mounting rail 2000 mm</b>	<b>6ES7590-5AA00-0AA0</b>
<b>BusAdapter BA 2xRJ45</b>	<b>6ES7193-6AR00-0AA0</b>
<b>BusAdapter BA 2xFC for increased vibration and EMC loads</b>	<b>6ES7193-6AF00-0AA0</b>
<b>Reference identification label</b>	<b>6ES7193-6LF30-0AW0</b>
10 sheets of 16 labels	

## Distributed controllers

Based on ET 200SP

Fail-safe CPUs

### CPU 1510SP F-1 PN

Ordering data	Article No.	Ordering data	Article No.
<b>Shield connection</b> 5 shield supports and 5 shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional ground	<b>6ES7193-6SC00-1AM0</b>	<b>IE FC TP Marine Cable 2 x 2 (Type B)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 with marine approval, sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1840-4AH10</b>
<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>	<b>IE FC stripping tool</b> Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>	<b>Manuals for ET 200SP distributed I/O system</b> ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files: <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a>	
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>	<b>SIMATIC Manual Collection Update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>
<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		<b>STEP 7 Professional V13 SP1</b> See CPU 1510SP-1 PN, page 7/4	
<b>IE FC RJ45 Plug 90</b> 90° cable outlet		<b>STEP 7 Safety Advanced V13 SP1</b> <b>Task:</b> Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco <b>Requirement:</b> STEP 7 Professional V13 SP1	
1 unit	<b>6GK1901-1BB20-2AA0</b>	Floating license for 1 user	<b>6ES7833-1FA13-0YA5</b>
10 units	<b>6GK1901-1BB20-2AB0</b>	Floating license for 1 user, license key download without software or documentation <sup>1)</sup>	<b>6ES7833-1FA13-0YH5</b>
50 units	<b>6GK1901-1BB20-2AE0</b>	Email address required for delivery	
<b>IE FC RJ45 Plug 180</b> 180° cable outlet		<b>Spare parts</b>	
1 unit	<b>6GK1901-1BB10-2AA0</b>	<b>Power supply connector</b> Spare part: for connecting the 24 V DC supply voltage	<b>6ES7193-4JB00-0AA0</b>
10 units	<b>6GK1901-1BB10-2AB0</b>	<ul style="list-style-type: none"> <li>With push-in terminals</li> </ul>	
50 units	<b>6GK1901-1BB10-2AE0</b>	<b>Server module</b>	<b>6ES7193-6PA00-0AA0</b>
<b>IE FC TP standard cable GP 2x2</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1840-2AH10</b>		
<b>IE FC TP Trailing Cable 2 x 2 (Type C)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1840-3AH10</b>		

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

## Overview

- CPU 1512SP F-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1513F-1 PN
- For applications with medium requirements in terms of program scope and processing speed, for distributed configurations via PROFINET IO or PROFIBUS DP
- Increase in availability of systems and machines
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO Controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), Web server and S7 communication (with loadable FBs)
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders

### Note

SIMATIC memory card required for operation of the CPU.

The bus adapter is not included in the scope of supply and must be ordered separately.

## Technical specifications

Article number	<b>6ES7512-1SK00-0AB0</b> CPU 1512SP F-1 PN, 300KB PROG./1MB DATA
<b>Product type designation</b>	
<b>General information</b>	
<b>Engineering with</b>	V13 SP1
• STEP 7 TIA Portal can be configured/integrated as of version	
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
<b>Power losses</b>	
Power loss, typ.	5.6 W
<b>Memory</b>	
<b>Work memory</b>	
• integrated (for program)	300 kbyte
• integrated (for data)	1 Mbyte
<b>Load memory</b>	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
<b>CPU processing times</b>	
for bit operations, typ.	48 ns
for word operations, typ.	58 ns
for fixed point arithmetic, typ.	77 ns
for floating point arithmetic, typ.	307 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• Number	Any (only limited by the main memory)
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• Number	Any (only limited by the main memory)
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Number, max.	16 kbyte

Article number	<b>6ES7512-1SK00-0AB0</b> CPU 1512SP F-1 PN, 300KB PROG./1MB DATA
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
<b>Time of day</b>	
<b>Clock</b>	
• Type	Hardware clock
<b>Interfaces</b>	
<b>1st interface</b>	
<b>Interface types</b>	
- Number of ports	3
- Integrated switch	Yes
- RJ 45 (Ethernet)	Yes; 1. integr. + 2. via Bus Adapter BA 2x RJ45
<b>Protocols</b>	
- PROFINET IO Controller	Yes
- PROFINET IO Device	Yes
- SIMATIC communication	Yes
- Open IE communication	Yes
- Web server	Yes
- Media redundancy	Yes
<b>2nd interface</b>	
<b>Interface types</b>	
- Number of ports	1
- RS 485	Yes; Via CM DP module
<b>Protocols</b>	
- SIMATIC communication	Yes
- PROFIBUS DP master	Yes
- PROFIBUS DP slave	Yes
<b>Protocols</b>	
<b>Number of connections</b>	
• Number of connections, max.	88

## Distributed controllers

Based on ET 200SP

Fail-safe CPUs

### CPU 1512SP F-1 PN

#### Technical specifications (continued)

Article number	<b>6ES7512-1SK00-0AB0</b> CPU 1512SP F-1 PN, 300KB PROG./1MB DATA
<b>PROFINET IO Controller</b>	
<b>Services</b>	
- Number of connectable IO devices, max.	128; In total, up to 253 distributed I/O devices can be connected via PROFIBUS or PROFINET
- Of which IO devices with IRT and "high performance" option, max.	64
- Max. number of connectable IO devices for RT	128
<b>PROFIBUS DP master</b>	
<b>Services</b>	
- Number of DP slaves	125
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes; Only with PROFINET; with minimum OB 6x cycle of 625 µs
<b>supported technology objects</b>	
Motion	Yes
• Speed-controlled axis	
- Number of speed-controlled axes, max.	6; Max. number of speed-controlled axes (requirement: there must be no other motion technology objects created)
• Positioning axis	
- Number of positioning axes, max.	6; Max. number of positioning axes (requirement: there must be no other motion technology objects created)
• Synchronized axes (relative gear synchronization)	
- Number of axes, max.	3; Max. number of synchronous axes (requirement: there must be no other motion technology objects created)
• External encoders	
- Number of external encoders, max.	6; Max. number of external encoders (requirement: there must be no other motion technology objects created)
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
• Low demand mode: PFDavg	< 2.00E-05
• High demand/continuous mode: PFH	< 1.00E-09
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C

Article number	<b>6ES7512-1SK00-0AB0</b> CPU 1512SP F-1 PN, 300KB PROG./1MB DATA
<b>Configuration</b>	
<b>programming</b>	
<b>Programming language</b>	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- GRAPH	Yes
<b>Know-how protection</b>	
• User program protection	Yes
• Copy protection	Yes
• Block protection	Yes
<b>Access protection</b>	
• Protection level: Write protection	Yes; Specific write protection both for Standard and for Failsafe
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Dimensions</b>	
Width	100 mm
Height	117 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	310 g

#### Ordering data

<b>Article No.</b>	<b>6ES7512-1SK00-0AB0</b>
<b>CPU 1512SP F-1 PN</b>	
Work memory 300 KB for program, 1 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required	
<b>Accessories</b>	
<b>SIMATIC Memory Card</b>	
4 MB	<b>6ES7954-8LC02-0AA0</b>
12 MB	<b>6ES7954-8LE02-0AA0</b>
24 MB	<b>6ES7954-8LF02-0AA0</b>
256 MB	<b>6ES7954-8LL02-0AA0</b>
2 GB	<b>6ES7954-8LP01-0AA0</b>
<b>DIN rail 35 mm</b>	
• Length: 483 mm for 19" cabinets	<b>6ES5710-8MA11</b>
• Length: 530 mm for 600 mm cabinets	<b>6ES5710-8MA21</b>
• Length: 830 mm for 900 mm cabinets	<b>6ES5710-8MA31</b>
• Length: 2 m	<b>6ES5710-8MA41</b>
<b>PE connection element for mounting rail 2000 mm</b>	<b>6ES7590-5AA00-0AA0</b>
<b>BusAdapter BA 2xRJ45</b>	<b>6ES7193-6AR00-0AA0</b>
<b>BusAdapter BA 2xFC for increased vibration and EMC loads</b>	<b>6ES7193-6AF00-0AA0</b>
<b>Reference identification label</b>	<b>6ES7193-6LF30-0AW0</b>
10 sheets of 16 labels	

Ordering data	Article No.	Article No.	
<b>Shield connection</b> 5 shield supports and 5 shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional ground	<b>6ES7193-6SC00-1AM0</b>	<b>IE FC TP Marine Cable 2 x 2 (Type B)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 with marine approval, sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1840-4AH10</b>
<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>	<b>IE FC Stripping Tool</b> Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>	<b>Manuals for ET 200SP distributed I/O system</b> ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files: <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a>	
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>		
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>		
<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
<b>IE FC RJ45 Plug 90</b> 90° cable outlet 1 unit 10 units 50 units	<b>6GK1901-1BB20-2AA0</b> <b>6GK1901-1BB20-2AB0</b> <b>6GK1901-1BB20-2AE0</b>	<b>SIMATIC Manual Collection Update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>
<b>IE FC RJ45 Plug 180</b> 180° cable outlet 1 unit 10 units 50 units	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>	<b>STEP 7 Professional V13 SP1</b> See CPU 1510SP-1 PN, page 7/4	
<b>IE FC TP standard cable GP 2x2</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1840-2AH10</b>	<b>STEP 7 Safety Advanced V13 SP1</b> See CPU 1510SP F-1 PN, page 7/10	
<b>IE FC TP Trailing Cable 2 x 2 (Type C)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1840-3AH10</b>	<b>Spare parts</b> <b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage • With push-in terminals	<b>6ES7193-4JB00-0AA0</b>
		<b>Server module</b>	<b>6ES7193-6PA00-0AA0</b>

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

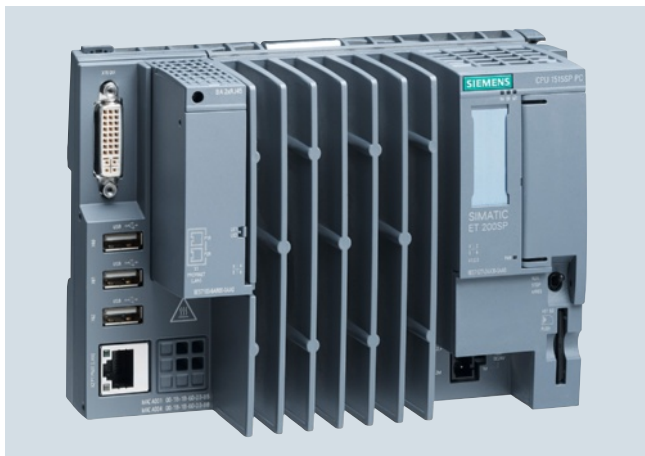
## Distributed controllers

Based on ET 200SP

ET 200SP Open Controller

### CPU 1515SP PC

#### Overview



- Turnkey all-in-one solution with pre-installed SIMATIC S7-1500 software controller and optionally pre-installed WinCC Runtime Advanced V13 SP1
- Central expansion via ET 200SP modules (station width up to 1 m or up to 64 modules)
- SIMATIC Hypervisor:  
For separating Windows systems from control functions
- Dual-core processor for optimal use of the hypervisor

- Swappable flash memory (CFast card) for operating system, runtime and project data
- Integrated DVI-I graphics connection; 3x USB 2.0 connection
- 2 PROFINET interfaces: X1 via PN-IO bus adapter (RJ45 or FC) with 2 ports; X2: GB-Ethernet interface (RJ45)
- PROFINET IRT
- Open Ethernet communication (TCP/IP, UDP, Iso-on-TCP)
- Web server functionality for information, status, diagnostics and user-defined web pages
- PROFIBUS DP communication optionally via CM DP module as DP master
- Configuration control (option handling)
- Improved know-how and copy protection; Security Integrated
- Integrated system diagnostics
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes with support for external encoders.
- Trace function
- Especially suitable for high data volumes and user-specific, open applications
- Integration of control functions and applications implemented in C/C++ (using SIMATIC ODK-1500S Open Development Kit)

#### Technical specifications

Article number	6ES7677-2AA31-0EB0 CPU 1515SP PC 2GB	6ES7677-2AA41-0FB0 CPU 1515SP PC 4GB
<b>Product type designation</b>		
<b>General information</b>		
Hardware product version	01	01
Firmware version	V1.7	V1.7
<b>Engineering with</b>		
• STEP 7 TIA Portal can be configured/integrated as of version	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher
<b>PC configuration</b>		
Processor	Dual-Core 1 GHz, AMD G Series APU T40E	Dual-Core 1 GHz, AMD G Series APU T40E
Main memory	2 GB RAM	4 GB RAM
Flash Disk	8 GB	16 GB
Operating systems	Windows Embedded Standard 7 E 32-bit	Windows Embedded Standard 7 P 64-bit
<b>Installed software</b>		
• Visualization	No	No
• Control	S7-1500 Software controller: CPU 1505S	S7-1500 Software controller: CPU 1505S
<b>Control elements</b>		
Mode selector switch	1	1
<b>Installation type/mounting</b>		
Type of fitting, rail mounting	Yes	Yes
<b>Supply voltage</b>		
Type of supply voltage	24 V DC	24 V DC
<b>Input current</b>		
Current consumption (rated value)	1.5 A; Full processor load, incl. ET 200SP modules and using USB	1.5 A; Full processor load, incl. ET 200SP modules and using USB
Current consumption (in no-load operation), typ.	0.6 A	0.6 A



## Technical specifications (continued)

Article number	<b>6ES7677-2AA31-0EB0</b> CPU 1515SP PC 2GB	<b>6ES7677-2AA41-0FB0</b> CPU 1515SP PC 4GB
<b>Power</b>		
Power consumption, max.	36 W; incl. ET 200SP modules and using USB	36 W; incl. ET 200SP modules and using USB
Infeed power to the backplane bus	8.75 W	8.75 W
<b>Power losses</b>		
Power loss, typ.	15 W; without ET 200SP modules and without using USB	15 W; without ET 200SP modules and without using USB
<b>Memory</b>		
Type of memory	DDR3-SDRAM	DDR3-SDRAM
CFast card	Yes; 8 GB flash memory	Yes; 16 GB flash memory
<b>Work memory</b>		
• Integrated	2 Gbyte	4 Gbyte
<b>Hardware configuration</b>		
Integrated power supply	Yes	Yes
<b>Time of day</b>		
<b>Clock</b>		
• Type	Hardware clock	Hardware clock
• Hardware clock (real-time clock)	Yes; Resolution: 1 s	Yes; Resolution: 1 s
• Deviation per day, max.	10 s; Typ.: 2 s	10 s; Typ.: 2 s
• Backup time	6 wk; At 40 °C ambient temperature, typically	6 wk; At 40 °C ambient temperature, typically
<b>Interfaces</b>		
USB port	3x USB 2.0 on the front	3x USB 2.0 on the front
Number of SD card slots	1	1
<b>Video interfaces</b>		
• Graphics interface	1x DVI-I	1x DVI-I
<b>Industrial Ethernet</b>		
• Industrial Ethernet interface	X2: 10/100/1000 Mbit/s (1x RJ45)	X2: 10/100/1000 Mbit/s (1x RJ45)
<b>1st interface</b>		
Interface type	PROFINET	PROFINET
Physics	Bus adapter BA for ET 200SP	Bus adapter BA for ET 200SP
Automatic detection of transmission speed	Yes	Yes
Autonegotiation	Yes	Yes
Autocrossing	Yes	Yes
<b>2nd interface</b>		
Interface type	Integrated Ethernet interface	Integrated Ethernet interface
Physics	RJ45	RJ45
Automatic detection of transmission speed	Yes	Yes
Autonegotiation	Yes	Yes
Autocrossing	Yes	Yes
<b>Interfaces</b>		
Number of industrial Ethernet interfaces	1	1
Number of PROFINET interfaces	2	2
Number of PROFIBUS interfaces	1; Via CM DP module	1; Via CM DP module
Number of USB interfaces	3; 3x USB 2.0 on the front, 500 mA each – of which 2x 500 mA and 1x 100 mA simultaneously	3; 3x USB 2.0 on the front, 500 mA each – of which 2x 500 mA and 1x 100 mA simultaneously
Number of RS 485 interfaces	1; Via CM DP module	1; Via CM DP module
Graphics interface	1x DVI-I	1x DVI-I
<b>1st interface</b>		
<b>Interface types</b>		
- Number of ports	2	2
- Integrated switch	Yes	Yes
- RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes



**Distributed controllers**

Based on ET 200SP

ET 200SP Open Controller

**CPU 1515SP PC****Technical specifications** (continued)

Article number	<b>6ES7677-2AA31-0EB0</b> CPU 1515SP PC 2GB	<b>6ES7677-2AA41-0FB0</b> CPU 1515SP PC 4GB
<b>2nd interface</b>		
<b>Interface types</b>		
- Number of ports	1	1
- RJ 45 (Ethernet)	Yes; Integrated	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s	1 000 Mbit/s
- Industrial Ethernet status LED	No	No
<b>3rd interface</b>		
<b>Interface types</b>		
- RS 485	Yes; Via CM DP module	Yes; Via CM DP module
<b>Interface types</b>		
<b>RJ 45 (Ethernet)</b>		
• 100 Mbps	Yes; For 1st interface X1	Yes; For 1st interface X1
• 1000 Mbps	Yes; For 2nd interface X2	Yes; For 2nd interface X2
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
<b>RS 485</b>		
• Transmission rate, max.	12 Mbit/s	12 Mbit/s
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	0 °C	0 °C
• horizontal installation, min.	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C
• vertical installation, max.	50 °C; With max. 32 ET 200SP modules and 3x 100 mA USB load	50 °C; With max. 32 ET 200SP modules and 3x 100 mA USB load
<b>I/O / Options</b>		
I/O devices		
• SD card	Optionally for additional mass storage	Optionally for additional mass storage
<b>Dimensions</b>		
Width	160 mm	160 mm
Height	117 mm	117 mm
Depth	75 mm	75 mm
<b>Weights</b>		
Weight, approx.	0.83 kg	0.83 kg

Ordering data	Article No.	Article No.
<b>SIMATIC ET 200SP Open Controller CPU 1515SP PC (+ HMI)</b> ET 200SP CPU with Windows Embedded Standard 7 and pre-installed SIMATIC S7-1500 Software Controller (optionally with WinCC RT Advanced V13 SP1); <b>Type of delivery:</b> German, English, Chinese, Italian, French, Spanish		
<b>Windows embedded Standard 7 E 32-bit, 8 GB CFast card</b> <ul style="list-style-type: none"> <li>• CPU 1515SP PC (2 GB RAM) 6ES7677-2AA31-0EB0</li> <li>• CPU 1515SP PC + HMI 128PT (4 GB RAM) 6ES7677-2AA31-0EK0</li> <li>• CPU 1515SP PC + HMI 512PT (4 GB RAM) 6ES7677-2AA31-0ELO</li> <li>• CPU 1515SP PC + HMI 2048PT (4 GB RAM) 6ES7677-2AA31-0EM0</li> </ul>		
<b>Windows embedded Standard 7 P 64-bit, Multitouch, 16 GB CFast card</b> <ul style="list-style-type: none"> <li>• CPU 1515SP PC (4 GB RAM) 6ES7677-2AA41-0FB0</li> <li>• CPU 1515SP PC + HMI 128PT (4 GB RAM) 6ES7677-2AA41-0FK0</li> <li>• CPU 1515SP PC + HMI 512PT (4 GB RAM) 6ES7677-2AA41-0FL0</li> <li>• CPU 1515SP PC + HMI 2048PT (4 GB RAM) 6ES7677-2AA41-0FM0</li> </ul>		
<b>Accessories</b>		
<b>BusAdapter BA 2xRJ45</b> 6ES7193-6AR00-0AA0		
<b>BusAdapter BA 2xFC</b> 6ES7193-6AF00-0AA0 For increased vibration and EMC loads		
<b>CM DP for ET 200SP CPU</b> 6ES7545-5DA00-0AB0 PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps		
<b>Server module</b> 6ES7193-6PA00-0AA0 Spare part		
<b>Power supply connector</b> 6ES7193-4JB00-0AA0 Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)		
<b>Reference identification label</b> 6ES7193-6LF30-0AW0 10 sheets of 16 labels		
<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer 6ES7193-6LR10-0AA0 1000 labeling strips DIN A4, light gray, card, for inscription with laser printer 6ES7193-6LA10-0AA0		
		<b>STEP 7 Professional V13 SP1</b> <b>Target system:</b> SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC <b>Requirement:</b> Windows 7 Professional SP1 (64-bit), Windows 7 Enterprise SP1 (64-bit), Windows 7 Ultimate SP1 (64-bit), Windows 8.1 (64-bit), Windows 8.1 Professional (64-bit), Windows 8.1 Enterprise (64-bit), Windows Server 2008 R2 StdE (full installation), Windows Server 2012 StdE (full installation) <b>Type of delivery:</b> German, English, Chinese, Italian, French, Spanish STEP 7 Professional V13 SP1, floating license 6ES7822-1AA03-0YA5 STEP 7 Professional V13 SP1, floating license, software download incl. license key <sup>1)</sup> 6ES7822-1AE03-0YA5 Email address required for delivery <b>SIMATIC ODK 1500S</b> 6ES7806-2CD00-0YA0 Open Development Kit for developing Windows and real-time library functions for S7-1500 Software Controllers <b>SIMATIC WinCC Advanced V13 SP1</b> Engineering software for the configuration and simulation of SIMATIC Panels; SIMATIC WinCC Runtime Advanced electronic documentation in English, German, French, Italian, Spanish, Chinese <ul style="list-style-type: none"> <li>• Software and documentation on DVD, floating license, license key on USB stick 6AV2102-0AA03-0AA5</li> <li>• As download <sup>1)</sup>, floating license, software and license key download, email address required for delivery 6AV2102-0AA03-0AH5</li> </ul>

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Distributed controllers

Based on ET 200SP

ET 200SP Open Controller

### ODK 1500S

#### Overview

- For developing dynamically loadable function libraries for S7-1500 Software Controllers:
  - Implementation of function libraries by means of high-level programming with C/C++.
  - Execution of the library functions under Windows or in the real-time context of the software controller.
  - Calling the functions directly from the PLC program.
- Development environment for real-time library functions included in the scope of delivery.
- Development of Windows library functions with MS Visual Studio.
- Automatic creation of function blocks for calling the library functions.
- Simple integration of the function blocks into STEP 7 by importing.
- Simple use of the library functions in the controller without specific high-level language know-how.

#### Technical specifications

##### System requirements

The SIMATIC ODK 1500S can be used on PC platforms with the following requirements:

- Windows 7, Windows 8 operating systems
- Min. 150 MB hard drive memory
- Min. 4 GB work memory
- Mouse, keyboard, screen

#### Ordering data

##### SIMATIC ODK 1500S

Open Development Kit for support in developing Windows and real-time library functions for S7-1500 Software Controllers

#### Article No.

**6ES7 806-2CD00-0YA0**

## Overview



- Interface module for SIMATIC ET 200S with integrated S7-CPU 314
- For high-performance control solutions in ET 200S
- Increases the availability of plants and machinery
- Programming via PROFIBUS DP
- Compact SIMATIC Micro Memory Card (MMC)
- Integrated 12 Mbps PROFIBUS DP slave/MPI interface in copper design
- Integrated CPU based on CPU S7-314
- IM 151-7 CPU FO available
- Fail-safe IM 151-7 F-CPU PROFIsafe available
- Also available as IM 151-8(F) PN/DP CPU with PROFINET interface

Note:  
Micro Memory Card required for operation of CPU.

## Technical specifications

Article number	6ES7151-7AB00-0AB0	6ES7151-7AA21-0AB0
	ET 200S, IM 151-7 CPU FO, 48KB	ET 200S, IM 151-7 CPU INTERFACE, 128KB
<b>Product type designation</b>		
<b>General information</b>		
<b>Engineering with</b>		
• Programming package	STEP 7 V5.1 or higher	V5.5 + SP1 or higher or V5.2 + SP1 or higher + HSP 219
<b>Supply voltage</b>		
Rated value (DC)		
• 24 V DC	Yes	Yes
<b>Power losses</b>		
Power loss, typ.	3.3 W	4.2 W
<b>Memory</b>		
<b>Work memory</b>		
• Integrated	48 kbyte; as of FW V1.13 48 KB; previously 24 KB	128 kbyte
• Size of retentive memory for retentive data blocks		64 kbyte
<b>Load memory</b>		
• pluggable (MMC), max.	2 Mbyte	8 Mbyte
<b>CPU processing times</b>		
for bit operations, typ.	0.3 µs	0.06 µs
for word operations, typ.	1 µs	0.12 µs
for fixed point arithmetic, typ.	2 µs	0.16 µs
for floating point arithmetic, typ.	50 µs	0.59 µs
<b>Counters, timers and their retentivity</b>		
<b>S7 counter</b>		
• Number	64	256
<b>IEC counter</b>		
• present	Yes	Yes
<b>S7 times</b>		
• Number	128	256
<b>IEC timer</b>		
• present	Yes	Yes
<b>Data areas and their retentivity</b>		
<b>Flag</b>		
• Number, max.	256 byte	256 byte
<b>Address area</b>		
<b>I/O address area</b>		
• Inputs	1 536 byte	2 048 byte
• Outputs	1 536 byte	2 048 byte
<b>Process image</b>		
• Inputs, adjustable		2 048 byte
• Outputs, adjustable		2 048 byte

## Distributed controllers

Based on ET 200S

Standard CPUs

### IM 151-7 CPU

#### Technical specifications (continued)

Article number	<b>6ES7151-7AB00-0AB0</b> ET 200S, IM 151-7 CPU FO, 48KB	<b>6ES7151-7AA21-0AB0</b> ET 200S, IM 151-7 CPU INTERFACE, 128KB
<b>Time of day</b>		
<b>Clock</b>		
• Hardware clock (real-time clock)		Yes
<b>Operating hours counter</b>		
• Number	0; No	1
<b>1st interface</b>		
Interface type	Fiber-optic interface and integrated RS 485 interface for programming	Integrated RS 485 interface
Physics	Fiber-optic cable or RS 485	RS 485
<b>Functionality</b>		
• MPI	No	Yes
• DP master		No
• DP slave	Yes	Yes; active / passive
• Point-to-point connection	No	No
<b>2nd interface</b>		
Interface type		External interface via master module 6ES7138-4HA00-0AB0
Physics		RS 485
<b>Functionality</b>		
• MPI		No
• DP master		Yes
• DP slave		No
<b>DP master</b>		
• Number of DP slaves, max.		32; Per station
<b>Isochronous mode</b>		
Isochronous operation (application synchronized up to terminal)		No
<b>Communication functions</b>		
PG/OP communication	Yes	Yes
Data record routing		Yes; With DP master module
<b>Global data communication</b>		
• supported	No	Yes
<b>S7 basic communication</b>		
• supported	Yes; as server	Yes
<b>S7 communication</b>		
• supported	Yes	Yes
<b>S5-compatible communication</b>		
• supported	No	
<b>Standard communication (FMS)</b>		
• supported	No	
<b>Number of connections</b>		
• overall		12
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	0 °C	
• max.	60 °C	
<b>Configuration</b>		
<b>Configuration software</b>		
• STEP 7 Lite	Yes; V2.0 or higher	No
<b>programming</b>		
<b>Programming language</b>		
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes; Optional
- CFC		Yes; Optional
- GRAPH		Yes; Optional
- HiGraph®		Yes; Optional

## Technical specifications (continued)

Article number	<b>6ES7151-7AB00-0AB0</b> ET 200S, IM 151-7 CPU FO, 48KB	<b>6ES7151-7AA21-0AB0</b> ET 200S, IM 151-7 CPU INTERFACE, 128KB
<b>Know-how protection</b>		
• User program protection/password protection	Yes	Yes
• Block encryption		Yes; With S7 block Privacy
<b>Dimensions</b>		
Width	60 mm	60 mm; DP master module: 35 mm
Height	119.5 mm	119.5 mm
Depth	75 mm	75 mm
<b>Weights</b>		
Weight, approx.	200 g	200 g; DP master module: Approx. 100 g

## Ordering data

Ordering data	Article No.	Article No.
<b>IM 151-7 CPU FO interface module (48 K)</b> Including termination module	<b>6ES7151-7AB00-0AB0</b>	
<b>IM 151-7 CPU interface module (128 K) V3.3</b> Including termination module	<b>6ES7151-7AA21-0AB0</b>	
<b>Accessories</b>		
<b>MMC 64 KB <sup>1)</sup></b> For program backup	<b>6ES7953-8LF30-0AA0</b>	
<b>MMC 128 KB <sup>1)</sup></b> For program backup	<b>6ES7953-8LG30-0AA0</b>	
<b>MMC 512 KB <sup>1)</sup></b> For program backup	<b>6ES7953-8LJ30-0AA0</b>	
<b>MMC 2 MB <sup>1)</sup></b> For program backup and/or firmware update	<b>6ES7953-8LL31-0AA0</b>	
<b>MMC 4 MB <sup>1)</sup></b> For program backup	<b>6ES7953-8LM31-0AA0</b>	
<b>MMC 8 MB <sup>1)</sup></b> For program backup	<b>6ES7953-8LP31-0AA0</b>	
<b>External prommer</b> E.g. for MMC with USB interface	<b>6ES7792-0AA00-0XA0</b>	
<b>PG</b> With integrated MMC interface	On request	
<b>Label sheets DIN A4 (10 pieces)</b> Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules		
• petrol	<b>6ES7193-4BH00-0AA0</b>	
• red	<b>6ES7193-4BD00-0AA0</b>	
• yellow	<b>6ES7193-4BB00-0AA0</b>	
• light beige	<b>6ES7193-4BA00-0AA0</b>	
<b>ET 200S distributed I/O system manuals</b> Available on the Internet as PDF files: <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a>		
<b>Termination module</b> As spare part for ET 200S	<b>6ES7193-4JA00-0AA0</b>	
		<b>Power supply connector</b> Spare part: for connecting the 24 V DC supply voltage
		• With push-in terminals
		• With screw terminals, 2-pin
		<b>SIMATIC S5, 35 mm DIN rail</b>
		• Length: 483 mm for 19" cabinets
		• Length: 530 mm for 600 mm cabinets
		• Length: 830 mm for 900 mm cabinets
		• Length: 2 m
		<b>PROFIBUS DP bus connector RS 485</b> With 90° cable outlet, max. transfer rate 12 Mbps
		• Without PG interface
		• With PG interface
		<b>PROFIBUS DP bus connector RS 485</b> With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbps
		• Without PG interface, 1 unit
		• Without PG interface, 100 units
		• With PG interface, 1 unit
		• With PG interface, 100 units
		<b>PROFIBUS Fast Connect bus cable</b>
		Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m
		<b>PROFIBUS bus components</b> For establishing MPI/PROFIBUS communication
		See IK PI, CA 01 catalogs

<sup>1)</sup> An MMC is essential for operating the CPU

## Distributed controllers

Based on ET 200S

Standard CPUs

### IM 151-8 PN/DP CPU

#### Overview



- Interface module for SIMATIC ET 200S with integrated CPU S7-314
- For high-performance control solutions in ET 200S
- Increase in availability of systems and machines

- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)
- Optional PROFIBUS master for 32 PROFIBUS DP slaves (with master interface 6ES7138-4HA00-0AB0)
- Fail-safe IM 151-8F PN/DP CPU PROFIsafe available

Note:

SIMATIC Micro Memory Card required for operation of CPU.

#### Technical specifications

Article number	<b>6ES7151-8AB01-0AB0</b> ET 200S, IM 151-8 PN/DP CPU, 192 KB
<b>Product type designation</b>	
<b>General information</b>	
<b>Engineering with</b>	
• Programming package	STEP7 V 5.5 or higher
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
<b>Power losses</b>	
Power loss, typ.	5.5 W
<b>Memory</b>	
<b>Work memory</b>	
• Integrated	192 kbyte
• Size of retentive memory for retentive data blocks	64 kbyte
<b>Load memory</b>	
• pluggable (MMC), max.	8 Mbyte
<b>CPU processing times</b>	
for bit operations, typ.	0.06 µs
for word operations, typ.	0.12 µs
for fixed point arithmetic, typ.	0.16 µs
for floating point arithmetic, typ.	0.59 µs
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	256
<b>IEC counter</b>	
• present	Yes
<b>S7 times</b>	
• Number	256
<b>IEC timer</b>	
• present	Yes

Article number	<b>6ES7151-8AB01-0AB0</b> ET 200S, IM 151-8 PN/DP CPU, 192 KB
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Number, max.	256 byte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	2 048 byte
• Outputs	2 048 byte
<b>Process image</b>	
• Inputs, adjustable	2 048 byte
• Outputs, adjustable	2 048 byte
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time clock)	Yes
<b>Operating hours counter</b>	
• Number	1
<b>1st interface</b>	
Interface type	PROFINET
Physics	Ethernet
Number of ports	3; RJ45
<b>Functionality</b>	
• MPI	No
• DP master	No
• DP slave	No
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality
• PROFINET CBA	Yes
• Point-to-point connection	No

## Technical specifications (continued)

Article number	<b>6ES7151-8AB01-0AB0</b> ET 200S, IM 151-8 PN/DP CPU, 192 KB
<b>PROFINET IO Controller</b>	
• Max. number of connectable IO devices for RT	128
• Number of IO devices with IRT and the option "high flexibility"	128
• Number of IO Devices with IRT and the option "high performance", max.	64
<b>2nd interface</b>	
Interface type	External interface via master module 6ES7138-4HA00-0AB0
Physics	RS 485
<b>Functionality</b>	
• MPI	No
• DP master	Yes
• DP slave	No
• PROFINET IO Controller	No
• PROFINET IO Device	No
• PROFINET CBA	No
<b>DP master</b>	
• Number of DP slaves, max.	32; Per station
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	No
<b>Communication functions</b>	
PG/OP communication	Yes
Data record routing	Yes; With DP master module
<b>Global data communication</b>	
• supported	No
<b>S7 basic communication</b>	
• supported	Yes; I blocks
<b>S7 communication</b>	
• supported	Yes
<b>Open IE communication</b>	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8
• ISO-on-TCP (RFC1006)	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8
• UDP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8

Article number	<b>6ES7151-8AB01-0AB0</b> ET 200S, IM 151-8 PN/DP CPU, 192 KB
<b>Web server</b>	
• supported	Yes
<b>Number of connections</b>	
• overall	12
<b>programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes; Optional
- CFC	Yes; Optional
- GRAPH	Yes; Optional
- HiGraph®	Yes; Optional
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Block encryption	Yes; With S7 block Privacy
<b>Dimensions</b>	
Width	120 mm; DP master module: 35 mm
Height	119.5 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	320 g; DP master module: Approx. 100 g



## Distributed controllers

Based on ET 200S

Standard CPUs

### IM 151-8 PN/DP CPU

Ordering data	Article No.	Ordering data	Article No.
<b>IM 151-8 PN/DP CPU interface module (192 K)</b> Including termination module	6ES7151-8AB01-0AB0	<b>Terminating module</b> as spare part for ET 200S	6ES7193-4JA00-0AA0
<b>Accessories</b>		<b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage	
<b>MMC 64 KB <sup>1)</sup></b> for program backup	6ES7953-8LF30-0AA0	• with push-in terminals	6ES7193-4JB00-0AA0
<b>MMC 128 KB <sup>1)</sup></b> for program backup	6ES7953-8LG30-0AA0	• with screw terminals, 2-pin	6ES7193-4JB50-0AA0
<b>MMC 512 KB <sup>1)</sup></b> for program backup	6ES7953-8LJ30-0AA0	<b>SIMATIC S5, 35 mm DIN rail</b>	
<b>MMC 2 MB <sup>1)</sup></b> for program backup and/or firmware update	6ES7953-8LL31-0AA0	• Length: 483 mm for 19" cabinets	6ES5710-8MA11
<b>MMC 4 MB <sup>1)</sup></b> for program backup	6ES7953-8LM31-0AA0	• Length: 530 mm for 600 mm cabinets	6ES5710-8MA21
<b>MMC 8 MB <sup>1)</sup></b> for program backup	6ES7953-8LP31-0AA0	• Length: 830 mm for 900 mm cabinets	6ES5710-8MA31
<b>External prommer</b> e.g. for MMC with USB interface	6ES7792-0AA00-0XA0	• Length 2 m	6ES5710-8MA41
<b>PG</b> with integrated MMC interface	on request	<b>Industrial Ethernet FC RJ45 Plug 90</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 90° cable outlet	
<b>Label sheets DIN A4 (10 pieces)</b> Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules		• 1 unit	6GK1901-1BB20-2AA0
• petrol	6ES7193-4BH00-0AA0	• 10 units	6GK1901-1BB20-2AB0
• red	6ES7193-4BD00-0AA0	• 50 units	6GK1901-1BB20-2AE0
• yellow	6ES7193-4BB00-0AA0	<b>Industrial Ethernet FastConnect installation cables</b>	
• light beige	6ES7193-4BA00-0AA0	• Fast Connect standard cable	6XV1840-2AH10
<b>ET 200S distributed I/O system manuals</b> available on the Internet as PDF files: <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a>		• Fast Connect trailing cable	6XV1840-3AH10
		• Fast Connect marine cable	6XV1840-4AH10
		<b>Industrial Ethernet FastConnect stripping tool</b>	6GK1901-1GA00

<sup>1)</sup> An MMC is essential for operating the CPU

## Master interface module for IM 151 CPU interface modules

## Overview



PROFIBUS DP master interface module for IM 151-7(F) CPU / IM 151-8(F) PN/DP CPU interface modules

- Integrated 12 Mbps PROFIBUS DP master interface in copper design
- Facilitates parallel operation of two PROFIBUS DP interfaces on one IM 151-7 (F-)CPU
- Enables operation of a PROFIBUS DP interface on an IM 151-8(F) PN/DP CPU
- Increases the availability of plants and machinery
- Functionality corresponds to the interface of an S7-300 CPU 314-2 DP configured as DP master

Programming is with STEP7 from Version V5.2 with Service Pack 1.

## Technical specifications

Article number	<b>6ES7138-4HA00-0AB0</b> DP MASTER INTERFACE FOR ET 200S CPU
<b>Product type designation</b>	
<b>Hardware configuration</b>	
Number of modules per CPU	1
<b>Dimensions</b>	
Width	35 mm
Height	119.5 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	100 g

## Ordering data

## Article No.

<b>Master interface module for IM 151-7 CPU / IM 151-7 F-CPU / IM 151-8 PN/DP CPU / IM 151-8F PN/DP CPU interface modules</b>	<b>6ES7138-4HA00-0AB0</b>
<b>Accessories</b>	
<b>PROFIBUS DP bus connector RS 485</b>	
With 90° cable outlet, max. transfer rate 12 Mbps	
• Without PG interface	<b>6ES7972-0BA12-0XA0</b>
• With PG interface	<b>6ES7972-0BB12-0XA0</b>
With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbps	
• Without PG interface, 1 unit	<b>6ES7972-0BA52-0XA0</b>
• Without PG interface, 100 units	<b>6ES7972-0BA52-0XB0</b>
• With PG interface, 1 unit	<b>6ES7972-0BB52-0XA0</b>
• With PG interface, 100 units	<b>6ES7972-0BB52-0XB0</b>
<b>PROFIBUS Fast Connect bus cable</b>	<b>6XV1830-0EH10</b>
Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	
<b>PROFIBUS bus components</b>	See IK PI, CA 01 catalogs
For establishing MPI/PROFIBUS communication	
<b>Label sheets DIN A4 (10 pieces)</b>	
Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules	
• petrol	<b>6ES7193-4BH00-0AA0</b>
• red	<b>6ES7193-4BD00-0AA0</b>
• yellow	<b>6ES7193-4BB00-0AA0</b>
• light beige	<b>6ES7193-4BA00-0AA0</b>
<b>ET 200S distributed I/O system manuals</b>	
Available on the Internet as PDF files: <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a>	

## Distributed controllers

Based on ET 200S  
SIPLUS Standard CPUs

### SIPLUS IM 151-7 CPU

#### Overview



- Interface module for SIMATIC ET 200S with integrated S7-CPU 314
- For high-performance control solutions in ET 200S
- Increase in availability of systems and machines
- Programming via PROFIBUS DP
- Compact SIMATIC Micro Memory Card (MMC)
- Integrated 12 Mbps PROFIBUS DP slave/MPI interface in Cu version
- Integrated CPU based on the CPU S7-314
- IM 151-7 CPU FO available
- Failsafe IM 151-7 F-CPU PROFIsafe available
- Alternatively, as IM 151-8(F) PN/DP CPU with PROFINET interface

Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Technical specifications

Article number	<b>6AG1151-7AA21-2AB0</b>
Based on	<b>6ES7151-7AA21-0AB0</b> SIPLUS ET200S IM151-7 CPU
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

#### Ordering data

#### Article No.

<b>SIPLUS IM 151-7 CPU interface module (96 K)</b> (extended temperature range and medial exposure)	<b>6AG1151-7AA21-2AB0</b>
<b>SIPLUS ET 200S terminating module</b>	<b>6AG1193-4JA00-2AA0</b>
<b>Accessories</b>	See SIMATIC IM 151-7 CPU interface module, page 7/21

## Overview



- Interface module for SIMATIC ET 200S with integrated CPU S7-314
- For high-performance control solutions in ET 200S
- Increases the availability of plants and machinery
- PROFINET IO Controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO Controller
- PROFINET interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), Web server and S7 communication (with loadable FBs)
- Fast, simple and uniform programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)
- Optional PROFIBUS master for 32 PROFIBUS DP slaves (with master interface 6ES7138-4HA00-0AB0)
- Fail-safe IM 151-8F PN/DP CPU PROFIsafe available

Micro Memory Card required for operation of CPU.

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

## Technical specifications

Article number	<b>6AG1151-8AB01-7AB0</b>
Based on	<b>6ES7151-8AB00-0AB0</b> SIPLUS ET 200S IM 151-8 PN/DP CPU
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-40 °C; = Tmin
• max.	70 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	-25 °C
<b>Relative humidity</b>	
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

## Ordering data

## Article No.

<b>SIPLUS IM 151-8 PN/DP CPU interface module</b>	
(extended temperature range and medial exposure)	
Including termination module	
• For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C	<b>6AG1151-8AB01-7AB0</b>
<b>Accessories</b>	See SIMATIC IM 151-8 PN/DP CPU interface module, page 7/24

## Distributed controllers

Based on ET 200S

SIPLUS Standard CPUs

### SIPLUS master interface modules for IM 151 CPU

#### Overview



PROFIBUS DP master interface module for interface module IM 151-7 (R) CPU / IM 151-8 (F) PN/DP CPU

- Integrated 12 Mbps PROFIBUS DP master interface in Cu version
- Allows parallel operation of two PROFIBUS DP interfaces on one IM 151-7 CPU
- Allows operation of one PROFIBUS DP interface with an IM 151-8(F) PN/DP CPU
- Increase in availability of systems and machines
- Functionality in accordance with a DP master configured interface of an S7-314 CPU

Programming is performed with STEP 7 from version V5.2 with Service Pack 1.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

#### Technical specifications

Article number	<b>6AG1138-4HA00-7AB0</b>
Based on	<b>6ES7138-4HA00-0AB0</b> SIPLUS ET 200S DP-MASTER INTERFACE
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-40 °C; = Tmin
• max.	70 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

#### Ordering data

**Master interface module for SIPLUS IM 151-7 CPU / IM 151-7 F-CPU / IM 151-8 PN/DP CPU / IM 151-8 F PN/DP CPU interface modules**

(extended temperature range and medial exposure)

#### Accessories

#### Article No.

**6AG1138-4HA00-7AB0**

See SIMATIC master interface module for IM 151 CPU, page 7/25

## Overview



- Interface module with integrated fail-safe CPU for SIMATIC ET 200S
- With DP/MPI interface
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061 and PL e according to 13849.1
- Fail-safe I/O modules can be connected in a distributed configuration through DP master modules (PROFIsafe)
- The fail-safe I/O modules of ET200S PROFIsafe can be connected in a centralized configuration
- Standard modules can be used for non-safety-relevant applications

Note:

Micro Memory Card required for operation of CPU.

## Technical specifications

Article number	<b>6ES7151-7FA21-0AB0</b> ET 200S, IM 151-7 F-CPU INTERFACE, 192KB
<b>Product type designation</b>	
<b>General information</b>	
<b>Engineering with</b>	
• Programming package	V5.5 + SP1 or higher or V5.2 + SP1 or higher + HSP 219 + Distributed Safety
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
<b>Power losses</b>	
Power loss, typ.	4.2 W
<b>Memory</b>	
<b>Work memory</b>	
• Integrated	192 kbyte
• Size of retentive memory for retentive data blocks	64 kbyte
<b>Load memory</b>	
• pluggable (MMC), max.	8 Mbyte
<b>CPU processing times</b>	
for bit operations, typ.	0.06 µs
for word operations, typ.	0.12 µs
for fixed point arithmetic, typ.	0.16 µs
for floating point arithmetic, typ.	0.59 µs
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	256
<b>IEC counter</b>	
• present	Yes
<b>S7 times</b>	
• Number	256
<b>IEC timer</b>	
• present	Yes
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Number, max.	256 byte

Article number	<b>6ES7151-7FA21-0AB0</b> ET 200S, IM 151-7 F-CPU INTERFACE, 192KB
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	2 048 byte
• Outputs	2 048 byte
<b>Process image</b>	
• Inputs, adjustable	2 048 byte
• Outputs, adjustable	2 048 byte
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time clock)	Yes
<b>Operating hours counter</b>	
• Number	1
<b>1st interface</b>	
Interface type	Integrated RS 485 interface
Physics	RS 485
<b>Functionality</b>	
• MPI	Yes
• DP master	No
• DP slave	Yes; active / passive
• Point-to-point connection	No
<b>2nd interface</b>	
Interface type	External interface via master module 6ES7138-4HA00-0AB0
Physics	RS 485
<b>Functionality</b>	
• MPI	No
• DP master	Yes
• DP slave	No
<b>DP master</b>	
• Number of DP slaves, max.	32; Per station
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	No

## Distributed controllers

Based on ET 200S

Fail-safe CPUs

### IM 151-7 F-CPU

#### Technical specifications (continued)

Article number	<b>6ES7151-7FA21-0AB0</b> ET 200S, IM 151-7 F-CPU INTERFACE, 192KB
<b>Communication functions</b>	
PG/OP communication	Yes
Data record routing	Yes; With DP master module
<b>Global data communication</b>	
• supported	Yes
<b>S7 basic communication</b>	
• supported	Yes
<b>S7 communication</b>	
• supported	Yes
<b>Number of connections</b>	
• overall	12
<b>Configuration</b>	
<b>Configuration software</b>	
• STEP 7 Lite	No
<b>programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes; Optional
- CFC	Yes; Optional
- GRAPH	Yes; Optional
- HiGraph®	Yes; Optional
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Block encryption	Yes; With S7 block Privacy
<b>Dimensions</b>	
Width	60 mm; DP master module: 35 mm
Height	119.5 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	200 g; DP master module: Approx. 100 g

#### Ordering data

#### Article No.

<b>IM 151-7 F-CPU interface module</b>	
For configuring a fail-safe automation system	
192 KB	<b>6ES7151-7FA21-0AB0</b>
<b>Accessories</b>	
<b>S7 Distributed Safety programming tool V5.4</b>	
Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco	
Requirement: STEP 7 V5.3 SP3 and higher	
Floating license	<b>6ES7833-1FC02-0YA5</b>
Floating License for 1 user, license key download without software or documentation <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FC02-0YH5</b>
<b>S7 Distributed Safety Upgrade</b>	
From V5.x to V5.4; Floating license for 1 user	<b>6ES7833-1FC02-0YE5</b>
<b>STEP 7 Safety Advanced V13 SP1</b>	
See CPU 1510SP F-1 PN, page 7/10	
Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco	
Requirement: STEP 7 Professional V13 SP1	
<b>SIMATIC Micro Memory Cards</b>	
<b>MMC 64 kByte</b>	<b>6ES7953-8LF30-0AA0</b>
For program backup	
<b>MMC 128 kByte</b>	<b>6ES7953-8LG30-0AA0</b>
For program backup	
<b>MMC 512 kByte</b>	<b>6ES7953-8LJ30-0AA0</b>
For program backup	
<b>MMC 2 MByte</b>	<b>6ES7953-8LL31-0AA0</b>
For program backup and/or firmware update	
<b>MMC 4 MByte</b>	<b>6ES7953-8LM31-0AA0</b>
For program backup	
<b>External prommer</b>	<b>6ES7792-0AA00-0XA0</b>
For MMC with USB interface	
<b>Termination module</b>	<b>6ES7193-4JA00-0AA0</b>
As spare part for ET 200S	
<b>Power supply connector</b>	
Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals	<b>6ES7193-4JB00-0AA0</b>
• With screw terminals, 2-pin	<b>6ES7193-4JB50-0AA0</b>
<b>SIMATIC S5, 35 mm DIN rail</b>	
• Length: 483 mm for 19" cabinets	<b>6ES5710-8MA11</b>
• Length: 530 mm for 600 mm cabinets	<b>6ES5710-8MA21</b>
• Length: 830 mm for 900 mm cabinets	<b>6ES5710-8MA31</b>
• Length: 2 m	<b>6ES5710-8MA41</b>

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>



## Overview



- Interface module with integrated fail-safe CPU for SIMATIC ET 200S
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061, up to PLe according to ISO 13849-1:2006 and PL e according to ISO 13849.1
- For high-performance control solutions in ET 200S

- Increase of the availability of systems and machines
- PROFINET IO Controller for up to 128 IO Devices
- PROFINET interface with integrated 3-port switch
- With multiple communication options:  
PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)
- Optional PROFIBUS master for 32 PROFIBUS DP slaves (with master interface 6ES7138-4HA00-0AB0)

Note:  
SIMATIC Micro Memory Card required for operation of CPU.

## Technical specifications

Article number	<b>6ES7151-8FB01-0AB0</b> ET 200S, IM 151-8F PN/DP CPU, 256KB
<b>Product type designation</b>	
<b>General information</b>	
<b>Engineering with</b>	
• Programming package	STEP 7 V 5.5 or higher, Distributed Safety V 5.4 SP4
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
<b>Power losses</b>	
Power loss, typ.	5.5 W
<b>Memory</b>	
<b>Work memory</b>	
• Integrated	256 kbyte; For program and data
• Size of retentive memory for retentive data blocks	64 kbyte
<b>Load memory</b>	
• pluggable (MMC), max.	8 Mbyte
<b>CPU processing times</b>	
for bit operations, typ.	0.06 µs
for word operations, typ.	0.12 µs
for fixed point arithmetic, typ.	0.16 µs
for floating point arithmetic, typ.	0.59 µs
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	256
<b>IEC counter</b>	
• present	Yes
<b>S7 times</b>	
• Number	256
<b>IEC timer</b>	
• present	Yes
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Number, max.	256 byte

Article number	<b>6ES7151-8FB01-0AB0</b> ET 200S, IM 151-8F PN/DP CPU, 256KB
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	2 048 byte
• Outputs	2 048 byte
<b>Process image</b>	
• Inputs, adjustable	2 048 byte
• Outputs, adjustable	2 048 byte
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time clock)	Yes
<b>Operating hours counter</b>	
• Number	1
<b>1st interface</b>	
Interface type	PROFINET
Physics	Ethernet
Number of ports	3; RJ45
<b>Functionality</b>	
• MPI	No
• DP master	No
• DP slave	No
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality
• PROFINET CBA	Yes
• Point-to-point connection	No
<b>PROFINET IO Controller</b>	
• Max. number of connectable IO devices for RT	128
• Number of IO devices with IRT and the option "high flexibility"	128
• Number of IO Devices with IRT and the option "high performance", max.	64



## Distributed controllers

Based on ET 200S

Fail-safe CPUs

### IM 151-8 F PN/DP CPU

#### Technical specifications (continued)

Article number	<b>6ES7151-8FB01-0AB0</b> ET 200S, IM 151-8F PN/DP CPU, 256KB
<b>2nd interface</b>	
Interface type	External interface via master module 6ES7138-4HA00-0AB0
Physics	RS 485
<b>Functionality</b>	
• MPI	No
• DP master	Yes
• DP slave	No
• PROFINET IO Controller	No
• PROFINET IO Device	No
• PROFINET CBA	No
<b>DP master</b>	
• Number of DP slaves, max.	32; Per station
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	No
<b>Communication functions</b>	
PG/OP communication	Yes
Data record routing	Yes; With DP master module
<b>Global data communication</b>	
• supported	No
<b>S7 basic communication</b>	
• supported	Yes; I blocks
<b>S7 communication</b>	
• supported	Yes
<b>Open IE communication</b>	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8
• ISO-on-TCP (RFC1006)	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8
• UDP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8
<b>Web server</b>	
• supported	Yes
<b>Number of connections</b>	
• overall	12
<b>programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes; Optional
- CFC	Yes; Optional
- GRAPH	Yes; Optional
- HiGraph®	Yes; Optional
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Block encryption	Yes; With S7 block Privacy
<b>Dimensions</b>	
Width	120 mm; DP master module: 35 mm
Height	119.5 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	320 g; DP master module: Approx. 100 g

#### Ordering data

Ordering data	Article No.
<b>IM 151-8F PN/DP CPU interface module (256 K)</b>	<b>6ES7151-8FB01-0AB0</b>
Including termination module	
<b>Distributed Safety V5.4 programming tool</b>	
Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco	
Requirement: STEP 7 V5.3 SP3 and higher	
Floating license	<b>6ES7833-1FC02-0YA5</b>
Floating License for 1 user, license key download without software or documentation <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FC02-0YH5</b>
<b>Distributed Safety Upgrade</b>	
From V5.x to V5.4; Floating license for 1 user	<b>6ES7833-1FC02-0YE5</b>
<b>STEP 7 Safety Advanced V13 SP1</b>	
Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco	
Requirement: STEP 7 Professional V13 SP1	
Floating license for 1 user	<b>6ES7833-1FA13-0YA5</b>
Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; email address required for delivery	<b>6ES7833-1FA13-0YH5</b>
<b>Accessories</b>	
<b>SIMATIC Micro Memory Cards</b>	
<b>MMC 64 KB <sup>2)</sup></b>	<b>6ES7953-8LF30-0AA0</b>
For program backup	
<b>MMC 128 KB <sup>2)</sup></b>	<b>6ES7953-8LG30-0AA0</b>
For program backup	
<b>MMC 512 KB <sup>2)</sup></b>	<b>6ES7953-8LJ30-0AA0</b>
For program backup	
<b>MMC 2 MB <sup>2)</sup></b>	<b>6ES7953-8LL31-0AA0</b>
For program backup and/or firmware update	
<b>MMC 4 MB <sup>2)</sup></b>	<b>6ES7953-8LM31-0AA0</b>
For program backup	
<b>MMC 8 MB <sup>2)</sup></b>	<b>6ES7953-8LP31-0AA0</b>
For program backup	
<b>External prommer</b>	<b>6ES7792-0AA00-0XA0</b>
For MMC with USB interface	
<b>PG</b>	On request
With integrated MMC interface	

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

<sup>2)</sup> An MMC is essential for operating the CPU

Ordering data	Article No.	Article No.
<b>Label sheets DIN A4 (10 pieces)</b> Each sheet contains 60 labeling strips for peripheral modules and 20 labeling strips for interface modules <ul style="list-style-type: none"> <li>• petrol</li> <li>• red</li> <li>• yellow</li> <li>• light beige</li> </ul>	<b>6ES7193-4BH00-0AA0</b> <b>6ES7193-4BD00-0AA0</b> <b>6ES7193-4BB00-0AA0</b> <b>6ES7193-4BA00-0AA0</b>	<b>SIMATIC S5, 35 mm DIN rail</b> <ul style="list-style-type: none"> <li>• Length: 483 mm for 19" cabinets</li> <li>• Length: 530 mm for 600 mm cabinets</li> <li>• Length: 830 mm for 900 mm cabinets</li> <li>• Length: 2 m</li> </ul>
<b>ET 200S distributed I/O system manuals</b> Available on the Internet as PDF files: <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a>		<b>Industrial Ethernet FC RJ45 Plug 90</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 90° cable outlet <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> <li>• 50 units</li> </ul>
<b>Termination module</b> As spare part for ET 200S	<b>6ES7193-4JA00-0AA0</b>	<b>Industrial Ethernet FastConnect installation cables</b> <ul style="list-style-type: none"> <li>• FastConnect Standard Cable</li> <li>• FastConnect Trailing Cable</li> <li>• FastConnect Marine Cable</li> </ul>
<b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage <ul style="list-style-type: none"> <li>• with push-in terminals</li> <li>• with screw terminals, 2-pin</li> </ul>	<b>6ES7193-4JB00-0AA0</b> <b>6ES7193-4JB50-0AA0</b>	<b>Industrial Ethernet FastConnect stripping tool</b>

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

<sup>2)</sup> An MMC is essential for operating the CPU

## Distributed controllers

Based on ET 200S  
SIPLUS fail-safe CPUs

### SIPLUS IM 151-7 F-CPU

#### Overview



- Interface module with integrated fail-safe CPU for SIMATIC ET 200S
- With DP/MPI interface
- For configuring a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061 and Cat. 4 according to EN 954-1
- Fail-safe I/O modules can be connected in a distributed configuration using DP master modules (PROFIsafe)
- The ET 200S PROFIsafe fail-safe I/O modules can be connected in a centralized configuration
- Standard modules for non-safety-relevant applications can also be used

Note: Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

#### Technical specifications

Article number	<b>6AG1151-7FA21-2AB0</b>
Based on	<b>6ES7151-7FA21-0AB0</b> SIPLUS ET 200S IM 151-7 F-CPU
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

#### Ordering data

#### Article No.

<b>SIPLUS IM 151-7 F-CPU interface module</b> (extended temperature range and medial exposure)	<b>6AG1151-7FA21-2AB0</b>
For configuring a fail-safe automation system	
<b>Accessories</b>	See SIMATIC IM 151-7 F-CPU interface module, page 7/30

## Overview



- Interface module for SIPLUS ET 200S with integrated CPU S7-314
- For high-performance control solutions in ET 200S
- Increases the availability of plants and machinery
- PROFINET IO Controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO Controller
- PROFINET interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), Web server and S7 communication (with loadable FBs)
- Fast, simple and uniform programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)
- Optional PROFIBUS master for 32 PROFIBUS DP slaves (with master interface 6ES7138-4HA00-0AB0)
- Fail-safe IM 151-8F PN/DP CPU PROFIsafe available

SIMATIC Micro Memory Card required for operation of CPU.

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

## Technical specifications

Article number	<b>6AG1151-8FB01-2AB0</b>
Based on	<b>6ES7151-8FB01-0AB0</b> SIPLUS ET 200S IM 151-8F PN/DP
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>	
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

## Ordering data

## Article No.

<b>SIPLUS interface module IM 151-8F PN/DP CPU</b> (extended temperature range and medial exposure) Including termination module	<b>6AG1151-8FB01-2AB0</b>
<b>Accessories</b>	See SIMATIC IM 151-8F PN/DP CPU interface module, page 7/33

## Distributed controllers

Based on ET 200Pro  
Standard CPUs

### IM 154-8 PN/DP CPU

#### Overview



- CPU with PLC functionality equivalent to S7-315-2 PN/DP provides distributed intelligence for preprocessing
- Interface module for exchanging pre-processed I/O data between the ET 200pro and a higher-level master IO Controller via PROFIBUS DP/PROFINET IO

- PROFINET IO Controller to operate distributed IO on PROFINET
- Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET interface with 3-port switch
- Isochronous mode on PROFIBUS or PROFINET
- Integrated Web server with the option of creating user-defined Web pages
- CPU with PLC functionality equivalent to S7-315-2 PN/DP provides distributed intelligence for preprocessing
- Interface module for exchanging preprocessed I/O data from ET 200pro with a higher-level master via PROFIBUS DP
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Fail-safe IM 154-8F PN/DP CPU PROFIsafe available

#### Note

Micro Memory Card required for operation of CPU.

#### Technical specifications

Article number	<b>6ES7154-8AB01-0AB0</b> ET 200PRO: IM 154-8 PN/DP CPU, 384KB
<b>Product type designation</b>	
<b>General information</b>	
<b>Engineering with</b>	
• Programming package	STEP7 V 5.5 or higher
<b>Supply voltage</b>	
Rated value (DC)	24 V
• 24 V DC	Yes
<b>Power losses</b>	
Power loss, typ.	8.5 W; Typical
<b>Memory</b>	
<b>Work memory</b>	
• Integrated	384 kbyte
<b>Load memory</b>	
• pluggable (MMC), max.	8 Mbyte
<b>CPU processing times</b>	
for bit operations, typ.	0.05 µs
for word operations, typ.	0.09 µs
for fixed point arithmetic, typ.	0.12 µs
for floating point arithmetic, typ.	0.45 µs
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	256
<b>IEC counter</b>	
• present	Yes
<b>S7 times</b>	
• Number	256
<b>IEC timer</b>	
• present	Yes

Article number	<b>6ES7154-8AB01-0AB0</b> ET 200PRO: IM 154-8 PN/DP CPU, 384KB
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Number, max.	2 048 byte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	2 048 byte
• Outputs	2 048 byte
<b>Process image</b>	
• Inputs, adjustable	2 048 byte
• Outputs, adjustable	2 048 byte
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time clock)	Yes
<b>Operating hours counter</b>	
• Number	1
<b>1st interface</b>	
Interface type	Integrated RS 485 interface
Physics	RS 485/connection: 2 x M12 b-coded
<b>Functionality</b>	
• MPI	Yes
• DP master	Yes
• DP slave	Yes
• Point-to-point connection	No
<b>DP master</b>	
• Number of DP slaves, max.	124

## Technical specifications (continued)

Article number	<b>6ES7154-8AB01-0AB0</b> ET 200PRO: IM 154-8 PN/DP CPU, 384KB
<b>2nd interface</b>	
Interface type	PROFINET
Physics	Ethernet (2 x M12 d-coded; 1 x RJ45)
Number of ports	3
<b>Functionality</b>	
• MPI	No
• DP master	No
• DP slave	No
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	Yes
<b>PROFINET IO Controller</b>	
• Max. number of connectable IO devices for RT	128
• Number of IO devices with IRT and the option "high flexibility"	128
• Number of IO Devices with IRT and the option "high performance", max.	64
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes; Via PROFIBUS DP or PROFINET interface
<b>Communication functions</b>	
PG/OP communication	Yes
<b>Global data communication</b>	
• supported	Yes
<b>S7 basic communication</b>	
• supported	Yes
<b>S7 communication</b>	
• supported	Yes

Article number	<b>6ES7154-8AB01-0AB0</b> ET 200PRO: IM 154-8 PN/DP CPU, 384KB
<b>Open IE communication</b>	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8
• ISO-on-TCP (RFC1006)	Yes
- Number of connections, max.	8
• UDP	Yes
- Number of connections, max.	8
<b>Web server</b>	
• supported	Yes
<b>Configuration</b>	
<b>programming</b>	
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes
- HiGraph®	Yes
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Block encryption	Yes; With S7 block Privacy
<b>Dimensions</b>	
Width	135 mm
Height	130 mm
Depth	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket
<b>Weights</b>	
Weight, approx.	720 g

## Ordering data

Article No.	Article No.
<b>IM 154-8 PN/DP CPU interface module, V3.2</b> PROFINET IO Controller for operat- ing distributed IO on PROFINET, with integrated PLC functionality.	<b>6ES7154-8AB01-0AB0</b>
<b>Accessories</b>	
<b>MMC 64 KB <sup>1)</sup></b> For program backup.	<b>6ES7953-8LF30-0AA0</b>
<b>MMC 128 KB <sup>1)</sup></b> For program backup.	<b>6ES7953-8LG30-0AA0</b>
<b>MMC 512 KB <sup>1)</sup></b> For program backup.	<b>6ES7953-8LJ30-0AA0</b>

Article No.	Article No.
<b>MMC 2 MB <sup>1)</sup></b> For program backup and/or firmware updates.	<b>6ES7953-8LL31-0AA0</b>
<b>MMC 4 MB <sup>1)</sup></b> For program backup.	<b>6ES7953-8LM31-0AA0</b>
<b>MMC 8 MB <sup>1)</sup></b> For program backup.	<b>6ES7953-8LP31-0AA0</b>
<b>Connection module</b> For CPU IM 154-8 PN/DP, with 4 x M12 and 2 x 7/8", for connecting PROFINET and PROFIBUS DP.	<b>6ES7194-4AN00-0AA0</b>

<sup>1)</sup> An MMC is essential for operating the CPU

## Distributed controllers

Based on ET 200Pro  
Standard CPUs

### IM 154-8 PN/DP CPU

Ordering data	Article No.	Article No.	
<b>SCALANCE X-200 Industrial Ethernet Switches</b> With integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics, for setting up linear, star and ring structures SCALANCE X208PRO, in degree of protection IP65, with eight 10/100 Mbps M12 ports, incl. eleven M12 dust caps.	6GK5208-0HA10-2AA6		
<b>Industrial Ethernet FC RJ45 Plug 180</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> <li>• 50 units</li> </ul>	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	<b>IE FC M12 Plug PRO</b> PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet. <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 8 units</li> <li>• PROFINET M12 plug connector, D-coded, angled.</li> </ul>	6GK1901-0DB20-6AA0 6GK1901-0DB20-6AA8 3RK1902-2DA00
<b>Industrial Ethernet Fast Connect installation cables</b> <ul style="list-style-type: none"> <li>• FastConnect Standard Cable</li> <li>• FastConnect Trailing Cable</li> <li>• FastConnect Marine Cable</li> </ul>	6XV1840-2AH10 6XV1840-3AH10 6XV1840-4AH10	<b>IE panel feedthrough</b> Cabinet feedthrough for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	6GK1901-0DM20-2AA5
<b>Industrial Ethernet FastConnect installation cables</b> <ul style="list-style-type: none"> <li>• <b>IE FC TP Trailing Cable GP 2 x 2;</b> sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.</li> <li>• <b>IE TP Torsion Cable GP 2 x 2;</b> sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.</li> </ul>	6XV1870-2D  6XV1870-2F	<b>7/8" connecting cable to power supply</b> 5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths: <ul style="list-style-type: none"> <li>- 1.5 m</li> <li>- 2.0 m</li> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> <li>- 15 m</li> <li>- Other special lengths with 90° or 180° cable outlet.</li> </ul>	6XV1822-5BH15 6XV1822-5BH20 6XV1822-5BH30 6XV1822-5BH50 6XV1822-5BN10 6XV1822-5BN15 See: <a href="http://support.automation.siemens.com/WWW/view/en/26999294">http://support.automation.siemens.com/WWW/view/en/26999294</a>
<b>Industrial Ethernet Fast Connect</b> Stripping tool	6GK1901-1GA00	<ul style="list-style-type: none"> <li>• Power cable, can be trailed, 5 x 1.5 mm<sup>2</sup>, preassembled at both ends with 7/8" angled connectors (female insert at one end, male insert at the other end), in various lengths:               <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> <li>• Power cable, can be trailed, 5 x 1.5 mm<sup>2</sup>, preassembled at one end with 7/8" angled connector with female insert (female insert at one end, other end open), in various lengths:               <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> </ul>	3RK1902-3NB30 3RK1902-3NB50 3RK1902-3NC10
<b>IE Connecting Cable M12-180/M12-180</b> <ul style="list-style-type: none"> <li>• Preassembled IE FC TP Trailing Cable GP 2 x 2 (PROFINET Type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:           <ul style="list-style-type: none"> <li>- 0.3 m</li> <li>- 0.5 m</li> <li>- 1.0 m</li> <li>- 1.5 m</li> <li>- 2.0 m</li> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> <li>- 15 m</li> </ul> </li> <li>• PROFINET M12 connecting cable, trailing cable preassembled at both ends with angled M12 connectors (male insert), in various lengths:           <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> <li>• PROFINET M12 connecting cable, trailing cable preassembled at one end with angled M12 connector (male insert at one end, other end open), in various lengths:           <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> </ul>	6XV1870-8AE30 6XV1870-8AE50 6XV1870-8AH10 6XV1870-8AH15 6XV1870-8AH20 6XV1870-8AH30 6XV1870-8AH50 6XV1870-8AN10 6XV1870-8AN15  3RK1902-2NB30 3RK1902-2NB50 3RK1902-2NC10  3RK1902-2HB30 3RK1902-2HB50 3RK1902-2HC10	<b>Power line</b> 5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	6XV1830-8AH10
		<b>7/8" cable connector</b> For ET 200eco, with axial cable outlet. <ul style="list-style-type: none"> <li>• with male insert, 5-pack</li> <li>• with female insert, 5-pack</li> <li>• angled, with female insert, 1 unit</li> <li>• angled, with male insert, 1 unit</li> </ul> 7/8" cover cap, 10 per pack	6GK1905-0FA00 6GK1905-0FB00 3RK1902-3DA00 3RK1902-3BA00 6ES7194-3JA00-0AA0
		<b>Twisted Pair cables 4x2 with RJ45 connectors</b> 0.5 m 1 m 2 m 6 m 10 m	6XV1870-3QE50 6XV1870-3QH10 6XV1870-3QH20 6XV1870-3QH60 6XV1870-3QN10



Ordering data	Article No.	Article No.
<b>Crossed Twisted Pair cables 4x2 with RJ45 connectors</b>		<b>M12 bus termination connector PROFIBUS, female insert</b>
0.5 m	6XV1870-3RE50	6GK1905-0ED00
1 m	6XV1870-3RH10	<b>M12 bus termination connector PROFIBUS, male insert</b>
2 m	6XV1870-3RH20	6GK1905-0EC00
6 m	6XV1870-3RH60	<b>M12 plug connector, axial outlet, with male insert</b>
10 m	6XV1870-3RN10	6GK1905-0EA00
<b>M12 sealing cap</b>	3RX9802-0AA00	<b>PROFIBUS FC Standard Cable GP</b>
For protection of unused M12 connections with ET 200pro		Standard type with special design for fast mounting, 2-core, shielded.
<b>M12 sealing caps with female thread</b>	6ES7194-4JD60-0AA0	Sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m.
5 units		<b>PROFIBUS FC Trailing Cable</b>
<b>PROFIBUS M12 connecting cable</b>		2-wire, shielded.
Preassembled, with two 5-pole M12 connectors/sockets, up to 100 m, in various lengths:		<b>PROFIBUS FC Food Cable</b>
1.5 m	6XV1830-3DH15	2-wire, shielded.
2.0 m	6XV1830-3DH20	Sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m.
3.0 m	6XV1830-3DH30	<b>PROFIBUS FC Robust Cable</b>
5.0 m	6XV1830-3DH50	2-core, shielded
10 m	6XV1830-3DN10	Sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m.
15 m	6XV1830-3DN15	<b>PROFIBUS M12 cable connector</b>
Other special lengths with 90° or 180° cable outlet	See: <a href="http://support.automation.siemens.com/WW/view/en/26999294">http://support.automation.siemens.com/WW/view/en/26999294</a>	5-pole, B-coded, metal casing, 1 pack = 5 units.
		• Female insert
		6GK1905-0EB00



## Distributed controllers

Based on ET 200Pro

Fail-safe CPUs

### IM 154-8 F PN/DP CPU

#### Overview



- Interface module for SIMATIC ET 200pro with integrated fail-safe CPU
- CPU with PLC functionality equivalent to CPU S7-315F PN/DP; with distributed intelligence for preprocessing

- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061 and PLe according to ISO 13849.1:2006
- For high-performance control solutions in ET 200pro
- Increase in availability of systems and machines
- Integral Web server with the option of creating user-defined Web sites
- Isochronous mode on PROFIBUS or PROFINET
- PROFINET IO Controller for up to 128 IO Devices
- PROFINET interface with integrated 3-port switch
- With multiple communication options:  
PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)

Note:  
SIMATIC Micro Memory Card required for operation of CPU.

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#### Technical specifications

Article number	6ES7154-8FB01-0AB0	6ES7154-8FX00-0AB0
	ET 200PRO: IM 154-8F PN/DP CPU, 512KB	ET 200PRO: IM 154-8FX PN/DP CPU, 1.5MB
<b>Product type designation</b>		
<b>General information</b>		
<b>Engineering with</b>		
• Programming package	STEP 7 V 5.5 or higher, Distributed Safety V 5.4 SP4	As of STEP7 V5.5 with HSP 222 + Distributed Safety V5.4 SP4
<b>Supply voltage</b>		
Rated value (DC)	24 V	24 V
• 24 V DC	Yes	Yes
<b>Power losses</b>		
Power loss, typ.	8.5 W; Typical	8.5 W; Typical
<b>Memory</b>		
<b>Work memory</b>		
• Integrated	512 kbyte	1 536 kbyte
<b>Load memory</b>		
• pluggable (MMC), max.	8 Mbyte	8 Mbyte
<b>CPU processing times</b>		
for bit operations, typ.	0.05 µs	0.025 µs
for word operations, typ.	0.09 µs	0.03 µs
for fixed point arithmetic, typ.	0.12 µs	0.04 µs
for floating point arithmetic, typ.	0.45 µs	0.16 µs
<b>Counters, timers and their retentivity</b>		
<b>S7 counter</b>		
• Number	256	256
<b>IEC counter</b>		
• present	Yes	Yes
<b>S7 times</b>		
• Number	256	256
<b>IEC timer</b>		
• present	Yes	Yes

## Technical specifications (continued)

Article number	<b>6ES7154-8FB01-0AB0</b> ET 200PRO: IM 154-8F PN/DP CPU, 512KB	<b>6ES7154-8FX00-0AB0</b> ET 200PRO: IM 154-8FX PN/DP CPU, 1.5MB
<b>Data areas and their retentivity</b>		
<b>Flag</b>		
• Number, max.	2 048 byte	2 048 byte
<b>Address area</b>		
<b>I/O address area</b>		
• Inputs	2 048 byte	2 048 byte
• Outputs	2 048 byte	2 048 byte
<b>Process image</b>		
• Inputs, adjustable	2 048 byte	2 048 byte
• Outputs, adjustable	2 048 byte	2 048 byte
<b>Time of day</b>		
<b>Clock</b>		
• Hardware clock (real-time clock)	Yes	Yes
<b>Operating hours counter</b>		
• Number	1	1
<b>1st interface</b>		
Interface type	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485/connection: 2 x M12 b-coded	RS 485/connection: 2 x M12 b-coded
<b>Functionality</b>		
• MPI	Yes	Yes
• DP master	Yes	Yes
• DP slave	Yes	Yes
• Point-to-point connection	No	No
<b>DP master</b>		
• Number of DP slaves, max.	124	124
<b>2nd interface</b>		
Interface type	PROFINET	PROFINET
Physics	Ethernet (2 x M12 d-coded; 1 x RJ45)	Ethernet (2 x M12 d-coded; 1 x RJ45)
Number of ports	3	3
<b>Functionality</b>		
• MPI	No	No
• DP master	No	No
• DP slave	No	No
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	Yes	Yes
<b>PROFINET IO Controller</b>		
• Max. number of connectable IO devices for RT	128	128
• Number of IO devices with IRT and the option "high flexibility"	128	128
• Number of IO Devices with IRT and the option "high performance", max.	64	64
<b>Isochronous mode</b>		
Isochronous operation (application synchronized up to terminal)	Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via PROFIBUS DP or PROFINET interface
<b>Communication functions</b>		
PG/OP communication	Yes	Yes
<b>Global data communication</b>		
• supported	Yes	Yes
<b>S7 basic communication</b>		
• supported	Yes	Yes
<b>S7 communication</b>		
• supported	Yes	Yes

## Distributed controllers

Based on ET 200Pro

Fail-safe CPUs

### IM 154-8 F PN/DP CPU

#### Technical specifications (continued)

Article number	<b>6ES7154-8FB01-0AB0</b> ET 200PRO: IM 154-8F PN/DP CPU, 512KB	<b>6ES7154-8FX00-0AB0</b> ET 200PRO: IM 154-8FX PN/DP CPU, 1.5MB
<b>Open IE communication</b>		
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8	8
• ISO-on-TCP (RFC1006)	Yes	Yes
- Number of connections, max.	8	8
• UDP	Yes	Yes
- Number of connections, max.	8	8
<b>Web server</b>		
• supported	Yes	Yes
<b>Configuration programming</b>		
<b>Programming language</b>		
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes
- CFC	Yes	Yes
- GRAPH	Yes	Yes
- HiGraph®	Yes	Yes
<b>Know-how protection</b>		
• User program protection/password protection	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>		
Width	135 mm	135 mm
Height	130 mm	130 mm
Depth	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket
<b>Weights</b>		
Weight, approx.	720 g	720 g

#### Ordering data

##### IM 154-8 F PN/DP CPU interface module, V3.2

Fail-safe PROFINET IO Controller for operating distributed IO on PROFINET, with integrated PLC functionality.

- 512 KB RAM
- 1.5 MB RAM

**6ES7154-8FB01-0AB0**  
**6ES7154-8FX00-0AB0**

##### Distributed Safety V5.4 programming tool

Task:

Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco

Requirement:

STEP 7 V5.3 SP3 and higher

Floating license

Floating License for 1 user, license key download without software or documentation<sup>1)</sup>; email address required for delivery

**6ES7833-1FC02-0YA5**  
**6ES7833-1FC02-0YH5**

##### Distributed Safety Upgrade

From V5.x to V5.4;  
Floating license for 1 user

**6ES7833-1FC02-0YE5**

##### STEP 7 Safety Advanced V13 SP1

Task:

Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco

Requirement:

STEP 7 Professional V13 SP1

Floating license for 1 user

**6ES7833-1FA13-0YA5**

Floating license for 1 user, license key download without software or documentation<sup>1)</sup>; email address required for delivery

**6ES7833-1FA13-0YH5**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

Ordering data	Article No.	Article No.
<b>Accessories</b>		
<b>SIMATIC Micro Memory Cards</b>		
<b>MMC 64 KB <sup>1)</sup></b>	<b>6ES7953-8LF30-0AA0</b>	
For program backup.		
<b>MMC 128 KB <sup>1)</sup></b>	<b>6ES7953-8LG30-0AA0</b>	
For program backup.		
<b>MMC 512 KB <sup>1)</sup></b>	<b>6ES7953-8LJ30-0AA0</b>	
For program backup.		
<b>MMC 2 MB <sup>1)</sup></b>	<b>6ES7953-8LL31-0AA0</b>	
For program backup and/or firmware updates.		
<b>MMC 4 MB <sup>1)</sup></b>	<b>6ES7953-8LM31-0AA0</b>	
For program backup.		
<b>MMC 8 MB <sup>1)</sup></b>	<b>6ES7953-8LP31-0AA0</b>	
For program backup.		
<b>Connection module</b>	<b>6ES7194-4AN00-0AA0</b>	
For CPU IM 154-8 PN/DP, with 4 x M12 and 2 x 7/8", for connecting PROFINET and PROFIBUS DP.		
<b>SCALANCE X-200 Industrial Ethernet Switches</b>	<b>6GK5208-0HA10-2AA6</b>	
With integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics, for setting up linear, star and ring structures SCALANCE X208PRO, in degree of protection IP65, with eight 10/100 Mbps M12 ports, incl. eleven M12 dust caps.		
<b>Industrial Ethernet FC RJ45 Plug 90</b>		
RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 90° cable outlet.		
<ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> </ul>	<b>6GK1901-1BB20-2AA0</b> <b>6GK1901-1BB20-2AB0</b>	
<b>Industrial Ethernet FC RJ45 Plug 180</b>		
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet		
<ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> <li>• 50 units</li> </ul>	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>	
<b>Industrial Ethernet FastConnect installation cables</b>		
<ul style="list-style-type: none"> <li>• FastConnect Standard Cable</li> <li>• FastConnect Trailing Cable</li> <li>• FastConnect Marine Cable</li> </ul>	<b>6XV1840-2AH10</b> <b>6XV1840-3AH10</b> <b>6XV1840-4AH10</b>	
<b>Industrial Ethernet FastConnect installation cables</b>		
<ul style="list-style-type: none"> <li>• IE FC TP Trailing Cable GP 2 x 2; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.</li> <li>• IE TP Torsion Cable GP 2 x 2; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.</li> </ul>	<b>6XV1870-2D</b> <b>6XV1870-2F</b>	
<b>Industrial Ethernet FastConnect</b>		
Stripping tool		<b>6GK1901-1GA00</b>
<b>IE Connecting Cable M12-180/M12-180</b>		
<ul style="list-style-type: none"> <li>• Preassembled IE FC TP Trailing Cable GP 2 x 2 (PROFINET Type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths: <ul style="list-style-type: none"> <li>- 0.3 m</li> <li>- 0.5 m</li> <li>- 1.0 m</li> <li>- 1.5 m</li> <li>- 2.0 m</li> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> <li>- 15 m</li> </ul> </li> <li>• PROFINET M12 connecting cable, trailing cable preassembled at both ends with angled M12 connectors (male contact insert), in various lengths: <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> <li>• PROFINET M12 connecting cable, trailing cable preassembled at one end with angled M12 connector (male contact insert at one end, other end open), in various lengths: <ul style="list-style-type: none"> <li>- 3.0 m</li> <li>- 5.0 m</li> <li>- 10 m</li> </ul> </li> </ul>	<b>6XV1870-8AE30</b> <b>6XV1870-8AE50</b> <b>6XV1870-8AH10</b> <b>6XV1870-8AH15</b> <b>6XV1870-8AH20</b> <b>6XV1870-8AH30</b> <b>6XV1870-8AH50</b> <b>6XV1870-8AN10</b> <b>6XV1870-8AN15</b>	
		<b>3RK1902-2NB30</b> <b>3RK1902-2NB50</b> <b>3RK1902-2NC10</b>
		<b>3RK1902-2HB30</b> <b>3RK1902-2HB50</b> <b>3RK1902-2HC10</b>
<b>IE FC M12 Plug PRO</b>		
PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet.		
<ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 8 units</li> <li>• PROFINET M12 plug connector, D-coded, angled</li> </ul>	<b>6GK1901-0DB20-6AA0</b> <b>6GK1901-0DB20-6AA8</b> <b>3RK1902-2DA00</b>	
<b>IE panel feedthrough</b>		
Cabinet feedthrough for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units		<b>6GK1901-0DM20-2AA5</b>

<sup>1)</sup> An MMC is essential for operating the CPU

## Distributed controllers

Based on ET 200Pro

Fail-safe CPUs

### IM 154-8 F PN/DP CPU

#### Ordering data

##### 7/8" connecting cable to power supply

- 5-core, 5 x 1.5 mm<sup>2</sup>, trailing type, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:

- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m
- Other special lengths with 90° or 180° cable outlet

6XV1822-5BH15  
6XV1822-5BH20  
6XV1822-5BH30  
6XV1822-5BH50  
6XV1822-5BN10  
6XV1822-5BN15

See:  
<http://support.automation.siemens.com/WWW/view/en/26999294>

- Power cable, can be trailed, 5 x 1.5 mm<sup>2</sup>, preassembled at both ends with 7/8" angled connectors (female contact insert at one end, male contact insert at the other end), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

3RK1902-3NB30  
3RK1902-3NB50  
3RK1902-3NC10

- Power cable, can be trailed, 5 x 1.5 mm<sup>2</sup>, preassembled at one end with 7/8" angled connector with female contact insert (female contact insert at one end, other end open), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

3RK1902-3GB30  
3RK1902-3GB50  
3RK1902-3GC10

##### Power line

6XV1830-8AH10

5-core, 5 x 1.5 mm<sup>2</sup>, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.

##### 7/8" cable connector

For ET 200eco, with axial cable outlet

- with male contact insert, 5-pack
- with female contact insert, 5-pack
- angled, with female contact insert, 1 unit
- angled, with male contact insert, 1 unit

6GK1905-0FA00  
6GK1905-0FB00  
3RK1902-3DA00

3RK1902-3BA00

7/8" cover cap, 10 per pack

6ES7194-3JA00-0AA0

##### Twisted Pair cables 4x2 with RJ45 connectors

- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

6XV1870-3QE50  
6XV1870-3QH10  
6XV1870-3QH20  
6XV1870-3QH60  
6XV1870-3QN10

##### Crossed Twisted Pair cables 4x2 with RJ45 connectors

- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

6XV1870-3RE50  
6XV1870-3RH10  
6XV1870-3RH20  
6XV1870-3RH60  
6XV1870-3RN10

##### M12 sealing cap

For protection of unused M12 connections with ET 200pro

3RX9802-0AA00

##### M12 sealing caps with female thread

5 units

6ES7194-4JD60-0AA0

##### PROFIBUS M12 connecting cable

Preassembled, with two 5-pole M12 connectors/sockets, up to 100 m, in various lengths:

- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

6XV1830-3DH15

6XV1830-3DH20

6XV1830-3DH30

6XV1830-3DH50

6XV1830-3DN10

6XV1830-3DN15

Additional special lengths with 90° or 180° cable outlet.

See:  
<http://support.automation.siemens.com/WWW/view/en/26999294>

##### M12 bus termination connector PROFIBUS, female contact insert

6GK1905-0ED00

##### M12 bus termination connector PROFIBUS, male contact insert

6GK1905-0EC00

##### M12 plug connector, axial outlet, with male contact insert

6GK1905-0EA00

##### PROFIBUS FC Standard Cable GP

Standard type with special design for fast mounting, 2-core, shielded.

Sold by the meter;  
max. delivery unit 1 000 m,  
minimum order quantity 20 m.

6XV1830-0EH10

##### PROFIBUS FC Trailing Cable

2-wire, shielded.

6XV1830-3EH10

##### PROFIBUS FC Food Cable

2-wire, shielded.

Sold by the meter;  
max. delivery unit 1 000 m,  
minimum order quantity 20 m.

6XV1830-0GH10

##### PROFIBUS FC Robust Cable

2-wire, shielded.

6XV1830-0JH10

Sold by the meter;  
max. delivery unit 1 000 m,  
minimum order quantity 20 m.

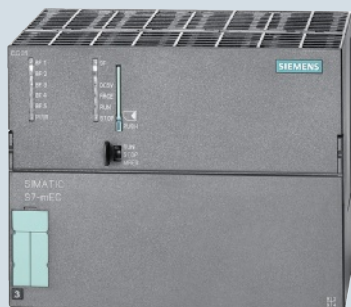
##### PROFIBUS M12 cable connector

5-pole, B-coded, metal casing, 1 pack = 5 units.

- Female contact insert

6GK1905-0EB00

## Software controllers

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SIMATIC WinAC ODK

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• SIMATIC IPC427D bundles

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• SIMATIC IPC277D bundles

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• SIMATIC HMI IPC477C bundles

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• Software packages for SIMATIC IPC and S7-mEC

**Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

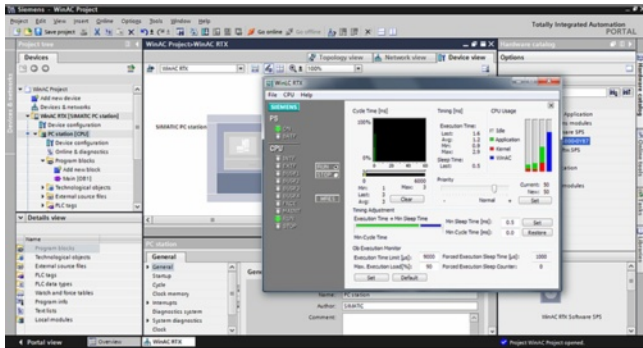
[www.siemens.com/simatic/printmaterial](http://www.siemens.com/simatic/printmaterial)

# Software controllers

## SIMATIC WinAC

### SIMATIC WinAC RTX

#### Overview



- SIMATIC WinAC RTX: Optimized for applications that require a high degree of flexibility and integration capability.
- The software solution for tasks that require hard deterministic behavior and high performance.
- With real-time expansion for assuring deterministic behavior for the control section.

New with WinAC RTX 2010 SP1:

- SIMATIC IPC427D and IPC477D are fully supported
  - Communication via onboard CP 5622
  - Retentive memory
  - LED display of the operating status
- Support for the new PROFIBUS CP 5612 (PCI) and CP 5622 (PCIe)

#### Technical specifications

Article number	<b>6ES7671-0RC08-0YA0</b> SIMATIC WINAC RTX 2010
<b>Product type designation</b>	
<b>General information</b>	
Firmware version	V4.6
<b>Engineering with</b>	
• Programming package	STEP7 as of V5.5 + HW update / IMap V3.0 SP1
<b>Memory</b>	
Type of memory	RAM
<b>Work memory</b>	
• integrated (for program)	4 Mbyte; Adjustable; depends on Non Paged Memory Pool
• integrated (for data)	4 Mbyte; Adjustable; depends on Non Paged Memory Pool
<b>Load memory</b>	
• integrated RAM, max.	8 Mbyte; Adjustable; depends on Non Paged Memory Pool
<b>CPU processing times</b>	
for bit operations, typ.	0.004 µs; Typical
for fixed point arithmetic, typ.	0.003 µs; Typical
for floating point arithmetic, typ.	0.004 µs; Typical
Reference platform	Pentium 4, 2.4 GHz
<b>CPU-blocks</b>	
<b>DB</b>	
• Number, max.	65 535; Limited only by RAM set for data
• Size, max.	64 kbyte
<b>FB</b>	
• Number, max.	65 536; Limited only by RAM set for code
• Size, max.	64 kbyte
<b>FC</b>	
• Number, max.	65 536; Limited only by RAM set for code
<b>OB</b>	
• Size, max.	64 kbyte

Article number	<b>6ES7671-0RC08-0YA0</b> SIMATIC WINAC RTX 2010
<b>Nesting depth</b>	
• per priority class	24
• additional within an error OB	24
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>Retentivity</b>	
- can be set	Yes
- lower limit	0
- upper limit	2 047
- preset	8
<b>Counting range</b>	
- can be set	Yes
- lower limit	0
- upper limit	999
<b>IEC counter</b>	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
<b>S7 times</b>	
• Number	2 048
<b>Retentivity</b>	
- can be set	Yes
- lower limit	0
- upper limit	2 047
<b>Time range</b>	
- lower limit	10 ms
- upper limit	9 990 s
<b>IEC timer</b>	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)

## Technical specifications (continued)

Article number	<b>6ES7671-0RC08-0YA0</b> SIMATIC WINAC RTX 2010
<b>Data areas and their retentivity</b>	
Retentivity without UPS and PS Extension Board	128 KB with SIMATIC IPC227D, IPC427C, IPC427D, HMI IPC277D, IPC477C, IPC477D; further SIMATIC IPCs on request
Retentivity with UPS	all data
<b>Flag</b>	
• Number, max.	16 kbyte
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8
<b>Data blocks</b>	
• Retentivity adjustable	Yes; via non-retain property on DB
• Retentivity preset	Yes
<b>Local data</b>	
• adjustable, max.	64 kbyte
• preset	32 kbyte
• per priority class, max.	61 440 byte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	16 kbyte
• Outputs	16 kbyte
<b>of which, distributed</b>	
- DP interface, inputs	16 kbyte
- DP interface, outputs	16 kbyte
- PN interface, inputs	16 kbyte
- PN interface, outputs	16 kbyte
<b>Process image</b>	
• Inputs, adjustable	8 kbyte; 16 KB with STEP 7 V5.5 SP3 or higher
• Outputs, adjustable	8 kbyte; 16 KB with STEP 7 V5.5 SP3 or higher
• Inputs, default	512 byte
• Outputs, default	512 byte
<b>Subprocess images</b>	
• Number of subprocess images, max.	15
<b>Digital channels</b>	
• Inputs	128 000
• Outputs	128 000
<b>Analog channels</b>	
• Inputs	8 000
• Outputs	8 000
<b>Submodules</b>	
• Number of submodules, max	4
• of which PROFIBUS, max.	4; Supported interfaces: see 1st and 2nd interface
• of which Industrial Ethernet, max.	1; Supported interfaces: see 3rd and 4th interface
<b>Number of operable FMs and CPs (recommended)</b>	
• FM	FM distributed: FM 350-1 / 350-2, FM 351, FM 352, FM 353, FM 355 / 355-2
• CP, point-to-point	CP 340, CP 341 distributed
• CP, LAN	Over PC CP

Article number	<b>6ES7671-0RC08-0YA0</b> SIMATIC WINAC RTX 2010
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time clock)	Yes
• battery-backed and synchronizable	Yes
<b>Operating hours counter</b>	
• Number	8
<b>Clock synchronization</b>	
• supported	Yes
• to PC-CP, slave	Yes
• on Ethernet via NTP	Yes
<b>1st interface</b>	
Interface type	CP 5611, CP 5611-A2, CP 5612, CP 5621, CP 5622, integrated PROFIBUS interface of the SIMATIC PC
Max. no. of simultaneously operable CPs	1
Physics	RS 485 / PROFIBUS
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	does not exist
Number of connection resources	8
<b>Functionality</b>	
• MPI	No
• DP master	Yes
• DP slave	No
<b>DP master</b>	
• Number of connections, max.	8
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	64
<b>Services</b>	
- PG/OP communication	Yes
- Global data communication	No
- S7 basic communication	No
- S7 communication	Yes
- S7 communication, as client	Yes
- S7 communication, as server	Yes
- Equidistance mode support	Yes; Only in conjunction with isochronous mode
- Isochronous mode	Yes
- SYNC/FREEZE	Yes
- Activation/deactivation of DP slaves	Yes
- Direct data exchange (slave-to-slave communication)	Yes
- DPV1	Yes
<b>Address area</b>	
- Inputs, max.	16 kbyte
- Outputs, max.	16 kbyte
<b>User data per DP slave</b>	
- Inputs, max.	244 byte
- Outputs, max.	244 byte



## Software controllers

### SIMATIC WinAC

#### SIMATIC WinAC RTX

#### Technical specifications (continued)

Article number	<b>6ES7671-0RC08-0YA0</b> SIMATIC WINAC RTX 2010
<b>2nd interface</b>	
Interface type	CP 5613, CP 5613-A2, CP 5603, CP 5623
Max. no. of simultaneously operable CPs	4
Physics	RS 485 / PROFIBUS
Isolated	Yes
<b>Functionality</b>	
• MPI	No
• DP master	Yes
• DP slave	No
<b>DP master</b>	
• Number of connections, max.	50
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	125
<b>Services</b>	
- PG/OP communication	Yes
- Global data communication	No
- S7 basic communication	No
- S7 communication	Yes
- S7 communication, as client	Yes
- S7 communication, as server	Yes
- Equidistance mode support	Yes; Only in conjunction with isochronous mode
- Isochronous mode	Yes
- SYNC/FREEZE	Yes
- Activation/deactivation of DP slaves	Yes
- Direct data exchange (slave-to-slave communication)	Yes
- DPV1	Yes
<b>Address area</b>	
- Inputs, max.	16 kbyte
- Outputs, max.	16 kbyte
<b>User data per DP slave</b>	
- Inputs, max.	244 byte
- Outputs, max.	244 byte
<b>3rd interface</b>	
Interface type	PROFINET
Max. no. of simultaneously operable CPs	1; Intel Pro/1000 (82573L, 82574L, 82541PI; non-shared IRQ required); integrated IE interface SIMATIC PC 4x7B, 6x7B, 8x7B, IPC4x7C, IPC6x7C, IPC8x7C, IPC2x7D, IPC4x7D
Physics	Ethernet
Isolated	Yes
Integrated switch	No
Number of ports	1
Automatic detection of transmission speed	Yes; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
<b>Media redundancy</b>	
• supported	No

Article number	<b>6ES7671-0RC08-0YA0</b> SIMATIC WINAC RTX 2010
<b>Functionality</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	No
• PROFINET CBA	Yes
• Open IE communication	Yes
<b>PROFINET IO Controller</b>	
• Transmission rate, min.	100 Mbit/s
• Transmission rate, max.	100 Mbit/s
• Max. number of connectable IO devices for RT	128
- of which in line, max.	128
• IRT	No
• Prioritized startup	Yes
- Number of IO Devices, max.	32
• Activation/deactivation of IO Devices	Yes
- Maximum number of IO devices that can be activated/deactivated at the same time.	8
• IO Devices changing during operation (partner ports), supported	Yes
• Device replacement without swap medium	Yes
• Send cycles	1 ms
• Updating time	1 - 512 ms (minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices, and on the volume of configured user data)
<b>Services</b>	
- PG/OP communication	Yes
- S7 communication	Yes
- Isochronous mode	No
- Open IE communication	Yes
<b>Address area</b>	
- Inputs, max.	16 kbyte
- Outputs, max.	16 kbyte
- User data per address area, max.	2 kbyte
- User data consistency, max.	254 byte
<b>Open IE communication</b>	
• Number of connections, max.	32
• Local port numbers used at the system end	0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
• Keep-alive function, supported	Yes
<b>4th interface</b>	
Interface type	PROFINET
Max. no. of simultaneously operable CPs	1; CP 1616 (hardware release 8 or higher), CP 1604 (hardware release 7 or higher), integrated PROFINET interface of SIMATIC IPC and S7-mEC
Physics	Ethernet
Isolated	Yes
Integrated switch	Yes
Number of ports	3
Automatic detection of transmission speed	Yes; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
Change of IP address at runtime, supported	Yes
Number of connection resources	32

## Technical specifications (continued)

Article number	<b>6ES7671-0RC08-0YA0</b> SIMATIC WINAC RTX 2010
<b>Media redundancy</b>	
• supported	Yes
• Switchover time on line break, typically	200 ms
• Number of stations in the ring, max.	50
<b>Functionality</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	No
• PROFINET CBA	Yes
• Open IE communication	Yes
<b>PROFINET IO Controller</b>	
• Transmission rate, max.	100 Mbit/s
• Max. number of connectable IO devices for RT	256
- of which in line, max.	256
• Number of IO devices with IRT and the option "high flexibility"	64
- of which in line, max.	32
• Number of IO Devices with IRT and the option "high performance", max.	64
- of which in line, max.	32
• IRT	Yes
• Prioritized startup	Yes
- Number of IO Devices, max.	32
• Activation/deactivation of IO Devices	Yes
- Maximum number of IO devices that can be activated/deactivated at the same time.	8
• IO Devices changing during operation (partner ports), supported	Yes
• Device replacement without swap medium	Yes
• Send cycles	250 µs, 500 µs, 1 ms
• Updating time	0.25...512 depending on the send cycle
<b>Services</b>	
- PG/OP communication	Yes
- S7 communication	Yes
- Isochronous mode	Yes
- Open IE communication	Yes
<b>Address area</b>	
- Inputs, max.	16 kbyte
- Outputs, max.	16 kbyte
- User data per address area, max.	2 kbyte
- User data consistency, max.	254 byte
<b>Open IE communication</b>	
• Number of connections, max.	32
• Local port numbers used at the system end	0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes
Number of DP masters with isochronous mode	2
User data per isochronous slave, max.	128 byte
equidistance	Yes
shortest clock pulse	2.2 ms; 2.2 ms without partial process image; 2.2 ms with partial process image

Article number	<b>6ES7671-0RC08-0YA0</b> SIMATIC WINAC RTX 2010
<b>Communication functions</b>	
PG/OP communication	Yes
Data record routing	Yes; only with CP 5611 or integrated PROFIBUS interface of the SIMATIC PC
<b>Global data communication</b>	
• supported	No
<b>S7 basic communication</b>	
• supported	No
<b>S7 communication</b>	
• supported	Yes
• as server	Yes
• As client	Yes
• User data per job, max.	64 kbyte; when using BSEND/USEND
<b>Open IE communication</b>	
• TCP/IP	Yes
- Number of connections, max.	32
- Data length for connection type 01H, max.	Not supported
- Data length for connection type 11H, max.	65 534 byte
- Data length, max.	65 534 byte
• ISO-on-TCP (RFC1006)	Yes
- Number of connections, max.	32
- Data length, max.	65 534 byte
• UDP	Yes
- Number of connections, max.	32
- Data length, max.	1 472 byte
<b>Web server</b>	
• supported	Yes
• Number of HTTP clients	2
• User-defined websites	No
<b>PROFINET CBA (at set setpoint communication load)</b>	
• Setpoint for the CPU communication load	20 %
• Number of remote interconnection partners	64
• Number of functions, master/slave	30
• Total of all Master/Slave connections	1 000
• Data length of all incoming connections master/slave, max.	6 800 byte
• Data length of all outgoing connections master/slave, max.	6 800 byte
• Number of device-internal and PROFIBUS interconnections	500
• Data length of device-internal and PROFIBUS interconnections, max.	4 000 byte
• Data length per connection, max.	1 400 byte
<b>Remote interconnections with acyclic transmission</b>	
- Sampling frequency: Sampling time, min.	500 ms
- Number of incoming interconnections	100
- Number of outgoing interconnections	100
- Data length of all incoming interconnections, max.	2 000 byte
- Data length of all outgoing interconnections, max.	2 000 byte
- Data length per connection, max.	1 400 byte

## Software controllers

### SIMATIC WinAC

#### SIMATIC WinAC RTX

#### Technical specifications (continued)

Article number	<b>6ES7671-0RC08-0YA0</b> SIMATIC WINAC RTX 2010
<b>Remote interconnections with cyclic transmission</b>	
- Transmission frequency: Transmission interval, min.	10 ms
- Number of incoming interconnections	200
- Number of outgoing interconnections	200
- Data length of all incoming interconnections, max.	4 800 byte
- Data length of all outgoing interconnections, max.	4 800 byte
- Data length per connection, max.	250 byte
<b>HMI variables via PROFINET (acyclic)</b>	
- Number of stations that can log on for HMI variables (PN OPC/IMap)	3
- HMI variable updating	500 ms
- Number of HMI variables	200
- Data length of all HMI variables, max.	2 000 byte
<b>PROFIBUS proxy functionality</b>	
- supported	Yes
- Number of linked PROFIBUS devices	16
- Data length per connection, max.	240 byte; Slave-dependent
<b>Number of connections</b>	
• overall	96
<b>S7 message functions</b>	
Number of login stations for message functions, max.	62
SCAN procedure	No
Process diagnostic messages	Yes; ALARM_S, ALARM_SQ, ALARM_D, ALARM_DQ
simultaneously active Alarm-S blocks, max.	20; of a total of 20 for all SFCs
Alarm 8-blocks	Yes
• Number of instances for alarm 8 and S7 communication blocks, max.	4 000
Process control messages	No
<b>Test commissioning functions</b>	
Status block	Yes
Single step	Yes
Number of breakpoints	20
<b>Status/control</b>	
• Status/control variable	Yes
<b>Forcing</b>	
• Forcing	No
<b>Diagnostic buffer</b>	
• present	Yes
• Number of entries, max.	
- can be set	Yes
- preset	120

Article number	<b>6ES7671-0RC08-0YA0</b> SIMATIC WINAC RTX 2010
<b>Hardware requirements</b>	
Hardware required	PC with color monitor, keyboard, mouse or pointing device for Windows
Main memory, min.	1 Gbyte; WES7: 2 GB
Required memory on hard disk, min.	100 Mbyte
Processor	Intel Celeron M, 900 MHz or compatible
• Multi-processor system	Yes; Dual Pentium, CoreDuo, Core2Duo or compatible
• Hyper-threading	Yes
<b>Configuration</b>	
<b>programming</b>	
• Nesting levels	8
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes
- HiGraph®	Yes
<b>Software libraries</b>	
- Easy Motion Control	Yes
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Block encryption	No
<b>Open Development interfaces</b>	
• CCX (Custom Code Extension)	Yes; WinAC ODK V4.2 or higher
• CMI (Controller Management Interface)	Yes; WinAC ODK V4.2 or higher
• SMX (Shared Memory Extension)	Yes; WinAC ODK V4.2 or higher
- Inputs	4 kbyte
- Outputs	4 kbyte
<b>Weights</b>	
Weight, approx.	100 g; With packaging

Ordering data	Article No.	Ordering data	Article No.
<b>SIMATIC WinAC RTX 2010</b> Software PLC for PC-based automation tasks with stringent deterministic requirements; PROFIBUS and PROFINET; CD-ROM with electronic documentation d, e, f; single license, executable under Windows XP SP2 and SP3 as well as Windows 7 (32 bit)	6ES7671-0RC08-0YA0	<b>CP 5613 A3 communications processor</b> PCI card (32 bit; 3.3 V/5 V) for connection to PROFIBUS incl. DP-Base software; DP-RAM interface for DP master, incl. PG and FDL protocols; single license for one installation, runtime software, software and electronic manual on CD-ROM, Class A, for operating system support see SIMATIC NET software V12; English/German	6GK1561-3AA02
<b>SIMATIC WinAC RTX 2010 Upgrade</b> For upgrading from basic/RTX V3.x, V4.0, V4.1 2005, 2008 and 2009; single license, executable under Windows XP SP2 and SP3 and Windows 7 (32 bit)	6ES7671-0RC08-0YE0	<b>CP 5623 communications processor</b> PCI Express x1 card (32 bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP slave, incl. PG and FDL protocols; single license for one installation, runtime software, software and electronic manual on CD-ROM, Class A, for operating system support see SIMATIC NET software; English/German	6GK1562-3AA00
<b>CP 5612 communications processor</b> PCI card (32 bit) for connection of a programming device or PC to PROFIBUS	6GK1561-2AA00	<b>CP 1616 communications processor</b> PCI card (32 bit; 3.3/5 V universal key) with ASIC ERTEC 400 for connecting PCs to PROFINET IO with 4-port real-time switch (RJ45); incl. IO-Base software for PROFINET IO controller (RT operation) and NCM PC; single license for one installation, runtime software, software and electronic manual on CD-ROM, Class A, for 32-bit Windows XP Professional; English/German	6GK1161-6AA02
<b>CP 5622 communications processor</b> PCI Express x1 card (32 bit) for connection of a programming device or PC to PROFIBUS	6GK1562-2AA00		
<b>CP 5603 Microbox Package</b> Comprising CP 5603 module and Microbox expansion rack	6GK1560-3AU00		

## Software controllers

### SIMATIC WinAC

#### SIMATIC WinAC RTX F

#### Overview



- SIMATIC WinAC RTX F:  
Optimized for applications that demand a high degree of flexibility and integration capability and that must also satisfy safety requirements up to SIL 3 (IEC 61508).
- The software solution for tasks that require hard deterministic behavior and high performance.
- With real-time expansion for assuring deterministic behavior for the control section.
- Distributed I/O can be connected over PROFIBUS and/or PROFINET, also safety-related over PROFIsafe.

New:

- SIMATIC IPC427D and IPC477D are fully supported
  - Communication via onboard CP 5622
  - Retentive memory
  - LED display of the operating status
- Support for the new PROFIBUS CP 5612 (PCI) and CP 5622 (PCIe)

#### Technical specifications

Article number	<b>6ES7671-1RC08-0YA0</b> SIMATIC WINAC RTX F 2010
<b>Product type designation</b>	
<b>General information</b>	
Firmware version	V4.6
<b>Engineering with</b>	
• Programming package	STEP 7 V5.5 or higher + hardware update / iMap V3.0 SP1 / option package S7 Distributed Safety V5.4 + SP5 / S7 F Configuration Pack V5.5 + SP6 + HF1
<b>Memory</b>	
Type of memory	RAM
<b>Work memory</b>	
• integrated (for program)	4 Mbyte; Adjustable; depends on Non Paged Memory Pool
• integrated (for data)	4 Mbyte; Adjustable; depends on Non Paged Memory Pool
<b>Load memory</b>	
• integrated RAM, max.	Adjustable; depends on Non Paged Memory Pool
<b>CPU processing times</b>	
for bit operations, typ.	0.004 µs; Typical
for fixed point arithmetic, typ.	0.003 µs; Typical
for floating point arithmetic, typ.	0.004 µs; Typical
Reference platform	Pentium 4, 2.4 GHz
<b>CPU-blocks</b>	
<b>DB</b>	
• Number, max.	65 535; Limited only by RAM set for data
• Size, max.	64 kbyte
<b>FB</b>	
• Number, max.	65 536; Limited only by RAM set for code
• Size, max.	64 kbyte
<b>FC</b>	
• Number, max.	65 536; Limited only by RAM set for code
• Size, max.	64 kbyte

Article number	<b>6ES7671-1RC08-0YA0</b> SIMATIC WINAC RTX F 2010
<b>OB</b>	
• Size, max.	64 kbyte
<b>Nesting depth</b>	
• per priority class	24
• additional within an error OB	24
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>Retentivity</b>	
- can be set	Yes
- lower limit	0
- upper limit	2 047
- preset	8
<b>Counting range</b>	
- can be set	Yes
- lower limit	0
- upper limit	999
<b>IEC counter</b>	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
<b>S7 times</b>	
• Number	2 048
<b>Retentivity</b>	
- can be set	Yes
- lower limit	0
- upper limit	2 047
- preset	0
<b>Time range</b>	
- lower limit	10 ms
- upper limit	9 990 s

## Technical specifications (continued)

Article number	<b>6ES7671-1RC08-0YA0</b> SIMATIC WINAC RTX F 2010
<b>IEC timer</b>	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
<b>Data areas and their retentivity</b>	
Retentivity without UPS and PS Extension Board	128 kbyte with SIMATIC IPC427C and HMI IPC477C; further SIMATIC PCs on request
Retentivity with UPS	all data
<b>Flag</b>	
• Number, max.	16 kbyte
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8
<b>Data blocks</b>	
• Retentivity adjustable	Yes; via non-retain property on DB
• Retentivity preset	Yes
<b>Local data</b>	
• adjustable, max.	64 kbyte
• preset	32 kbyte
• per priority class, max.	61 440 byte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	16 kbyte
• Outputs	16 kbyte
<b>of which, distributed</b>	
- DP interface, inputs	16 kbyte
- DP interface, outputs	16 kbyte
- PN interface, inputs	16 kbyte
- PN interface, outputs	16 kbyte
<b>Process image</b>	
• Inputs, adjustable	8 kbyte
• Outputs, adjustable	8 kbyte
• Inputs, default	512 byte
• Outputs, default	512 byte
<b>Subprocess images</b>	
• Number of subprocess images, max.	15
<b>Digital channels</b>	
• Inputs	128 000
• Outputs	128 000
<b>Analog channels</b>	
• Inputs	8 000
• Outputs	8 000
<b>Submodules</b>	
• Number of submodules, max.	4
• of which PROFIBUS, max.	4; Supported interfaces: see 1st and 2nd interface
• of which Industrial Ethernet, max.	1; Supported interfaces: see 3rd and 4th interface
<b>Number of operable FMs and CPs (recommended)</b>	
• FM	4; FM distributed: FM 350-1, FM 350-2, FM 351, FM 352 / FM 352-5, FM 353, FM 354, FM 355, FM 355-2
• CP, point-to-point	2; CP 340, CP 341 distributed
• CP, LAN	Over PC CP

Article number	<b>6ES7671-1RC08-0YA0</b> SIMATIC WINAC RTX F 2010
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time clock)	Yes
• battery-backed and synchronizable	Yes
<b>Operating hours counter</b>	
• Number	8
<b>Clock synchronization</b>	
• supported	Yes
• to PC-CP, slave	Yes
• on Ethernet via NTP	Yes
<b>1st interface</b>	
Interface type	CP 5611-A2, CP 5621, integrated PROFIBUS interface of the SIMATIC PC
Max. no. of simultaneously operable CPs	1
Physics	RS 485 / PROFIBUS
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	does not exist
Number of connection resources	8
<b>Functionality</b>	
• MPI	No
• DP master	Yes
• DP slave	No
<b>DP master</b>	
• Number of connections, max.	8
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	64
<b>Services</b>	
- PG/OP communication	Yes
- Global data communication	No
- S7 basic communication	No
- S7 communication	Yes
- S7 communication, as client	Yes
- S7 communication, as server	Yes
- Equidistance mode support	Yes; Only in conjunction with isochronous mode
- Isochronous mode	Yes
- SYNC/FREEZE	Yes
- Activation/deactivation of DP slaves	Yes
- Direct data exchange (slave-to-slave communication)	Yes
- DPV1	Yes
<b>Address area</b>	
- Inputs, max.	16 kbyte
- Outputs, max.	16 kbyte
<b>User data per DP slave</b>	
- Inputs, max.	244 byte
- Outputs, max.	244 byte
<b>2nd interface</b>	
Interface type	CP 5613, CP 5613-A2, CP 5603, CP 5623
Max. no. of simultaneously operable CPs	4
Physics	RS 485 / PROFIBUS
Isolated	Yes

## Software controllers

### SIMATIC WinAC

#### SIMATIC WinAC RTX F

#### Technical specifications (continued)

Article number	<b>6ES7671-1RC08-0YA0</b> SIMATIC WINAC RTX F 2010
<b>Functionality</b>	
• MPI	No
• DP master	Yes
• DP slave	No
<b>DP master</b>	
• Number of connections, max.	50
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	125
<b>Services</b>	
- PG/OP communication	Yes
- Global data communication	No
- S7 basic communication	No
- S7 communication	Yes
- S7 communication, as client	Yes
- S7 communication, as server	Yes
- Equidistance mode support	Yes; Only in conjunction with isochronous mode
- Isochronous mode	Yes
- SYNC/FREEZE	Yes
- Activation/deactivation of DP slaves	Yes
- Direct data exchange (slave-to-slave communication)	Yes
- DPV1	Yes
<b>Address area</b>	
- Inputs, max.	16 kbyte
- Outputs, max.	16 kbyte
<b>User data per DP slave</b>	
- Inputs, max.	244 byte
- Outputs, max.	244 byte
<b>3rd interface</b>	
Interface type	PROFINET
Max. no. of simultaneously operable CPs	1; Intel Pro/1000 (Intel 82571EB, 82573L, 82574L, 82541PI; non-shared IRQ required); integrated IE interface SIMATIC PC 4x7B, 6x7B, 8x7B, IPC4x7C, IPC6x7C, IPC8x7C
Physics	Ethernet
Isolated	Yes
Integrated switch	No
Number of ports	1
Automatic detection of transmission speed	Yes; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
<b>Media redundancy</b>	
• supported	No
<b>Functionality</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	No
• PROFINET CBA	Yes
• Open IE communication	Yes

Article number	<b>6ES7671-1RC08-0YA0</b> SIMATIC WINAC RTX F 2010
<b>PROFINET IO Controller</b>	
• Transmission rate, min.	100 Mbit/s
• Transmission rate, max.	100 Mbit/s
• Number of connectable IO devices, max.	128
• Max. number of connectable IO devices for RT	128
- of which in line, max.	128
• IRT	No
• Prioritized startup	Yes
- Number of IO Devices, max.	32
• Activation/deactivation of IO Devices	Yes
- Maximum number of IO devices that can be activated/deactivated at the same time.	8
• IO Devices changing during operation (partner ports), supported	Yes
• Device replacement without swap medium	Yes
• Send cycles	1 ms
• Updating time	1 - 512 ms (minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices, and on the volume of configured user data)
<b>Services</b>	
- PG/OP communication	Yes
- S7 communication	Yes
- Isochronous mode	No
- Open IE communication	Yes
<b>Address area</b>	
- Inputs, max.	16 kbyte
- Outputs, max.	16 kbyte
- User data per address area, max.	2 kbyte
- User data consistency, max.	254 byte
<b>Open IE communication</b>	
• Number of connections, max.	32
• Local port numbers used at the system end	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
• Keep-alive function, supported	Yes
<b>4th interface</b>	
Interface type	PROFINET
Max. no. of simultaneously operable CPs	1; CP 1616 (HW release 8 or above), CP 1604 (HW release 7 or higher), integrated PROFINET interface of SIMATIC PC and S7-mEC
Physics	Ethernet
Isolated	Yes
Integrated switch	Yes
Number of ports	3
Automatic detection of transmission speed	Yes; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
Change of IP address at runtime, supported	Yes
Number of connection resources	32



## Technical specifications (continued)

Article number	<b>6ES7671-1RC08-0YA0</b> SIMATIC WINAC RTX F 2010
<b>Media redundancy</b>	
• supported	Yes
• Switchover time on line break, typically	200 ms
• Number of stations in the ring, max.	50
<b>Functionality</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	No
• PROFINET CBA	Yes
• Open IE communication	Yes
<b>PROFINET IO Controller</b>	
• Transmission rate, max.	100 Mbit/s
• Max. number of connectable IO devices for RT	256
- of which in line, max.	256
• Number of IO devices with IRT and the option "high flexibility"	64
- of which in line, max.	32
• Number of IO Devices with IRT and the option "high performance", max.	64
- of which in line, max.	64
• IRT	Yes
• Prioritized startup	Yes
- Number of IO Devices, max.	32
• Activation/deactivation of IO Devices	Yes
- Maximum number of IO devices that can be activated/deactivated at the same time.	8
• IO Devices changing during operation (partner ports), supported	Yes
• Device replacement without swap medium	Yes
• Send cycles	250 µs, 500 µs, 1 ms
• Updating time	0.25...512 depending on the send cycle
<b>Services</b>	
- PG/OP communication	Yes
- S7 communication	Yes
- Isochronous mode	Yes
- Open IE communication	Yes
<b>Address area</b>	
- Inputs, max.	16 kbyte
- Outputs, max.	16 kbyte
- User data per address area, max.	2 kbyte
- User data consistency, max.	254 byte
<b>Open IE communication</b>	
• Number of connections, max.	32
• Local port numbers used at the system end	0, 20, 21, 25, 80, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes
Number of DP masters with isochronous mode	2
User data per isochronous slave, max.	128 byte
equidistance	Yes
shortest clock pulse	2.2 ms; 2.2 ms without partial process image; 2.2 ms with partial process image

Article number	<b>6ES7671-1RC08-0YA0</b> SIMATIC WINAC RTX F 2010
<b>Communication functions</b>	
PG/OP communication	Yes
Data record routing	Yes; only with CP 5611 or integrated PROFIBUS interface of the SIMATIC PC
<b>Global data communication</b>	
• supported	No
<b>S7 basic communication</b>	
• supported	No
<b>S7 communication</b>	
• supported	Yes
• as server	Yes
• As client	Yes
• User data per job, max.	64 kbyte; Depends on which block is used: BSEND/USEND or PUT/GET
<b>Open IE communication</b>	
• TCP/IP	Yes
- Number of connections, max.	32
- Data length for connection type 01H, max.	Not supported
- Data length for connection type 11H, max.	65 534 byte
- Data length, max.	65 534 byte
• ISO-on-TCP (RFC1006)	Yes
- Number of connections, max.	32
- Data length, max.	65 534 byte
• UDP	Yes
- Number of connections, max.	32
- Data length, max.	1 472 byte
<b>Web server</b>	
• supported	Yes
• Number of HTTP clients	2
• User-defined websites	No
<b>PROFINET CBA (at set setpoint communication load)</b>	
• Setpoint for the CPU communication load	20 %
• Number of remote interconnection partners	64
• Number of functions, master/slave	30
• Total of all Master/Slave connections	1 000
• Data length of all incoming connections master/slave, max.	6 800 byte
• Data length of all outgoing connections master/slave, max.	6 800 byte
• Number of device-internal and PROFIBUS interconnections	500
• Data length of device-internal und PROFIBUS interconnections, max.	4 000 byte
• Data length per connection, max.	1 400 byte



## Software controllers

### SIMATIC WinAC

#### SIMATIC WinAC RTX F

#### Technical specifications (continued)

Article number	<b>6ES7671-1RC08-0YA0</b> SIMATIC WINAC RTX F 2010
<b>Remote interconnections with acyclic transmission</b>	
- Sampling frequency: Sampling time, min.	500 ms
- Number of incoming interconnections	100
- Number of outgoing interconnections	100
- Data length of all incoming interconnections, max.	2 000 byte
- Data length of all outgoing interconnections, max.	2 000 byte
- Data length per connection, max.	1 400 byte
<b>Remote interconnections with cyclic transmission</b>	
- Transmission frequency: Transmission interval, min.	10 ms
- Number of incoming interconnections	200
- Number of outgoing interconnections	200
- Data length of all incoming interconnections, max.	4 800 byte
- Data length of all outgoing interconnections, max.	4 800 byte
- Data length per connection, max.	250 byte
<b>HMI variables via PROFINET (acyclic)</b>	
- Number of stations that can log on for HMI variables (PN OPC/iMap)	3
- HMI variable updating	500 ms
- Number of HMI variables	200
- Data length of all HMI variables, max.	2 000 byte
<b>PROFIBUS proxy functionality</b>	
- supported	Yes
- Number of linked PROFIBUS devices	16
- Data length per connection, max.	240 byte; Slave-dependent
<b>Number of connections</b>	
• overall	96
<b>S7 message functions</b>	
Number of login stations for message functions, max.	62
SCAN procedure	No
Process diagnostic messages	Yes; ALARM_S, ALARM_SQ, ALARM_D, ALARM_DQ
simultaneously active Alarm-S blocks, max.	20; of a total of 20 for all SFCs
Alarm 8-blocks	Yes
• Number of instances for alarm 8 and S7 communication blocks, max.	4 000
Process control messages	No

Article number	<b>6ES7671-1RC08-0YA0</b> SIMATIC WINAC RTX F 2010
<b>Test commissioning functions</b>	
Status block	Yes
Single step	Yes
Number of breakpoints	20
<b>Status/control</b>	
• Status/control variable	Yes
<b>Forcing</b>	
• Forcing	No
<b>Diagnostic buffer</b>	
• present	Yes
• Number of entries, max.	
- can be set	Yes
- preset	120
<b>Hardware requirements</b>	
Hardware required	PC with color monitor, keyboard, mouse or pointing device for Windows
Main memory, min.	1 Gbyte
Required memory on hard disk, min.	100 Mbyte
Processor	Intel Celeron M 900 MHz or compatible (older PC systems with Programmable Interrupt Controllers (PIC) are not suitable for WinAC RTX F 2010.)
• Multi-processor system	No
• Hyper-threading	Yes
<b>Configuration programming</b>	
• Nesting levels	8
<b>Programming language</b>	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes
- HiGraph®	Yes
<b>Software libraries</b>	
- Easy Motion Control	Yes
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Block encryption	No
<b>Open Development interfaces</b>	
• CCX (Custom Code Extension)	Yes; WinAC ODK V4.2 or higher
• CMI (Controller Management Interface)	Yes; WinAC ODK V4.2 or higher
• SMX (Shared Memory Extension)	Yes; WinAC ODK V4.2 or higher
- Inputs	4 kbyte
- Outputs	4 kbyte
<b>Weights</b>	
Weight, approx.	100 g; With packaging

Ordering data	Article No.	Ordering data	Article No.
<b>SIMATIC WinAC RTX F 2010</b>	<b>6ES7671-1RC08-0YA0</b>	<b>CP 5623 communications processor</b>	<b>6GK1562-3AA00</b>
<b>SIMATIC WinAC RTX F 2010 upgrade</b>	<b>6ES7671-1RC08-0YE0</b>	PCI Express x1 card (32 bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP slave, incl. PG and FDL protocols; single license for one installation, runtime software, software and electronic manual on CD-ROM, Class A, for operating system support see SIMATIC NET software; English/German	
<b>CP 5612 communications processor</b>	<b>6GK1561-2AA00</b>	<b>CP 1616 communications processor</b>	<b>6GK1161-6AA02</b>
PCI card (32 bit) for connection of a programming device or PC to PROFIBUS		PCI card (32 bit; 3.3/5 V universal key) with ASIC ERTEC 400 for connecting PCs to PROFINET IO with 4-port real-time switch (RJ45); incl. IO-Base software for PROFINET IO controller (RT operation) and NCM PC; single license for one installation, runtime software, software and electronic manual on CD-ROM, Class A, for 32-bit Windows XP Professional; English/German	
<b>CP 5622 communications processor</b>	<b>6GK1562-2AA00</b>		
PCI Express x1 card (32 bit) for connection of a programming device or PC to PROFIBUS			
<b>CP 5603 Microbox Package</b>	<b>6GK1560-3AU00</b>		
Comprising CP 5603 module and Microbox expansion rack			
<b>CP 5613 A3 communications processor</b>	<b>6GK1561-3AA02</b>		
PCI card (32 bit; 3.3 V/5 V) for connection to PROFIBUS incl. DP-Base software; DP-RAM interface for DP master, incl. PG and FDL protocols; single license for one installation, runtime software, software and electronic manual on CD-ROM, Class A, for operating system support see SIMATIC NET software V12; English/German			

## Software controllers

### SIMATIC WinAC

#### SIMATIC WinAC ODK

##### Overview



- SIMATIC WinAC software PLCs support powerful interfaces which permit close meshing of the control task with PC-based applications.
- WinAC ODK allows the user to develop applications or to integrate already existing applications into the control task.

New with WinAC ODK V4.2:

- CCX interface:
  - New SFB 65003 for asynchronous execution of ODK applications
  - Expansion of data access functions
  - Creation of Windows DLL with C# and VB
- SMX interface:
  - Access to the Shared Memory interface under IntervalZero RTX
  - Expansion of data access functions
  - Creation of Windows applications with C# and VB
- Supports MS Visual Studio 2005 and 2008 (under Windows)

##### Technical specifications

Article number	<b>6ES7806-1CC03-0BA0</b> SIMATIC WINAC ODK V4.2
<b>Product type designation</b>	
<b>Hardware requirements</b>	
Hardware required	PC with color monitor, keyboard, mouse or pointing device for Windows
Main memory, min.	1 Gbyte
Required memory on hard disk, min.	30 Mbyte
Processor	Intel Pentium 800 MHz
<b>Open Development interfaces</b>	
• CCX (Custom Code Extension)	Yes; See product information: <a href="http://support.automation.siemens.com/WW/view/en/48207241">http://support.automation.siemens.com/WW/view/en/48207241</a>
• CMI (Controller Management Interface)	Yes; See product information: <a href="http://support.automation.siemens.com/WW/view/en/48207241">http://support.automation.siemens.com/WW/view/en/48207241</a>
• SMX (Shared Memory Extension)	Yes; See product information: <a href="http://support.automation.siemens.com/WW/view/en/48207241">http://support.automation.siemens.com/WW/view/en/48207241</a>
<b>Weights</b>	
Weight, approx.	200 g

##### Ordering data

##### Article No.

##### **SIMATIC WinAC ODK V4.2**

for integration of C/C++ code in WinAC PLCs, executable under Windows XP SP2 or SP3; CD-ROM with electronic documentation

Single license

**6ES7806-1CC03-0BA0**

## Overview



- Get off to a fast start in automation solutions with embedded PC platforms.
  - Ready-to-use SIMATIC WinAC RTX or WinAC RTX F preinstalled on EC31
  - Prepared for use in a SIMATIC environment with PROFINET and Industrial Ethernet
  - Commissioning by specialist automation personnel as with the S7-300
  - Configuring and programming with SIMATIC STEP 7 over Industrial Ethernet
  - Optional visualization

- Modular expansion capability:
  - Central expansion with
  - S7-300 I/O (SM modules of S7-300)
  - Expansion modules for additional PC interfaces, e.g. DVI-I, USB, Gigabit Ethernet networks and memory card slots, as well as PCI-104
- Rugged operation
  - Hard-disk-free operation based on flash disk and Windows Embedded Standard
  - Fan-free operation
- Flexibility of a PC-based automation environment
  - Free memory space on flash disk can be used for other PC applications
  - Use of WinAC ODK with SIMATIC WinAC RTX and WinAC RTX F (read-only in safety-related program part)
  - Connection option for USB devices
  - Memory capacity expandable using multimedia card
- Data retentivity for WinAC RTX and RTX F without uninterruptible power supply (UPS)

## Technical specifications

Article number	6ES7677-1DD10-0BA0	6ES7677-1DD10-0BB0	6ES7677-1FD10-0FB0	6ES7677-1DD10-0BF0	6ES7677-1DD10-0BG0	6ES7677-1DD10-0BH0
	S7-MODULAR EMBEDDED CONTROLLER EC31	S7-MODULAR EMBEDDED CONTROLLER EC31-RTX	S7-MOD. EMBEDDED CONTROLLER EC31-RTX F	S7-MEC, EC31-HMI/RTX 128 PT	S7-MEC, EC31-HMI/RTX 512 PT	S7-MEC, EC31-HMI/RTX 2048 PT
<b>Product type designation</b>						
<b>General information</b>						
Hardware product version	01	01	01	01	01	01
Firmware version	V2.0	V2.0	V2.0	V2.0	V2.0	V2.0
<b>PC configuration</b>						
Computer platform	SIMATIC S7 modular embedded controller	SIMATIC S7 modular embedded controller	SIMATIC S7 modular embedded controller	SIMATIC S7 modular embedded controller	SIMATIC S7 modular embedded controller	SIMATIC S7 modular embedded controller
Processor	Intel Core Duo 1.2 GHz	Intel Core Duo 1.2 GHz	Intel Core Duo 1.2 GHz	Intel Core Duo 1.2 GHz	Intel Core Duo 1.2 GHz	Intel Core Duo 1.2 GHz
Main memory	1 GB RAM	1 GB RAM	1 GB RAM	1 GB RAM	1 GB RAM	1 GB RAM
Flash Disk	4 Gbyte	4 Gbyte	4 Gbyte	4 Gbyte	4 Gbyte	4 Gbyte
Operating systems	Windows Embedded Standard 2009	Windows Embedded Standard 2009	Windows Embedded Standard 2009	Windows Embedded Standard 2009	Windows Embedded Standard 2009	Windows Embedded Standard 2009
<b>Installed software</b>						
• Visualization				WinCC flexible RT 2008 SP2, incl. Sm@rtAccess, recipes, archives options	WinCC flexible RT 2008 SP2, incl. Sm@rtAccess, recipes, archives options	WinCC flexible RT 2008 SP2, incl. Sm@rtAccess, recipes, archives options
• Control		SIMATIC WinAC RTX 2010	SIMATIC WinAC RTX F 2010	SIMATIC WinAC RTX 2010	SIMATIC WinAC RTX 2010	SIMATIC WinAC RTX 2010
• Communication		Yes	Yes	Yes	Yes	Yes

## Software controllers

SIMATIC WinAC

SIMATIC S7-modular Embedded Controller

EC31

### Technical specifications (continued)

Article number	6ES7677-1DD10-0BA0 S7-MODULAR EMBEDDED CONTROLLER EC31	6ES7677-1DD10-0BB0 S7-MODULAR EMBEDDED CONTROLLER EC31-RTX	6ES7677-1FD10-0FB0 S7-MOD. EMBEDDED CONTROLLER EC31-RTX F	6ES7677-1DD10-0BF0 S7-MEC, EC31-HMI/RTX 128 PT	6ES7677-1DD10-0BG0 S7-MEC, EC31-HMI/RTX 512 PT	6ES7677-1DD10-0BH0 S7-MEC, EC31-HMI/RTX 2048 PT
<b>Power losses</b>						
Power loss, typ.	34 W	34 W	34 W	34 W	34 W	34 W
<b>Memory</b>						
Type of memory	256 KB non-volatile memory for retentive data	512 KB non-volatile memory for retentive data	512 KB non-volatile memory for retentive data	512 KB non-volatile memory for retentive data	512 KB non-volatile memory for retentive data	512 KB non-volatile memory for retentive data
<b>Work memory</b>						
• Integrated	1 Gbyte	1 Gbyte	1 Gbyte	1 Gbyte	1 Gbyte	1 Gbyte
<b>CPU processing times</b>						
for bit operations, typ.		0.004 µs; Typical	0.004 µs; Typical	0.004 µs; Typical	0.004 µs; Typical	0.004 µs; Typical
for fixed point arithmetic, typ.		0.003 µs; Typical	0.003 µs; Typical	0.003 µs; Typical	0.003 µs; Typical	0.003 µs; Typical
for floating point arithmetic, typ.		0.004 µs; Typical	0.004 µs; Typical	0.004 µs; Typical	0.004 µs; Typical	0.004 µs; Typical
<b>CPU-blocks</b>						
<b>DB</b>						
• Number, max.		Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each
• Size, max.		64 kbyte	64 kbyte	64 kbyte	64 kbyte	64 kbyte
<b>FB</b>						
• Number, max.		Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each
• Size, max.		64 kbyte	64 kbyte	64 kbyte	64 kbyte	64 kbyte
<b>FC</b>						
• Number, max.		Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each	Max. code size and max. data size: 4 MB each
• Size, max.		64 kbyte	64 kbyte	64 kbyte	64 kbyte	64 kbyte
<b>OB</b>						
• Size, max.		64 kbyte	64 kbyte	64 kbyte	64 kbyte	64 kbyte
• Number of startup OBs		2; OB 100, 102	2; OB 100, 102	2; OB 100, 102	2; OB 100, 102	2; OB 100, 102
• Number of asynchronous error OBs		7; OB 80, 82-85, 86, 88	7; OB 80, 82-85, 86, 88	7; OB 80, 82-85, 86, 88	7; OB 80, 82-85, 86, 88	7; OB 80, 82-85, 86, 88
• Number of synchronous error OBs		2; OB 121, 122	2; OB 121, 122	2; OB 121, 122	2; OB 121, 122	2; OB 121, 122
<b>Nesting depth</b>						
• per priority class		24	24	24	24	24
• additional within an error OB		24	24	24	24	24
<b>Counters, timers and their retentivity</b>						
<b>S7 counter</b>						
• Number		2 048	2 048	2 048	2 048	2 048
<b>Retentivity</b>						
- can be set		Yes	Yes	Yes	Yes	Yes
- lower limit		0	0	0	0	0
- upper limit		2 047	2 047	2 047	2 047	2 047
- preset		8	8	8	8	8
<b>Counting range</b>						
- can be set		Yes	Yes	Yes	Yes	Yes
- lower limit		0	0	0	0	0
- upper limit		999	999	999	999	999
<b>IEC counter</b>						
• present		Yes	Yes	Yes	Yes	Yes
• Type		SFB	SFB	SFB	SFB	SFB

#### Technical specifications (continued)

Article number	6ES7677-1DD10-0BA0	6ES7677-1DD10-0BB0	6ES7677-1FD10-0FB0	6ES7677-1DD10-0BF0	6ES7677-1DD10-0BG0	6ES7677-1DD10-0BH0
	S7-MODULAR EMBEDDED CONTROLLER EC31	S7-MODULAR EMBEDDED CONTROLLER EC31-RTX	S7-MOD. EMBEDDED CONTROLLER EC31-RTX F	S7-MEC, EC31-HMI/RTX 128 PT	S7-MEC, EC31-HMI/RTX 512 PT	S7-MEC, EC31-HMI/RTX 2048 PT
<b>S7 times</b>						
• Number		2 048	2 048	2 048	2 048	2 048
<b>Retentivity</b>						
- can be set		Yes	Yes	Yes	Yes	Yes
- lower limit		0	0	0	0	0
- upper limit		2 047	2 047	2 047	2 047	2 047
<b>Time range</b>						
- lower limit		10 ms	10 ms	10 ms	10 ms	10 ms
- upper limit		9 990 s	9 990 s	9 990 s	9 990 s	9 990 s
<b>IEC timer</b>						
• present		Yes	Yes	Yes	Yes	Yes
• Type		SFB	SFB	SFB	SFB	SFB
<b>Data areas and their retentivity</b>						
Total retentive data area		512 KB	512 KB	512 KB	512 KB	512 KB
<b>Flag</b>						
• Number, max.		16 kbyte	16 kbyte	16 kbyte	16 kbyte	16 kbyte
• Retentivity preset		MB 0 to MB 15	MB 0 to MB 15	MB 0 to MB 15	MB 0 to MB 15	MB 0 to MB 15
• Number of clock memories		8	8	8	8	8
<b>Address area</b>						
<b>I/O address area</b>						
• Inputs		16 kbyte	16 kbyte	16 kbyte	16 kbyte	16 kbyte
• Outputs		16 kbyte	16 kbyte	16 kbyte	16 kbyte	16 kbyte
<b>of which, distributed</b>						
- Inputs		8 kbyte	8 kbyte	8 kbyte	8 kbyte	8 kbyte
- Outputs		8 kbyte	8 kbyte	8 kbyte	8 kbyte	8 kbyte
<b>Process image</b>						
• Inputs, adjustable		16 kbyte	16 kbyte	8 kbyte	8 kbyte	8 kbyte
• Outputs, adjustable		16 kbyte	16 kbyte	8 kbyte	8 kbyte	8 kbyte
• Inputs, default		512 byte	512 byte	512 byte	512 byte	512 byte
• Outputs, default		512 byte	512 byte	512 byte	512 byte	512 byte
<b>Subprocess images</b>						
• Number of subprocess images, max.		15	15	15	15	15
<b>Digital channels</b>						
• Inputs		128 000	128 000	128 000	128 000	128 000
• Outputs		128 000	128 000	128 000	128 000	128 000
<b>Analog channels</b>						
• Inputs		8 000	8 000	8 000	8 000	8 000
• Outputs		8 000	8 000	8 000	8 000	8 000
<b>Hardware configuration</b>						
Integrated power supply	Yes	Yes	Yes	Yes	Yes	Yes
<b>Time of day</b>						
<b>Clock</b>						
• Hardware clock (real-time clock)		Yes	Yes; Resolution: 1 s	Yes	Yes	Yes
<b>Clock synchronization</b>						
• supported		Yes	Yes	Yes	Yes	Yes
• to PC-CP, slave		Yes	Yes	Yes	Yes	Yes
• on Ethernet via NTP		Yes	Yes	Yes	Yes	Yes
<b>Interfaces</b>						
serial interface	0	0		0	0	0
USB port		2 x USB 2.0 high speed/high current		2 x USB 2.0 high speed/high current	2 x USB 2.0 high speed/high current	2 x USB 2.0 high speed/high current

## Software controllers

SIMATIC WinAC

SIMATIC S7-modular Embedded Controller

EC31

### Technical specifications (continued)

Article number	<b>6ES7677-1DD10-0BA0</b> S7-MODULAR EMBEDDED CONTROLLER EC31	<b>6ES7677-1DD10-0BB0</b> S7-MODULAR EMBEDDED CONTROLLER EC31-RTX	<b>6ES7677-1FD10-0FB0</b> S7-MOD. EMBEDDED CONTROLLER EC31-RTX F	<b>6ES7677-1DD10-0BF0</b> S7-MEC, EC31-HMI/RTX 128 PT	<b>6ES7677-1DD10-0BG0</b> S7-MEC, EC31-HMI/RTX 512 PT	<b>6ES7677-1DD10-0BH0</b> S7-MEC, EC31-HMI/RTX 2048 PT
<b>Industrial Ethernet</b>						
• Industrial Ethernet interface	X1: 2 ports 10/100 Mbit/s (ERTEC-based) X2: 1 port 10/100 Mbit/s	X1: 2 ports 10/100 Mbit/s (ERTEC-based) X2: 1 port 10/100 Mbit/s	X1: 2 ports 10/100 Mbit/s (ERTEC-based) X2: 1 port 10/100 Mbit/s	X1: 2 ports 10/100 Mbit/s (ERTEC-based) X2: 1 port 10/100 Mbit/s	X1: 2 ports 10/100 Mbit/s (ERTEC-based) X2: 1 port 10/100 Mbit/s	X1: 2 ports 10/100 Mbit/s (ERTEC-based) X2: 1 port 10/100 Mbit/s
<b>1st interface</b>						
Interface type		PROFINET	PROFINET	PROFINET	PROFINET	PROFINET
Physics		2x RJ45	2x RJ45	2x RJ45	2x RJ45	2x RJ45
Automatic detection of transmission speed		Yes	Yes	Yes	Yes	Yes
Autonegotiation		Yes	Yes	Yes	Yes	Yes
Autocrossing		Yes	Yes	Yes	Yes	Yes
Number of connection resources		32	32	32	32	32
<b>Functionality</b>						
• MPI			No			
• DP master			No			
• DP slave			No			
• PROFINET IO Device		No	No	No	No	No
• PROFINET IO Controller		Yes	Yes	Yes	Yes	Yes
• PROFINET CBA		Yes	Yes	Yes	Yes	Yes
• Open IE communication		Yes		Yes	Yes	Yes
• Point-to-point connection			No			
<b>PROFINET IO Controller</b>						
• Number of connectable IO devices, max.		256	256	256	256	256
• Max. number of connectable IO devices for RT		256	256	256	256	256
- of which in line, max.		256		256	256	256
• Number of IO devices with IRT and the option "high flexibility"		256	256	256	256	256
- of which in line, max.		61	61	61	61	61
• Number of IO Devices with IRT and the option "high performance", max.		256	256	256	256	256
- of which in line, max.		64	64	64	64	64
• IRT		Yes	Yes	Yes	Yes	Yes
• Prioritized startup		Yes	Yes	Yes	Yes	Yes
- Number of IO Devices, max.		32	32	32	32	32
• Activation/deactivation of IO Devices		Yes	Yes	Yes	Yes	Yes
- Maximum number of IO devices that can be activated/deactivated at the same time.		8	8	8	8	8
• IO Devices changing during operation (partner ports), supported		Yes	Yes	Yes	Yes	Yes
- Max. number of IO devices per tool		8	8	8	8	8
• Device replacement without swap medium		Yes	Yes	Yes	Yes	Yes
• Send cycles		Adjustable: 250 µs, 500 µs and 1 ms	Adjustable: 250 µs, 500 µs and 1 ms	Adjustable: 250 µs, 500 µs and 1 ms	Adjustable: 250 µs, 500 µs and 1 ms	Adjustable: 250 µs, 500 µs and 1 ms
• Updating times		250 µs - 128 ms (with signal cycle 250 µs); 500 µs - 256 ms (with signal cycle 500 µs); 1 ms - 512 ms (with signal cycle 1 ms)	250 µs - 128 ms (with signal cycle 250 µs); 500 µs - 256 ms (with signal cycle 500 µs); 1 ms - 512 ms (with signal cycle 1 ms)	250 µs - 128 ms (with signal cycle 250 µs); 500 µs - 256 ms (with signal cycle 500 µs); 1 ms - 512 ms (with signal cycle 1 ms)	250 µs - 128 ms (with signal cycle 250 µs); 500 µs - 256 ms (with signal cycle 500 µs); 1 ms - 512 ms (with signal cycle 1 ms)	250 µs - 128 ms (with signal cycle 250 µs); 500 µs - 256 ms (with signal cycle 500 µs); 1 ms - 512 ms (with signal cycle 1 ms)

**Technical specifications** (continued)

Article number	<b>6ES7677-1DD10-OBAA0</b> S7-MODULAR EMBEDDED CONTROLLER EC31	<b>6ES7677-1DD10-OBBO</b> S7-MODULAR EMBEDDED CONTROLLER EC31-RTX	<b>6ES7677-1FD10-OFB0</b> S7-MOD. EMBEDDED CONTROLLER EC31-RTX F	<b>6ES7677-1DD10-OBFO</b> S7-MEC. EC31-HMI/RTX 128 PT	<b>6ES7677-1DD10-OBGO</b> S7-MEC. EC31-HMI/RTX 512 PT	<b>6ES7677-1DD10-OBHO</b> S7-MEC. EC31-HMI/RTX 2048 PT
<b>Services</b>						
- PG/OP communication		Yes	Yes	Yes	Yes	Yes
- S7 routing		Yes	Yes	Yes	Yes	Yes
- S7 communication		Yes	Yes	Yes	Yes	Yes
- Isochronous mode		Yes	Yes	Yes	Yes	Yes
<b>Address area</b>						
- Inputs, max.		16 kbyte	16 kbyte	16 kbyte	16 kbyte	16 kbyte
- Outputs, max.		16 kbyte	16 kbyte	16 kbyte	16 kbyte	16 kbyte
- User data per address area, max.		2 kbyte	2 kbyte	2 kbyte	2 kbyte	2 kbyte
- User data consistency, max.		256 byte	256 byte	256 byte	256 byte	256 byte
<b>Open IE communication</b>						
• Open IE communication		Yes	Yes	Yes	Yes	Yes
• Number of connections, max.		32	32	32	32	32
• Local port numbers used at the system end		0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
<b>PROFINET functions</b>						
• Detection of accessible nodes, supported		Yes; DCP	Yes; DCP	Yes; DCP	Yes; DCP	Yes; DCP
• Assignment of the IP address, supported		Yes; DCP	Yes; DCP	Yes; DCP	Yes; DCP	Yes; DCP
• Assignment of the device name, supported		Yes; DCP	Yes; DCP	Yes; DCP	Yes; DCP	Yes; DCP
• Topology recognition, supported		Yes; LLDP, LLDP MIB, SNMP	Yes; LLDP, LLDP MIB, SNMP	Yes; LLDP, LLDP MIB, SNMP	Yes; LLDP, LLDP MIB, SNMP	Yes; LLDP, LLDP MIB, SNMP
• Extended network diagnostics with Standard MIB II, supported		Yes; Standard MIB II, SNMP	Yes; Standard MIB II, SNMP	Yes; Standard MIB II, SNMP	Yes; Standard MIB II, SNMP	Yes; Standard MIB II, SNMP
<b>2nd interface</b>						
Interface type		Integrated Ethernet interface	Integrated Ethernet interface	Integrated Ethernet interface	Integrated Ethernet interface	Integrated Ethernet interface
Physics		Ethernet RJ45	Ethernet RJ45	Ethernet RJ45	Ethernet RJ45	Ethernet RJ45
Automatic detection of transmission speed		Yes	Yes	Yes	Yes	Yes
Autonegotiation		Yes	Yes	Yes	Yes	Yes
Autocrossing		No	No	No	No	No
Number of connection resources		32	32	32	32	32
<b>Functionality</b>						
• PROFINET IO Controller		No	No	No	No	No
• PROFINET IO Device		No	No	No	No	No
• PROFINET CBA		No	No	No	No	No
<b>PROFINET functions</b>						
• Detection of accessible nodes, supported		Yes; DCP	Yes; DCP	Yes; DCP	Yes; DCP	Yes; DCP
• Assignment of the IP address, supported		Yes; DCP	Yes; DCP	Yes; DCP	Yes; DCP	Yes; DCP
• Assignment of the device name, supported		Yes; DCP	Yes; DCP	Yes; DCP	Yes; DCP	Yes; DCP
• Topology recognition, supported		Yes; LLDP, LLDP MIB, SNMP	Yes; LLDP, LLDP MIB, SNMP	Yes; LLDP, LLDP MIB, SNMP	Yes; LLDP, LLDP MIB, SNMP	Yes; LLDP, LLDP MIB, SNMP
• Extended network diagnostics with Standard MIB II, supported		Yes; Standard MIB II, SNMP	Yes; Standard MIB II, SNMP	Yes; Standard MIB II, SNMP	Yes; Standard MIB II, SNMP	Yes; Standard MIB II, SNMP



## Software controllers

SIMATIC WinAC

SIMATIC S7-modular Embedded Controller

EC31

### Technical specifications (continued)

Article number	6ES7677-1DD10-0BA0 S7-MODULAR EMBEDDED CONTROLLER EC31	6ES7677-1DD10-0BB0 S7-MODULAR EMBEDDED CONTROLLER EC31-RTX	6ES7677-1FD10-0FB0 S7-MOD. EMBEDDED CONTROLLER EC31-RTX F	6ES7677-1DD10-0BF0 S7-MEC, EC31-HMI/RTX 128 PT	6ES7677-1DD10-0BG0 S7-MEC, EC31-HMI/RTX 512 PT	6ES7677-1DD10-0BH0 S7-MEC, EC31-HMI/RTX 2048 PT
<b>Communication functions</b>						
PG/OP communication		Yes	Yes	Yes	Yes	Yes
<b>Global data communication</b>						
• supported		No	No	No	No	No
<b>S7 basic communication</b>						
• supported		No	No	No	No	No
<b>S7 communication</b>						
• supported		Yes	Yes	Yes	Yes	Yes
• as server		Yes	Yes	Yes	Yes	Yes
• As client		Yes	Yes	Yes	Yes	Yes
<b>Open IE communication</b>						
• TCP/IP		Yes; Via integrated PROFINET interface (X1) and loadable FBs	Yes; Via integrated PROFINET interface (X1) and loadable FBs	Yes; Via integrated PROFINET interface (X1) and loadable FBs	Yes; Via integrated PROFINET interface (X1) and loadable FBs	Yes; Via integrated PROFINET interface (X1) and loadable FBs
- Number of connections, max.		32	32	32	32	32
- Data length, max.		32 kbyte	32 kbyte	32 kbyte	32 kbyte	32 kbyte
• ISO-on-TCP (RFC1006)		Yes; Via integrated PROFINET interface (X1) and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs	Yes; Via integrated PROFINET interface (X1) and loadable FBs	Yes; Via integrated PROFINET interface (X1) and loadable FBs	Yes; Via integrated PROFINET interface (X1) and loadable FBs
- Number of connections, max.		32	32	32	32	32
- Data length, max.		32 kbyte	32 kbyte	32 kbyte	32 kbyte	32 kbyte
• UDP		Yes; Via integrated PROFINET interface (X1) and loadable FBs	Yes; Via integrated PROFINET interface (X1) and loadable FBs	Yes; Via integrated PROFINET interface (X1) and loadable FBs	Yes; Via integrated PROFINET interface (X1) and loadable FBs	Yes; Via integrated PROFINET interface (X1) and loadable FBs
- Number of connections, max.		32	32	32	32	32
- Data length, max.		1 472 byte	1 472 byte	1 472 byte	1 472 byte	1 472 byte
<b>S7 message functions</b>						
Number of login stations for message functions, max.		62; The alarm functions cannot currently be used for central bus modules	62; The alarm functions cannot currently be used for central bus modules	62; The alarm functions cannot currently be used for central bus modules	62; The alarm functions cannot currently be used for central bus modules	62; The alarm functions cannot currently be used for central bus modules
Process diagnostic messages		Yes; Alarm_S	Yes; Alarm_S	Yes; Alarm_S	Yes; Alarm_S	Yes; Alarm_S
<b>Test commissioning functions</b>						
<b>Status/control</b>						
• Status/control variable		Yes	Yes	Yes	Yes	Yes
<b>Forcing</b>						
• Forcing		No	No	No	No	No
<b>Diagnostic buffer</b>						
• present		Yes	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>						
<b>Ambient temperature in operation</b>						
• Min.	0 °C	0 °C	0 °C	0 °C	0 °C	0 °C
• max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
<b>Configuration</b>						
<b>programming</b>						
<b>Programming language</b>						
- LAD		Yes	Yes	Yes	Yes	Yes
- FBD		Yes	Yes	Yes	Yes	Yes
- STL		Yes	Yes	Yes	Yes	Yes
- SCL		Yes	Yes	Yes	Yes	Yes
- CFC		Yes	Yes	Yes	Yes	Yes
- GRAPH		Yes	Yes	Yes	Yes	Yes
- HiGraph®		Yes	Yes	Yes	Yes	Yes

**Technical specifications** (continued)

Article number	<b>6ES7677-1DD10-0BA0</b>	<b>6ES7677-1DD10-0BB0</b>	<b>6ES7677-1FD10-0FB0</b>	<b>6ES7677-1DD10-0BF0</b>	<b>6ES7677-1DD10-0BG0</b>	<b>6ES7677-1DD10-0BH0</b>
	S7-MODULAR EMBEDDED CONTROLLER EC31	S7-MODULAR EMBEDDED CONTROLLER EC31-RTX	S7-MOD. EMBEDDED CONTROLLER EC31-RTX F	S7-MEC, EC31-HMI/RTX 128 PT	S7-MEC, EC31-HMI/RTX 512 PT	S7-MEC, EC31-HMI/RTX 2048 PT
<b>Dimensions</b>						
Width	160 mm	160 mm	160 mm	160 mm	160 mm	160 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	115 mm	115 mm	115 mm	115 mm	115 mm	115 mm
<b>Weights</b>						
Weight, approx.	1.5 kg	1.5 kg	1.5 kg	1.5 kg	1.5 kg	1.5 kg

**Ordering data**

	Article No.	Article No.
<b>SIMATIC S7-modular Embedded Controller</b>		<b>EC31-HMI/RTX</b>
<b>EC31</b>	<b>6ES7677-1DD10-0BA0</b>	Intel CoreDuo 1.2 GHz processor Memory configuration: 1 GB RAM, 4 GB Flash Disk; interfaces: 1 Industrial Ethernet port, 2 PROFINET ports, 2 USB ports, 1 slot for multimedia card; Software: Windows Embedded Standard pre-installed, Software Development Kit (SDK) for creating C/C++ applications with accesses to central I/O modules
<b>EC31-RTX</b>	<b>6ES7677-1DD10-0BB0</b>	• With WinCC flexible 2008 RT 128 PT <b>6ES7677-1DD10-0BF0</b> • With WinCC flexible 2008 RT 512 PT <b>6ES7677-1DD10-0BG0</b> • With WinCC flexible 2008 RT 2048 PT <b>6ES7677-1DD10-0BH0</b>
<b>EC31-RTX F</b>	<b>6ES7677-1FD10-0FB0</b>	<b>Accessories</b>
		<b>EM PCI-104 expansion module</b> <b>6ES7677-1DD60-1AA0</b> For fitting up to 3 additional PCI-104 cards
		<b>EM PC expansion module</b> <b>6ES7677-1DD50-2AA0</b> Additional connection options: 2 USB interfaces, 1 Gigabit Ethernet interface, 1 serial interface, 1 slot for CF card, 1 slot for SD card/Micro Memory Card

## Software controllers

SIMATIC WinAC

SIMATIC S7-modular Embedded Controller

### Expansion modules

#### Overview



- Expansion modules for SIMATIC S7-modular Embedded Controller EC31
  - EM PCI-104 for fitting up to 3 additional PCI-104 cards
  - EM PC with additional PC interfaces and slots for memory media

#### Technical specifications

Article number	6ES7677-1DD60-1AA0 S7-MEC, EM PCI-104	6ES7677-1DD50-2AA0 S7-MEC, EM PC
<b>Product type designation</b>		
<b>General information</b>		
Hardware product version	01	01
<b>Input current</b>		
from expansion bus	100 mA	580 mA
<b>Power losses</b>		
Power loss, typ.	2.4 W; Without inserted PCI-104 cards	9 W
Power loss, max.		14 W
<b>Hardware configuration</b>		
Integrated power supply	Yes	No
<b>Interfaces</b>		
serial interface	0	1x V.24 (RS232)
<b>Industrial Ethernet</b>		
• Industrial Ethernet interface		Onboard, 10/100/1000 Mbit/s, RJ45
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	0 °C	0 °C
• max.	50 °C	50 °C
<b>Dimensions</b>		
Width	120 mm; Without bus connector Extension-Bus	80 mm; Without bus connector Extension-Bus
Height	125 mm; Without external voltage connecting terminal	125 mm
Depth	115 mm	115 mm
<b>Weights</b>		
Weight, approx.	0.5 kg	0.4 kg

#### Ordering data

##### EM PCI-104 expansion module

For fitting up to 3 additional PCI-104 cards

##### Article No.

6ES7677-1DD60-1AA0

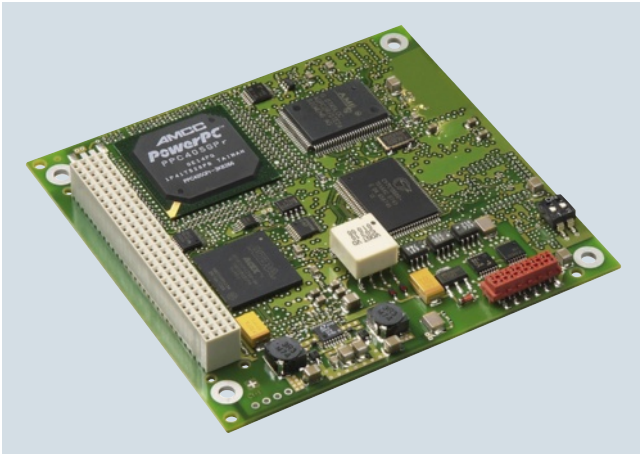
##### Article No.

##### EM PC expansion module

Additional connection options:  
1 DVI-I interface, 2 USB interfaces,  
1 Gigabit Ethernet interface,  
1 serial interface, 1 slot for CF card,  
1 slot for SD card/Micro Memory Card

6ES7677-1DD50-2AA0

## Overview



DP-M	DP-S	FMS	OPC	PG/OP	S7/S5
●	●	●	●	●	●

- PCI-104 interface card with own microprocessor for connecting embedded systems with PCI-104 interface to PROFIBUS at up to 12 Mbit/s
- Function compatible with CP 5613 A2
- Communication services:
  - PROFIBUS DP master Class 1 and 2 or DP slave according to IEC 61158/61784
  - PG/OP communication with STEP 5 and STEP 7
  - S7 communication with HARDNET-PB S7 software package
  - Open communication (SEND/RECEIVE) based on the FDL interface
  - PROFIBUS FMS according to IEC 61158/61784 with FMS-5613 software package
- Extensive diagnostics options for installation, commissioning and operation of the module
- Event and filter mechanism for reducing the load on the host CPU
- Multiprotocol operation and parallel operation of up to three CPs
- The appropriate OPC server and configuration tools are included in the scope of delivery of the respective communication software
- Development kit with driver sources for integration into "non-Windows" environments

## Note:

FMS-5613 supports up to two CP 5603/CP 5613 A2/5614 A2/CP 5623/CP 5624 processors

## Technical specifications

Article number	<b>6GK1560-3AA00</b>
Product type designation	CP 5603
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>Interfaces</b>	
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS 485)
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage	
• 1 from backplane bus	5 V
Relative symmetrical tolerance for DC	
• at 5 V	5 %
Consumed current	
• 1 from backplane bus for DC maximum	0.66 A
Active power loss	3.3 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	85 %
Protection class IP	IP00
<b>Design, dimensions and weight</b>	
Module format	PCI-104
Width	90 mm
Height	21 mm
Depth	96 mm
Net weight	80 g
Mounting type	Screw mounting
Number of plug-in cards of same design plug-in per PC station	3
Number of units Note	FMS-5613 supports up to two CP 5603 / CP 5613 A2 / CP 5614 A2 / CP 5623 / CP 5624 processors
<b>Performance data</b>	
<b>Performance data open communication</b>	
Software for open communication by means of SEND/RECEIVE required	FDL driver included in scope of delivery of the CP
Number of possible connections for open communication by means of SEND/RECEIVE maximum	80
<b>Performance data PROFIBUS DP</b>	
Software for DP master function required	No
Service as DP master	
• DPV0	Yes
• DPV1	Yes
• DPV2	Yes

## Software controllers

SIMATIC WinAC

SIMATIC S7-modular Embedded Controller – Communication

### CP 5603

#### Technical specifications (continued)

Article number	<b>6GK1560-3AA00</b>
Product type designation	CP 5603
Number of DP slaves on DP master usable	124
Amount of data	
• of the address area of the inputs as DP master total	30 256 byte
• of the address area of the outputs as DP master total	30 256 byte
• of the address area of the inputs per DP slave	244 byte
• of the address area of the outputs per DP slave	244 byte
• of the address area of the diagnostic data per DP slave	244 byte
Software for DP slave function required	No
Service as DP slave	
• DPV0	Yes
• DPV1	Yes
Amount of data	
• of the address area of the inputs as DP slave total	244 byte
• of the address area of the outputs as DP slave total	244 byte
<b>Performance data FMS functions</b>	
Software for FMS communication required	Yes, FMS-5613
Number of possible connections for FMS connection maximum	40
<b>Performance data S7 communication</b>	
Software for S7 communication required	Yes, HARDNET-PB S7 (S7-5613)
Number of possible connections for S7/PG communication maximum	50
<b>Performance data multi-protocol mode</b>	
Number of active connections with multi-protocol mode	50
Number of configurable connections per PC station	207
<b>Product functions management, configuration</b>	
Configuration software required	Included in scope of supply
<b>Product functions Diagnosis</b>	
Product function	
• Port diagnostics	Yes
<b>Standards, specifications, approvals</b>	
Standard	
• for EMC	2004/108/EC
• for safety from CSA and UL	CAN/CSA C22.2 & UL 60950-1, UL 508
• for emitted interference	EN 61000-6-3, EN 61000-6-4
• for interference immunity	EN 61000-6-1, EN 61000-6-2
Certificate of suitability	
• CE marking	Yes
• C-Tick	Yes
<b>Accessories</b>	
accessories	optional: Expansion rack for SIMATIC Microbox and slide-in plate for SIMATIC S7-modular Embedded Controller

#### Ordering data

#### Article No.

<b>CP 5603 communications processor</b>	<b>6GK1560-3AA00</b>
PCI-104 card for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP slave, incl. PG and FDL protocols; single license for one installation, runtime software, software and electronic manual on CD-ROM, Class A, for operating system support see SIMATIC NET software; English/German	
<b>CP 5603 Microbox Package</b>	<b>6GK1560-3AU00</b>
For use of CP 5603 in Microbox 420/427B/427C; consisting of CP 5603 module and Microbox expansion rack	
<b>CP 5603 expansion rack</b>	<b>6GK1560-3AA00-0AU0</b>
For use in Microbox 420/427B/427C with mounting material	
<b>CP 5603 mEC Package</b>	<b>6GK1560-3AE00</b>
For use of CP 5603 in SIMATIC S7-MEC; consisting of CP 5603 and withdrawable unit for CP 5603 for installation in the EM PCI-104 expansion module of the SIMATIC S7-MEC	
<b>CP 5603 insert plate</b>	<b>6GK1560-3AA00-0AE0</b>
Metal plate with RS485 cutout for inserting for the S7 modular embedded controller	
<b>HARDNET-PB DP Development Kit</b>	See <a href="http://www.siemens.com/simatic-net/dk5613">http://www.siemens.com/simatic-net/dk5613</a>
HARDNET-PB DP Development Kit software for CP 5603, CP 5613, CP 5613 A2, CP 5623, CP 5613 FO, CP 5614, CP 5614 A2, CP 5624; for integration into other operating system environments on systems with a PCI slot	
<b>HARDNET-PB DP</b>	
Software for DP, incl. PG and FDL protocols, OPC server and NCM PC; runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A, for CP 5603, CP 5613 A2, CP 5623, CP 5614 A2, CP 5624;	
<b>HARDNET-PB DP V8.2</b>	
for 32/64-bit: Windows 7 Professional/Ultimate; for 64-bit: Windows 2008 Server R2 English/German	
• Single license for one installation	<b>6GK1713-5DB08-2AA0</b>
<b>DP-5613 Edition 2008</b>	
for 32-bit Windows XP Professional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows 2008 Server; English/German	
• Single license for one installation	<b>6GK1713-5DB71-3AA0</b>
<b>Software Update Service</b>	<b>6GK1713-5DB00-3AL0</b>
For 1 year with automatic extension; requirement: current software version	

Ordering data	Article No.	Ordering data	Article No.
<b>Upgrade</b> <ul style="list-style-type: none"> <li>From Edition 2006 or 2007 to DP-5613 Edition 2008 or HARDNET-PB DP V8.1</li> <li>From V6.0, V6.1, V6.2 or V6.3 to DP-5613 Edition 2008 or HARDNET-PB DP V8.1</li> </ul>	<b>6GK1713-5DB00-3AE0</b>  <b>6GK1713-5DB00-3AE1</b>	<b>Software Update Service</b> For 1 year with automatic extension; requirement: current software version	<b>6GK1713-5FB00-3AL0</b>
<b>HARDNET-PB S7</b>  Software for S7 communication, incl. PG and FDL protocols, OPC server and NCM PC; runtime software, software and electronic manual on USB flash drive, Class A, for CP 5603, CP 5613 A2, CP 5623, CP 5614 A2, CP 5624;		<b>Upgrade</b> <ul style="list-style-type: none"> <li>From Edition 2006 or 2007 to FMS-5613 Edition 2008</li> <li>From V6.0, V6.1, V6.2 or V6.3 to FMS-5613 Edition 2008</li> </ul>	<b>6GK1713-5FB00-3AE0</b>  <b>6GK1713-5FB00-3AE1</b>
<b>HARDNET-PB S7 V8.2</b>  for 32/64-bit: Windows 7 Professional/Ultimate; for 64-bit: Windows 2008 Server R2 English/German <ul style="list-style-type: none"> <li>Single license for one installation</li> </ul>	<b>6GK1713-5CB08-2AA0</b>	<b>Accessories</b>  <b>PROFIBUS FastConnect bus connector RS 485 Plug 180</b>  With 180° cable outlet, insulation displacement	<b>6GK1500-0FC10</b>
<b>S7-5613 Edition 2008</b>  for 32-bit Windows XP Professional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows 2008 Server; English/German <ul style="list-style-type: none"> <li>Single license for one installation</li> </ul>	<b>6GK1713-5CB71-3AA0</b>	<b>PROFIBUS FC Standard Cable GP</b>  Standard type with special design for quick assembly, 2-core, shielded, sold in meters; max. length 1000 m, minimum order 20 m	<b>6XV1830-0EH10</b>
<b>Software Update Service</b>  For 1 year with automatic extension; requirement: current software version	<b>6GK1713-5CB00-3AL0</b>	<b>PROFIBUS FastConnect Stripping Tool</b>  Preset stripping tool for fast stripping of PROFIBUS FastConnect bus cables	<b>6GK1905-6AA00</b>
<b>Upgrade</b> <ul style="list-style-type: none"> <li>From Edition 2006 or 2007 to S7-5613 Edition 2008 or HARDNET-PB S7 V8.1</li> <li>From V6.0, V6.1, V6.2 or V6.3 to S7-5613 Edition 2008 or HARDNET-PB S7 V8.1</li> </ul>	<b>6GK1713-5CB00-3AE0</b>  <b>6GK1713-5CB00-3AE1</b>	<b>PROFIBUS bus terminal 12M</b>  Bus terminal for connection of PROFIBUS stations up to 12 Mbps with connecting cable 1.5 m long	<b>6GK1500-0AA10</b>
<b>FMS-5613 Edition 2008</b>  Software for FMS protocol incl. PG/OP communication; FDL, FMS-OPC server and NCM PC; runtime software, software and electronic manual on USB flash drive, Class A, for 32-bit Windows XP Professional SP2/3; Windows 2003 Server R2, SP2; Windows Vista Business/Ultimate SP1; Windows 2008 Server; for CP 5603, CP 5613, CP 5613 A2, CP 5623, CP 5613 FO, CP 5614, CP 5614 A2, CP 5624; English/German <ul style="list-style-type: none"> <li>Single license for one installation</li> </ul>	<b>6GK1713-5FB71-3AA0</b>		

Note:

You can find order information for software for communication with PC systems in the IK PI catalog.

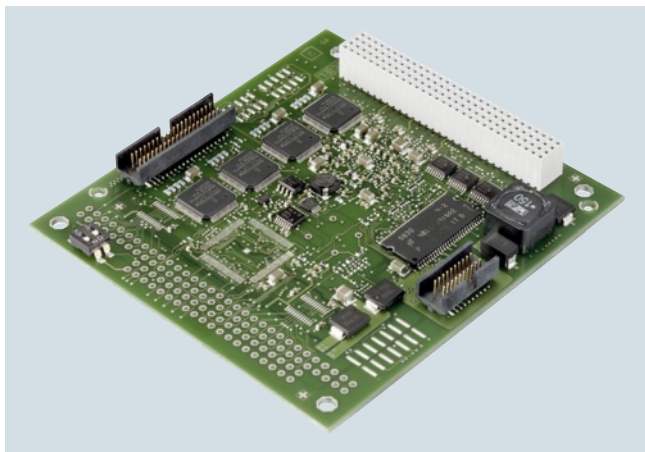
## Software controllers

SIMATIC WinAC

SIMATIC S7-modular Embedded Controller – Communication

### CP 1604

#### Overview



- PCI-104 module for connecting PCI-104 systems to PROFINET IO
- Full/half duplex with autonegotiation
- With Ethernet real-time ASIC ERTEC 400
- Integral 4-port real-time switch
- Communication services:
  - PROFINET IO controller and/or PROFINET IO device
  - Support of IRT in motion control applications
  - Support of PROFlenergy functionality
- High performance through direct memory access
- Integration in network management systems through the support of SNMP
- Comprehensive diagnostics possibilities for installation, start-up and operation of the module
- Powerful configuration tools are included in delivery of module

ISO	TCP/UDP	PN	MRP	OPC	PG/OP	S7/S5	IT
	●	●	●				

#### Technical specifications

Article number	<b>6GK1160-4AA01</b>
Product type designation	CP 1604
<b>Transmission rate</b>	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
<b>Interfaces</b>	
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	4
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port via connection board
• for power supply	4-pole terminal block through power supply board
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Type of voltage supply optional external supply	Yes
Supply voltage	
• 1 from backplane bus	5 V
• external	24 V
• Note	optional external power supply and external supply voltage alternatively via power supply board (optional accessory)
Relative symmetrical tolerance for DC	
• at 5 V	5 %
• at 24 V	20 %

Article number	<b>6GK1160-4AA01</b>
Product type designation	CP 1604
<b>Consumed current</b>	
• 1 from backplane bus for DC maximum	0.8 A
• from external supply voltage for DC at 24 V maximum	0.3 A
Active power loss	4 W
Active power loss in switch mode maximum	4.1 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	5 ... 60 °C
• during storage	-20 ... +60 °C
• during transport	-20 ... +60 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP00
<b>Design, dimensions and weight</b>	
Module format	PC/104-Plus
Width	90 mm
Height	24 mm
Depth	95 mm
Net weight	110 g
Mounting type	Screw mounting
Number of plug-in cards of same design plug-in per PC station	1
Number of units Note	-



## Technical specifications (continued)

Article number	<b>6GK1160-4AA01</b>
Product type designation	CP 1604
<b>Performance data</b>	
<b>Performance data PROFINET communication as PN IO-Controller</b>	
Software for PROFINET IO communication required	No
Number of PN IO devices on PROFINET IO controller usable total	128
Number of PN IO IRT devices on PROFINET IO controller usable	64
Amount of data	
• as user data for input variables as PROFINET IO controller maximum	8 192 byte
• as user data for input variables as PROFINET IO controller maximum	8 192 byte
• as user data for input variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for output variables per PN IO device as PROFINET IO controller maximum	1 433 byte
<b>Performance data PROFINET communication as PN IO-Device</b>	
Amount of data	
• as user data for input variables as PROFINET IO device maximum	1 433 byte
• as user data for input variables as PROFINET IO device maximum	1 433 byte
• as user data for input variables for each sub-module as PROFINET IO device	254 byte
• as user data for input variables for each sub-module as PROFINET IO device	254 byte
• as user data for the consistency area for each sub-module	254 byte
Number of submodules per PROFINET IO-Device	64
<b>Product functions management, configuration</b>	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
Configuration software required	Included in scope of supply
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
• I&M2 - installation date	Yes
• I&M3 - comment	Yes
• I&M4 - signature	Yes

Article number	<b>6GK1160-4AA01</b>
Product type designation	CP 1604
<b>Product functions Diagnosis</b>	
Product function	
• Web-based diagnostics	Yes
• Port diagnostics	Yes
<b>Product functions switch</b>	
Product feature Switch	Yes
Product function switch-managed	No
Product function with IRT PROFINET IO switch	Yes
<b>Product functions Redundancy</b>	
Software for redundancy function required	No
Product function	
• Ring redundancy	Yes
• Redundancy manager	Yes
Protocol is supported Media Redundancy Protocol (MRP)	Yes
<b>Standards, specifications, approvals</b>	
Standard	
• for EMC	2004/108/EC
• for safety from CSA and UL	CAN/CSA C22.2 & UL 60950-1
• for emitted interference	EN 61000-6-3, EN 61000-6-4
• for interference immunity	EN 61000-6-1, EN 61000-6-2
Certificate of suitability	
• CE marking	Yes
• C-Tick	Yes
<b>Accessories</b>	
accessories	optional: Connection board for CP 1604, power supply board for CP 1604, HARDNET-IE DK (development kit)



## Software controllers

SIMATIC WinAC

SIMATIC S7-modular Embedded Controller – Communication

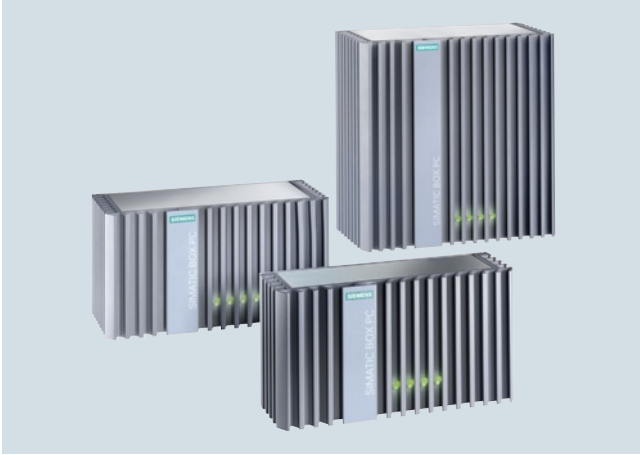
### CP 1604

Ordering data	Article No.	Article No.
<b>CP 1604 communications processor</b> PCI-104 card (32-bit) with ASIC ERTEC 400 for connecting PCI-104 systems to PROFINET IO with 4-port real-time switch (RJ45); incl. IO-Base software for PROFINET IO Controller and NCM PC; single license for one installation, runtime software, software and electronic manual on CD-ROM, Class A, for 32-bit Windows XP Professional and Windows 7; other operating systems using DK-16xx PN IO Development Kit English/German	<b>6GK1160-4AA01</b>	<b>Development Kit DK-16xx PN IO</b> Software Development Kit for CP 1616/CP 1604; driver and IO-Base software for CP 1616/CP 1604 as PN IO Controller and PN IO device in source code for transfer to other PC-based operating systems; incl. executable sample code for SUSE Linux 10, Windows XP Professional and Windows 7  <b>IE TP Cord RJ45/RJ45</b> TP cable 4 x 2 with 2 RJ45 connectors <ul style="list-style-type: none"> <li>• 0.5 m</li> <li>• 1 m</li> <li>• 2 m</li> <li>• 6 m</li> <li>• 10 m</li> </ul>
<b>CP 1604 Microbox Package</b> Package for implementing the CP 1604 in the SIMATIC Microbox PC; comprising the CP 1604, connection board, power supply and expansion racks for Microbox PC; for use with Development Kit DK-16xx PN IO; NCM PC	<b>6GK1160-4AU01</b>	<b>6XV1870-3QE50</b> <b>6XV1870-3QH10</b> <b>6XV1870-3QH20</b> <b>6XV1870-3QH60</b> <b>6XV1870-3QN10</b>
<b>Accessories</b>		<b>SCALANCE X204IRT</b> Managed Industrial Ethernet switches; isochronous real time, LED diagnostics, error signaling contact with SET button, redundant power supply; 4 x 10/100 Mbit/s RJ45 ports
<b>Connection board for CP 1604</b> Connection board for CP 1604 with four RJ45 sockets incl. connecting cable	<b>6GK1160-4AC00</b>	
<b>Power supply for CP 1604</b> Redundant power supply for CP 1604 for operating the integral 4-port switch of the CP 1604 with the PC-104 system switched off; includes connecting cable	<b>6GK1160-4AP00</b>	

Note:

You can find order information for software in the IK PI catalog.

## Overview



- A quick start in automation solutions with embedded PC platforms
  - SIMATIC WinAC RTX or SIMATIC WinAC RTX F preinstalled on SIMATIC IPC227D and ready for use
  - PROFINET RT and Industrial Ethernet pre-configured for use in a SIMATIC environment
  - Optional WinCC RT Advanced for visualization tasks in parallel with SIMATIC WinAC RTX
  - Configuration and programming with SIMATIC STEP 7 via Industrial Ethernet or PROFINET
- Safety requirements up to SIL 3 in accordance with IEC 61508/62061 or EN ISO 13849-1 up to PL e can be implemented with WinAC RTX F.
- Rugged operation
  - Hard-disk-free operation with CompactFlash card (CF card) or solid-state drive and Windows Embedded Standard 2009 or Windows Embedded Standard 7, 32-bit
  - Fan-free operation
  - 128 KB of retentive data for WinAC RTX, also without uninterruptible power supply (UPS)
- Flexibility of a PC-based automation environment
  - Use of WinAC ODK with SIMATIC WinAC RTX or SIMATIC WinAC RTX F (read-only for fail-safe program section)
  - Connection option for USB devices, flat panel monitor or screen
  - PCIe cards can be plugged in

## Ordering data

**SIMATIC IPC227D**

1 x DVI-D graphics interface  
 2 x 10/100/1000 Mbps Ethernet RJ45  
 4 x USB V2.0 (high current)  
 CompactFlash slot  
 24 V DC industrial power supply

Processors / memory configuration / NVRAM

- Atom E620 (600 MHz), 512 MB RAM
- Atom E620 (600 MHz), 512 MB RAM, NVRAM
- Atom E640 (1.0 GHz), 1 GB RAM
- Atom E640 (1.0 GHz), 1 GB RAM, NVRAM
- Atom E660 (1.3 GHz), 2 GB RAM
- Atom E660 (1.3 GHz), 2 GB RAM, NVRAM

Drives

- Without drive, with CF slot
- 320 GB HDD SATA
- 160 GB Solid-State Drive SATA
- 80 GB Solid-State Drive SATA
- 2 GB SIMATIC IPC CompactFlash
- 4 GB SIMATIC IPC CompactFlash
- 8 GB SIMATIC IPC CompactFlash
- 16 GB SIMATIC IPC CompactFlash

COM interface

- COM1: RS 232
- COM1: RS 485
- COM1: CAN

Operating system

- Without operating system
- Windows Embedded Standard 2009 preinstalled (CF from 2 GB/SSD/HD)
- XP Prof. MUI preinstalled on SSD/HD
- Windows Embedded Standard 7 (32-bit) preinstalled (CF from 4 GB/SSD/HD)
- Windows 7 (32-bit) MUI preinstalled on SSD/HD

## Article No.

Article No.	Options
<b>6ES7647-8A</b>	-
	<b>A</b>
	<b>B</b>
	<b>E</b>
	<b>F</b>
	<b>G</b>
	<b>H</b>
	<b>0</b>
	<b>1</b>
	<b>2</b>
	<b>4</b>
	<b>5</b>
	<b>6</b>
	<b>7</b>
	<b>8</b>
	<b>0</b>
	<b>1</b>
	<b>2</b>
	<b>0</b>
	<b>1</b>
	<b>2</b>
	<b>3</b>
	<b>4</b>

## Software controllers

SIMATIC WinAC

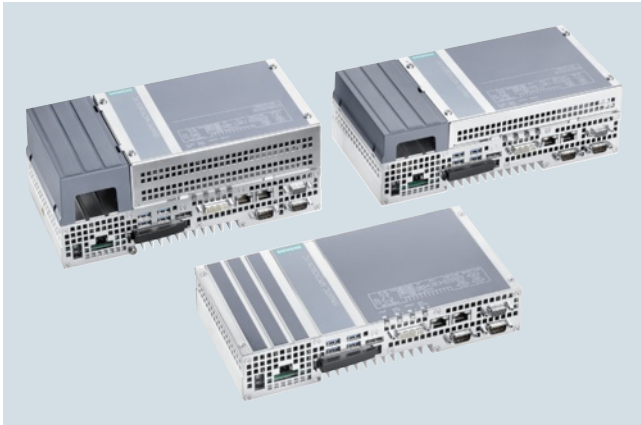
SIMATIC S7-modular Embedded Controller - Embedded bundles/Software packages

### SIMATIC IPC227D bundles

Ordering data	Article No.	Article No.
<b>SIMATIC IPC227D</b>	<b>6ES7647-8A</b>	
<u>Software bundles</u>		<u>Accessories</u>
• Without RTX/HMI software	<b>A</b>	<b>Cable strain relief set for IPC227D</b>
• RTX: WinAC RTX 2010	<b>B</b>	6ES7648-1AA50-0XL0
• RTX-F: WinAC RTX F 2010	<b>C</b>	Packing unit: 5 units
• HMI: WinCC RT Advanced 128 PT	<b>F</b>	
• HMI: WinCC RT Advanced 512 PT	<b>G</b>	<b>Dust protection set for IPC227D</b>
• HMI: WinCC RT Advanced 2048 PT	<b>H</b>	6ES7648-1AA50-0XG0
• HMI/RTX: RT 128 PT	<b>M</b>	
• HMI/RTX: RT 512 PT	<b>N</b>	
• HMI/RTX: RT 2048 PT	<b>P</b>	
• HMI/RTX-F: RT 128 PT	<b>R</b>	
• HMI/RTX-F: RT 512 PT	<b>S</b>	
• HMI/RTX-F: RT 2048 PT	<b>T</b>	
<u>Device versions</u>		
• Device version: Base line	<b>A</b>	
• Device version: PCIe (1 slot)	<b>B</b>	
• Device version: COM (COM2-4: RS 232)	<b>D</b>	
• Device version: IO (4x dig. inputs/outputs each)	<b>E</b>	
<u>Mounting accessories</u>		
• Standard mounting rail	<b>1</b>	
• Wall mounting	<b>2</b>	
• Portrait mounting	<b>3</b>	
• Side mounting	<b>4</b>	

Release for individual order variants: See releases in the ordering procedure.

## Overview


**SIMATIC IPC427D (Microbox PC): The powerful embedded IPC – maintenance-free with versatile configuration**

Ready-to-run, complete solutions (software is already installed and preconfigured) for visualization and automation in connection with WinCC RT Advanced and/or WinAC RTX.

- Ultra-compact
- Maintenance-free
- Third generation Intel Core i technology
- Current product versions of the pre-installed software:
  - SIMATIC WinCC RT Advanced V13
  - SIMATIC WinAC RTX 2010
  - SIMATIC Net V12.1

## Ordering data

## Article No.

**SIMATIC IPC427D (Box PC) <sup>1)2)</sup>**

Article No.	Configuration
6AG4140-	0
	1
	2
	3
	4
	5
	6
	7
	8
	A
	B
	D
	E
	A
	B
	C
	D
	G
	H
	J
	K
	L
	M
	N
	P

Processor and fieldbus:

- Celeron U827E (1C/1T, 1.4 GHz, 1.5 MB cache); 2 x Gigabit Ethernet (IE/PN)
- Celeron U827E (1C/1T, 1.4 GHz, 1.5 MB cache); 2 x Gigabit Ethernet (IE/PN); PROFIBUS DP12
- Celeron U827E (1C/1T, 1.4 GHz, 1.5 MB cache); 2 x Gigabit Ethernet (IE/PN); CAN interface
- Core i3-3217UE (2C/4T, 1.6 GHz, 3 MB cache); 2 x Gigabit Ethernet (IE/PN)
- Core i3-3217UE (2C/4T, 1.6 GHz, 3 MB cache); 2 x Gigabit Ethernet (IE/PN); PROFIBUS DP12
- Core i3-3217UE (2C/4T, 1.6 GHz, 3 MB cache); 1 x Gigabit Ethernet (IE/PN); 1 x PROFINET (IRT, 3 ports)
- Core i7-3517UE (2C/4T, 1.7 (2.8) GHz, 4 MB cache); 2 x Gigabit Ethernet (IE/PN) (optional ECC only here)
- Core i7-3517UE (2C/4T, 1.7 (2.8) GHz, 4 MB cache); 2 x Gigabit Ethernet (IE/PN); PROFIBUS DP12
- Core i7-3517UE (2C/4T, 1.7 (2.8) GHz, 4 MB cache); 1 x Gigabit Ethernet (IE/PN); 1 x PROFINET (IRT, 3 ports)

Mounting accessories:

- Without mounting accessories
- DIN rail mounting
- Wall mounting
- Portrait mounting

Work memory/NVRAM/ECC:

- 1 GB
- 2 GB
- 4 GB
- 8 GB
- 4 GB with ECC (only with Core i7, 2 x Gigabit Ethernet (IE/PN))
- 8 GB with ECC (only with Core i7, 2 x Gigabit Ethernet (IE/PN))
- 1 GB and NVRAM
- 2 GB and NVRAM
- 4 GB and NVRAM
- 8 GB and NVRAM
- 4 GB with ECC and NVRAM (only with Core i7, 2 x Gigabit Ethernet (IE/PN))
- 8 GB with ECC and NVRAM (only with Core i7, 2 x Gigabit Ethernet (IE/PN))

<sup>1)</sup> "Built to order" – versions with a delivery time of max. 15 working days and with identified repair, if not preferred type.

<sup>2)</sup> For an up-to-date overview, see the SIMATIC PC online configurator at: <http://www.siemens.com/ipc-configurator>

## Software controllers

### SIMATIC WinAC

### SIMATIC S7-modular Embedded Controller - Embedded bundles/Software packages

#### SIMATIC IPC427D bundles

##### Ordering data

##### Article No.

##### SIMATIC IPC427D (Box PC) <sup>1)2)</sup>

6AG4140- -

##### Expansions/interface:

- One RS 232, without PCIe
- One RS 232 and one PCIe
- One RS 232 and two PCIe
- Second RS 232, without PCIe
- Second RS 232 and one PCIe
- Second RS 232 and second PCIe

0  
1  
2  
3  
4  
5

##### Operating system:

- Without operating system
- Windows Embedded Standard 7 Professional, 32-bit, MUI
- Windows Embedded Standard 7 SP1, English, 32-bit
- Windows Embedded Standard 7 SP1, English, 64-bit
- Windows 7 Ultimate SP1, 32-bit, MUI (Eng, Ger, Fr, It, Sp)
- Windows 7 Ultimate SP1, 64-bit, MUI (Eng, Ger, Fr, It, Sp)

0  
3  
4  
5  
6  
7

##### Mass storage, externally accessible:

- Without external mass storage
- CFast 2 GB  
Without operating system
- CFast 4 GB  
(only optionally with operating system if no internal mass storage)
- CFast 8 GB  
(only optionally with operating system if no internal mass storage)
- CFast 16 GB  
(only optionally with operating system if no internal mass storage)

0  
1  
2  
3  
4

##### Internal mass storage:

- Without internal mass storage
- CFast 2 GB, without software
- CFast 4 GB, without software
- CFast 8 GB, without software
- CFast 16 GB, without software
- 80 GB solid-state drive (standard)
- HDD 250 GB
- 160 GB solid-state drive (standard)

A  
B  
C  
D  
E  
H  
K  
P

##### Article No.

##### SIMATIC IPC427D (Box PC) <sup>1)2)</sup>

6AG4140- -

##### SIMATIC software preinstalled (bundles, only with Windows Embedded Standard 7):

- Without SIMATIC software
- WinAC RTX 2010 <sup>3)</sup>
- WinCC RT Advanced, 128 PT
- WinCC RT Advanced, 512 PT
- WinCC RT Advanced, 2 048 PT
- WinCC RT Advanced, 4 096 PT
- WinCC RT Advanced 128 PT, WinAC RTX 2010 <sup>3)</sup>
- WinCC RT Advanced 512 PT, WinAC RTX 2010 <sup>3)</sup>
- WinCC RT Advanced 2 048 PT, WinAC RTX 2010 <sup>3)</sup>
- WinCC RT Advanced 4 096 PT, WinAC RTX 2010 <sup>3)</sup>
- WinAC RTX F 2010 <sup>3)</sup>
- WinCC RT Advanced 128 PT, WinAC RTX F 2010 <sup>3)</sup>
- WinCC RT Advanced 512 PT, WinAC RTX F 2010 <sup>3)</sup>
- WinCC RT Advanced 2 048 PT, WinAC RTX F 2010 <sup>3)</sup>
- WinCC RT Advanced 4 096 PT, WinAC RTX F 2010 <sup>3)</sup>
- WinCC RT Professional Client/ single-user station 128 PT

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C  
D  
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##### Power supply:

- 24 V DC industrial power supply
- 24 V DC and TPM (not for China and Russia)

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<sup>1)</sup> "Built to order" – versions with a delivery time of max. 15 working days and with identified repair, if not preferred type.

<sup>2)</sup> For an up-to-date overview, see the SIMATIC PC online configurator at: <http://www.siemens.com/ipc-configurator>

<sup>3)</sup> Only with "main memory and NVRAM".

##### Note:

Bundles with SIMATIC software only with Windows Embedded Standard 7, main memory and NVRAM (with RTX and RTX F), and CFast mass storage of 4 GB or more / SSD.

## Overview



SIMATIC IPC277D for implementing simple visualization and control tasks

- High degree of flexibility when selecting rugged widescreen fronts from 7" to 19" for more freely configurable display area
- High resolution, large viewing angle and up to 100% dimmable backlighting for brilliant display with optimized power consumption
- Absolutely maintenance-free due to the use of CompactFlash and SSD as mass storage and fanless operation up to 50 °C ambient temperature
- Maximum industrial functionality due to non-volatile retentive memory for battery-free operation
- Ready-to-run embedded bundles with visualization or/and control software

The following front installation versions are available:

- 7" Touch
- 9" Touch
- 12" Touch
- 15" Touch with front USB interface
- 19" Touch with front USB interface
- All fronts in widescreen design

## Technical specifications

SIMATIC IPC277D	
<b>General features</b>	
Processors	<ul style="list-style-type: none"> <li>• Intel Atom E660 1.3 GHz, 2 GB RAM</li> <li>• Intel Atom E640 1.0 GHz, 1 GB RAM</li> </ul>
Chipset	Intel Controller Hub EG20T
NVRAM optional	512 KB, of which 128 KB can be written within the buffer time
Operating system	<ul style="list-style-type: none"> <li>• Windows Embedded Standard 2009 preinstalled, in combination with CF card of 2 GB or more, or solid-state drive, or hard drive (optional)</li> <li>• Windows XP Professional MUI (in connection with solid-state drive or hard drive; MUI: Multi Language User Interface) (optional)</li> <li>• Windows Embedded Standard 7 32-bit, preinstalled, in combination with CF card or solid-state drive (optional)</li> <li>• Windows 7 Ultimate MUI 32-bit (in combination with solid-state drive; MUI: Multi Language User Interface) (optional)</li> <li>• Linux <sup>1)</sup> (project-specific, on request)</li> </ul> <p>Others on request project-specifically</p>
Power supply	<ul style="list-style-type: none"> <li>• 24 V DC (20.4 V ... 28.8 V)</li> <li>• Isolated</li> <li>• With buffering of temporary power failures: max. 10 ms</li> <li>• Line side switch</li> <li>• With power failure indication by means of Power Fail signal</li> </ul>
<b>Drives</b>	
FlashDrive	Optional; replaceable, accessible, diagnosable <ul style="list-style-type: none"> <li>• 2 GB</li> <li>• 4 GB</li> <li>• 8 GB</li> <li>• 16 GB</li> </ul>
Solid-state drive (SSD)	Optional <ul style="list-style-type: none"> <li>• 80 GB SATA, 2.5"</li> <li>• 160 GB SATA, 2.5"</li> </ul>
CD/DVD/Floppy	Via USB (not included in scope of delivery)
<b>Ports</b>	
PROFINET	PROFINET RT via Standard Ethernet controller
Ethernet	<ul style="list-style-type: none"> <li>• 2 x 10/100/1000 Mbps (RJ 45)</li> <li>• Two independent Intel Controllers: Intel 82574L / Intel Controller Hub EG20T</li> </ul> With teaming function
USB	V2.0, 3 x
Serial	COM1 (V.24)
Keyboard	Via USB (not included in scope of delivery)
Mouse	Via USB (not included in scope of delivery)
<b>Monitoring functions</b>	
Temperature	<ul style="list-style-type: none"> <li>• Processor temperature</li> <li>• Motherboard</li> </ul> Messages can be evaluated by the application program
Watchdog	<ul style="list-style-type: none"> <li>• Monitoring of program execution</li> <li>• Monitoring time can be parameterized in software</li> <li>• Can be parameterized for a fault or restart</li> </ul> Messages can be evaluated by the application program

<sup>1)</sup> Suitable for specific LINUX versions in accordance with the specifications of the Siemens manufacturer's declaration "Suitable for LINUX", see <http://support.automation.siemens.com/WWW/view/en/10805661/134200> (LINUX is a brand name of Linus Torvalds)

## Software controllers

SIMATIC WinAC

SIMATIC S7-modular Embedded Controller - Embedded bundles/Software packages

### SIMATIC IPC277D bundles

#### Technical specifications (continued)

SIMATIC IPC277D	
Monitoring functions via the network	<ul style="list-style-type: none"> <li>• DiagBase</li> <li>• SIMATIC IPC DiagMonitor</li> </ul> Remote monitoring capability for: <ul style="list-style-type: none"> <li>• Watchdog</li> <li>• Temperature</li> <li>• Mass memory monitoring (SMART)</li> <li>• System/Ethernet monitoring (Heart Beat)</li> <li>• Runtime meter</li> </ul> Communication: <ul style="list-style-type: none"> <li>• Ethernet interface (SNMP protocol)</li> <li>• OPC for integration in SIMATIC software</li> <li>• Configuration of client/server architectures</li> <li>• Structure of log files</li> </ul>
<b>Supply voltage</b>	
Supply voltage	24 V DC
<b>Monitoring functions</b>	
Temperature	Yes
Watchdog	Yes
Mass storage	Yes

SIMATIC IPC277D	
<b>Ambient conditions</b>	
Vibration load during operation	Requirements according to: IEC 61131-2, tested according to: IEC 60068-2-6, Test Fc 10-58: 0.0375 mm, 58-200: 9.8 m/s <sup>2</sup> , 10x /axis
Shock loading during operation	Requirements according to: IEC 61131-2, tested according to: IEC 60068-2-27, Test Ea, 50 m/s <sup>2</sup>
Relative humidity	Tested in accordance with DIN IEC 68-78, DIN IEC 60068-2-30: 5% to 80% at 25 °C (no condensation)
Maximum permissible installation angle +/-	45° over vertical
Ambient temperature during operation	0 °C ... +50° C in maximum configuration; no fan (19": 0 °C ... +45 °C)
<b>Certifications &amp; standards</b>	
Approvals	CE, cULus (508), marine approval available for 7"/9"/12" (GL, LRS, BV, DNV, ABS, ClassNK)
EMC	CE, FFC A, 55022A, EN 61000-6-4, EN 61000-6-2

SIMATIC IPC277D					
Front panel	7" TFT Touch, widescreen	9" TFT Touch, widescreen	12" TFT Touch, widescreen	15" TFT Touch, widescreen	19" TFT Touch, widescreen
<b>Display</b>					
Resolution (W x H in pixels)	800 x 480		1 280 x 800		1 366 x 768
<b>General features</b>					
Accessories	Touch pen, touch protective films				
<b>Type of operation</b>					
Function keys	No				
Alphanumeric keyboard	No				
Touch screen (analog/resistive)	Yes				
USB port on the front	No			Yes	
<b>Design</b>					
Centralized configuration	Yes				
Distributed configuration	No				
<b>Dimensions</b>					
Mounting dimensions in centralized configuration (W x H x D) in mm	197 x 141 x 71	251 x 166 x 71	310 x 221 x 66	396 x 291 x 73	465 x 319 x 73
Operator control unit (W x H) in mm	214 x 158	274 x 190	330 x 241	415 x 310	483 x 337
<b>Weight</b>	1500 g	1950 g	2750 g	4000 g	5700 g
<b>Max. power loss in maximum configuration</b>	27 W	29 W	37 W	42 W	45 W

Ordering data	Article No.	Article No.
<b>Nanopanel PC SIMATIC IPC277D</b> Interfaces: 2 x Gbit LAN (RJ45), 1 x serial (COM1), 3 x USB	<b>6AV7881-</b>	
<u>Operator control unit</u>		
• Touch 7" TFT	1	
• Touch 9" TFT	2	
• Touch 12" TFT	3	
• Touch 15" TFT, front USB interface	4	
• Touch 19" TFT, front USB interface	5	
<u>Processors / memory configuration / NVRAM</u>		
• Atom E640 (1.0 GHz), 1 GB RAM	A	
• Atom E640 (1.0 GHz), 1 GB RAM, NVRAM	B	
• Atom E660 (1.3 GHz), 2 GB RAM	E	
• Atom E660 (1.3 GHz), 2 GB RAM, NVRAM	F	
<u>Drives</u>		
• Without drive, with CF slot		0
• 2 GB SIMATIC PC CompactFlash		1
• 4 GB SIMATIC PC CompactFlash		2
• 8 GB SIMATIC PC CompactFlash		3
• 16 GB SIMATIC PC CompactFlash		4
• 160 GByte solid-state drive SATA		6
• 80 GByte solid-state drive SATA		8
<u>Operating system</u>		
• Without operating system		A
• WES 2009 preinstalled (CF from 2 GB/SSD)		B
• XP-Prof. MUI preinstalled on SSD		C
• WES 7 32 bit preinstalled (CF from 4 GB/SSD)		D
• Windows 7 MUI 32 bit preinstalled on SSD		E
<u>Software bundles</u>		
• Without RTX/HMI software		A
• RTX: WinAC RTX 2010		B
• RTX-F: WinAC RTX F 2010		C
• HMI: WinCC RT Advanced 128 PT		F
• HMI: WinCC RT Advanced 512 PT		G
• HMI: WinCC RT Advanced 2048 PT		H
• HMI/RTX: RT 128 PT		M
• HMI/RTX: RT 512 PT		N
• HMI/RTX: RT 2048 PT		P
• HMI/RTX-F: RT 128 PT		R
• HMI/RTX-F: RT 512 PT		S
• HMI/RTX-F: RT 2048 PT		T
<u>Accessories</u>		
<b>Bracket clamp, long</b> for 15", 19" and 22" widescreen, Comfort Panels, IPC, Flat Panel monitors and Thin Client (except SCD1900 19" widescreen)		<b>6AV6671-8XK00-0AX4</b>
<b>Protective film</b>		See Catalog ST 80 / ST PC
<b>Touch pen</b>		See Catalog ST 80 / ST PC

Please be sure to note:

The IPC277D with bundled software is always supplied with inserted CF card.

The licenses are on the supplied USB flash drive.



## Software controllers

SIMATIC WinAC

SIMATIC S7-modular Embedded Controller - Embedded bundles/Software packages

### SIMATIC IPC477D bundles

#### Overview



#### **SIMATIC IPC477D: The powerful embedded Panel PC – maintenance-free with versatile configuration**

Ready-to-run, complete solutions (software is already installed and preconfigured) for visualization and automation in connection with WinCC RT Advanced and/or WinAC RTX.

- Embedded PC platform with extremely high industrial compatibility for demanding tasks in the field of PC-based automation
- Maintenance-free (no rotating components such as fan and hard disk)
- Rugged construction: the PC is resistant to even the harshest mechanical stress and is extremely reliable in operation
- Compact design
- Battery-independent retentive memory onboard
- High investment protection
- Fast integration capability
- Safety requirements up to SIL 3 in accordance with IEC 61508/62061 or EN ISO 13849-1 up to PL e can be implemented with WinAC RTX F

The following front versions are available:

- Built-in versions
  - 12" TFT Touch
  - 15" TFT Touch
  - 19" TFT Touch
  - 22" TFT Touch
  - 15" TFT Touch/Key
- Current product versions of the pre-installed SIMATIC software:
  - SIMATIC WinCC RT Advanced V13
  - SIMATIC WinAC RTX 2010 or SIMATIC WinAC RTX F 2010
  - SIMATIC NET V12.1 (including SIMATIC SOFTNET S7 Basis license)
  - and the combinations of the software packages listed above

#### Technical specifications

	SIMATIC IPC477D
<b>General features</b>	
Supply voltage <sup>1)</sup>	<ul style="list-style-type: none"> <li>• 24 V DC (-20 % / +20 %) <sup>1)</sup></li> <li>• 100 - 240 V AC (-15 % / +20 %); 50 - 60 Hz</li> </ul>
Brief voltage interruption in accordance with NAMUR	<ul style="list-style-type: none"> <li>• Min. 20 ms (DC)</li> <li>• Min. 20 ms (AC); max. 10 events per hour; min. 1 s recovery time</li> </ul>
Power consumption (DC) of devices (without expansions):	
<ul style="list-style-type: none"> <li>• 12" display</li> <li>• 15" display</li> <li>• 19" display</li> <li>• 22" display</li> </ul>	55 W 56 W 65 W 74 W
Additional power consumption of devices with expansions:	
<ul style="list-style-type: none"> <li>• DVD drive</li> <li>• PCIe card</li> </ul>	1 W 5 W
<b>Processor</b>	<ul style="list-style-type: none"> <li>• Intel Celeron 827E 1.4 GHz; 1.5 MB SLC or</li> <li>• Intel Core i3-3217UE 1.6 GHz; 3 MB SLC or</li> <li>• Intel Core i7-3517UE 1.7 GHz; 4 MB SLC</li> </ul>
Main memory	<ul style="list-style-type: none"> <li>• SO-DIMM module; 1024 MB DDR3-SDRAM or</li> <li>• SO-DIMM module; 2048 MB DDR3-SDRAM or</li> <li>• SO-DIMM module; 4096 MB DDR3-SDRAM or</li> <li>• SO-DIMM module; 8192 MB DDR3-SDRAM</li> </ul>
Buffer memory <sup>2)</sup>	512 KB MRAM
<b>Drive and storage media</b>	
SATA drive	1 slot
Solid-state drive	<ul style="list-style-type: none"> <li>• 1 x ≥ 80 GB; 2.5" SATA-SSD, standard or</li> <li>• 1 x ≥ 160 GB; 2.5" SATA-SSD, standard</li> </ul>
Hard disk drive (HDD)	<ul style="list-style-type: none"> <li>• 1 x ≥ 250 GB, 2.5"-SATA-HD</li> </ul>
CFast card	<ul style="list-style-type: none"> <li>• 2 GB or</li> <li>• 4 GB or</li> <li>• 8 GB or</li> <li>• 16 GB</li> </ul>
DVD drive, RW	1 slot for devices with expansion
<b>Graphics</b>	
Display, resolution	<ul style="list-style-type: none"> <li>• 12" screen diagonal with LED backlighting, resolution 1 280 x 800 pixels, WXGA (Wide XGA)</li> <li>• 15" screen diagonal with LED backlighting, resolution 1 280 x 800 pixels, WXGA (Wide XGA)</li> <li>• 19" screen diagonal with LED backlighting, resolution 1 366 x 768 pixels</li> <li>• 22" screen diagonal with LED backlighting, resolution 1 920 x 1 080 pixels</li> </ul>
Touch controller	Analog-resistive or capacitive touch
Backlighting (MTBF)	LED

<sup>1)</sup> The generation of the supply voltage by the line-side power supply must be realized as safety extra-low voltage with safe electrical isolation, isolated according to IEC 60364 4 41, or as SELV according to IEC/UL/EN/DIN-EN 60950-1.

<sup>2)</sup> For devices with retentivity

**Technical specifications** (continued)

Half brightness life time, typical	Min. 50 000 h at 50 °C, 50 % brightness
Graphics controller	<ul style="list-style-type: none"> <li>Intel HD 2000 or</li> <li>Intel HD 4000</li> </ul>
Graphics memory	<ul style="list-style-type: none"> <li>32 ... 512 MB shared memory</li> </ul>
Resolutions, frequency, colors	<ul style="list-style-type: none"> <li>DVI-I: 640 x 480 ... 1 920 x 1 200, 60 Hz</li> <li>DP display port: 1 920 x 1 200, 60 Hz</li> </ul>
<b>Interfaces</b>	
COM 1 and COM 2	RS 232, max. 115 kbps, 9-pin, sub-D connector
DVI	Connection of VDUs with DVI connection
Display port (DPP)	Connection of VDUs with DPP connection
Keyboard	Connection via USB port
Mouse	Connection via USB port
USB	<ul style="list-style-type: none"> <li>Rear of device: 4 x USB 3.0, max. 2 high-current at the same time</li> <li>Front of device (only with IPC477D with 15", 19" or 22" display): 1 x USB 2.0, high-current</li> </ul>
PROFIBUS/MPI	9-pole, 2 rows, electrically isolated, Sub-D socket, compatible with CP 5622
<ul style="list-style-type: none"> <li>Transmission rate</li> <li>Operating modes</li> </ul>	9.6 Kbps ... 12 Mbps DP master: DP-V0, DP-V1 with SOFTNET-DP DP slave: DP-V0, DP-V1 with SOFTNET-DP slave
PROFINET	3 x RJ45 interface, CP 1616 compatible onboard interface based on ERTEC 400
Ethernet <sup>3)</sup>	10/100 Mbps, electrically isolated <ul style="list-style-type: none"> <li>2 x RJ45 connection, Intel 82579LM and Intel 82574L 10/100/1000 Mbps, electrically isolated, teaming-capable <sup>4)</sup></li> <li>or</li> <li>For PROFINET versions: 1 x Ethernet</li> </ul>
Slot for PCIe expansion cards	Only for device with expansions: 1 x PCIe-x4 expansion card can be used, max. permissible power loss: 5 W
<b>Degree of protection</b>	
Degree of protection	<ul style="list-style-type: none"> <li>IP 20 to IEC 60529 (enclosure)</li> <li>IP 65 (front)</li> </ul>
<b>Quality assurance</b>	
Quality assurance	In accordance with ISO 9001
<b>Electromagnetic compatibility</b>	
Emitted interference S	EN 61000-6-4; CISPR 22 Class A; FCC Class A
Immunity with regard to conducted interference on the supply lines	<ul style="list-style-type: none"> <li>± 2 kV to IEC 61000-4-4; burst</li> <li>± 1 kV to IEC 61000-4-5; surge symmetrical</li> <li>± 2 kV to IEC 61000-4-5; surge asymmetrical</li> </ul>
Noise immunity on signal lines	<ul style="list-style-type: none"> <li>± 2 kV to IEC 61000-4-4; burst, length &gt; 3 m</li> <li>± 1 kV to IEC 61000-4-4; burst, length &lt; 3 m</li> <li>± 2 kV to IEC 61000-4-5; symmetrical surge, length &gt; 30 m</li> </ul>

Immunity to static discharge	<ul style="list-style-type: none"> <li>± 6 kV, contact discharge at the front to IEC 61000-4-2</li> <li>± 4 kV contact discharge at the rear to IEC 61000-4-2</li> <li>± 8 kV air discharge to IEC 61000-4-2</li> </ul>
Immunity to high radio frequency interference	<ul style="list-style-type: none"> <li>10 V/m, 80 ... 1000 MHz 80 % AM to IEC 61000-4-3</li> <li>1 V/m, 2 ... 2.7 GHz</li> <li>3 V/m, 2 ... 2.7 GHz</li> <li>10 V, 10 kHz ... 80 MHz to IEC 61000-4-6</li> </ul>
Immunity to magnetic fields	<ul style="list-style-type: none"> <li>100 A/m, 50/60 Hz to IEC 61000-4-8</li> </ul>
<b>Weight</b>	
<ul style="list-style-type: none"> <li>IPC477D, touch device, 12" display</li> <li>IPC477D, touch device, 15" display</li> <li>IPC477D, touch/key device (without expansions), 15" display</li> <li>IPC477D, touch device, 19" display</li> <li>IPC477D, touch device, 22" display</li> </ul>	approx. 3 200 g approx. 4 920 g approx. 5 750 g approx. 6 400 g approx. 7 000 g

<sup>3)</sup> For unambiguous labeling, the Ethernet ports are numbered on the enclosure. The numbering by the operating system can differ.

<sup>4)</sup> Teaming can be set and initiated in the configuration interface. In teaming operation, jumbo frames, e.g. for the camera application, are not supported

**Ordering data****Article No.****SIMATIC IPC477D <sup>1)</sup>****6AV7240-****Processor and fieldbus:**

- Celeron U827E (1C/1T, 1.4 GHz, 1.5 MB cache); 2 x Gigabit Ethernet (IE/PN)
- Celeron U827E (1C/1T, 1.4 GHz, 1.5 MB cache); 2 x Gigabit Ethernet (IE/PN); PROFIBUS DP12
- Core i3-3217UE (2C/4T, 1.6 GHz, 3 MB cache); 2 x Gigabit Ethernet (IE/PN)
- Core i3-3217UE (2C/4T, 1.6 GHz, 3 MB cache); 2 x Gigabit Ethernet (IE/PN); PROFIBUS DP12
- Core i3-3217UE (2C/4T, 1.6 GHz, 3 MB cache); 1 x Gigabit Ethernet (IE/PN); 1 x PROFINET (IRT, 3 ports)
- Core i7-3517UE (2C/4T, 1.7 (2.8) GHz, 4 MB cache); 2 x Gigabit Ethernet (IE/PN)
- Core i7-3517UE (2C/4T, 1.7 (2.8) GHz, 4 MB cache); 2 x Gigabit Ethernet (IE/PN); PROFIBUS DP12
- Core i7-3517UE (2C/4T, 1.7 (2.8) GHz, 4 MB cache); 1 x Gigabit Ethernet (IE/PN); 1 x PROFINET (IRT, 3 ports)

6AV7240-

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<sup>1)</sup> Built to order versions with a delivery time of max. 15 working days and with identified repair.

## Software controllers

### SIMATIC WinAC

### SIMATIC S7-modular Embedded Controller - Embedded bundles/Software packages

#### SIMATIC IPC477D bundles

Ordering data	Article No.	Article No.	
<b>SIMATIC IPC477D <sup>1)</sup></b>	<b>6AV7240-</b>	<b>SIMATIC IPC477D <sup>1)</sup></b>	
<u>Operator control unit:</u>		<u>Internal mass storage (continued):</u>	
• 12" Touch (1 280 x 800) (caution, restrictions regarding options: HDD, PCI, AC, DVD)	A	• CFAST 8 GB	D
• 15" Touch (1 280 x 800) with front USB	B	• CFAST 16 GB	E
• 15" Touch/Key (1 280 x 800) with front USB	C	• SSD 80 GB Standard	H
• 19" Touch (1 366 x 768) with front USB	D	• HDD 250 GB	K
• 22" Touch (1 920 x 1 080) with front USB	E	• DVD	L
• 15" Multi-Touch (1 366 x 768) without front USB	H	• SSD 80 GB standard with DVD	N
• 19" Multi-Touch (1 366 x 768) without front USB	K	• SSD 160 GB standard without DVD	P
• 22" Multi-Touch (1 920 x 1 080) without front USB	L	• HDD min. 250 GB with DVD	Q
<u>Main memory/NVRAM</u>		<u>SIMATIC software pre-installed (bundles):</u>	
• 1 GB	A	• Without SIMATIC software	A
• 2 GB	B	• WinAC RTX 2010 <sup>2)</sup>	B
• 4 GB	C	• WinCC RT Advanced 128 PT	C
• 8 GB	D	• WinCC RT Advanced 512 PT	D
• 1 GB and NVRAM	J	• WinCC RT Advanced 2 048 PT	E
• 2 GB and NVRAM	K	• WinCC RT Advanced 4 096 PT	F
• 4 GB and NVRAM	L	• WinCC RT Advanced 128 PT, WinAC RTX <sup>2)</sup>	J
• 8 GB and NVRAM	M	• WinCC RT Advanced 512 PT, WinAC RTX <sup>2)</sup>	K
<u>Expansions/interface:</u>		• WinCC RT Advanced 2 048 PT, WinAC RTX <sup>2)</sup>	L
• 1 x RS 232, without PCIe	0	• WinCC RT Advanced 4 096 PT, WinAC RTX <sup>2)</sup>	M
• 1 x RS 232 and 1 x PCIe	1	• WinCC RT Advanced 2 048 PT, WinAC RTX <sup>2)</sup>	N
• Second RS 232, without PCIe	3	• WinCC RT Advanced 4 096 PT, WinAC RTX <sup>2)</sup>	P
• Second RS 232 and 1 x PCIe	4	• WinCC RT Advanced 128 PT, WinAC RTX <sup>2)</sup>	Q
<u>Operating system:</u>		• WinCC RT Advanced 512 PT, WinAC RTX <sup>2)</sup>	R
• Without operating system	0	• WinCC RT Advanced 2 048 PT, WinAC RTX <sup>2)</sup>	S
• Windows Embedded Standard 7 Professional, 32-bit, MUI	3	• WinCC RT Advanced 4 096 PT, WinAC RTX <sup>2)</sup>	Y
• Windows Embedded Standard 7 SP1, English, 32-bit	4	• WinCC RT Professional Client/ single-user station 128 PT	
• Windows Embedded Standard 7 SP1, English, 64-bit	5	<u>Power supply:</u>	
• Windows 7 Ultimate SP1, 32-bit, MUI (Eng, Ger, Fr, It, Sp)	6	• 24 V DC industrial power supply	0
• Windows 7 Ultimate SP1, 64-bit, MUI (Eng, Ger, Fr, It, Sp)	7	• 110/230 V AC industrial power supply with Namur; no power cable	1
<u>Externally accessible mass storage (without operating system):</u>		• 110/230 V AC industrial power supply with Namur; European power cable	2
• Without external mass storage	0	• 110/230 V AC industrial power supply with Namur; US power cable	3
• CFAST 2 GB, without software	1	• 110/230 V AC industrial power supply with Namur; Chinese power cable	4
• CFAST 4 GB	2	• 110/230 V AC industrial power supply with Namur; Italian power cable	5
• CFAST 8 GB	3	• 110/230 V AC industrial power supply with Namur; Swiss power cable	6
• CFAST 16 GB	4	• 110/230 V AC industrial power supply with Namur; UK power cable	7
• DVD	6	• 24 V DC industrial power supply and TPM (not for China and Russia)	8
<u>Internal mass storage:</u>			
• Without internal mass storage	A		
• CFAST 2 GB	B		
• CFAST 4 GB	C		

<sup>1)</sup> Built to order versions with a delivery time of max. 15 working days and with identified repair.

<sup>2)</sup> Only with main memory and NVRAM.

Overview



Embedded PC platform with extremely high industrial compatibility for demanding tasks in the field of PC-based automation.

- Rugged operation
  - Operation without a hard disk, based on CompactFlash card (CF card) or solid-state drive and Windows Embedded Standard
  - Fan-free operation
  - 128 KB of retentive data for WinAC RTX, also without uninterruptible power supply (UPS)

- Flexibility of a PC-based automation environment
  - Free memory space on CF card can be used for other PC applications
  - Use of WinAC ODK with SIMATIC WinAC RTX or SIMATIC WinAC RTX F (read-only for fail-safe program section)
  - Connection option for USB devices, flat panel monitor or screen
- High-performance service concept
  - Replacement parts for preferred types available ex stock
- Safety requirements up to SIL 3 in accordance with IEC 61508/62061 or EN ISO 13849-1 up to PL e can be implemented with WinAC RTX F.
- Cost-effective versions with PROFINET, based on the standard Ethernet interface
- Product versions of the pre-installed software:
  - SIMATIC WinAC RTX 2010 or SIMATIC WinAC RTX F 2010
  - SIMATIC WinCC flexible 2008
  - and the combinations of the software packages above
  - SIMATIC NET Edition 2008 or V8.x (depending on operating system)

The following display versions are available:

- Built-in versions
  - 12" and 15" TFT Touch
  - 12" and 15" TFT Key
  - 19" Touch
- Support arm versions
  - PRO 15" and 19" Touch

Fully-enclosed device to IP65 degree of protection for mounting on a support arm/stand.

Ordering data

Article No.

Article No.

**SIMATIC HMI IPC477C bundles**

RTX bundles with SIMATIC WinAC RTX (F) 2010

HMI bundles with WinCC flexible 2008

HMI/RTX bundles combining HMI and RTX

("Built to order" version, max. delivery time of 15 working days and with identified repair, if not preferred type)

SIMATIC HMI IPC477C PRO	6AV7883- A
Embedded and fan-free with fully enclosed IP65 enclosure 4 x USB (500 mA), standard front, 24 V DC power supply with On/Off switch	
<b>Front panels</b>	
• 15" TFT Touch (IP65 enclosure; PRO)	6
• 19" TFT Touch (IP65 housing; PRO)	7
<b>Processors and fieldbus</b>	
• Celeron M 1.2 GHz, 2 x PROFINET (IE) <sup>1)</sup>	A
• Celeron M 1.2 GHz, 2 x PROFINET (IE), 1 x PROFIBUS DP 12 <sup>1)</sup>	B
• Core2 Duo 1.2 GHz, 2 x PROFINET (IE) <sup>1)</sup>	G
• Core2 Duo 1.2 GHz, 2 x PROFINET (IE), 1 x PROFIBUS DP 12 <sup>1)</sup>	H
• Core2 Duo 1.2 GHz, 1 x PROFINET (IE), 1 x PROFINET (3 ports) <sup>1)</sup>	J

SIMATIC HMI IPC477C PRO	6AV7883- A
<b>Main memory (DDR3 RAM), 1 database</b>	
• 1 GB	1
• 2 GB <sup>1)</sup>	2
• 4 GB	3
<b>Second mass storage (installed, CF replaceable)</b>	
• None <sup>1)</sup>	0
• CompactFlash 2 GB (only with Windows Embedded Standard 2009) <sup>1)</sup>	2
• CompactFlash 4 GB <sup>1)</sup>	3
• CompactFlash 8 GB <sup>1)</sup>	4
• CompactFlash 16 GB <sup>1)</sup>	5
• 80 GB SSD (Standard) <sup>2)</sup>	7
<b>Mass storage (installed, operating system pre-installed, optionally with SIMATIC software)</b>	
• CompactFlash 2 GB <sup>1)</sup>	2
• CompactFlash 4 GB <sup>1)</sup>	3
• CompactFlash 8 GB <sup>1)</sup>	4
• CompactFlash 16 GB <sup>1)</sup>	5
• 80 GB SSD (Standard) <sup>2)</sup>	7

<sup>1)</sup> Preferred versions with repaired replacement device from warehouse

<sup>2)</sup> Only with IPC477C

## Software controllers

SIMATIC WinAC

SIMATIC S7-modular Embedded Controller - Embedded bundles/Software packages

### SIMATIC HMI IPC477C bundles

#### Ordering data

#### Article No.

#### SIMATIC HMI IPC477C PRO

6AV7883- A - - - - -

#### Operating system

- Windows Embedded Standard 2009, pre-installed <sup>1)</sup>
- Windows Embedded Standard 7 SP1, pre-installed <sup>2)</sup>

B A

E A

#### Software packages, only with CF 4 GB or higher <sup>1)</sup>

- with operating system and RTX pre-installed and configured
- with operating system and HMI (incl. archives/recipes) pre-installed and configured
  - number of tags 128 PT
  - number of tags 512 PT
  - number of tags 2048 PT
  - number of tags 4096 PT
- with operating system and HMI/RTX (incl. archives/recipes) pre-installed and configured
  - number of tags 128 PT
  - number of tags 512 PT
  - number of tags 2048 PT
  - number of tags 4096 PT
- with operating system and RTX F pre-installed and configured
- with operating system and HMI/RTX F (incl. archives/recipes) pre-installed and configured
  - number of tags 128 PT
  - number of tags 512 PT
  - number of tags 2048 PT
  - number of tags 4096 PT

B

C

D

E

F

K

L

M

N

P

R

S

T

U

0

<sup>1)</sup> Preferred versions with repaired replacement device from warehouse

<sup>2)</sup> Only together with 2 GB main memory

<sup>3)</sup> With WES 2009: SP2; with WES 7: SP3

#### Article No.

#### Note:

Other ready-to-use SIMATIC HMI IPC477Cs can be found under Panel PC -> HMI IPC477C.

#### Please be sure to note:

The HMI IPC477C is delivered as standard with an inserted CF card. The licenses are on the supplied USB flash drive.

#### Accessories

#### Protective film for Panel PCs 477/577/677

For protecting the touch screen against dirt/scratches

- for 12" Touch
- for 15" Touch (not for PRO)
- for 19" Touch

6AV7671-2BA00-0AA0

6AV7671-4BA00-0AA0

6AV7672-1CE00-0AA0

#### Labeling membranes for Panel PCs 477/577/677

For labeling soft keys and function keys, blank, supplied in sets of 10

6AV7672-0DA00-0AA0

#### Touch pen

Captive pen for operation of the touch devices; holder can be mounted on the control cabinet or direct on the PRO unit

6AV7672-1JB00-0AA0

#### Expansion components

See Catalog ST 80 / ST PC

## Overview

## PC-based automation solutions



SIMATIC IPC family

**SIMATIC IPC and S7-mEC with SIMATIC WinCC flexible**

SIMATIC IPC packages with WinCC flexible RT represent the ideal solution for simple, machine-oriented HMI visualization tasks.

In combination with the embedded SIMATIC IPC (HMI IPC477C (PRO) and IPC427C) and the embedded S7-mEC controller, there are turn-key overall solutions (bundles) available, where the runtime software is already preinstalled on the IPC.

**SIMATIC IPC with SIMATIC WinCC RT (TIA Portal)**

The SIMATIC IPC packages with WinCC RT make it easy to order all necessary components for an IPC-based HMI solution.

In combination with the embedded SIMATIC IPC (IPC277D / IPC477D and IPC227D / IPC427D), there are turn-key overall solutions (bundles) available, where the runtime software is already preinstalled on the IPC.

**SIMATIC IPC with SIMATIC WinAC RTX (F)**

The SIMATIC IPC packages with WinAC RTX (F) make it easy to order all the components required for a control solution on the basis of an industrial PC.

In combination with the embedded SIMATIC IPC (IPC277D / HMI IPC477C (PRO) / IPC477D and IPC227D / IPC427C / IPC427D) and the S7-mEC embedded controller, there are turn-key overall solutions (bundles) available where the runtime software is pre-installed on the IPC.

Software packages can only be ordered together with SIMATIC IPCs (same number). It cannot be ordered subsequently.

Note:

For ordering data for Panel PCs and accessories, see configurators in Catalog ST 80 / ST PC.

## Ordering data

## Article No.

<b>SIMATIC WinCC package</b> <sup>1)2)</sup>	<b>6AV6382- 2</b>	<b>A 0 7 - 3 A X 0</b>
<b>WinCC V7.3 Runtime</b> <sup>1)2)</sup>		C
• 128 Power Tags		D
• 256 Power Tags		E
• 1 024 Power Tags		H
• 8 192 Power Tags		F
• 65 536 Power Tags		
<b>SIMATIC WinCC package</b> <sup>1)2)</sup>	<b>6AV6382- 2</b>	<b>A 0 7 - 2 A X 0</b>
<b>WinCC V7.2 Runtime</b> <sup>1)2)</sup>		C
• 128 Power Tags		D
• 512 Power Tags		E
• 2 048 Power Tags		H
• 8 192 Power Tags		F
• 65 536 Power Tags		

<sup>1)</sup> Only if ordered together with a SIMATIC IPC

<sup>2)</sup> Not with IPC227D / IPC277D

SIMATIC WinCC (TIA Portal)		
<b>WinCC Runtime Advanced package V13 SP1</b> <sup>1)2)3)</sup>	<b>6AV2114- 2</b>	<b>A 0 3 - 0 A A 0</b>
incl. Recipes + Logging		B
• 128 Power Tags		D
• 512 Power Tags		F
• 2 048 Power Tags		H
• 4 096 Power Tags		
<b>SIMATIC WinCC Runtime Professional package V13 SP1</b> <sup>2)3)</sup>	<b>6AV2115- 2</b>	<b>A 0 3 - 0 A A 0</b>
• 128 Power Tags		B
• 512 Power Tags		D
• 2 048 Power Tags		F
• 4 096 Power Tags		H
• 8 192 Power Tags		K
• 65 536 Power Tags		M
<b>SIMATIC WinCC Runtime Professional package V12 SP1</b> <sup>2)</sup>	<b>6AV2115- 2</b>	<b>A 0 0 - 0 A A 0</b>
• 128 Power Tags		B
• 512 Power Tags		D
• 2 048 Power Tags		F
• 4 096 Power Tags		H
• 8 192 Power Tags		K
• 65 536 Power Tags		M

<sup>1)</sup> Only if ordered together with a SIMATIC IPC, SIMATIC Panel PC Ex, or S7-mEC

<sup>2)</sup> Only if ordered together with a SIMATIC IPC

<sup>3)</sup> The current version will always be supplied

<b>SIMATIC WinAC RTX (F) package</b>	
• SIMATIC WinAC RTX <sup>1) 2) 3) 4)</sup>	<b>6ES7671-0RC08-6YA0</b>
• SIMATIC WinAC RTX F <sup>1) 2) 3) 4)</sup>	<b>6ES7671-1RC08-6YA0</b>

<sup>1)</sup> Only if ordered together with a SIMATIC IPC

<sup>2)</sup> The current version will always be supplied

<sup>3)</sup> For 32-bit operating systems only

<sup>4)</sup> Not for Rack IPC347D

## Software controllers

### Notes





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**Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

[www.siemens.com/simatic/printmaterial](http://www.siemens.com/simatic/printmaterial)



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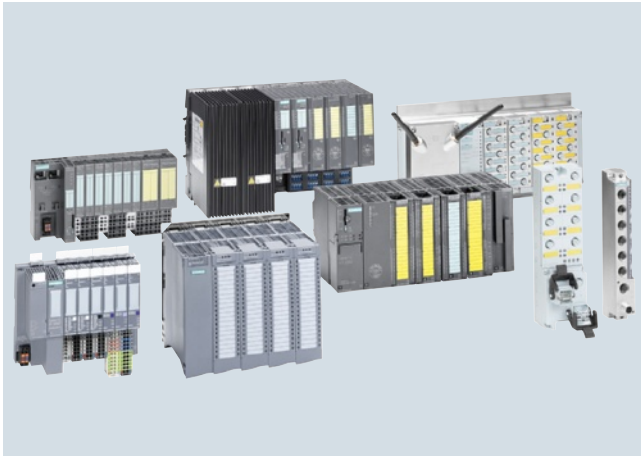
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## I/O systems

### Introduction

#### I/O systems

#### Overview



#### **SIMATIC ET 200 offers the right solution for every application**

With SIMATIC ET 200 a wide range of distributed I/O systems is available - for solutions in the control cabinet or without a control cabinet directly at the machine, as well as for applications in hazardous areas. The modular design makes it possible to scale and expand the ET 200 systems simply and in small stages. Already integrated add-on modules reduce costs, and at the same time offer a widely diverse range of possible applications. You can choose from many different combination options: Digital and analog inputs/outputs, intelligent modules with CPU functionality, safety systems, motor starters, pneumatic devices, frequency converters, as well as various different technology modules (e.g. for counting, positioning).

Communication over PROFINET and PROFIBUS, uniform engineering, transparent diagnostic possibilities as well as optimal interfacing to SIMATIC controllers and HMI units prove the unique integration of Totally Integrated Automation.

#### **PROFINET**

PROFINET is the open, cross-vendor Industrial Ethernet standard (IEC 61158/61784) for automation.

Based on Industrial Ethernet, PROFINET enables direct communication between field devices (IO Devices) and controllers (IO Controllers), up to and including the solution of isochronous drive controls for motion control applications.

As PROFINET is based on Standard Ethernet according to IEEE 802.3, any devices from the field level to the management level can be connected.

In this way, PROFINET enables system-wide communication, supports plant-wide engineering and applies IT standards, such as Web server or FTP, right down to field level. Tried and tested fieldbus systems, such as PROFIBUS or AS-Interface, can be easily integrated without any modification to the existing devices.

#### **PROFIBUS**

PROFIBUS is the international standard (IEC 61158/61784) for the field level. It is the only fieldbus to allow communication both in manufacturing applications and in process-oriented applications.

PROFIBUS is used to connect field devices, e.g. distributed I/O devices or drives, to automation systems such as SIMATIC S7, SIMOTION, SINUMERIK, or PCs.

PROFIBUS is standardized in accordance with IEC 61158 and is a powerful, open and rugged fieldbus system with short response times. PROFIBUS is available in different forms for various applications.

#### **PROFIBUS DP (distributed I/O)**

PROFIBUS DP is used for connecting distributed field devices, e.g. SIMATIC ET 200, or drives with extremely fast response times. PROFIBUS DP is used when sensors/actuators are distributed at the machine or in the plant (e.g. field level).

#### **AS-Interface**

AS-Interface, the international standard (IEC 62026/EN 50295) which, as an alternative to the cable harness, links especially cost-effective sensors and actuators by means of a two-wire line. This two-wire line is also used to supply the individual stations with power. Thus the AS-Interface is the ideal partner for the PROFIBUS DP fieldbus.

#### **IO-Link**

The communication standard IO-Link permits the intelligent connection of sensors and switching devices to the control level. IO-Link facilitates the integration of all components in the control cabinet and on the field level - for maximum integration and seamless communication on the final meters to the process.

IO-Link solutions from Siemens ensure maximum precision and cost-effectiveness in any production system. IO-Link is completely integrated in Totally Integrated Automation (TIA) and offers many advantages.

- The open standard permits the networking of devices from different manufacturers
- Simple wiring facilitates the installation process
- Reduced wiring effort saves time and money during installation
- Efficient engineering facilitates configuration and commissioning
- High-speed diagnostics ensures short plant standstill times and high plant availability
- High process transparency permits, for example, efficient energy management

## Overview



### **SIMATIC ET 200SP**

The scalable SIMATIC ET 200SP I/O system is a highly flexible, modular I/O system with IP20 degree of protection. Via interface modules with PROFINET or PROFIBUS interface it can exchange IO data of the connected I/O modules with a higher-level control system. Alternatively, as further head-end stations, various PLC, F-PLC and open controllers are available as compact S7-1500 controllers (distributed controllers). ET 200SP components are available as SIPPLUS version for extreme requirements and a high degree of robustness.

#### Compact design

- Modular configuration with up to 64 modules
- System-integrated self-assembling load group supply without power module via light BaseUnits
- Small size and highly flexible due to the modular design and comprehensive product range
- Up to 16 channels per module
- Permanent wiring
- Hot swapping: Module replacement without tools in RUN
- Operation with gaps

#### Flexible connection system

- Push-in terminals for cross-sections up to 2.5 mm<sup>2</sup>
- BaseUnits for 1-wire or direct multi-wire connection
- Optimum accessibility for wiring due to spring release and measuring tap next to the conductor opening
- Flexible PROFINET-connection via BusAdapter (RJ45, FastConnect, FiberOptic), also as integrated media converter

#### Safety Integrated

- Easy integration of fail-safe modules
- Easy F parameter assignment via software
- Group-by-group disconnection of non-failsafe modules

#### High performance

- Isochronous PROFINET
- Internal data transfer with up to 100 Mbit/s
- Record analog values and output as of 50 µs
- Record digital values and output as of 1 µs

#### High-performance technology

- Modules for the functions Counting, Positioning, Weighing

#### Energy efficiency

- Energy meter for recording electrical variables
- System-integrated PROFIenergy with interval substitute values

#### Advanced functions

- Configuration control:  
Practical adaptation of the actual configuration via user software (option handling)
- Time-based IO:  
Time stamping of the signals to the µs
- MSI/MSO:  
Simultaneous access to I/O data from up to 4 PLCs
- Oversampling:  
N-fold acquisition or output of digital and analog signals within a PN cycle

#### Communication standards

- PROFINET IO
- PROFIBUS DP V0/V1
- ET connection for connecting the ET 200AL (IP67)
- IO-Link V1.1
- AS-Interface
- Point-to-point (RS 232, RS 485, RS 422)

#### CPU

- PROFINET connection with 3 ports
- IO Controller and PNIO Device
- Optional expansion as DP master/slave
- Also as failsafe version and open controller

#### Labeling of I/O modules

- Meaningful labeling on the front of the I/O modules
- Optionally expandable with
  - Labeling strips
  - Reference identification label

## I/O systems

ET 200 systems for the control cabinet  
ET 200SP

### Introduction

#### Overview (continued)

##### Overview of ET 200SP components

Basic components	Function
<b>Mounting rail according to EN 60715</b>	The mounting rail is the module support of the ET 200SP. The ET 200SP is mounting on the mounting rail.
<b>CPU</b>	<p>The CPU:</p> <ul style="list-style-type: none"> <li>• executes the user program.</li> <li>• is used as IO Controller, I-Device on PROFINET IO, or as standalone CPU</li> <li>• connects the ET 200SP with the IO Devices or the IO Controller</li> <li>• exchanges data with the I/O modules via the backplane bus</li> </ul> <p>Further functions of the CPU:</p> <ul style="list-style-type: none"> <li>• Communication via PROFIBUS DP (in combination with the CM DP communication module, the CPU can be used as DP master or slave)</li> <li>• Integrated Web server</li> <li>• Integrated technology</li> <li>• Integrated trace functionality</li> <li>• Integrated system diagnostics</li> <li>• Integrated safety</li> </ul>
<b>Open controller</b>	<p>As the first controller of this type, the SIMATIC ET 200SP Open Controller combines the functions of a PC-based software controller with visualization, PC applications and central I/Os (inputs/outputs) in a single, compact device.</p> <ul style="list-style-type: none"> <li>• All in one</li> <li>• High system availability</li> <li>• Compact and modular</li> <li>• Rugged</li> <li>• User-friendly design</li> <li>• Efficient engineering in the TIA Portal</li> </ul>
<b>Interface modules for PROFINET IO (IM 155-6PN)</b>	<p>The interface module:</p> <ul style="list-style-type: none"> <li>• is used as IO Device on the PROFINET IO</li> <li>• connects the ET 200SP with the IO Controller</li> <li>• exchanges data with the I/O modules via the backplane bus</li> </ul>
<b>Interface module for PROFIBUS DP (IM 155-6DP)</b>	<p>The interface module:</p> <ul style="list-style-type: none"> <li>• is used as DP slave on the PROFIBUS DP</li> <li>• connects the ET 200SP with the DP master</li> <li>• exchanges data with the I/O modules via the backplane bus</li> </ul>
<b>BusAdapter (BA)</b>	<p>BusAdapters permit the free selection of the connection method and connection technology for head-end stations with PROFINET interface. The following versions are currently available:</p> <ul style="list-style-type: none"> <li>• BA 2xRJ45 (copper)</li> <li>• BA 2xFC (FastConnect, direct connection)</li> <li>• BA 2xSCRJ (FOC, POF or PCF)</li> <li>• BA SCRJ/RJ45 (media converter FOC-copper RJ45)</li> <li>• BA SCRJ/FC (media converter FOC-copper FC)</li> </ul> <p>Cable length between 2 stations: max. 100 m (copper), max. 50 m (POF), max. 100 m (PCF), max. 250 m (PCF-GI).</p> <p>For expanding the station with the I/O systems ET 200AL via ET-connection, the BusAdapter BA-Send is available.</p>

Basic components	Function
<b>BaseUnit (BU)</b>	<p>The BaseUnits provide the electrical and mechanical connection for the ET 200SP components.</p> <ul style="list-style-type: none"> <li>• Bright BaseUnits permit a new potential group up to max. 10 A</li> <li>• Dark BaseUnits forward the self-assembling voltage busbars P1, P2 and AUX from the left to the right BaseUnit.</li> <li>• Suitable BaseUnits with 12 to 28 terminals are available for different connection systems and functions.</li> <li>• The I/O module is plugged onto the desired BaseUnit and determines the potential assignment of the terminals on the BaseUnit.</li> <li>• For expanding the station with the I/O systems ET 200AL via ET-connection, the BaseUnit BU-Send is available.</li> </ul>
<b>I/O modules and fail-safe I/O modules</b>	<p>The I/O module determines the function at the terminals. The controller detects the current process state via the connected sensors and triggers corresponding responses via the connected actuators. Some I/O modules feature extended functions, in part they are also designed as individual operating mode. I/O module are divided into the following module types; the fail-safe versions are identified by a preceding "F-" and a yellow module enclosure.</p> <ul style="list-style-type: none"> <li>• DI (digital input)</li> <li>• DO (digital output)</li> <li>• AI (analog input)</li> <li>• AO (analog output)</li> <li>• TM (technology modules)</li> <li>• CM (communication modules)</li> <li>• SM (special modules)</li> </ul>
<b>Protective cover (BU cover)</b>	<p>The ET 200SP system can be operated with any number of slot gaps (BU slot without I/O module). Applications for this include:</p> <ul style="list-style-type: none"> <li>• partial commissioning</li> <li>• prewired, and currently unequipped options</li> </ul> <p>To protect against damage, such slot gaps must be covered by a BU cover. Within des BU cover, an equipment labeling plate for the planned I/O module can be stored.</p> <p>Versions:</p> <ul style="list-style-type: none"> <li>• for BaseUnits with a width of 15 mm</li> <li>• for BaseUnits with a width of 20 mm</li> </ul>
<b>Server module</b>	<p>The server module concludes the setup of an ET 200SP station. On the server module there are holders for 3 spare fuses (5 × 20 mm). The server module is included in the scope of delivery of all head-end stations.</p>

#### Overview (continued)

Basic components	Function	Basic components	Function
<b>Coding element</b>	<p>When plugging an I/O module onto a BaseUnit for the first time, the coding element moves from the I/O module to the BaseUnit. There it prevents the destruction of the ET 200SP components in the event of a subsequent module replacement with incorrectly selected I/O module.</p> <p>The coding element is available in two versions:</p> <ul style="list-style-type: none"> <li>• Mechanical coding element</li> <li>• Electronic coding element: Additionally features an electronic, re-writable memory for the redundant storage of module-specific configuration data (e.g. F target address for fail-safe modules, parameter data for IO-Link master). Thus these data are automatically backed up during a module replacement.</li> </ul>	<b>Reference identification label</b>	<p>Optionally, one equipment labeling plate each can be plugged onto head-end stations, BusAdapters, BaseUnits, and I/O modules. Equipment labeling plates are supplied in packs of 10 sheets with 16 labels each. The labels can be printed with thermal-transfer card printers, inkjet printers or plotting units or stickers can be attached to them. Advantages compared to labels that are attached directly:</p> <ul style="list-style-type: none"> <li>• The inscription on the front is not covered</li> <li>• Simple label replacement when replacing a module</li> <li>• No parallax errors when marking the BaseUnits on the mounting plate</li> </ul> <p>The size of the inscribable area of the labels is 14.8 x 10.5 mm (W x H)</p>
<b>Shield connection</b>	<p>The shield connection permits the connection of cable shields. Compared to external shield supports, the system offers the following advantages:</p> <ul style="list-style-type: none"> <li>• Quick installation without tools by plugging the shield connection element onto the BaseUnit</li> <li>• Automatic low-impedance connection to the functional ground (mounting rail)</li> <li>• Optimized EMC-properties by separating the supply voltage lines from the signal lines by means of the shield connection element and short, unshielded cable lengths</li> <li>• Low space requirements</li> </ul>	<b>Color-coded labels</b>	<p>The I/O modules that are plugged onto the BaseUnits determine the potentials connected at the process terminals. These potentials can optionally be identified using module-specific color-coded labels. The potentials of the AUX and add-on terminals can also be marked using color-coded labels. Advantages of the color-coded labels:</p> <ul style="list-style-type: none"> <li>• Quick installation (one label for marking 16 terminals)</li> <li>• Avoidance of wiring errors</li> <li>• Simple detection of potentials during servicing</li> </ul>
<b>Labeling strips</b>	<p>Optionally, for system-specific marking the head-end stations and I/O modules can be equipped with labeling strips (13 x 31 mm). The labeling strips can be inscribed mechanically. Labeling strips are available in two versions in the colors light gray and yellow:</p> <ul style="list-style-type: none"> <li>• 500 strips on the roll, for printing on thermal-transfer printers. Core diameter 40 mm, external diameter 70 mm, width 62 mm.</li> <li>• 10 DIN A4 sheets with 100 strips each, cardboard, preperforated, for printing using a laser printer direct from TIA-Portal or via print templates.</li> </ul>		



## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - Interface modules

### IM 155-6

#### Overview



- Interface module for connecting the I/O modules to a higher-level control with PROFINET or PROFIBUS
- Server module included in the scope of delivery
- Station expansion with IP67 I/O system ET200AL via ET-connection to BU-Send/BA-Send
- PROFINET bus connection
  - 2 ports for linear topology
  - Selectable PN connection via BusAdapter (ST, HF)
  - Two integrated RJ45 sockets (BA)
- PROFIBUS bus connection
  - 9-pole sub D socket function classes
  - PROFIBUS connector included in the scope of delivery
  - Hot swapping (module replacement during operation)
  - Startup and operation with gaps
  - Dynamic re-parameterization in RUN
  - Configuration control (option handling)
  - Plug-in 24 V DC power supply connector
  - Electronically readable rating plate (I&M data)

#### Technical specifications

Article number	6ES7155-6AA00-0BNO	6ES7155-6AU00-0BNO	6ES7155-6AU00-0CN0	6ES7155-6BA00-0CN0
	IM155-6PN ST INCL. BA 2XRJ45	IM155-6PN ST	ET 200SP IM155-6PN HF	IM155-6DP HF INCL. DP-CONNECTOR
<b>Product type designation</b>				
<b>General information</b>				
<b>Product function</b>				
• I&M data	Yes	Yes	Yes; I&M0 to I&M4	Yes; I&M0 to I&M3
<b>Engineering with</b>				
• STEP 7 TIA Portal can be configured/integrated as of version	V11 SP2 with HSP0024 / -	V11 SP2 with HSP0024 / -	V12 SP1 / V13	- / -
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision				GSD as of Revision 5
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	
<b>Supply voltage</b>				
Type of supply voltage			DC	DC
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
<b>Mains buffering</b>				
• Mains/voltage failure stored energy time	5 ms	5 ms	5 ms	5 ms
<b>Hardware configuration</b>				
<b>Rack</b>				
• Modules per rack, max.	32	32	64	

**Technical specifications (continued)**

Article number	<b>6ES7155-6AA00-0BN0</b> IM155-6PN ST INCL. BA 2XRJ45	<b>6ES7155-6AU00-0BN0</b> IM155-6PN ST	<b>6ES7155-6AU00-0CN0</b> ET 200SP IM155-6PN HF	<b>6ES7155-6BA00-0CN0</b> IM155-6DP HF INCL. DP-CONNECTOR
<b>Interfaces</b>				
Number of PROFINET interfaces	1	1	1	
Number of PROFIBUS interfaces				1
<b>1st interface</b>				
<b>Interface types</b>				
- Number of ports	2	2	2	
- Integrated switch	Yes	Yes	Yes	
- RJ 45 (Ethernet)	Yes; Pre-assembled BusAdapter BA 2x RJ45			
- RS 485				Yes
- Bus adapter (PROFINET)	Yes; Applicable BusAdapters: BA 2x RJ45, BA 2x FC	Yes; Applicable BusAdapters: BA 2x RJ45, BA 2x FC	Yes; Applicable bus adapters: BA 2xRJ45, BA 2xFC, BA 2xSCRJ (as from FS03)	
- Output current of the interface, max.				90 mA
<b>Protocols</b>				
- PROFINET IO Device	Yes	Yes	Yes	
- Open IE communication	Yes	Yes	Yes	
- PROFIBUS DP slave				Yes
- Media redundancy	Yes	Yes	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring	
<b>Interface types</b>				
<b>RJ 45 (Ethernet)</b>				
• 10 Mbps	Yes; for Ethernet services	Yes; for Ethernet services	Yes; for Ethernet services	
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	
• Autonegotiation	Yes	Yes	Yes	
• Autocrossing	Yes	Yes	Yes	
<b>RS 485</b>				
• Transmission rate, max.				12 Mbit/s
<b>Protocols</b>				
<b>PROFINET IO</b>				
• PROFINET IO	Yes	Yes	Yes	
<b>PROFINET IO Device</b>				
<b>Services</b>				
- Isochronous mode	No		Yes; Bus cycle time: min. 250 µs	
- Open IE communication	Yes	Yes	Yes	
- IRT	Yes; with send cycles of between 250 µs and 4 ms in increments of 125 µs	Yes; with send cycles of between 250 µs and 4 ms in increments of 125 µs	Yes; 250 µs, 500 µs, 1 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 µs to 4 ms in 125 µs frame	
- MRP			Yes	
- MRPD			Yes	
- PROFInergy	Yes	Yes	Yes	
- Prioritized startup	Yes	Yes	Yes	
- Shared device	Yes	Yes	Yes	
- Number of IO controllers with shared device, max.	2	2	4	



**I/O systems**

ET 200 systems for the control cabinet  
ET 200SP - Interface modules

**IM 155-6****Technical specifications** (continued)

Article number	<b>6ES7155-6AA00-0BNO</b> IM155-6PN ST INCL. BA 2XRJ45	<b>6ES7155-6AU00-0BNO</b> IM155-6PN ST	<b>6ES7155-6AU00-0CNO</b> ET 200SP IM155-6PN HF	<b>6ES7155-6BA00-0CNO</b> IM155-6DP HF INCL. DP-CONNECTOR
<b>Open IE communication</b>				
• TCP/IP	Yes	Yes	Yes	
• SNMP	Yes	Yes	Yes; MIB2, LLDP-MIBm, MRP-MIB	
• LLDP	Yes	Yes	Yes	
<b>PROFIBUS</b>				
<b>Services</b>				
- SYNC capability				Yes
- FREEZE capability				Yes
- DPV0				No
- DPV1				Yes
<b>Isochronous mode</b>				
Isochronous operation (application synchronized up to terminal)		No	Yes	
equidistance			Yes	
shortest clock pulse			250 µs	
max. cycle			4 ms	
<b>Interrupts/diagnostics/ status information</b>				
Status indicator	Yes	Yes	Yes	Yes
<b>Alarms</b>				
• Alarms	Yes	Yes	Yes	Yes
<b>Diagnostic messages</b>				
• Diagnostic functions	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>				
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• MAINT LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; green PWR LED
• Connection display LINK TX/RX	Yes; 2x green LED	Yes; 2x green LED	Yes; 2x green LED	
• Connection display DP				Yes; Green DP LED
<b>Isolation</b>				
Isolation checked with	707 V DC between supply voltage and electronics; 1500 V AC between Ethernet and electronics	707 V DC between supply voltage and electronics (type test); 1500 V AC between Ethernet and electronics (type test)	707 V DC between supply voltage and electronics (type test); 1500 V AC between Ethernet and electronics (type test)	707 V DC (type test)
<b>Standards, approvals, certificates</b>				
Network loading class	3	3	3	
Security level	According to Security Level 1 Test Cases V1.1.1	According to Security Level 1 Test Cases V1.1.1	According to Security Level 1 Test Cases V1.1.1	
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• horizontal installation, min.				0 °C
• horizontal installation, max.				60 °C
• vertical installation, min.				0 °C
• vertical installation, max.				50 °C
<b>Dimensions</b>				
Width	50 mm	50 mm	50 mm	50 mm
Height	117 mm	117 mm	117 mm	117 mm
Depth	74 mm	74 mm	74 mm	74 mm
<b>Weights</b>				
Weight, approx.	191 g; IM155PN ST with BA 2x RJ45 (mounted)	147 g; without bus adapter	147 g; without bus adapter	150 g

Ordering data	Article No.	Ordering data	Article No.
<b>Interface module Basic</b> <ul style="list-style-type: none"> <li>IM 155-6PN BA, with server module</li> </ul>	6ES7155-6AR00-0AN0	<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0
<b>Interface module Standard</b> <ul style="list-style-type: none"> <li>IM 155-6PN ST, with server module and installed BusAdapter BA 2xRJ45</li> <li>IM 155-6PN ST, with server module, without BusAdapter</li> </ul>	6ES7155-6AA00-0BN0 6ES7155-6AU00-0BN0	500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer  1000 labeling strips DIN A4, light gray, cardboard, preperforated, for inscription with laser printer	6ES7193-6LR10-0AG0 6ES7193-6LA10-0AA0
<b>Interface module High Feature</b> <ul style="list-style-type: none"> <li>IM 155-6DP HF, with server module, with multi-hot-swap, incl. PROFIBUS connector</li> <li>IM 155-6PN HF, incl. server module, without BusAdapter</li> </ul>	6ES7155-6BA00-0CN0 6ES7155-6AU00-0CN0	1000 labeling strips DIN A4, yellow, cardboard, preperforated, for inscription with laser printer	6ES7193-6LA10-0AG0
<b>Accessories</b> <b>BusAdapter BA 2xRJ45</b> for IM 155-6PN ST, HF	6ES7193-6AR00-0AAA	<b>DIN rail 35 mm</b> Length: 483 mm for 19" cabinets	6ES5710-8MA11
<b>BusAdapter BA 2xFC</b> for IM 155-6PN ST, HF; for increased vibration and EMC loads	6ES7193-6AF00-0AAA	Length: 530 mm for 600 mm cabinets	6ES5710-8MA21
<b>BusAdapter BA 2xSCRJ</b> for IM 155-6PN HF, fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of damping	6ES7193-6AP00-0AAA	Length: 830 mm for 900 mm cabinets	6ES5710-8MA31
<b>BusAdapter BA SCRJ/RJ45</b> for IM 155-6PN HF; with media converter FOC-copper; 1 x SCRJ FO connection, 1 x RJ45 connection	6ES7193-6AP20-0AAA	Length: 2 m	6ES5710-8MA41
<b>BusAdapter BA SCRJ/FC</b> for IM 155-6PN HF; with media converter FOC-copper; 1 x SCRJ FO connection, 1 x FastConnect connection	6ES7193-6AP40-0AAA	<b>Manuals for ET 200SP distributed I/O system</b> SIMATIC ET 200SP Manual Collection: PDF file with the following content: <ul style="list-style-type: none"> <li>Basic information System manual, product information, overview tables, correction information or manual supplements</li> <li>Device-specific information Manuals for the interface modules, PLC, OC and I/O modules incl. failsafe</li> <li>General information Function manuals</li> </ul> The Manual Collection is available on the Internet as PDF file: <a href="https://support.industry.siemens.com/cs/de/en/view/84133942">https://support.industry.siemens.com/cs/de/en/view/84133942</a>	
<b>Station expansion with IP67 I/O system ET 200AL</b> <b>BusAdapter BA-Send 1 x FC</b> for station expansion with IP67 I/O system ET 200AL	6ES7193-6AS00-0AAA	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	6ES7998-8XC01-8YE0
<b>BaseUnit BU-Send</b> for accommodating the BusAdapter BA-Send 1 x FC	6ES7193-6BN00-0NE0	<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	6ES7998-8XC01-8YE2
<b>Further accessories</b> <b>Reference identification label</b> 10 sheets of 16 labels; for printing with thermal-transfer card printer or plotting unit	6ES7193-6LF30-0AW0	<b>Spare parts</b> <b>Server module</b> Terminates an ET 200SP station, included in the scope of delivery of the interface modules	
<b>Shield connection</b> 5 shield connections and 5 shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional ground	6ES7193-6SC00-1AM0	<b>Power supply connector for interface module</b> for connecting the 24 V DC supply voltage <ul style="list-style-type: none"> <li>with push-in terminals (10 units)</li> <li>with screw-type terminals (10 units)</li> </ul>	6ES7193-6PA00-0AAA 6ES7193-4JB00-0AAA 6ES7193-4JB50-0AAA

## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - Interface modules

### SIPLUS interface modules

#### Overview



- Interface module for linking the ET 200SP to PROFINET
- Handles all data exchange with the PROFINET IO Controller
- Bus Adapter (BA) for individual PROFINET connection
- Integrated 2-port switch for line configuration
- Max. 32 I/O modules
- Operation with gaps (non-equipped BaseUnits) possible
- Replacement of an I/O module possible during operation (single hot-swap)
- Load group formation without power module

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

#### Technical specifications

Article number	<b>6AG1155-6AA00-7BN0</b>
Based on	<b>6ES7155-6AA00-0BN0</b> SIPLUS ET 200SP IM155-6PN ST
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• horizontal installation, min.	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

#### Ordering data

#### Article No.

**SIPLUS IM 155-6PN Standard interface module**  
(Extended temperature range and medial exposure)  
With server module and installed bus adapter BA 2xRJ45

**6AG1155-6AA00-7BN0**

#### Accessories

See SIMATIC ET 200SP, IM 155-6 PN Standard interface module, page 9/11

#### Overview



- 4, 8 and 16-channel DI modules
- BaseUnits for single-wire or multi-wire connection
- Function classes Basic, Standard, High-Feature, High-Speed as well as fail-safe DI
- Clear labeling on front of module
- LEDs for diagnostics, status, and error
- Individual system-integrated load group formation with self-assembling voltage busbars (power module not required for ET 200SP)
- Electronically readable rating plate (I&M data)
- Partially with additional operating modes
- Optional accessories
  - Labeling Strips
  - Equipment marking label
  - Color-coded label with module-specific CC code
  - Shield terminal
- Alternatively, partially also available as pack of 10 (Ordering quantities: integer multiples of ten only)

#### Overview of digital input modules

Digital input	Article number	CC code	BU type	PU
DI 16 x DC 24 V ST	6ES7131-6BH00-0BA0	CC00	A0	1
DI 16 x DC 24 V ST	6ES7131-6BH00-2BA0	CC00	A0	10
DI 8 x 24 V DC BA	6ES7131-6BF00-0AA0	CC01	A0	1
DI 8 x 24 V DC BA	6ES7131-6BF00-2AA0	CC01	A0	10
DI 8 x 24 V DC SRC BA	6ES7131-6BF60-0AA0	CC02	A0	1
DI 8 x 24 V DC ST	6ES7131-6BF00-0BA0	CC01	A0	1
DI 8 x 24 V DC ST	6ES7131-6BF00-2BA0	CC01	A0	10
DI 8 x 24 V DC HF	6ES7131-6BF00-0CA0	CC01	A0	1
DI 8 x NAMUR HF	6ES7131-6TF00-0CA0	CC01	A0	1
DI 8 x 24 V DC HS	6ES7131-6BF00-0DA0	CC01	A0	1
With three operating modes:				
• High-speed isochronous DI				
• 4 pulse counters 32-bit, 10 kHz				
• Oversampling				
DI 4 x 120...230 V AC ST	6ES7131-6FD00-0BB1	CC41	B1	1

**I/O systems**

ET 200 systems for the control cabinet

ET 200SP - I/O modules

**Digital input modules****Overview** (continued)

## Overview of BaseUnits

BaseUnit	Article number	CC codes for process terminals	CC codes for AUX terminals	PU
<b>BU type A0</b> • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73	1
<b>BU type A0</b> • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73	10
<b>BU type A0</b> • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0DA0	CC01 to CC05	--	1
<b>BU type A0</b> • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2DA0	CC01 to CC05	--	10
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73	1
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73	10
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0BA0	CC01 to CC05	--	1
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2BA0	CC01 to CC05	--	10
<b>BU type B1</b> • Forwarding of load group (dark) • 12 process terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	6ES7193-6BP20-0BB1	CC41	--	1

#### Technical specifications

Article number	<b>6ES7131-6BF00-0BA0</b> DI 8X24VDC ST	<b>6ES7131-6BF60-0AA0</b> DI 8X24VDC SOURCE BA	<b>6ES7131-6BH00-0BA0</b> DI 16X24VDC ST	<b>6ES7131-6BF00-0CA0</b> DI 8X24VDC HF	<b>6ES7131-6TF00-0CA0</b> DI 8XNAMUR HF	<b>6ES7131-6FD00-0BB1</b> DI 4X120..230VAC ST
<b>Product type designation</b>						
<b>General information</b>						
<b>Product function</b>						
• I&M data	Yes	Yes	Yes	Yes	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
<b>Engineering with</b>						
• STEP 7 TIA Portal can be configured/integrated as of version	V11 SP2 / V13	V13 / V13	V11 SP2 / V13	V12 SP1 / V13	V13 / V13	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	GSD as of Revision 5	GSD Revision 5	GSD as of Revision 5	GSD Revision 5	GSD Revision 5	GSD as of Revision 5
• PROFINET as of GSD version/GSD revision					V2.3	V2.3 / -
<b>Operating mode</b>						
• DI	Yes	Yes	Yes	Yes		
• Counter	No	No	No	No		
• Oversampling	No	No	No	No		
• MSI	No	No	No	Yes		
<b>Supply voltage</b>						
Type of supply voltage	DC	24 V DC	DC	DC	24 V DC	100 - 240 V AC
Rated value (DC)	24 V	24 V	24 V	24 V	24 V	
Rated value (AC)						230 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes	Yes
<b>Encoder supply</b>						
Number of outputs		8			8	4
short-circuit protection					Yes	No; when using BU type B1, a fuse with 10 A tripping current must be provided
<b>Output current</b>						
• up to 60 °C, max.						10 A
<b>24 V encoder supply</b>						
• 24 V	Yes			Yes		
• short-circuit protection	Yes			Yes		
• Output current, max.	700 mA			700 mA		
<b>Digital inputs</b>						
Number of digital inputs	8	8	16	8	8	4
Digital inputs, configurable					Yes	
Type					NAMUR	
m/p-reading	p-reading	Yes; m-reading	p-reading	p-reading		No
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes		
Input characteristic curve in accordance with IEC 61131, type 2	No	No	No	No		
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes	Yes		Yes
Pulse extension	No	No	No	Yes; Pulse duration from 4 µs	Yes; 0.5 s, 1 s, 2 s	No
• Length				50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s		
Edge evaluation					Yes; rising edge, falling edge, edge change	
Signal change flutter					Yes; 2 to 32 signal changes	
Flutter observation window					Yes; 0.5 s, 1 s to 100 s in 1-s steps	

## I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

### Digital input modules

#### Technical specifications (continued)

Article number	6ES7131-6BF00-0BA0 DI 8X24VDC ST	6ES7131-6BF60-0AA0 DI 8X24VDC SOURCE BA	6ES7131-6BH00-0BA0 DI 16X24VDC ST	6ES7131-6BF00-0CA0 DI 8X24VDC HF	6ES7131-6TF00-0CA0 DI 8XNAMUR HF	6ES7131-6FD00-0BB1 DI 4X120..230VAC ST
<b>Input voltage</b>						
• Type of input voltage	DC	DC	DC	DC	DC	120/230V AC (47 Hz to 63 Hz) 230 V
• Rated value (AC)						
• Rated value (DC)	24 V	24 V	24 V	24 V	8.2 V	
• for signal "0"	-30 to +5V	30 V to -5 V (reference potential is L+)	-30 to +5V	-30 to +5V		0V AC to 40V AC
• for signal "1"	+11 to +30V	-11 V to -30 V (reference potential is L+)	+11 to +30V	+11 to +30V		74 V AC to 264 V AC
<b>Input current</b>						
• for signal "1", typ.	2.5 mA	6 mA	2.5 mA	2.5 mA		10.8 mA
<b>for 10 k switched contact</b>						
- for signal "0"					0.35 to 1.2 mA	
- for signal "1"					2.1 to 7 mA	
<b>for unswitched contact</b>						
- for signal "0", max. (permissible quiescent current)					0.5 mA	
- for signal "1"					typ. 8 mA	
<b>for NAMUR encoders</b>						
- for signal "0"					0.35 to 1.2 mA	
- for signal "1"					2.1 to 7 mA	
<b>Input delay (for rated value of input voltage)</b>						
• Tolerated changeover time for changeover contacts					300 ms	
<b>for standard inputs</b>						
- Parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)		No
<b>for interrupt inputs</b>						
- Parameterizable	No	No	No	Yes		
<b>for counter/technological functions</b>						
- Parameterizable	No	No	No	No		
<b>for NAMUR inputs</b>						
- at "0" to "1", max.					12 ms	
- at "1" to "0", max.					12 ms	
<b>Cable length</b>						
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	200 m	1 000 m
• Unshielded, max.	600 m	200 m	600 m	600 m		600 m
<b>Encoder</b>						
<b>Connectable encoders</b>						
• NAMUR encoder/changeover contact according to EN 60947					Yes	
• Single contact / changeover contact unconnected					Yes	
• Single contact / changeover contact connected with 10 kΩ					Yes	
• 2-wire sensor	Yes	Yes	Yes	Yes		Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA	1.5 mA		

#### Technical specifications (continued)

Article number	<b>6ES7131-6BF00-0BA0</b> DI 8X24VDC ST	<b>6ES7131-6BF60-0AA0</b> DI 8X24VDC SOURCE BA	<b>6ES7131-6BH00-0BA0</b> DI 16X24VDC ST	<b>6ES7131-6BF00-0CA0</b> DI 8X24VDC HF	<b>6ES7131-6TF00-0CA0</b> DI 8XNAMUR HF	<b>6ES7131-6FD00-0BB1</b> DI 4X120..230VAC ST
<b>Isochronous mode</b>						
Isochronous operation (application synchronized up to terminal)	No	No	No	Yes		No
Filtering and processing time (TCI), min.				420 µs		
Bus cycle time (TDP), min.				500 µs		
<b>Interrupts/diagnostics/ status information</b>						
<b>Alarms</b>						
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes; channel by channel	No
• Hardware interrupt		No		Yes	Yes; Parameterizable, channels 0 to 7	No
<b>Diagnostic messages</b>						
• Diagnostic information readable	Yes	Yes	Yes	Yes	Yes	
• Diagnostics	Yes	Yes	Yes	Yes		
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes	
• Wire break	Yes		Yes	Yes	Yes	
• Short circuit	Yes	No	No	Yes	Yes	
• Group error					Yes	
<b>Diagnostics indication LED</b>						
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No	No	No	Yes; Red LED	Yes; Red LED	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Galvanic isolation</b>						
<b>Electrical isolation channels</b>						
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes	Yes
<b>Isolation</b>						
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	2545V DC 2s (routine test)
<b>Standards, approvals, certificates</b>						
Suitable for safety functions					No	No
<b>Dimensions</b>						
Width	15 mm	15 mm	15 mm	15 mm	15 mm	20 mm
<b>Weights</b>						
Weight, approx.	28 g	28 g	28 g	28 g	32 g	36 g



## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - I/O modules

### Digital input modules

#### Ordering data

##### Digital input modules

Digital input module DI 8x24 V DC Basic, BU type A0, color code CC01

- PU: 1 unit
- PU: 10 units

Digital input module DI 8x24 V DC Source Input, Basic, BU type A0, color code CC02; PU: 1 unit

Digital input module DI 8x24 V DC Standard, BU type A0, color code CC01

- PU: 1 unit
- PU: 10 units

Digital input module DI 16x24 V DC Standard, BU type A0, color code CC00

- PU: 1 unit
- PU: 10 units

Digital input module DI 8x24 V DC High Feature, BU type A0, color code CC01, channel-specific diagnostics, isochronous mode, shared input (MSI), PU: 1 unit

Digital input module DI 8x24VDC High Speed, BU type A0, color code CC01, 3 operating modes (high-speed isochronous DI, 4 pulse counters 32-bit 10 kHz, oversampling); PU: 1 unit

Digital input module DI 8xNAMUR High Feature, BU type A0, color code CC01; PU: 1 unit

Digital input module DI 4x120 V AC-230 V AC Standard, BU type B1, color code CC41; PU: 1 unit

#### Article No.

**6ES7131-6BF00-0AA0**

**6ES7131-6BF00-2AA0**

**6ES7131-6BF60-0AA0**

**6ES7131-6BF00-0BA0**

**6ES7131-6BF00-2BA0**

**6ES7131-6BH00-0BA0**

**6ES7131-6BH00-2BA0**

**6ES7131-6BF00-0CA0**

**6ES7131-6BF00-0DA0**

**6ES7131-6TF00-0CA0**

**6ES7131-6FD00-0BB1**

#### Article No.

##### Supported BaseUnits

###### BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

- PU: 1 unit
- PU: 10 units

**6ES7193-6BP20-0DA0**

**6ES7193-6BP20-2DA0**

###### BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

- PU: 1 unit
- PU: 10 units

**6ES7193-6BP00-0DA0**

**6ES7193-6BP00-2DA0**

###### BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

- PU: 1 unit
- PU: 10 units

**6ES7193-6BP20-0BA0**

**6ES7193-6BP20-2BA0**

###### BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- PU: 1 unit
- PU: 10 units

**6ES7193-6BP00-0BA0**

**6ES7193-6BP00-2BA0**

###### BU20-P12+A0+4B

BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the load group; PU: 1 unit

**6ES7193-6BP20-0BB1**

Ordering data	Article No.		Article No.
<b>Accessories</b>		<b>Color-coded labels for 15 mm wide BaseUnits</b>	
<b>Reference identification label</b>	<b>6ES7193-6LF30-0AW0</b>	Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), red (terminals 9 to 16), 10 units	<b>6ES7193-6CP00-2MA0</b>
10 sheets of 16 labels; for printing with thermal-transfer card printer or plotting unit		Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), red (terminals 9 to 16), 10 units	<b>6ES7193-6CP01-2MA0</b>
<b>Labeling strips</b>		Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), blue (terminals 9 to 16), 10 units	<b>6ES7193-6CP02-2MA0</b>
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>	Color code CC71, for 10 AUX terminals, BU type A0, yellow-green (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP71-2AA0</b>
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>	Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP72-2AA0</b>
1000 labeling strips DIN A4, light gray, cardboard, preperforated, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>	Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP73-2AA0</b>
1000 labeling strips DIN A4, yellow, cardboard, preperforated, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>	<b>Color-coded labels for 20 mm wide BaseUnits</b>	
<b>BU cover</b>		Color code CC41, for 16 process terminals, BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units	<b>6ES7193-6CP41-2MB0</b>
for covering empty slots (gaps); 5 units			
• 15 mm wide	<b>6ES7133-6CV15-1AM0</b>		
<b>Shield connection</b>	<b>6ES7193-6SC00-1AM0</b>		
5 shield supports and 5 shield terminals			

## I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

### Digital output modules

#### Overview



- 4, 8 and 16-channel DQ modules
- 4-channel RQ modules
- BaseUnits for single-wire or multi-wire connection
- Function classes Basic, Standard, High-Feature, High-Speed as well as fail-safe DQ and RQ
- Clear labeling on front of module
- LEDs for diagnostics, status, and error
- Individual system-integrated load group formation with self-assembling voltage busbars (power module not required for ET 200SP)
- Electronically readable rating plate (I&M data)
- Partially with additional operating modes
- Optional accessories
  - Labeling strips
  - Equipment marking label
  - Color-coded label with module-specific CC code
  - Shield terminal
- Alternatively, partially also available as pack of 10 (Ordering quantities: integer multiples of ten only)

#### Overview of digital output modules

Digital output	Article number	CC code	BU type	PU
DQ 16 x 24 V DC/0.5 A ST	6ES7132-6BH00-0BA0	CC00	A0	1
DQ 16 x 24 V DC/0.5 A ST	6ES7132-6BH00-2BA0	CC00	A0	10
DQ 8 x 24 V DC/0.5 A SNK BA	6ES7132-6BF60-0AA0	CC01	A0	1
DQ 8 x 24 V DC/0.5 A ST	6ES7132-6BF00-0BA0	CC02	A0	1
DQ 8 x 24 V DC/0.5 A ST	6ES7132-6BF00-2BA0	CC02	A0	10
DQ 8 x 24 V DC/0.5 A HF	6ES7132-6BF00-0CA0	CC02	A0	1
DQ 4 x 24 V DC/2 A ST	6ES7132-6BD20-0BA0	CC02	A0	1
DQ 4 x 24 V DC/2 A ST	6ES7132-6BD20-2BA0	CC02	A0	10
DQ 4 x 24 V DC/2 A HF	6ES7132-6BD20-0CA0	CC02	A0	1
DQ 4 x 24 V DC/2 A HF	6ES7132-6BD20-2CA0	CC02	A0	10
DQ 4 x 24 V DC/2 A HS	6ES7132-6BD20-0DA0	CC02	A0	1
With three operating modes				
• High-speed isochronous DQ with valve control				
• Pulse width modulation				
• Oversampling				
DQ 4 x 24...230 V AC/2 A ST	6ES7132-6FD00-0BB1	CC41	B0, B1	1
RQ 4 x 24 V UC/2 A CO ST	6ES7132-6GD50-0BA0	--	A0	1
RQ 4 x 120 V DC - 230 V AC/5 A NO ST	6ES7132-6HD00-0BB1	--	B0, B1	1

**Overview** (continued)

Overview of BaseUnits

BaseUnit	Article number	CC codes for process terminals	CC codes for AUX terminals	PU
<b>BU type A0</b> • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73	1
<b>BU type A0</b> • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73	10
<b>BU type A0</b> • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0DA0	CC01 to CC05	--	1
<b>BU type A0</b> • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2DA0	CC01 to CC05	--	10
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73	1
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73	10
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0BA0	CC01 to CC05	--	1
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2BA0	CC01 to CC05	--	10
<b>BU type B0</b> • Forwarding of load group (dark) • 12 process terminals • With 4 AUX terminals	6ES7193-6BP20-0BB0	CC41	CC81 to CC83	1
<b>BU type B1</b> • Forwarding of load group (dark) • 12 process terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	6ES7193-6BP20-0BB1	CC41	--	1

## I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

### Digital output modules

#### Technical specifications

Article number	<b>6ES7132-6BD20-0BA0</b> DQ 4X24VDC/2A ST	<b>6ES7132-6BD20-0CA0</b> DQ 4X24VDC/2A HF	<b>6ES7132-6FD00-0BB1</b> DQ 4X24..230VAC/ 2A ST	<b>6ES7132-6BF00-0BA0</b> DQ 8X24VDC/0,5A ST	<b>6ES7132-6BF00-0CA0</b> DQ 8X24VDC/0,5A HF
<b>Product type designation</b>					
<b>General information</b>					
<b>Product function</b>					
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
<b>Engineering with</b>					
• STEP 7 TIA Portal can be configured/integrated as of version	V11 SP2 / V13	V13 / V13	V13 / V13	V11 SP2 / V13	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	GSD as of Revision 5	GSD Revision 5	GSD as of Revision 5	GSD Revision 5	GSD Revision 5
<b>Operating mode</b>					
• DQ	Yes	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	No	No
• PWM	No	No	No	No	No
• Oversampling	No	No	No	No	No
• MSO	No	Yes	No	No	Yes
<b>Supply voltage</b>					
Type of supply voltage	DC	DC	24 V AC to 230 V AC	DC	DC
Rated value (DC)	24 V	24 V		24 V	24 V
Rated value (AC)			230 V		
Reverse polarity protection	Yes	Yes		Yes	Yes
<b>Digital outputs</b>					
Type of digital output			Triac with zero point detection		
Number of digital outputs	4	4	4	8	8
Current-sinking	No	No	No	No	No
Current-sourcing	Yes	Yes	Yes	Yes	Yes
Digital outputs, configurable short-circuit protection	Yes	Yes	No	Yes	Yes
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)	L+ -(37 to 41V)	No; when using BU type B1, a fuse with 10 A tripping current must be provided	Typ. L+ (-50 V)	Typ. L+ (-50 V)
Controlling a digital input	Yes	Yes; Minimum current consumption 7 mA		Yes	Yes
<b>Switching capacity of the outputs</b>					
• with resistive load, max.	2 A	2 A	2 A	0.5 A	0.5 A
• on lamp load, max.	10 W	10 W	100 W	5 W	5 W
<b>Load resistance range</b>					
• lower limit	12 Ω	12 Ω		48 Ω	48 Ω
• upper limit	3 400 Ω	3 400 Ω		12 kΩ	12 kΩ
<b>Output voltage</b>					
• Type of output voltage			24 V AC to 230 V AC		
• for signal *1*, min.			20.4 V		
• Permissible voltage at output, min.			20.4 V		
• Permissible voltage at output, max.			264 V		

#### Technical specifications (continued)

Article number	6ES7132-6BD20-0BA0 DQ 4X24VDC/2A ST	6ES7132-6BD20-0CA0 DQ 4X24VDC/2A HF	6ES7132-6FD00-0BB1 DQ 4X24..230VAC/ 2A ST	6ES7132-6BF00-0BA0 DQ 8X24VDC/0,5A ST	6ES7132-6BF00-0CA0 DQ 8X24VDC/0,5A HF
<b>Output current</b>					
• for signal "1" rated value	2 A	2 A	2 A	0.5 A	0.5 A
• for signal "0" residual current, max.	0.1 mA	0.1 mA	460 µA	0.1 mA	0.1 mA
<b>Output delay with resistive load</b>					
• "0" to "1", typ.	50 µs	50 µs			50 µs
• "0" to "1", max.	50 µs		10 ms	50 µs	
• "1" to "0", typ.	100 µs	100 µs			100 µs
• "1" to "0", max.	100 µs		10 ms	100 µs	
<b>Parallel switching of 2 outputs</b>					
• for logic links			No		
• for increased power	No	No	No	No	No
• for redundant control of a load	Yes		Yes	Yes	Yes
<b>Switching frequency</b>					
• with resistive load, max.	100 Hz	100 Hz	10 Hz	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz	0.5 Hz	2 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz	1 Hz	10 Hz	10 Hz
<b>Aggregate current of the outputs</b>					
• Current per channel, max.			2 A		
• Current per module, max.	8 A	8 A	8 A	4 A	4 A
<b>Total current of the outputs (per module)</b>					
<b>horizontal installation</b>					
- up to 30 °C, max.	8 A	8 A			
- up to 40 °C, max.	8 A	8 A	8 A		
- up to 50 °C, max.	6 A	6 A	6 A		
- up to 60 °C, max.	4 A	4 A	4 A	4 A	4 A
<b>vertical installation</b>					
- up to 30 °C, max.	8 A	8 A	8 A		
- up to 40 °C, max.	6 A	6 A	6 A		
- up to 50 °C, max.	4 A	4 A	4 A	4 A	4 A
- up to 60 °C, max.	4 A				
<b>Output current per channel</b>					
<b>horizontal installation</b>					
- up to 60 °C, max.			2 A		
<b>vertical installation</b>					
- up to 50 °C, max.			2 A		
<b>Triac outputs</b>					
• Size of motor starters according to NEMA, max.			5		
<b>Cable length</b>					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m
<b>Isochronous mode</b>					
Isochronous operation (application synchronized up to terminal)	No	Yes	No	No	Yes
Execution and activation time (TCO), min.					48 µs
Bus cycle time (TDP), min.		500 µs			500 µs

## I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

### Digital output modules

#### Technical specifications (continued)

Article number	<b>6ES7132-6BD20-0BA0</b> DQ 4X24VDC/2A ST	<b>6ES7132-6BD20-0CA0</b> DQ 4X24VDC/2A HF	<b>6ES7132-6FD00-0BB1</b> DQ 4X24..230VAC/ 2A ST	<b>6ES7132-6BF00-0BA0</b> DQ 8X24VDC/0,5A ST	<b>6ES7132-6BF00-0CA0</b> DQ 8X24VDC/0,5A HF
<b>Interrupts/diagnostics/ status information</b>					
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
<b>Alarms</b>					
• Diagnostic alarm	Yes	Yes	No	Yes	Yes
<b>Diagnostic messages</b>					
• Diagnostics	Yes	Yes	No	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	No	Yes	Yes
• Wire break	Yes	Yes		Yes	Yes
• Short circuit	Yes	Yes		Yes	Yes
<b>Diagnostics indication LED</b>					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics		Yes; Red LED			Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Galvanic isolation</b>					
<b>Electrical isolation channels</b>					
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes
<b>Isolation</b>					
Isolation checked with	707 V DC (type test)	707 V DC (type test)	2545V DC 2s (routine test)	707 V DC (type test)	707 V DC (type test)
<b>Dimensions</b>					
Width	15 mm	15 mm	20 mm	15 mm	15 mm
<b>Weights</b>					
Weight, approx.	30 g	30 g	50 g	28 g	30 g
Article number	<b>6ES7132-6BF60-0AA0</b> DQ 8X24VDC/0,5A SINK BASIC	<b>6ES7132-6BH00-0BA0</b> DQ 16X24VDC/0,5A ST	<b>6ES7132-6HD00-0BB0</b> RQ NO 4X120VDC..230VAC/ 5A ST	<b>6ES7132-6GD50-0BA0</b> RQ 4X24VDC/2A CO ST	
<b>Product type designation</b>					
<b>General information</b>					
<b>Product function</b>					
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	
<b>Engineering with</b>					
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13	V11 SP2 / V13	V12 SP1 / V13	V13 / V13	
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5	GSD Revision 5	GSD Revision 5	GSD Revision 5	
<b>Operating mode</b>					
• DQ	Yes	Yes	Yes	Yes	
• DQ with energy-saving function	No	No	No	No	
• PWM	No	No	No	No	
• Oversampling	No	No	No	No	
• MSO	No	No	No	No	
<b>Supply voltage</b>					
Type of supply voltage	24 V DC	DC	DC	DC	
Rated value (DC)	24 V	24 V	24 V	24 V	
Reverse polarity protection		Yes	Yes		

**Technical specifications (continued)**

Article number	<b>6ES7132-6BF60-0AA0</b> DQ 8X24VDC/0,5A SINK BASIC	<b>6ES7132-6BH00-0BA0</b> DQ 16X24VDC/0,5A ST	<b>6ES7132-6HD00-0BB0</b> RQ NO 4X120VDC..230VAC/ 5A ST	<b>6ES7132-6GD50-0BA0</b> RQ 4X24VDC/2A CO ST
<b>Digital outputs</b>				
Type of digital output			Relays	Relays
Number of digital outputs	8	16	4	4
Current-sinking	Yes	No		
Current-sourcing	No	Yes		
Digital outputs, configurable	Yes	Yes		
short-circuit protection	Yes	Yes	No	No
Open-circuit detection	No			
Limitation of inductive shutdown voltage to	Typ. 47 V	Typ. L+ (-50 V)		
Controlling a digital input	Yes	Yes		
<b>Switching capacity of the outputs</b>				
• with resistive load, max.	0.5 A	0.5 A		
• on lamp load, max.	5 W	5 W		
<b>Load resistance range</b>				
• lower limit	48 Ω	48 Ω		
• upper limit	3 400 Ω	12 kΩ		
<b>Output current</b>				
• for signal "1" rated value	0.5 A	0.5 A		
• for signal "0" residual current, max.	5 μA	0.1 mA		
<b>Output delay with resistive load</b>				
• "0" to "1", typ.		50 μs		
• "0" to "1", max.	300 μs			
• "1" to "0", typ.		100 μs		
• "1" to "0", max.	600 μs			
<b>Parallel switching of 2 outputs</b>				
• for increased power	No	No		
• for redundant control of a load	Yes	Yes		
<b>Switching frequency</b>				
• with resistive load, max.	100 Hz	100 Hz	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	2 Hz	0.5 Hz	
• on lamp load, max.	10 Hz	10 Hz	2 Hz	
<b>Aggregate current of the outputs</b>				
• Current per channel, max.	0.5 A			
• Current per module, max.	4 A	8 A	20 A	
<b>Total current of the outputs (per module)</b>				
<b>horizontal installation</b>				
- up to 30 °C, max.		8 A		
- up to 40 °C, max.		8 A		
- up to 50 °C, max.		6 A		
- up to 60 °C, max.	4 A	4 A		
<b>vertical installation</b>				
- up to 30 °C, max.		8 A		
- up to 40 °C, max.		6 A		
- up to 50 °C, max.	4 A	4 A		



**I/O systems**

ET 200 systems for the control cabinet

ET 200SP - I/O modules

**Digital output modules****Technical specifications** (continued)

Article number	<b>6ES7132-6BF60-0AA0</b> DQ 8X24VDC/0,5A SINK BASIC	<b>6ES7132-6BH00-0BA0</b> DQ 16X24VDC/0,5A ST	<b>6ES7132-6HD00-0BB0</b> RQ NO 4X120VDC..230VAC/ 5A ST	<b>6ES7132-6GD50-0BA0</b> RQ 4X24VDC/2A CO ST
<b>Relay outputs</b>				
• Number of relay outputs			4	4
• Rated input voltage of relay coil L+ (DC)			24 V	24 V
• Current consumption of relays (coil current of all relays), max.			40 mA	40 mA
• external protection for relay outputs			Yes, with 6A	
<b>Switching capacity of contacts</b>				
- with resistive load, max.				2 A
- Thermal continuous current, max.			5 A	2 A
- Switching current, min.			100 mA	1 mA; 5 V DC
- rated switching voltage (DC)				24 V
- rated switching voltage (AC)				24 V
<b>Cable length</b>				
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	200 m	200 m
<b>Isochronous mode</b>				
Isochronous operation (application synchronized up to terminal)	No	No	No	No
<b>Interrupts/diagnostics/ status information</b>				
Substitute values connectable	No	Yes	Yes	Yes
<b>Alarms</b>				
• Diagnostic alarm	Yes	Yes	Yes	Yes
<b>Diagnostic messages</b>				
• Diagnostics	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire break		Yes		
• Short circuit	No	Yes		
<b>Diagnostics indication LED</b>				
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Galvanic isolation</b>				
<b>Electrical isolation channels</b>				
• between the channels and the backplane bus	Yes	Yes	Yes	Yes
<b>Isolation</b>				
Isolation checked with	707 V DC (type test)	707 V DC (type test)		707 V DC (type test)
<b>tested with</b>				
• between channels and backplane bus/supply voltage			2500 V DC	
• between backplane bus and supply voltage			500 V DC	
<b>Dimensions</b>				
Width	15 mm	15 mm	20 mm	15 mm
<b>Weights</b>				
Weight, approx.	30 g	28 g	40 g	30 g

Ordering data	Article No.	Article No.
<b>Digital output modules</b>		<b>Supported BaseUnits</b>
Digital output module DQ 16x24 V DC/0.5 A Standard, BU type A0, color code CC00 • PU: 1 unit • PU: 10 units	<b>6ES7132-6BH00-0BA0</b> <b>6ES7132-6BH00-2BA0</b>	<b>BU15-P16+A10+2D</b> BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 inter- nally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A) • PU: 1 unit • PU: 10 units
Digital output module DQ 8x24 V DC/0.5 A Sink Output, Basic, BU type A0, color code CC01; PU: 1 unit	<b>6ES7132-6BF60-0AA0</b>	<b>6ES7193-6BP20-0DA0</b> <b>6ES7193-6BP20-2DA0</b>
Digital output module DQ 8x24 V DC/0.5 A Standard, BU type A0, color code CC02 • PU: 1 unit • PU: 10 units	<b>6ES7132-6BF00-0BA0</b> <b>6ES7132-6BF00-2BA0</b>	<b>BU15-P16+A0+2D</b> BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A) • PU: 1 unit • PU: 10 units
Digital output module DQ 8x24 V DC/0.5 A High Feature, BU type A0, color code CC02; PU: 1 unit	<b>6ES7132-6BF00-0CA0</b>	<b>6ES7193-6BP00-0DA0</b> <b>6ES7193-6BP00-2DA0</b>
Digital output module DQ 4x24 V DC/2 A Standard, BU type A0, color code CC02 • PU: 1 unit • PU: 10 units	<b>6ES7132-6BD20-0BA0</b> <b>6ES7132-6BD20-2BA0</b>	<b>BU15-P16+A10+2B</b> BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 inter- nally jumpered AUX terminals (1 A to 10 A); for continuing the load group • PU: 1 unit • PU: 10 units
Digital output module DQ 4x24 V DC/2 A High Feature, BU type A0, color code CC02, channel-precise diagnostics, isochronous mode, shared output (MSO); PU: 1 unit • PU: 1 unit • PU: 10 units	<b>6ES7132-6BD20-0CA0</b> <b>6ES7132-6BD20-2CA0</b>	<b>6ES7193-6BP20-0BA0</b> <b>6ES7193-6BP20-2BA0</b>
Digital output module DQ 4x24VDC/2A High Feature, BU type A0, color code CC02, 3 operating modes (high-speed isochronous DQ with valve control, pulse width modulation, oversampling); PU: 1 unit	<b>6ES7132-6BD20-0DA0</b>	<b>BU15-P16+A0+2B</b> BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group • PU: 1 unit • PU: 10 units
Digital output module DQ 4x24VAC...230VAC/2A Standard for BU type B1, color code CC41; 1 unit	<b>6ES7132-6FD00-0BB1</b>	<b>6ES7193-6BP00-0BA0</b> <b>6ES7193-6BP00-2BA0</b>
Signal relay module RQ CO 4x24 V UC/2 A Standard, changeover contact, BU type A0, color code CC00; PU: 1 unit	<b>6ES7132-6GD50-0BA0</b>	<b>BU20-P12+A4+0B</b> <b>6ES7193-6BP20-0BB0</b>
Relay module RQ NO 4x120 V DC - 230 V AC/5 A Standard, normally-open contact, BU type B0, color code CC00; PU: 1 unit	<b>6ES7132-6HD00-0BB0</b>	<b>BU20-P12+A0+4B</b> BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the load group; PU: 1 unit

## I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

### Digital output modules

Ordering data	Article No.		Article No.
<b>Accessories</b>		<b>Color-coded labels for 15 mm wide BaseUnits</b>	
<b>Reference identification label</b>	<b>6ES7193-6LF30-0AW0</b>	Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), red (terminals 9 to 16), 10 units	<b>6ES7193-6CP00-2MA0</b>
10 sheets of 16 labels; for printing with thermal-transfer card printer or plotting unit		Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), red (terminals 9 to 16), 10 units	<b>6ES7193-6CP01-2MA0</b>
<b>Labeling strips</b>		Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), blue (terminals 9 to 16), 10 units	<b>6ES7193-6CP02-2MA0</b>
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>	Color code CC71, for 10 AUX terminals, BU type A0, yellow-green (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP71-2AA0</b>
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>	Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP72-2AA0</b>
1000 labeling strips DIN A4, light gray, cardboard, preperforated, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>	Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP73-2AA0</b>
1000 labeling strips DIN A4, yellow, cardboard, preperforated, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>	<b>Color-coded labels for 20 mm wide BaseUnits</b>	
<b>BU cover</b>		Color code CC41, for 16 process terminals, BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units	<b>6ES7193-6CP41-2MB0</b>
for covering empty slots (gaps); 5 units		Color code CC81, for 4 AUX terminals, BU type B0, yellow-green (terminals 1 A to 4 A); 10 units	<b>6ES7193-6CP81-2AB0</b>
• 15 mm wide	<b>6ES7133-6CV15-1AM0</b>	Color code CC82, for 4 AUX terminals, BU type B0, red (terminals 1 A to 4 A); 10 units	<b>6ES7193-6CP82-2AB0</b>
• 20 mm wide	<b>6ES7133-6CV20-1AM0</b>	Color code CC83, for 4 AUX terminals, BU type B0, blue (terminals 1 A to 4 A); 10 units	<b>6ES7193-6CP83-2AB0</b>
<b>Shield connection</b>	<b>6ES7193-6SC00-1AM0</b>		
5 shield supports and 5 shield terminals			

## Overview



- 8 and 16-channel digital input modules for the ET 200SP
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete article number
- Optional labeling accessories
  - Labeling strips
  - Reference identification label
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

## Technical specifications

Article number	6AG1131-6BF00-7BA0	6AG1131-6BH00-7BA0
Based on	6ES7131-6BF00-0BA0	6ES7131-6BH00-0BA0
	SIPLUS ET 200SP DI 8X24VDC ST	DI 16X24VDC ST
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• horizontal installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 6	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 4
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**I/O systems**

ET 200 systems for the control cabinet

ET 200SP - I/O modules

**SIPLUS digital input modules****Ordering data****Article No.****Article No.****SIPLUS digital input modules**

(Extended temperature range and medial exposure)

DI 8x24 V DC Standard,  
BU type A0, color code CC01**6AG1131-6BF00-7BA0**DI 16x24 V DC Standard,  
BU type A0, color code CC00**6AG1131-6BH00-7BA0****Supported SIPLUS BaseUnits****BU15-P16+A0+2D**

(Extended temperature range and medial exposure)

BU type A0; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A)

**6AG1193-6BP00-7DA0****BU15-P16+A0+2B**

(Extended temperature range and medial exposure)

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

**6AG1193-6BP00-7BA0****BU15-P16+A10+2D**

(Extended temperature range and medial exposure)

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

**6AG1193-6BP20-7DA0****BU15-P16+A10+2B**

(Extended temperature range and medial exposure)

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

**6AG1193-6BP20-7BA0****Accessories**

See SIMATIC ET 200SP, digital input modules, page 9/19

**Overview**

- 4, 8 and 16-channel digital output modules for the ET 200SP
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DQ: black
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete article number
- Optional labeling accessories
  - Labeling strips
  - Reference identification label
- Optional module-specific color identification of the terminals according to the color code CC

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

## I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

### SIPLUS digital output modules

#### Technical specifications

Article number	<b>6AG1132-6BD20-7BA0</b>	<b>6AG1132-6BF00-7BA0</b>	<b>6AG1132-6BH00-7BA0</b>
Based on	<b>6ES7132-6BD20-0BA0</b> SIPLUS ET200SP DQ 4X24VDC/2A ST	<b>6ES7132-6BF00-0BA0</b> SIPLUS ET200SP DQ 8X24VDC/0,5A ST	<b>6ES7132-6BH00-0BA0</b> SIPLUS ET 200SP DQ 16X24VDC/0.5A ST
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• horizontal installation, min.	-40 °C	-40 °C; = Tmin	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax; > +60 °C number of simultaneously controllable outputs max. 2 x 0.25 A or max. 4 x 0.125 A, max. total current 0.5 A	70 °C; = Tmax; > +60 °C max. total current 1.0 A	70 °C; = Tmax; > +60 °C max. total current 1.0 A
• vertical installation, min.	-40 °C	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	50 °C	50 °C; = Tmax	50 °C; = Tmax
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>			
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data	Article No.	Article No.										
<p><b>SIPLUS digital output modules</b> (Extended temperature range and medial exposure)</p> <p>DQ 4x24VDC/2A Standard, BU type A0, color code CC02</p> <p>DQ 8x24VDC/0.5A Standard, BU type A0, color code CC02</p> <p>DQ 16x24 V DC/0.5 A Standard, BU type A0, color code CC00</p>	<p><b>6AG1132-6BD20-7BA0</b></p> <p><b>6AG1132-6BF00-7BA0</b></p> <p><b>6AG1132-6BH00-7BA0</b></p>	<p><b>Supported SIPLUS BaseUnits</b></p> <tr> <td> <p><b>BU15-P16+A0+2D</b> (Extended temperature range and medial exposure)</p> <p>BU type A0; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A)</p> </td> <td><b>6AG1193-6BP00-7DA0</b></td> </tr> <tr> <td> <p><b>BU15-P16+A0+2B</b> (Extended temperature range and medial exposure)</p> <p>BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group</p> </td> <td><b>6AG1193-6BP00-7BA0</b></td> </tr> <tr> <td> <p><b>BU15-P16+A10+2D</b> (Extended temperature range and medial exposure)</p> <p>BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)</p> </td> <td><b>6AG1193-6BP20-7DA0</b></td> </tr> <tr> <td> <p><b>BU15-P16+A10+2B</b> (Extended temperature range and medial exposure)</p> <p>BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group</p> </td> <td><b>6AG1193-6BP20-7BA0</b></td> </tr> <tr> <td> <p><b>Accessories</b></p> </td> <td>See SIMATIC ET 200SP, digital output modules, page 9/28</td> </tr>	<p><b>BU15-P16+A0+2D</b> (Extended temperature range and medial exposure)</p> <p>BU type A0; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A)</p>	<b>6AG1193-6BP00-7DA0</b>	<p><b>BU15-P16+A0+2B</b> (Extended temperature range and medial exposure)</p> <p>BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group</p>	<b>6AG1193-6BP00-7BA0</b>	<p><b>BU15-P16+A10+2D</b> (Extended temperature range and medial exposure)</p> <p>BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)</p>	<b>6AG1193-6BP20-7DA0</b>	<p><b>BU15-P16+A10+2B</b> (Extended temperature range and medial exposure)</p> <p>BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group</p>	<b>6AG1193-6BP20-7BA0</b>	<p><b>Accessories</b></p>	See SIMATIC ET 200SP, digital output modules, page 9/28
<p><b>BU15-P16+A0+2D</b> (Extended temperature range and medial exposure)</p> <p>BU type A0; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A)</p>	<b>6AG1193-6BP00-7DA0</b>											
<p><b>BU15-P16+A0+2B</b> (Extended temperature range and medial exposure)</p> <p>BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group</p>	<b>6AG1193-6BP00-7BA0</b>											
<p><b>BU15-P16+A10+2D</b> (Extended temperature range and medial exposure)</p> <p>BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)</p>	<b>6AG1193-6BP20-7DA0</b>											
<p><b>BU15-P16+A10+2B</b> (Extended temperature range and medial exposure)</p> <p>BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group</p>	<b>6AG1193-6BP20-7BA0</b>											
<p><b>Accessories</b></p>	See SIMATIC ET 200SP, digital output modules, page 9/28											



## I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

### Analog input modules

#### Overview



- 2, 4 and 8-channel AI modules
- Measuring range for current, voltage, thermocouples, resistance thermometers, resistors, and PTC
- BaseUnits for 2, 3 and 4-wire connection
- Function classes Basic, Standard, High-Feature and High-Speed
- Clear labeling on front of module
- LEDs for diagnostics, status, and error
- Individual system-integrated load group formation with self-assembling voltage busbars (power module not required for ET 200SP), electronically readable rating plate (I&M data)
- Partially with additional operating modes
- Optional accessories
  - Labeling strips
  - Equipment marking label
  - Color-coded label with module-specific CC code
  - Shield terminal

#### Overview of analog input modules

Analog input	Article number	CC code	BU type	PU
AI 8 x I 2-/4-wire BA	6ES7134-6GF00-0AA1	CC01	A0, A1	1
AI 8 x U BA	6ES7134-6FF00-0AA1	CC02	A0, A1	1
AI 4 x U/I 2-wire ST	6ES7134-6HD00-0BA1	CC03	A0, A1	1
AI 4 x I 2-/4-wire ST	6ES7134-6GD00-0BA1	CC03	A0, A1	1
AI 4 x I 2-wire 4...20 mA HART	6ES7134-6TD00-0CA1	CC03	A0, A1	1
AI 2 x U/I 2-/4-wire HF	6ES7134-6HB00-0CA1	CC05	A0, A1	1
AI 2xU/I 2-/4-wire HS	6ES7134-6HB00-0DA1	CC00	A0, A1	1
With two operating modes <ul style="list-style-type: none"> <li>• High-speed isochronous AI</li> <li>• Oversampling</li> </ul>				
AI 8 x RTD/TC 2-wire HF	6ES7134-6JF00-0CA1	CC00	A0, A1	1
AI 4 x RTD/TC 2-/3-/4-wire HF	6ES7134-6JD00-0CA1	CC00	A0, A1	1
AI Energy Meter AC 400 V ST	6ES7134-6PA00-0BD0	--	D0	1

**Overview** (continued)

## Overview of BaseUnits

BaseUnit	Article number	CC codes for process terminals	CC codes for AUX terminals	PU
<b>BU type A0</b> • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73	1
<b>BU type A0</b> • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73	10
<b>BU type A0</b> • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0DA0	CC01 to CC05	--	1
<b>BU type A0</b> • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2DA0	CC01 to CC05	--	10
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73	1
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73	10
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0BA0	CC01 to CC05	--	1
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2BA0	CC01 to CC05	--	10
<b>BU type A1</b> • New load group (light) • With temperature sensor • 16 process terminals • With 2x5 add-on terminals	6ES7193-6BP40-0DA1	CC01 to CC05	CC74	1
<b>BU type A1</b> • New load group (light) • With temperature sensor • 16 process terminals • Without 2x5 add-on terminals	6ES7193-6BP00-0DA1	CC01 to CC05	--	1
<b>BU type A1</b> • Forwarding of load group (dark) • With temperature sensor • 16 process terminals • With 2x5 add-on terminals	6ES7193-6BP40-0BA1	CC01 to CC05	CC74	1
<b>BU type A1</b> • Forwarding of load group (dark) • With temperature sensor • 16 process terminals • Without 2x5 add-on terminals	6ES7193-6BP00-0BA1	CC01 to CC05	--	1
<b>BU type D0</b> • Forwarding of load group (dark) • 12 process terminals • Without AUX terminals	6ES7193-6BP00-0BD0	--	--	1

## I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

### Analog input modules

#### Technical specifications

Article number	<b>6ES7134-6HD00-0BA1</b> AI 4XU/I 2-WIRE ST	<b>6ES7134-6GD00-0BA1</b> AI 4XI 2-/4-WIRE ST	<b>6ES7134-6JD00-0CA1</b> AI 4XRTD/TC 2-/3-/4-WIRE HF	<b>6ES7134-6TD00-0CA1</b> AI 4XI 2-WIRE 4...20MA HART
<b>Product type designation</b>				
<b>General information</b>				
<b>Product function</b>				
• I&M data	Yes	Yes	Yes; I&M0 to I&M3	Yes
• Scalable measuring range	No			No
<b>Engineering with</b>				
• STEP 7 TIA Portal can be configured/integrated as of version	V11 SP2 / V13	V11 SP2 / V13	V12 SP1 / V13	V13 SP1
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / V5.5 SP4	V5.5 SP4 and higher
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5	GSD Revision 5	GSD Revision 5	GSD Revision 5
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -	GSDML V2.3	GSDML V2.31
<b>Operating mode</b>				
• Oversampling	No			No
• MSI	No			No
<b>CiR - Configuration in RUN</b>				
Reparameterization possible in RUN	Yes		Yes	Yes
Calibration possible in RUN	No		Yes	No
<b>Supply voltage</b>				
Type of supply voltage	DC			DC
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
<b>Analog inputs</b>				
Number of analog inputs	4	4	4	4
permissible input voltage for voltage input (destruction limit), max.	30 V		30 V	
Constant measurement current for resistance-type transmitter, typ.			2 mA	
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels); for line compensation in case of a three-wire connection, an additional cycle is necessary	Yes
Technical unit for temperature measurement adjustable			Yes	
<b>Input ranges (rated values), voltages</b>				
• 0 to +10 V	Yes; 15 bit			
• 1 V to 5 V	Yes; 15 bit			
• -1 V to +1 V			Yes; 16 bit incl. sign	
• -10 V to +10 V	Yes; 16 bit incl. sign			
• -250 mV to +250 mV			Yes; 16 bit incl. sign	
• -5 V to +5 V	Yes; 16 bit incl. sign			
• -50 mV to +50 mV			Yes; 16 bit incl. sign	
• -80 mV to +80 mV			Yes; 16 bit incl. sign	

**Technical specifications** (continued)

Article number	<b>6ES7134-6HD00-0BA1</b> AI 4XU/I 2-WIRE ST	<b>6ES7134-6GD00-0BA1</b> AI 4XI 2-/4-WIRE ST	<b>6ES7134-6JD00-0CA1</b> AI 4XRTD/TC 2-/3-/4-WIRE HF	<b>6ES7134-6TD00-0CA1</b> AI 4XI 2-WIRE 4...20mA HART
<b>Input ranges (rated values), currents</b>				
• 0 to 20 mA	Yes; 15 bit	Yes; 15 bit		No
• -20 mA to +20 mA		Yes; 16 bit incl. sign		No
• 4 mA to 20 mA	Yes; 15 bit	Yes; 15 bit		Yes; 15 bits + sign
<b>Input ranges (rated values), thermoelements</b>				
• Type B			Yes; 16 bit incl. sign	
• Type C			Yes; 16 bit incl. sign	
• Type E			Yes; 16 bit incl. sign	
• Type J			Yes; 16 bit incl. sign	
• Type K			Yes; 16 bit incl. sign	
• Type L			Yes; 16 bit incl. sign	
• Type N			Yes; 16 bit incl. sign	
• Type R			Yes; 16 bit incl. sign	
• Type S			Yes; 16 bit incl. sign	
• Type T			Yes; 16 bit incl. sign	
• Type U			Yes; 16 bit incl. sign	
• Type TXK/TXK(L) to GOST			Yes; 16 bit incl. sign	
<b>Input ranges (rated values), resistance thermometer</b>				
• Cu 10			Yes; 16 bit incl. sign	
• Ni 100			Yes; 16 bit incl. sign	
• Ni 1000			Yes; 16 bit incl. sign	
• LG-Ni 1000			Yes; 16 bit incl. sign	
• Ni 120			Yes; 16 bit incl. sign	
• Ni 200			Yes; 16 bit incl. sign	
• Ni 500			Yes; 16 bit incl. sign	
• Pt 100			Yes; 16 bit incl. sign	
• Pt 1000			Yes; 16 bit incl. sign	
• Pt 200			Yes; 16 bit incl. sign	
• Pt 500			Yes; 16 bit incl. sign	
<b>Input ranges (rated values), resistors</b>				
• 0 to 150 ohms			Yes; 15 bit	
• 0 to 300 ohms			Yes; 15 bit	
• 0 to 600 ohms			Yes; 15 bit	
• 0 to 3000 ohms			Yes; 15 bit	
• 0 to 6000 ohms			Yes; 15 bit	
• PTC			Yes; 15 bit	
<b>Thermocouple (TC)</b>				
• Technical unit for temperature measurement			°C/°F/K	
<b>Temperature compensation</b>				
- Parameterizable			Yes	
<b>Resistance thermometer (RTD)</b>				
• permissible input voltage for voltage input (destruction limit), max.			30 V	
• Technical unit for temperature measurement			°C/°F/K	
<b>Cable length</b>				
• shielded, max.	1 000 m; 200 m for voltage measurement	1 000 m	200 m; 50 m with thermocouples	800 m

**I/O systems**

ET 200 systems for the control cabinet

ET 200SP - I/O modules

**Analog input modules****Technical specifications (continued)**

Article number	<b>6ES7134-6HD00-0BA1</b> AI 4XU/I 2-WIRE ST	<b>6ES7134-6GD00-0BA1</b> AI 4XI 2-/4-WIRE ST	<b>6ES7134-6JD00-0CA1</b> AI 4XRTD/TC 2-/3-/4-WIRE HF	<b>6ES7134-6TD00-0CA1</b> AI 4XI 2-WIRE 4...20MA HART
<b>Analog value generation for the inputs</b>				
<b>Integration and conversion time/ resolution per channel</b>				
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes	Yes; channel by channel
• Basic conversion time, including integration time (ms)				
- additional processing time for wire-break check			2 ms; In the ranges resistance thermometers, resistors and thermocouples	
- additional power line wire-break check			2 ms; for 3/4 wire transducer (resistance thermometer and resistor)	
• Interference voltage suppression for interference frequency $f_1$ in Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz	10 / 50 / 60 Hz
• Conversion time (per channel)	180 / 60 / 50 ms	180 / 60 / 50 ms	180 / 60 / 50 ms	
<b>Smoothing of measured values</b>				
• Number of levels	4			4
• Parameterizable	Yes	Yes	Yes	Yes
<b>Encoder</b>				
<b>Connection of signal encoders</b>				
• for voltage measurement	Yes		Yes	No
• for current measurement as 2-wire transducer	Yes	Yes		Yes
- Burden of 2-wire transmitter, max.	650 $\Omega$	650 $\Omega$		
• for current measurement as 4-wire transducer	No	Yes		
• for resistance measurement with two-wire connection			Yes	
• for resistance measurement with three-wire connection			Yes	
• for resistance measurement with four-wire connection			Yes	
<b>Errors/accuracies</b>				
<b>Basic error limit (operational limit at 25 °C)</b>				
• Voltage, relative to input area, (+/-)	0.3 %		0.05 %	
• Current, relative to input area, (+/-)	0.3 %	0.3 %		0.3 %
• Resistance, relative to input area, (+/-)			0.05 %	
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>				
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB	70 dB	70 dB	60 dB
• common mode voltage, max.	10 V	10 V	10 V	
• Common mode interference, min.	90 dB	90 dB	90 dB	

**Technical specifications (continued)**

Article number	<b>6ES7134-6HD00-0BA1</b> AI 4XU/I 2-WIRE ST	<b>6ES7134-6GD00-0BA1</b> AI 4XI 2-/4-WIRE ST	<b>6ES7134-6JD00-0CA1</b> AI 4XR TD/TC 2-/3-/4-WIRE HF	<b>6ES7134-6TD00-0CA1</b> AI 4XI 2-WIRE 4...20mA HART
<b>Isochronous mode</b>				
Isochronous operation (application synchronized up to terminal)	No			No
<b>Interrupts/diagnostics/ status information</b>				
<b>Alarms</b>				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Limit value alarm	No		Yes; two upper and two lower limit values in each case	Yes
<b>Diagnostic messages</b>				
• Diagnostics		Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire break	Yes; at 4 to 20 mA	Yes; at 4 to 20 mA	Yes; channel by channel	Yes; channel by channel
• Short circuit	Yes; with 1 to 5 V or 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply		Yes; Channel-by-channel, short-circuit of the encoder supply to ground or of an input to the encoder supply
• Group error	Yes			
• Overflow/underflow	Yes	Yes	Yes; channel by channel	Yes; channel by channel
<b>Diagnostics indication LED</b>				
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No		Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; Green/red LED	Yes; Green/red LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Electrical isolation channels</b>				
• between the channels and the backplane bus	Yes	Yes	Yes	Yes
<b>Isolation</b>				
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• horizontal installation, min.		0 °C		
• horizontal installation, max.		60 °C		
• vertical installation, min.		0 °C		
• vertical installation, max.		50 °C		
<b>Dimensions</b>				
Width	15 mm	15 mm	15 mm	15 mm
<b>Weights</b>				
Weight, approx.	31 g	31 g	30 g	31 g

## I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

### Analog input modules

#### Technical specifications (continued)

Article number	<b>6ES7134-6HB00-0DA1</b> ET 200SP AI 2 X U/I 2-, 4-WIRE HS	<b>6ES7134-6HB00-0CA1</b> ET 200SP AI 2 X U/I 2-, 4-WIRE HF	<b>6ES7134-6JF00-0CA1</b> AI 8XRTD/TC 2-WIRE HF
<b>Product type designation</b>			
<b>General information</b>			
<b>Product function</b>			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Scalable measuring range	No	No	
<b>Engineering with</b>			
• STEP 7 TIA Portal can be configured/integrated as of version	V13 SP1	V13	V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 / -
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5	GSD Revision 5	GSD Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3
<b>Operating mode</b>			
• Oversampling	Yes	No	
• MSI	No	No	
<b>CiR - Configuration in RUN</b>			
Reparameterization possible in RUN	Yes	Yes	Yes
Calibration possible in RUN	No	Yes	Yes
<b>Supply voltage</b>			
Type of supply voltage	DC	DC	
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
<b>Analog inputs</b>			
Number of analog inputs	2	2	8
permissible input voltage for voltage input (destruction limit), max.	30 V	30 V	30 V
Constant measurement current for resistance-type transmitter, typ.			2 mA
Cycle time (all channels), min.	125 µs		Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)
Technical unit for temperature measurement adjustable			Yes
<b>Input ranges (rated values), voltages</b>			
• 0 to +10 V	Yes; 15 bit	Yes; 15 bit	
• 1 V to 5 V	Yes; 13 bit	Yes; 15 bit	
• -1 V to +1 V			Yes; 16 bit incl. sign
• -10 V to +10 V	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• -250 mV to +250 mV			Yes; 16 bit incl. sign
• -5 V to +5 V	Yes; 15 bit incl. sign	Yes; 16 bit incl. sign	
• -50 mV to +50 mV			Yes; 16 bit incl. sign
• -80 mV to +80 mV			Yes; 16 bit incl. sign

**Technical specifications** (continued)

Article number	<b>6ES7134-6HB00-0DA1</b> ET 200SP AI 2 X U/I 2-, 4-WIRE HS	<b>6ES7134-6HB00-0CA1</b> ET 200SP AI 2 X U/I 2-, 4-WIRE HF	<b>6ES7134-6JF00-0CA1</b> AI 8XRTD/TC 2-WIRE HF
<b>Input ranges (rated values), currents</b>			
• 0 to 20 mA	Yes; 15 bit	Yes; 15 bit	
• -20 mA to +20 mA	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• 4 mA to 20 mA	Yes; 14 bit	Yes; 15 bit	
<b>Input ranges (rated values), thermoelements</b>			
• Type B			Yes; 16 bit incl. sign
• Type C			Yes; 16 bit incl. sign
• Type E			Yes; 16 bit incl. sign
• Type J			Yes; 16 bit incl. sign
• Type K			Yes; 16 bit incl. sign
• Type L			Yes; 16 bit incl. sign
• Type N			Yes; 16 bit incl. sign
• Type R			Yes; 16 bit incl. sign
• Type S			Yes; 16 bit incl. sign
• Type T			Yes; 16 bit incl. sign
• Type U			Yes; 16 bit incl. sign
• Type TXK/TXK(L) to GOST			Yes; 16 bit incl. sign
<b>Input ranges (rated values), resistance thermometer</b>			
• Ni 100			Yes; 16 bit incl. sign
• Ni 1000			Yes; 16 bit incl. sign
• LG-Ni 1000			Yes; 16 bit incl. sign
• Ni 120			Yes; 16 bit incl. sign
• Ni 200			Yes; 16 bit incl. sign
• Ni 500			Yes; 16 bit incl. sign
• Pt 100			Yes; 16 bit incl. sign
• Pt 1000			Yes; 16 bit incl. sign
• Pt 200			Yes; 16 bit incl. sign
• Pt 500			Yes; 16 bit incl. sign
<b>Input ranges (rated values), resistors</b>			
• 0 to 150 ohms			Yes; 15 bit
• 0 to 300 ohms			Yes; 15 bit
• 0 to 600 ohms			Yes; 15 bit
• 0 to 3000 ohms			Yes; 15 bit
• 0 to 6000 ohms			Yes; 15 bit
• PTC			Yes; 15 bit
<b>Thermocouple (TC)</b>			
• Technical unit for temperature measurement			°C/°F/K
<b>Temperature compensation</b>			
- Parameterizable			Yes
<b>Resistance thermometer (RTD)</b>			
• permissible input voltage for voltage input (destruction limit), max.			30 V
• Technical unit for temperature measurement			°C/°F/K
<b>Cable length</b>			
• shielded, max.	1 000 m; 200 m for voltage measurement	1 000 m; 200 m for voltage measurement	200 m; 50 m with thermocouples



## I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

### Analog input modules

#### Technical specifications (continued)

Article number	6ES7134-6HB00-0DA1	6ES7134-6HB00-0CA1	6ES7134-6JF00-0CA1
	ET 200SP AI 2 X U/I 2-, 4-WIRE HS	ET 200SP AI 2 X U/I 2-, 4-WIRE HF	AI 8XRTD/TC 2-WIRE HF
<b>Analog value generation for the inputs</b>			
<b>Integration and conversion time/resolution per channel</b>			
<ul style="list-style-type: none"> <li>Resolution with overrange (bit including sign), max.</li> <li>Integration time, parameterizable</li> <li>Basic conversion time, including integration time (ms)               <ul style="list-style-type: none"> <li>- additional processing time for wire-break check</li> </ul> </li> </ul>	16 bit	16 bit	16 bit
<ul style="list-style-type: none"> <li>Interference voltage suppression for interference frequency f1 in Hz</li> <li>Conversion time (per channel)</li> <li>Basic execution time of the module (all channels released)</li> </ul>	No 10 µs	Yes 1 ms	Yes 2 ms; In the ranges resistance thermometers, resistors and thermocouples 16.6 / 50 / 60 Hz 180 / 60 / 50 ms
<b>Smoothing of measured values</b>			
<ul style="list-style-type: none"> <li>Number of levels</li> <li>Parameterizable</li> </ul>	7; none; 2-/4-/8-/16-/32-/64-fold Yes	6; none; 2-/4-/8-/16-/32-fold Yes	Yes
<b>Encoder</b>			
<b>Connection of signal encoders</b>			
<ul style="list-style-type: none"> <li>for voltage measurement</li> <li>for current measurement as 2-wire transducer               <ul style="list-style-type: none"> <li>- Burden of 2-wire transmitter, max.</li> </ul> </li> <li>for current measurement as 4-wire transducer</li> <li>for resistance measurement with two-wire connection</li> <li>for resistance measurement with three-wire connection</li> <li>for resistance measurement with four-wire connection</li> </ul>	Yes Yes 650 Ω Yes	Yes Yes 650 Ω Yes	Yes   Yes No No
<b>Errors/accuracies</b>			
<b>Basic error limit (operational limit at 25 °C)</b>			
<ul style="list-style-type: none"> <li>Voltage, relative to input area, (+/-)</li> <li>Current, relative to input area, (+/-)</li> <li>Resistance, relative to input area, (+/-)</li> </ul>	0.2 % 0.2 %	0.05 %; 0.1 % at SFU 4.8 kHz 0.05 %; 0.1 % at SFU 4.8 kHz	0.05 % 0.05 %
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, f1 = interference frequency</b>			
<ul style="list-style-type: none"> <li>Series mode interference (peak value of interference &lt; rated value of input range), min.</li> <li>common mode voltage, max.</li> <li>Common mode interference, min.</li> </ul>	35 V 90 dB	35 V 90 dB	70 dB 10 V 90 dB
<b>Isochronous mode</b>			
<ul style="list-style-type: none"> <li>Isochronous operation (application synchronized up to terminal)</li> <li>Filtering and processing time (TCI), min.</li> <li>Bus cycle time (TDP), min.</li> </ul>	Yes 80 µs 125 µs	Yes 800 µs 1 ms	

**Technical specifications (continued)**

Article number	<b>6ES7134-6HB00-0DA1</b> ET 200SP AI 2 X U/I 2-, 4-WIRE HS	<b>6ES7134-6HB00-0CA1</b> ET 200SP AI 2 X U/I 2-, 4-WIRE HF	<b>6ES7134-6JF00-0CA1</b> AI 8XRTD/TC 2-WIRE HF
<b>Interrupts/diagnostics/status information</b>			
<b>Alarms</b>			
• Diagnostic alarm	Yes	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
<b>Diagnostic messages</b>			
• Diagnostics	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	Yes; channel-by-channel, at 4 to 20 mA only	Yes; Measuring range 4 to 20 mA only	Yes; channel by channel
• Short circuit	Yes; channel-by-channel, at 1 to 5 V or for current measuring ranges short-circuit in encoder supply	Yes; For 1 to 5 V or for current measuring ranges short-circuit in encoder supply	
• Overflow/underflow	Yes	Yes	Yes; channel by channel
<b>Diagnostics indication LED</b>			
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Electrical isolation channels</b>			
• between the channels and the backplane bus	Yes	Yes	Yes
<b>Isolation</b>			
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
<b>Dimensions</b>			
Width	15 mm	15 mm	15 mm
<b>Weights</b>			
Weight, approx.	32 g	32 g	32 g
Article number	<b>6ES7134-6PA00-0BD0</b> ET 200SP AI ENERGY METER ST	Article number	<b>6ES7134-6PA00-0BD0</b> ET 200SP AI ENERGY METER ST
<b>Product type designation</b>		<b>Supply voltage</b>	
<b>General information</b>		Description	Supply via voltage measurement channel L1
Supported BaseUnits	BU type D0, BU20-P12+A0+0B	Type of supply voltage	100 - 240 V AC
Color code for module-specific color identification plate	CC00	Relative symmetrical tolerance of the supply voltage	10 %
<b>Product function</b>		permissible range, lower limit (AC)	90 V
• Voltage measurement	Yes	permissible range, upper limit (AC)	264 V
• Current measurement	Yes	<b>Line frequency</b>	
• Energy measurement	Yes	• permissible frequency range, lower limit	47 Hz
• Frequency measurement	Yes	• permissible frequency range, upper limit	63 Hz
• Active power measurement	Yes	<b>Power</b>	
• Reactive power measurement	Yes	Power consumption without expansion module, typ.	0.6 V·A
• I&M data	Yes		
• Isochronous mode	No		
<b>Operating mode</b>			
• Cyclic measurement	Yes		
• Acyclic measurement	Yes		
<b>Installation type/mounting</b>			
Mounting position	Any		

## I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

### Analog input modules

#### Technical specifications (continued)

Article number	<b>6ES7134-6PA00-0BD0</b> ET 200SP AI ENERGY METER ST
<b>Address area</b>	
<b>Address space per module</b>	
• Address space per module, max.	44 byte; 32 byte input / 12 byte output
<b>Analog inputs</b>	
Cycle time (all channels), typ.	50 ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	24 bit; Sigma-delta converter, 1.024 MHz
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Limit value alarm	No
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes
• Channel status display	Yes
• for channel diagnostics	Yes
• for module diagnostics	Yes
<b>Integrated Functions</b>	
<b>Measuring functions</b>	
• Buffering of measured variables	No
• Parameter length	44 byte
• Measuring procedure for voltage measurement	TRMS
• Measuring procedure for current measurement	TRMS
• Type of measured value acquisition	seamless
• Curve shape of voltage	Sinusoidal or distorted
<b>Operating mode for measured value acquisition</b>	
- Automatic detection of line frequency	No; Parameterizable
- Fixation to 50 Hz	No; Default setting
- Fixation to 60 Hz	No
<b>Measuring range</b>	
- Frequency measurement, min.	45 Hz
- Frequency measurement, max.	65 Hz
<b>Measuring inputs for voltage</b>	
- Measurable line voltage between phase and neutral conductor	230 V
- Measurable line voltage between the line conductors	400 V
- Measurable line voltage between phase and neutral conductor, min.	90 V
- Measurable line voltage between phase and neutral conductor, max.	264 V
- Measurable line voltage between the line conductors, min.	155 V
- Measurable line voltage between the line conductors, max.	460 V
- Measurement category for voltage measurement	CAT III acc. to IEC 61010 Part 1
- Power consumption per phase	20 mW

Article number	<b>6ES7134-6PA00-0BD0</b> ET 200SP AI ENERGY METER ST
<b>Integrated Functions (continued)</b>	
<b>Measuring inputs for current</b>	
- Measurable relative current (AC), min.	5 %; Relative to the secondary rated current; 1 A, 5 A
- Measurable relative current (AC), max.	100 %; Relative to the secondary rated current; 1 A, 5 A
- Continuous current (AC), maximum permissible	5 A
- Apparent power consumption per phase for measuring range 5 A	0.6 V·A
- Rated value short-time withstand current restricted to 1 s	100 A
- Zero point suppression	Parameterizable: 20 - 250 mA, default 50 mA
- Surge strength for 1 s	10 A; for 1 minute
<b>Meter uncertainties</b>	
- Reference condition for measurement accuracy	Symmetric load, rated current: 20-100%, 50 Hz; active power: LF = 1, reactive power: LF = 0
- for measured variable voltage	±0.5%
- for measured variable current	±0.5%
- for measured variable power	±0.5%
- for measured variable active power	±0.5%
- for measured variable reactive power	±0.5%
- for measured variable total active energy	Class 1 acc. to IEC 62053-21:2003
- for measured variable total reactive energy	Class 2 acc. to IEC 62053-23:2003
<b>Dimensions</b>	
Width	20 mm
<b>Weights</b>	
Weight (without packaging)	45 g
<b>other</b>	
<b>Data for selecting a current transformer</b>	
• Burden power current transformer x/1A, min.	1.25 V·A
• Burden power current transformer x/5A, min.	1.5 V·A
• Cable length (terminal-transformer) dependent on Zn and I <sub>max</sub>	200 m

Ordering data	Article No.	Article No.
<b>Analog input modules</b>		<b>Supported type A0 BaseUnits</b>
Analog input module AI 8xI 2-/4-wire BA, BU type A0 or A1, color code CC01	<b>6ES7134-6GF00-0AA1</b>	<b>BU15-P16+A10+2D</b>
Analog input module AI 8xU BA, BU type A0 or A1, color code CC02	<b>6ES7134-6FF00-0AA1</b>	BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)
Analog input module AI 4xU/I 2-wire Standard, BU type A0 or A1, color code CC03, 16 bit, ± 0.3%	<b>6ES7134-6HD00-0BA1</b>	<ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> </ul>
Analog input module AI 4xI 2-/4-wire Standard, BU type A0 or A1, color code CC03, 16 bit, ± 0.3%	<b>6ES7134-6GD00-0BA1</b>	<b>BU15-P16+A0+2D</b>
Analog input module AI 4xI 2-wire 4...20 mA HART, BU type A0 or A1, color code CC03	<b>6ES7134-6TD00-0CA1</b>	BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)
Analog input module AI 2xU/I 2-/4-wire High Feature, BU type A0 or A1, color code CC05, 16 bit, ± 0.1%, independent channel isolation, isochronous mode above 1 ms	<b>6ES7134-6HB00-0CA1</b>	<ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> </ul>
Analog input module AI 2xU/I 2-/4-wire High Speed, BU type A0 or A1, color code CC00, 16 bit, ± 0.3%, isochronous mode above 250 µs, oversampling above 50 µs	<b>6ES7134-6HB00-0DA1</b>	<b>BU15-P16+A10+2B</b>
Analog input module AI 8xRTD/TC 2-wire High Feature, BU type A0 or A1, color code CC00, 16 bit, ± 0.1%, scalable measuring range	<b>6ES7134-6JF00-0CA1</b>	BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group
Analog input module AI 4xRTD/TC 2-, 3-, 4-wire High Feature, BU type A0 or A1, color code CC00, 16 bit, ± 0.1%, scalable measuring range	<b>6ES7134-6JD00-0CA1</b>	<ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> </ul>
Analog input module AI Energy Meter Standard, BU type D0	<b>6ES7134-6PA00-0BD0</b>	<b>BU15-P16+A0+2B</b>
		BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group
		<ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> </ul>
		<b>6ES7193-6BP00-0DA0</b> <b>6ES7193-6BP20-2DA0</b>
		<b>6ES7193-6BP00-0DA0</b> <b>6ES7193-6BP00-2DA0</b>
		<b>6ES7193-6BP20-0BA0</b> <b>6ES7193-6BP20-2BA0</b>
		<b>6ES7193-6BP00-0BA0</b> <b>6ES7193-6BP00-2BA0</b>

## I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

### Analog input modules

Ordering data	Article No.	Accessories	Article No.
<b>Supported type A1 BaseUnits (temperature detection)</b>		<b>Reference identification label</b>	<b>6ES7193-6LF30-0AW0</b>
<b>BU15-P16+A0+12D/T</b> BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and additionally 2x5 internally jumpered add-on terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	<b>6ES7193-6BP40-0DA1</b>	10 sheets of 16 labels; for printing with thermal-transfer card printer or plotting unit	
<b>BU15-P16+A0+2D/T</b> BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	<b>6ES7193-6BP00-0DA1</b>	<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>
<b>BU15-P16+A0+12B/T</b> BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered add-on terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	<b>6ES7193-6BP40-0BA1</b>	500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>
<b>BU15-P16+A0+2B/T</b> BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	<b>6ES7193-6BP00-0BA1</b>	1000 labeling strips DIN A4, light gray, cardboard, preperforated, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>
<b>Supported type D0 BaseUnits</b>		1000 labeling strips DIN A4, yellow, cardboard, preperforated, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>
<b>BU20-P12+A0+0B</b> BU type D0; BaseUnit with 12 push-in terminals, without AUX terminals, bridged to the left	<b>6ES7193-6BP00-0BD0</b>	<b>BU cover</b> for covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide	<b>6ES7133-6CV15-1AM0</b> <b>6ES7133-6CV20-1AM0</b>
		<b>Shield connection</b> 5 shield supports and 5 shield terminals	<b>6ES7193-6SC00-1AM0</b>
		<b>Color-coded labels</b> Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), red (terminals 9 to 16), 10 units	<b>6ES7193-6CP00-2MA0</b>
		Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), red (terminals 9 to 16), 10 units	<b>6ES7193-6CP01-2MA0</b>
		Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), blue (terminals 9 to 16), 10 units	<b>6ES7193-6CP02-2MA0</b>
		Color code CC03, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 12), gray (terminals 13 to 16); 10 units	<b>6ES7193-6CP03-2MA0</b>
		Color code CC05, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 12), red (terminals 13 to 14), blue (terminals 15 to 16); 10 units	<b>6ES7193-6CP05-2MA0</b>
		Color code CC71, for 10 AUX terminals, BU type A0, yellow-green (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP71-2AA0</b>
		Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP72-2AA0</b>
		Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP73-2AA0</b>
		Color code CC74, for 2x5 add-on terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C); 10 units	<b>6ES7193-6CP74-2AA0</b>

## Overview



- 2 and 4-channel AQ modules
- Output ranges for current, voltage
- BaseUnits for 2, 3 and 4-wire connection
- Function classes Standard, High-Feature and High-Speed
- Clear labeling on front of module
- LEDs for diagnostics, status, and error
- Individual system-integrated load group formation with self-assembling voltage busbars (power module not required for ET 200SP)
- Electronically readable rating plate (I&M data)
- Partially with additional operating modes
- Optional accessories
  - Labeling strips
  - Equipment marking label
  - Color-coded label with module-specific CC code
  - Shield terminal

## Overview of analog output modules

Analog input	Article number	CC code	BU type	PU
AQ 4 x U/I ST	6ES7135-6HD00-0BA1	CC00	A0, A1	1
AQ 2 x U/I HF	6ES7135-6HB00-0CA1	CC00	A0, A1	1
AQ 2xU/I HS	6ES7135-6HB00-0DA1	CC00	A0, A1	1

With two operating modes

- High-speed isochronous AQ
- Oversampling

**I/O systems**

ET 200 systems for the control cabinet

ET 200SP - I/O modules

**Analog output modules****Overview** (continued)

## Overview of BaseUnits

BaseUnit	Article number	CC codes for process terminals	CC codes for AUX terminals	PU
<b>BU type A0</b> • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73	1
<b>BU type A0</b> • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73	10
<b>BU type A0</b> • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0DA0	CC01 to CC05	--	1
<b>BU type A0</b> • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2DA0	CC01 to CC05	--	10
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73	1
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73	10
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0BA0	CC01 to CC05	--	1
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2BA0	CC01 to CC05	--	10
<b>BU type A1</b> • New load group (light) • With temperature sensor • 16 process terminals • With 2x5 add-on terminals	6ES7193-6BP40-0DA1	CC01 to CC05	CC74	1
<b>BU type A1</b> • New load group (light) • With temperature sensor • 16 process terminals • Without 2x5 add-on terminals	6ES7193-6BP00-0DA1	CC01 to CC05	--	1
<b>BU type A1</b> • Forwarding of load group (dark) • With temperature sensor • 16 process terminals • With 2x5 add-on terminals	6ES7193-6BP40-0BA1	CC01 to CC05	CC74	1
<b>BU type A1</b> • Forwarding of load group (dark) • With temperature sensor • 16 process terminals • Without 2x5 add-on terminals	6ES7193-6BP00-0BA1	CC01 to CC05	--	1

#### Technical specifications

Article number	<b>6ES7135-6HD00-0BA1</b> AQ 4XU/I ST	<b>6ES7135-6HB00-0DA1</b> ET 200SP AQ 2 X U/I HIGH SPEED	<b>6ES7135-6HB00-0CA1</b> ET 200SP AQ 2 X U/I HIGH FEATURE
<b>Product type designation</b>			
<b>General information</b>			
<b>Product function</b>			
• I&M data	Yes	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
<b>Engineering with</b>			
• STEP 7 TIA Portal can be configured/integrated as of version	V11 SP2 / V13	V12 SP1 / V13	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5	GSD Revision 5	GSD Revision 5
• PROFINET as of GSD version/GSD revision	V2.3 / -	GSDML V2.3	GSDML V2.3
<b>Operating mode</b>			
• Oversampling		Yes; 1 channel per module	
<b>CiR - Configuration in RUN</b>			
Reparameterization possible in RUN	Yes	Yes	Yes
Calibration possible in RUN		Yes	Yes
<b>Supply voltage</b>			
Type of supply voltage	DC	DC	DC
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes		
<b>Analog outputs</b>			
Number of analog outputs	4	2	2
Cycle time (all channels), min.	5 ms	125 µs	750 µs
<b>Output ranges, voltage</b>			
• 0 to 10 V	Yes; 15 bit	Yes; 15 bit	Yes; 15 bit
• 1 V to 5 V	Yes; 13 bit	Yes; 13 bit	Yes; 13 bit
• -5 V to +5 V	Yes; 15 bit incl. sign	Yes; 15 bit incl. sign	Yes; 15 bit incl. sign
• -10 V to +10 V	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
<b>Output ranges, current</b>			
• 0 to 20 mA	Yes; 15 bit	Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 14 bit	Yes; 14 bit	Yes; 14 bit
<b>Connection of actuators</b>			
• for voltage output two-wire connection	Yes	Yes	Yes
• for voltage output four-wire connection	Yes	Yes	Yes
• for current output two-wire connection	Yes	Yes	Yes
<b>Load impedance (in rated range of output)</b>			
• with voltage outputs, min.	2 kΩ	2 kΩ	2 kΩ
• with voltage outputs, capacitive load, max.	1 µF	1 µF	1 µF
• with current outputs, max.	500 Ω	500 Ω	500 Ω
• with current outputs, inductive load, max.	1 mH	1 mH	1 mH
<b>Cable length</b>			
• shielded, max.	1 000 m; 200 m for voltage output	200 m	1 000 m; 200 m for voltage output



## I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

### Analog output modules

#### Technical specifications (continued)

Article number	<b>6ES7135-6HD00-0BA1</b> AQ 4XU/I ST	<b>6ES7135-6HB00-0DA1</b> ET 200SP AQ 2 X U/I HIGH SPEED	<b>6ES7135-6HB00-0CA1</b> ET 200SP AQ 2 X U/I HIGH FEATURE
<b>Analog value generation for the outputs</b>			
<b>Integration and conversion time/resolution per channel</b>			
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit
<b>Settling time</b>			
• for resistive load	0.1 ms	0.05 ms	0.05 ms
• for capacitive load	1 ms	0.05 ms	0.05 ms
• for inductive load	0.5 ms	0.05 ms	0.05 ms
<b>Errors/accuracies</b>			
<b>Basic error limit (operational limit at 25 °C)</b>			
• Voltage, relative to output area, (+/-)	0.3 %	0.1 %	0.1 %
• Current, relative to output area, (+/-)	0.3 %	0.1 %	0.1 %
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)		Yes	Yes
Execution and activation time (TCO), min.		130 µs	500 µs
Bus cycle time (TDP), min.		250 µs	750 µs
<b>Interrupts/diagnostics/status information</b>			
Substitute values connectable	Yes	Yes	Yes
<b>Alarms</b>			
• Diagnostic alarm	Yes	Yes	Yes
<b>Diagnostic messages</b>			
• Diagnostics	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	Yes	Yes; channel-by-channel, only for output type "current"	Yes; channel-by-channel, only for output type "current"
• Short circuit	Yes	Yes; channel-by-channel, only for output type "voltage"	Yes; channel-by-channel, only for output type "voltage"
• Overflow/underflow	Yes	Yes	Yes
<b>Diagnostics indication LED</b>			
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics		Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; Green/red LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
<b>Electrical isolation channels</b>			
• between the channels and the backplane bus	Yes	Yes	Yes
<b>Isolation</b>			
Isolation checked with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• horizontal installation, min.	0 °C	0 °C	
• horizontal installation, max.	60 °C	60 °C	
• vertical installation, min.	0 °C	0 °C	
• vertical installation, max.	50 °C	50 °C	
<b>Dimensions</b>			
Width	15 mm	15 mm	15 mm
<b>Weights</b>			
Weight, approx.	31 g	31 g	31 g

Ordering data	Article No.	Accessories	Article No.
<b>Analog output modules</b>		<b>Reference identification label</b>	<b>6ES7193-6LF30-0AW0</b>
Analog output module AQ 4xU/I Standard, BU type A0 or A1, color code CC00, 16 bit, ± 0.3%	<b>6ES7135-6HD00-0BA1</b>	10 sheets of 16 labels; for printing with thermal-transfer card printer or plotting unit	
Analog output module AQ 2xU/I High Feature, BU type A0 or A1, color code CC00, 16 bit, ± 0.1%	<b>6ES7135-6HB00-0CA1</b>	<b>Labeling strips</b>	
Analog output module AQ 2xU/I High Speed, BU type A0 or A1, color code CC00, 16 bit, ± 0.3%	<b>6ES7135-6HB00-0DA1</b>	500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>
<b>Supported type A0 BaseUnits</b>		500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>
<b>BU15-P16+A10+2D</b>		1000 labeling strips DIN A4, light gray, cardboard, preperforated, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>
BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	<b>6ES7193-6BP20-0DA0</b> <b>6ES7193-6BP20-2DA0</b>	1000 labeling strips DIN A4, yellow, cardboard, preperforated, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>
• 1 unit • 10 units		<b>BU cover</b>	
<b>BU15-P16+A0+2D</b>		for covering empty slots (gaps); 5 units	<b>6ES7133-6CV15-1AM0</b> <b>6ES7133-6CV20-1AM0</b>
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	<b>6ES7193-6BP00-0DA0</b> <b>6ES7193-6BP00-2DA0</b>	• 15 mm • 20 mm	
• 1 unit • 10 units		<b>Shield connection</b>	<b>6ES7193-6SC00-1AM0</b>
<b>BU15-P16+A10+2B</b>		5 shield supports and 5 shield terminals	
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	<b>6ES7193-6BP20-0BA0</b> <b>6ES7193-6BP20-2BA0</b>	<b>Color-coded labels</b>	
• 1 unit • 10 units		Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 16), red (terminals 9 to 16), 10 units	<b>6ES7193-6CP00-2MA0</b>
<b>BU15-P16+A0+2B</b>		Color code CC71, for 10 AUX terminals, BU type A0, yellow-green (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP71-2AA0</b>
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	<b>6ES7193-6BP00-0BA0</b> <b>6ES7193-6BP00-2BA0</b>	Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP72-2AA0</b>
• 1 unit • 10 units		Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP73-2AA0</b>
<b>Supported type A1 BaseUnits (temperature detection)</b>		Color code CC74, for 2x5 add-on terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C); 10 units	<b>6ES7193-6CP74-2AA0</b>
<b>BU15-P16+A0+12D/T</b>	<b>6ES7193-6BP40-0DA1</b>		
BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and additionally 2x5 internally jumpered add-on terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)			
<b>BU15-P16+A0+2D/T</b>	<b>6ES7193-6BP00-0DA1</b>		
BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)			
<b>BU15-P16+A0+12B/T</b>	<b>6ES7193-6BP40-0BA1</b>		
BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered add-on terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group			
<b>BU15-P16+A0+2B/T</b>	<b>6ES7193-6BP00-0BA1</b>		
BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group			

## I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

### SIPLUS analog input modules

#### Overview



- 4-channel analog input modules for the ET 200SP

Can be plugged into type A0 or A1 BaseUnits (BU) with automatic coding

- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type AI: light blue
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete article number
- Optional labeling accessories
  - Labeling strips
  - Reference identification label
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

#### Technical specifications

Article number	6AG1134-6HD00-7BA1	6AG1134-6GD00-7BA1	6AG1134-6JD00-2CA1
Based on	6ES7134-6HD00-0BA1	6ES7134-6GD00-0BA1	6ES7134-6JD00-0CA1
	SIPLUS ET 200SP AI 4XU/I 2-WIRE ST	SIPLUS ET 200SP AI 4XI 2-/4-WIRE ST	SIPLUS ET 200SP AI 4XRTD/TC HF
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• horizontal installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C
• horizontal installation, max.	70 °C; = Tmax; > 60 °C max. 1x +/- 20 mA or 4x +/- 10 V permissible	70 °C; = Tmax; > 60 °C max. 1x +/- 20 mA permissible	60 °C
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C
<b>Extended ambient conditions</b>			
<b>Relative humidity</b>			
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data	Article No.	Ordering data	Article No.
<b>SIPLUS analog input modules</b> (Extended temperature range and medial exposure) AI 4XU/I 2-wire Standard BU type A0 or A1, color code CC03 AI 4xI 2-, 4-wire Standard, BU type A0 or A1, color code CC03 AI 4xRTD/TC 2-, 3-, 4-wire High Feature BU type A0 or A1, color code CC00	<b>6AG1134-6HD00-7BA1</b>  <b>6AG1134-6GD00-7BA1</b>  <b>6AG1134-6JD00-2CA1</b>	<b>Supported SIPLUS BaseUnits type A1 (temperature detection)</b> <b>BU15-P16+A0+2D/T</b> (Extended temperature range and medial exposure) BU type A1; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A) <b>BU15-P16+A0+2B/T</b> (Extended temperature range and medial exposure) BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group <b>BU15-P16+A0+12D/T</b> (Extended temperature range and medial exposure) BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered AUX terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A) <b>BU15-P16+A0+12B/T</b> (Extended temperature range and medial exposure) BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered AUX terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	<b>6AG1193-6BP00-7DA1</b>  <b>6AG1193-6BP00-7BA1</b>  <b>6AG1193-6BP40-7DA1</b>  <b>6AG1193-6BP40-7BA1</b>
<b>Supported SIPLUS BaseUnits type A0</b> <b>BU15-P16+A0+2D</b> (Extended temperature range and medial exposure) BU type A0; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A) <b>BU15-P16+A0+2B</b> (Extended temperature range and medial exposure) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group <b>BU15-P16+A10+2D</b> (Extended temperature range and medial exposure) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A) <b>BU15-P16+A10+2B</b> (Extended temperature range and medial exposure) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	<b>6AG1193-6BP00-7DA0</b>  <b>6AG1193-6BP00-7BA0</b>  <b>6AG1193-6BP20-7DA0</b>  <b>6AG1193-6BP20-7BA0</b>	<b>Accessories</b> See SIMATIC ET 200SP, analog input modules, page 9/46	

## I/O systems

ET 200 systems for the control cabinet

ET 200SP - I/O modules

### SIPLUS analog output modules

#### Overview



- 4-channel analog input modules for the ET 200SP
- Can be plugged into type A0 or A1 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type AQ: dark blue
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete article number
- Optional labeling accessories
  - Labeling strips
  - Reference identification label
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

#### Technical specifications

Article number	<b>6AG1135-6HD00-7BA1</b>
Based on	<b>6ES7135-6HD00-0BA1</b> SIPLUS ET 200SP AQ 4XU/I ST
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• horizontal installation, min.	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax; > +60 °C max. 2x +/- 10 V permissible
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data	Article No.	Ordering data	Article No.
<b>SIPLUS analog output modules</b> (Extended temperature range and medial exposure) AQ 4XU/I Standard, BU type A0 or A1, color code CC03	<b>6AG1135-6HD00-7BA1</b>	<b>Supported SIPLUS BaseUnits type A1 (temperature detection)</b> <b>BU15-P16+A0+2D/T</b> (Extended temperature range and medial exposure) BU type A1; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A)	<b>6AG1193-6BP00-7DA1</b>
<b>Supported SIPLUS BaseUnits type A0</b> <b>BU15-P16+A0+2D</b> (Extended temperature range and medial exposure) BU type A0; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A)	<b>6AG1193-6BP00-7DA0</b>	<b>BU15-P16+A0+2B/T</b> (Extended temperature range and medial exposure) BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	<b>6AG1193-6BP00-7BA1</b>
<b>BU15-P16+A0+2B</b> (Extended temperature range and medial exposure) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	<b>6AG1193-6BP00-7BA0</b>	<b>BU15-P16+A0+12D/T</b> (Extended temperature range and medial exposure) BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered AUX terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	<b>6AG1193-6BP40-7DA1</b>
<b>BU15-P16+A10+2D</b> (Extended temperature range and medial exposure) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	<b>6AG1193-6BP20-7DA0</b>	<b>BU15-P16+A0+12B/T</b> (Extended temperature range and medial exposure) BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered AUX terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	<b>6AG1193-6BP40-7BA1</b>
<b>BU15-P16+A10+2B</b> (Extended temperature range and medial exposure) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	<b>6AG1193-6BP20-7BA0</b>	<b>Accessories</b> See SIMATIC ET 200SP, analog output modules, page 9/51	

## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - I/O modules - Technology modules

### TM Count 1x24V counter module

#### Overview

##### Technical properties

- ET 200SP counter module
- Interfaces:
  - 24 V encoder signals A, B and N from P, M or push-pull-switching encoders and sensors
  - 24 V encoder supply output, short-circuit-proof
  - 3 digital inputs for controlling the count operation, for saving or for setting the count value
  - 2 digital outputs for fast responses regardless of the counter status or the measured value
- Counting frequency 200 kHz (800 kHz with quadruple evaluation)
- Counting range +/- 31 bit
- Measurement function
- Process interrupts, parameterizable
- Parameterizable input filter for suppressing faults at encoder and digital inputs

##### Supported encoders/signal types

- 24 V incremental encoder with and without signal N
- 24 V pulse encoder with direction signal
- 24 V pulse encoder without direction signal
- 24 V pulse encoder for pulse up and down respectively

##### Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

#### Technical specifications

Article number	<b>6ES7138-6AA00-0BA0</b> ET 200SP, TM COUNT 1X24V
<b>Product type designation</b>	
<b>General information</b>	
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / V5.5 SP4
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3
<b>Installation type/mounting</b>	
Rack mounting possible	Yes
Type of fitting, rail mounting	Yes
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes
<b>Input current</b>	
Current consumption, max.	60 mA; without load
<b>Encoder supply</b>	
Number of outputs	1
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	300 mA

Article number	<b>6ES7138-6AA00-0BA0</b> ET 200SP, TM COUNT 1X24V
<b>Power losses</b>	
Power loss, typ.	1 W
<b>Digital inputs</b>	
Number of digital inputs	3
Digital inputs, configurable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Digital input functions, parameterizable</b>	
• Gate start/stop	Yes
• Capture	Yes
• Synchronization	Yes
• Freely usable digital input	Yes
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V
• permissible voltage at input, max.	30 V
<b>Input current</b>	
• for signal "1", typ.	2.5 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
<b>for counter/technological functions</b>	
- Parameterizable	Yes
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	600 m



## Technical specifications (continued)

Article number	<b>6ES7138-6AA00-0BA0</b> ET 200SP, TM COUNT 1X24V
<b>Digital outputs</b>	
Type of digital output	Transistor
Number of digital outputs	2
Digital outputs, configurable	Yes
short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
<b>Digital output functions, parameterizable</b>	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	48 Ω
• upper limit	12 kΩ
<b>Output voltage</b>	
• for signal "1", min.	23.2 V; L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	50 μs
• "1" to "0", max.	50 μs
<b>Switching frequency</b>	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
<b>Aggregate current of the outputs</b>	
• Current per module, max.	1 A
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
<b>Encoder</b>	
<b>Connectable encoders</b>	
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Signal filter, can be parameterized	Yes
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Incremental encoder with A/B tracks, 90° out of phase	Yes
• Incremental encoder with A/B tracks, 90° out of phase and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes

Article number	<b>6ES7138-6AA00-0BA0</b> ET 200SP, TM COUNT 1X24V
<b>Encoder signal 24 V</b>	
- Permissible voltage at input, min.	-30 V
- Permissible voltage at input, max.	30 V
<b>Interface types</b>	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
• m/p-reading	Yes
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes
<b>Interrupts/diagnostics/status information</b>	
Substitute values connectable	Yes; Parameterizable
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
<b>Diagnostic messages</b>	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• Short circuit	Yes
• A/B transition error at incremental encoder	Yes
• Group error	Yes
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• for module diagnostics	Yes; green/red DIAG LED
• Status indicator backward counting (green)	Yes
• Status indicator forward counting (green)	Yes
<b>Integrated Functions</b>	
Number of counters	1
Counter frequency (counter) max.	800 kHz; with quadruple evaluation
<b>Counting functions</b>	
• Can be used with TO High_Speed_Counter	Yes
• Continuous counting	Yes
• Counter response can be parameterized	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
<b>Comparator</b>	
- Number of comparators	2
- Direction dependency	Yes
- Can be changed from user program	Yes
<b>Position detection</b>	
• Incremental acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes



## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - I/O modules - Technology modules

### TM Count 1x24V counter module

#### Technical specifications (continued)

Article number	<b>6ES7138-6AA00-0BA0</b> ET 200SP, TM COUNT 1X24V
<b>Measuring functions</b>	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
<b>Measuring range</b>	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz
- Period measurement, min.	1.25 µs
- Period measurement, max.	25 s
<b>Accuracy</b>	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Speed measurement	100 ppm; depending on measuring interval and signal evaluation
<b>Electrical isolation channels</b>	
• between the channels and the backplane bus	Yes
<b>Permissible potential difference</b>	
between different circuits	75 V DC/60 V AC (base isolation)
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Dimensions</b>	
Width	15 mm
<b>Weights</b>	
Weight, approx.	45 g

#### Ordering data

Ordering data	Article No.
<b>TM Count 1x24V counter module</b>	
With one channel, max. 200 kHz; for 24 V encoder	<b>6ES7138-6AA00-0BA0</b>
<b>Supported BaseUnits</b>	
<b>BU15-P16+A0+2D</b>	
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	<b>6ES7193-6BP00-0DA0</b>
• 10 units	<b>6ES7193-6BP00-2DA0</b>
<b>BU15-P16+A0+2B</b>	
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
• 1 unit	<b>6ES7193-6BP00-0BA0</b>
• 10 units	<b>6ES7193-6BP00-2BA0</b>

#### Ordering data

Ordering data	Article No.
<b>BU15-P16+A10+2D</b>	
BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• 1 unit	<b>6ES7193-6BP20-0DA0</b>
• 10 units	<b>6ES7193-6BP20-2DA0</b>
<b>BU15-P16+A10+2B</b>	
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• 1 unit	<b>6ES7193-6BP20-0BA0</b>
• 10 units	<b>6ES7193-6BP20-2BA0</b>
<b>Accessories</b>	
<b>Reference identification label</b>	<b>6ES7193-6LF30-0AW0</b>
10 sheets of 16 labels	
<b>Labeling strips</b>	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>
<b>BU cover</b>	
for covering empty slots (gaps); 5 units	
• 15 mm wide	<b>6ES7133-6CV15-1AM0</b>
• 20 mm wide	<b>6ES7133-6CV20-1AM0</b>
<b>Shield connection</b>	<b>6ES7193-6SC00-1AM0</b>
5 shield supports and 5 shield terminals	
<b>Color-coded labels</b>	
• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	<b>6ES7193-6CP71-2AA0</b>
• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	<b>6ES7193-6CP72-2AA0</b>
• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	<b>6ES7193-6CP73-2AA0</b>

## Overview



## Technical properties

- Counter and position recording module for ET 200SP
- Interfaces:
  - Encoder signals A, B and N for 5 V TTL or RS 422 differential signals
  - SSI interface with clock and data for RS 422 differential signals
  - 24 V encoder supply output, short-circuit proof
  - 2 digital inputs for controlling the counting process, for saving or setting the counter or position value
  - 2 digital outputs for fast reactions depending on the counter reading, position value or measured value
- Counter frequency 1 MHz (4 MHz with four-fold evaluation)
- Count range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

## Supported types of encoders/signals

- Incremental encoders with or without N signal
- Pulse encoders with directional signal
- Pulse encoders without directional signal
- Pulse encoders for forward or reverse pulses
- SSI encoders with a frame length of 10 to 40 bits, of which up to 31 bits position value

## Supported system functions

- Isochronous mode
- Firmware update
- Identification data (I&M)

## Technical specifications

Article number	<b>6ES7138-6BA00-0BA0</b> ET 200SP, TM POSINPUT 1
<b>Product type designation</b>	
<b>General information</b>	
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / V5.5 SP4
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3
<b>Installation type/mounting</b>	
Rack mounting possible	Yes
Type of fitting, rail mounting	Yes
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes
<b>Input current</b>	
Current consumption, max.	75 mA; without load
<b>Encoder supply</b>	
Number of outputs	1
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	300 mA
<b>Power losses</b>	
Power loss, typ.	1.9 W
<b>Digital inputs</b>	
Number of digital inputs	2
Digital inputs, configurable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Digital input functions, parameterizable</b>	
• Gate start/stop	Yes; only for pulse and incremental encoders
• Capture	Yes
• Synchronization	Yes; only for pulse and incremental encoders
• Freely usable digital input	Yes

## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - I/O modules - Technology modules

### TM PosInput 1 position recording module

#### Technical specifications (continued)

Article number	<b>6ES7138-6BA00-0BA0</b> ET 200SP, TM POSINPUT 1
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V
• permissible voltage at input, max.	30 V
<b>Input current</b>	
• for signal "1", typ.	2.5 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
<b>for counter/technological functions</b>	
- Parameterizable	Yes
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
<b>Digital outputs</b>	
Type of digital output	Transistor
Number of digital outputs	2
Digital outputs, configurable short-circuit protection	Yes
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
<b>Digital output functions, parameterizable</b>	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	48 Ω
• upper limit	12 kΩ
<b>Output voltage</b>	
• for signal "1", min.	23.2 V; L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
<b>Switching frequency</b>	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz

Article number	<b>6ES7138-6BA00-0BA0</b> ET 200SP, TM POSINPUT 1
<b>Aggregate current of the outputs</b>	
• Current per module, max.	1 A
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Input voltage	RS 422
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, can be parameterized	Yes
• Cable length, shielded, max.	32 m; at 1 MHz
• Incremental encoder with A/B tracks, 90° out of phase	Yes
• Incremental encoder with A/B tracks, 90° out of phase and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Input voltage	5 V TTL (push-pull encoders only)
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, can be parameterized	Yes
• Incremental encoder with A/B tracks, 90° out of phase	Yes
• Incremental encoder with A/B tracks, 90° out of phase and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes
<b>Encoder signals, absolute encoder (SSI)</b>	
• Input signal	to RS-422
• Message frame length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max. 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.
• Parity bit, parameterizable	Yes
• Monoflop time	16, 32, 48, 64 µs & automatic
• Multiturn	Yes
• Singleturn	Yes
<b>Interface types</b>	
• RS422	Yes
• TTL 5 V	Yes

## Technical specifications (continued)

Article number	<b>6ES7138-6BA00-0BA0</b> ET 200SP, TM POSINPUT 1
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes
<b>Interrupts/diagnostics/status information</b>	
Substitute values connectable	Yes; Parameterizable
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
<b>Diagnostic messages</b>	
• Monitoring the supply voltage	Yes
• Wire break	Yes
• Short circuit	Yes
• A/B transition error at incremental encoder	Yes
• Frame error at SSI encoder	Yes
• Group error	Yes
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• for module diagnostics	Yes; green/red DIAG LED
• Status indicator backward counting (green)	Yes
• Status indicator forward counting (green)	Yes
<b>Integrated Functions</b>	
Number of counters	1
Counter frequency (counter) max.	4 MHz; with quadruple evaluation
<b>Counting functions</b>	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response can be parameterized	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
<b>Comparator</b>	
- Number of comparators	2
- Direction dependency	Yes
- Can be changed from user program	Yes

Article number	<b>6ES7138-6BA00-0BA0</b> ET 200SP, TM POSINPUT 1
<b>Position detection</b>	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
<b>Measuring functions</b>	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
<b>Measuring range</b>	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	4 MHz
- Period measurement, min.	0.25 µs
- Period measurement, max.	25 s
<b>Accuracy</b>	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Speed measurement	100 ppm; depending on measuring interval and signal evaluation
<b>Electrical isolation channels</b>	
• between the channels and the backplane bus	Yes
<b>Permissible potential difference</b>	
between different circuits	75 V DC/60 V AC (base isolation)
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C; Observe derating
<b>Dimensions</b>	
Width	15 mm
<b>Weights</b>	
Weight, approx.	45 g

## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - I/O modules - Technology modules

### TM PosInput 1 position recording module

#### Ordering data

#### Article No.

##### TM PosInput 1 counter and position recording module

With one channel, max. 1 MHz for 5 V TTL or RS 422 differential signals or SSI absolute encoder

6ES7138-6BA00-0BA0

##### Supported BaseUnits

##### BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

- 1 unit
- 10 units

6ES7193-6BP00-0DA0  
6ES7193-6BP00-2DA0

##### BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- 1 unit
- 10 units

6ES7193-6BP00-0BA0  
6ES7193-6BP00-2BA0

##### BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

- 1 unit
- 10 units

6ES7193-6BP20-0DA0  
6ES7193-6BP20-2DA0

##### BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

- 1 unit
- 10 units

6ES7193-6BP20-0BA0  
6ES7193-6BP20-2BA0

#### Article No.

#### Accessories

##### Reference identification label

10 sheets of 16 labels

6ES7193-6LF30-0AW0

##### Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AG0

1000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

1000 labeling strips DIN A4, yellow, card, for inscription with laser printer

6ES7193-6LA10-0AG0

##### BU cover

For covering empty slots (gaps); 5 units

- 15 mm wide
- 20 mm wide

6ES7133-6CV15-1AM0  
6ES7133-6CV20-1AM0

##### Shield connection

5 shield supports and 5 shield terminals

6ES7193-6SC00-1AM0

##### Color-coded labels

- Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units
- Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units
- Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units

6ES7193-6CP71-2AA0

6ES7193-6CP72-2AA0

6ES7193-6CP73-2AA0

## Overview



- 4 digital inputs, 6 digital outputs
- Inputs for detecting the input edges with  $\mu\text{s}$  accuracy
- Outputs for outputting the switching signals with  $\mu\text{s}$  accuracy
- 32x oversampling
- PWM output
- Counter function
- Outputs can be switched between 0.5 A standard and especially fast 0.1 A high-speed mode

## Technical specifications

Article number	<b>6ES7138-6CG00-0BA0</b>
	ET 200SP, TM TIMER DIDQ 10X24V
<b>Product type designation</b>	
<b>General information</b>	
<b>Product function</b>	
• I&M data	Yes; I&M 0
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	V13 Update 3
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes; against destruction
<b>Input current</b>	
Current consumption, max.	50 mA; without load
<b>Encoder supply</b>	
Number of outputs	1
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	500 mA; Observe derating
<b>Power losses</b>	
Power loss, typ.	1.5 W
<b>Digital inputs</b>	
Number of digital inputs	4
Digital inputs, configurable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes

Article number	<b>6ES7138-6CG00-0BA0</b>
	ET 200SP, TM TIMER DIDQ 10X24V
<b>Digital input functions, parameterizable</b>	
• Digital input with time stamp	Yes
- Number, max.	4
• Counter	Yes
- Number, max.	3
• Counter for incremental encoder	Yes
- Number, max.	1
• Digital input with oversampling	Yes
- Number, max.	4
• HW enable for digital input	Yes
- Number, max.	1
• HW enable for digital output	Yes
- Number, max.	3
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V
• permissible voltage at input, max.	30 V
<b>Input current</b>	
• for signal "1", typ.	2.5 mA
<b>Input delay (for rated value of input voltage)</b>	
• Minimum pulse width for program reactions	3 $\mu\text{s}$ for parameterization "none"
<b>for standard inputs</b>	
- Parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms
- at "0" to "1", min.	4 $\mu\text{s}$
- at "1" to "0", min.	4 $\mu\text{s}$
<b>Cable length</b>	
• shielded, max.	1 000 m; Depending on sensor, cable quality and rate of change
• Unshielded, max.	600 m; Depending on sensor, cable quality and rate of change

## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - I/O modules - Technology modules

### Time-based IO module TM Timer DIDQ 10x24V

#### Technical specifications (continued)

Article number	<b>6ES7138-6CG00-0BA0</b> ET 200SP, TM TIMER DIDQ 10X24V
<b>Digital outputs</b>	
Type of digital output	Transistor
Number of digital outputs	6
Current-sinking	Yes; With High Speed output
Current-sourcing	Yes
Digital outputs, configurable short-circuit protection	Yes
Limitation of inductive shutdown voltage to	-0.8 V
<b>Digital output functions, parameterizable</b>	
• Digital output with time stamp	Yes
- Number, max.	6
• PWM output	Yes
- Number, max.	6
• Digital output with oversampling	Yes
- Number, max.	6
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A; 0.1 A with High Speed output
• on lamp load, max.	5 W; 1 W with High Speed output
<b>Load resistance range</b>	
• lower limit	48 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
<b>Output voltage</b>	
• Type of output voltage	DC
• for signal "0", max.	1 V; With High Speed output
• for signal "1", min.	23.2 V; L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A; 0.1 A with High Speed output, observe derating
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	1 μs; With High Speed output, 5 μs with Standard output
• "1" to "0", max.	1 μs; With High Speed output, 6 μs with Standard output
<b>Switching frequency</b>	
• with resistive load, max.	10 kHz
• on lamp load, max.	10 Hz
<b>Aggregate current of the outputs</b>	
• Current per module, max.	3.5 A; Observe derating
<b>Cable length</b>	
• shielded, max.	1 000 m; Depending on load and cable quality
• Unshielded, max.	600 m; Depending on load and cable quality
<b>Encoder</b>	
<b>Connectable encoders</b>	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA

Article number	<b>6ES7138-6CG00-0BA0</b> ET 200SP, TM TIMER DIDQ 10X24V
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
• Input voltage	24 V
• Input frequency, max.	50 kHz
• Counting frequency, max.	200 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz
• Incremental encoder with A/B tracks, 90° out of phase	Yes
• Pulse encoder	Yes
<b>Encoder signal 24 V</b>	
- Permissible voltage at input, min.	-30 V
- Permissible voltage at input, max.	30 V
<b>Interface types</b>	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes
Bus cycle time (TDP), min.	375 μs
<b>Interrupts/diagnostics/status information</b>	
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnostic messages</b>	
• Diagnostics	Yes
• Monitoring the supply voltage	Yes
• Short circuit	Yes
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes
• for module diagnostics	Yes; green/red DIAG LED
<b>Integrated Functions</b>	
Number of counters	3
Counter frequency (counter) max.	200 kHz; with quadruple evaluation
<b>Counting functions</b>	
• Continuous counting	Yes
<b>Electrical isolation channels</b>	
• between the channels and the backplane bus	Yes
<b>Permissible potential difference</b>	
between different circuits	75 V DC/60 V AC (base isolation)
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C; Observe derating
<b>Decentralized operation</b>	
To SIMATIC S7-1500	Yes
<b>Dimensions</b>	
Width	15 mm
<b>Weights</b>	
Weight, approx.	45 g



Ordering data	Article No.	Accessories	Article No.
<b>TM Timer DIDQ 10x24V time-based IO module</b>		<b>Reference identification label</b>	<b>6ES7193-6LF30-0AW0</b>
4 time-controlled inputs, 6 time-controlled outputs	<b>6ES7138-6CG00-0BA0</b>	10 sheets of 16 labels	
<b>Supported BaseUnits</b>		<b>Labeling strips</b>	
<b>BU15-P16+A0+2D</b>		500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)		500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>
• 1 unit	<b>6ES7193-6BP00-0DA0</b>	1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>
• 10 units	<b>6ES7193-6BP00-2DA0</b>	1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>
<b>BU15-P16+A0+2B</b>		<b>BU cover</b>	
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group		For covering empty slots (gaps); 5 units	
• 1 unit	<b>6ES7193-6BP00-0BA0</b>	• 15 mm wide	<b>6ES7133-6CV15-1AM0</b>
• 10 units	<b>6ES7193-6BP00-2BA0</b>	• 20 mm wide	<b>6ES7133-6CV20-1AM0</b>
<b>BU15-P16+A10+2D</b>		<b>Shield connection</b>	<b>6ES7193-6SC00-1AM0</b>
BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 inter- nally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)		5 shield supports and 5 shield terminals	
• 1 unit	<b>6ES7193-6BP20-0DA0</b>	<b>Color-coded labels</b>	
• 10 units	<b>6ES7193-6BP20-2DA0</b>	• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	<b>6ES7193-6CP71-2AA0</b>
<b>BU15-P16+A10+2B</b>		• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	<b>6ES7193-6CP72-2AA0</b>
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 inter- nally jumpered AUX terminals (1 A to 10 A); for continuing the load group		• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	<b>6ES7193-6CP73-2AA0</b>
• 1 unit	<b>6ES7193-6BP20-0BA0</b>		
• 10 units	<b>6ES7193-6BP20-2BA0</b>		



## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - I/O modules - Technology modules

### SIWAREX WP321

#### Overview



SIWAREX WP321 is a versatile and flexible weighing module for the seamless integration of a static scale into the SIMATIC automation environment.

The electronic weighing system is integrated in the SIMATIC ET 200SP series and uses all the features of a modern automation system, such as integrated communication, operator control and monitoring, the diagnostic system and configuration tools in the TIA Portal, SIMATIC Step 7 and WinCC flexible.

#### Technical specifications

SIWAREX WP321	
<b>Integration in automation systems</b>	<p>SIMATIC S7-300, S7-400, S7-1200 and S7-1500</p> <p>Other manufacturers (with restrictions)</p>
<b>Communication interfaces</b>	<p>Via SIMATIC ET 200SP interface module (PROFIBUS or PROFINET)</p> <p>Via SIMATIC ET 200SP interface module (PROFIBUS or PROFINET)</p> <ul style="list-style-type: none"> <li>• SIMATIC ET 200SP backplane bus</li> <li>• RS485 (SIWATOOL, Siebert remote indicator)</li> </ul>
<b>Optional remote weight indicator (via RS 485)</b>	Siebert S102
<b>Commissioning options for the scale</b>	<ul style="list-style-type: none"> <li>• using SIWATOOL (PC software)</li> <li>• using CPU / Touch Panel</li> </ul>
<b>Measuring accuracy</b>	<p>according to DIN 1319-1 of full-scale value at 20 °C ± 10 K</p> <p>Internal resolution</p>
	<p>0,05 %</p> <p>± 2 million parts</p>
<b>Number of measurements/second (internal)</b>	100 / 120 Hz
<b>Digital filter</b>	Variable adjustable low-pass and average filter
<b>Typical applications</b>	<ul style="list-style-type: none"> <li>• Non-automatic scales</li> <li>• Force measurements</li> <li>• Fill-level monitoring</li> <li>• Belt tension monitors</li> </ul>
<b>Weighing functions</b>	
Weight values	<ul style="list-style-type: none"> <li>• Gross</li> <li>• Net</li> <li>• Tare</li> </ul>
Limits	<ul style="list-style-type: none"> <li>• Min/max</li> <li>• Empty</li> </ul>
Zeroing function	Via command by controller or HMI
Tare function	Via command by controller or HMI
External tare specification	Via command by controller or HMI
Calibration commands	Via command by controller or HMI
<b>Load cells</b>	Strain gauges in 4-wire or 6-wire system

SIWAREX WP321	
<b>Load cell excitation</b>	<p>Supply voltage (value applies at sensor, cable-related voltage drops of up to 5 V are controlled)</p> <p>Permissible load resistance</p> <ul style="list-style-type: none"> <li>• <math>R_{Lmin}</math></li> <li>• <math>R_{Lmax}</math></li> </ul> <p>With SIWAREX IS Ex interface</p> <ul style="list-style-type: none"> <li>• <math>R_{Lmin}</math></li> <li>• <math>R_{Lmax}</math></li> </ul>
	<p>4.85 V DC ± 2 %</p> <p>&gt; 40 Ω</p> <p>&lt; 4100 Ω</p> <p>&gt; 50 Ω</p> <p>&lt; 4100 Ω</p>
<b>Load cell characteristic</b>	1 ... 4 mV/V
<b>Permissible range of measuring signal (at greatest set characteristic value)</b>	-21.3 ... +21.3 mV
<b>Max. distance of load cells</b>	1000 m (459.32 ft)
<b>Connection to load cells in Ex zone 1</b>	Optionally via SIWAREX IS Ex interface (compatibility of the load cells must be checked)
<b>Approvals</b>	<ul style="list-style-type: none"> <li>• ATEX Zone 2 (manufacturer declaration)</li> <li>• UL available soon</li> <li>• FM available soon</li> </ul>
<b>Max. cable length</b>	1000 m
<b>Transmission rate</b>	9 600 ... 115 000 bit/s
<b>Auxiliary power supply</b>	
Rated voltage	24 V DC
Max. power consumption	typ. 0.1 A @ 24 V DC (0.2 A max.)
Max. power consumption SIMATIC Bus	30 mA
<b>IP degree of protection to DIN EN 60529; IEC 60529</b>	IP20
<b>Climatic requirements</b>	
$T_{min} (IND) ... T_{max} (IND)$ (operating temperature)	
Vertical installation in SIMATIC S7 <sup>1)</sup>	-25 ... +60 °C (-13 ... 140 °F)
Horizontal installation in SIMATIC S7 <sup>1)</sup>	-25 ... +60 °C (-13 ... 140 °F)
EMC requirements according to	IEC 61000-6-2, IEC 61000-6-4, OIML-R76-1
Dimensions (width)	15 mm (0.6 in.)

<sup>1)</sup> The S7 standard modules may not be operated at temperatures below 0 °C. For operating conditions below 0 °C, SIMATIC modules from the SIPLUS series must be used.

Ordering data	Article No.	Article No.
<b>SIWAREX WP321</b> <b>Single-channel weighing electronics for scales in SIMATIC ET200SP</b>	7MH4138-6AA00-0BA0	
<b>SIWAREX WP321 manual</b> Available in a range of languages Free download from the Internet at: <a href="http://www.siemens.com/weighing">http://www.siemens.com/weighing</a>		
<b>SIWAREX WP321 "Ready for Use"</b> TIA Portal and SIMATIC Manager sample configuration Free download from the Internet at: <a href="http://www.siemens.com/weighing">http://www.siemens.com/weighing</a>		
<b>SIWAREX WP321 configuration package on CD-ROM</b> • "Ready for use" software for operating a scale with SIWAREX WP321 and a touch panel (in many different languages) • SIWATOOL V7.0 calibration tool • Device manuals (PDF files in a variety of languages)	7MH4138-1AK01	
<b>Accessories (mandatory)</b>		
<b>BaseUnit (Type A0 – one BaseUnit required for each WP321)</b> • For opening a new potential group - BU15P-16+A0+2D or - BU15P-16+A10+2D • For continuing the potential group - BU15P-16+A0+2B - BU15P-16+A10+2B	6ES7193-6BP00-0DA0 6ES7193-6BP20-0DA0  6ES7193-6BP00-0BA0 6ES7193-6BP20-0BA0	
<b>Shielded connection for BaseUnit (5 units / for 5 scales)</b> For laying the load cell cable	6ES7193-6SC00-1AM0	
<b>Accessories (optional)</b>		
<b>SIWAREX JB junction box, aluminum housing</b> For connecting up to 4 load cells in parallel, and for connecting several junction boxes	7MH4710-1BA	
<b>SIWAREX JB junction box, stainless steel housing</b> For connecting up to 4 load cells in parallel	7MH4710-1EA	
<b>SIWAREX JB junction box, stainless steel housing (ATEX)</b> For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate)	7MH4710-1EA01	
<b>Ex interface, type SIWAREX IS</b> With ATEX approval, but <b>without UL and FM approvals</b> , for intrinsically-safe connection of load cells, including device manual Suitable for the SIWAREX U, CS, MS, FTA, FTC, M, CF, WP231 and WP321 weighing modules Approved for use in the EU • Short-circuit current < 199 mA DC • Short-circuit current < 137 mA DC	7MH4710-5BA 7MH4710-5CA	
<b>Cable (optional)</b>		
<b>Cables Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY, orange sheath</b> To connect SIWAREX U, CS, MS, FTA, FTC, M, CF, WP231, WP241 and WP321 to the junction box (JB), extension box (EB) and Ex interface (Ex I) or between two JB's, for fixed laying, occasional bending permitted, approx. 10.8 mm (0.43") outer diameter, for ambient temperature -40 to +80 °C (-104 to +176 °F)		7MH4702-8AG
<b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY, blue sheath</b> To connect SIWAREX U, CS, MS, FTA, FTC, M, CF, WP231, WP241 and WP321 to the junction box (JB), extension box (EB) and Ex interface (Ex I) or between two JB's, for fixed laying, occasional bending permitted, approx. 10.8 mm (0.43") outer diameter, for ambient temperature -40 to +80 °C (-104 to +176 °F)		7MH4702-8AF
<b>RS 485/USB interface converter</b> Commercially available interface converter with FTDI chip, e.g. USB-Nano from CTI <a href="http://www.cti-shop.com/RS485-Konverter/USB-Nano-485">http://www.cti-shop.com/RS485-Konverter/USB-Nano-485</a>		
<b>Remote display</b> The Siebert S102 and S302 remote digital displays can be directly connected to the SIWAREX FTA via an RS 485 interface. Siebert Industrieelektronik GmbH P.O. Box 1180 65565 Eppelborn Germany Tel.: +49 6806/980-9 Fax: +49 6806/980-999 Internet: <a href="http://www.siebert-group.com/en">http://www.siebert-group.com/en</a> Detailed information is available from the manufacturer.		

## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - I/O modules - Communication

### CM PtP serial interface

#### Overview



- CM PtP communication module; module for serial communication connections with RS 232 and RS 422 interfaces. RS 485 for the Freeport, 3964(R), Modbus RTU, and USS protocols, max. 115.2 kbit/s, 2 KB frame length, 4 KB receive buffer.
- Protocols supported
  - Freeport: User-parameterizable frame format for universal communication
  - 3964(R) for improved transmission reliability
  - Modbus RTU master (requires instructions in SIMATIC S7)
  - Modbus RTU slave (requires instructions in SIMATIC S7)
  - USS, implemented through instructions
- Interface properties
  - RS 232 with auxiliary signals
  - RS 422 for full-duplex connections
  - RS 485 for half-duplex and multi-point connections
  - Transmission rates from 300 to 115200 bit/s
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for errors, operation, and supply voltage
- Communication display for sending and receiving
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the CM module type: silver
  - Hardware and firmware version
  - Complete article number
- Optional labeling accessories
  - Labeling strips
  - Reference identification label
- Optional system-integrated shield connection

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#### Technical specifications

Article number	<b>6ES7137-6AA00-0BA0</b> ET 200SP, CM PTP
<b>Product type designation</b>	
<b>General information</b>	
<b>Product function</b>	
• I&M data	Yes
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	V12 / V12
• STEP 7 can be configured/integrated as of version	V5.5 SP2 with GSD file
<b>Installation type/mounting</b>	
Rack mounting possible	Yes
Type of fitting, rail mounting	Yes
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes

Article number	<b>6ES7137-6AA00-0BA0</b> ET 200SP, CM PTP
<b>Input current</b>	
Current consumption (rated value)	29 mA
<b>Power losses</b>	
Power loss, typ.	0.7 W
<b>Interfaces</b>	
<b>1st interface</b>	
<b>Interface types</b>	
- RS 232	Yes
- RS 422	Yes
- RS 485	Yes
<b>RS 232</b>	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	15 m
• RS-232 accompanying signals	RTS, CTS, DTR, DSR, RI, DCD
<b>RS 485</b>	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	1 200 m
<b>RS 422</b>	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	1 200 m
• 4-wire full duplex connection	Yes
• 4-wire multipoint connection	Yes

**Technical specifications (continued)**

Article number	<b>6ES7137-6AA00-0BA0</b> ET 200SP, CM PTP
<b>Integrated protocols</b>	
<b>Freeport</b>	
- Telegram length, max.	2 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any
<b>3964 (R)</b>	
- Telegram length, max.	2 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any
<b>Modbus RTU master</b>	
- Address area	1 to 247, extended 1 to 65535
- Number of slaves, max.	32
<b>MODBUS RTU slave</b>	
- Address area	1 to 247, extended 1 to 65535
<b>Frame buffer</b>	
• Buffer memory for message frames	4 kbyte
• Number of message frames which can be buffered	255
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	No
<b>Diagnostic messages</b>	
• Diagnostics	Yes
• Wire break	Yes
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• for module diagnostics	Yes; green/red DIAG LED
• Receive RxD	Yes; Green LED
• Send TxD	Yes; Green LED
<b>Galvanic isolation</b>	
between the backplane bus and interface	Yes
<b>Permissible potential difference</b>	
between different circuits	75 V DC/60 V AC (base isolation)
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Decentralized operation</b>	
To SIMATIC S7-300	Yes
To SIMATIC S7-400	Yes
To SIMATIC S7-1200	No
To SIMATIC S7-1500	Yes
To standard PROFINET controller	Yes
<b>Dimensions</b>	
Width	15 mm
<b>Weights</b>	
Weight, approx.	30 g

**Ordering data****Article No.**

<b>CM PtP communication module</b>	<b>6ES7137-6AA00-0BA0</b>
for serial communication connections with RS 232, RS 422, RS 485 interfaces, BU type A0, color code CC00	
<b>Accessories</b>	
<b>BU15-P16+A0+2D</b>	<b>6ES7193-6BP00-0DA0</b>
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
<b>BU15-P16+A0+2B</b>	<b>6ES7193-6BP00-0BA0</b>
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
<b>BU15-P16+A10+2D</b>	<b>6ES7193-6BP20-0DA0</b>
BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
<b>BU15-P16+A10+2B</b>	<b>6ES7193-6BP20-0BA0</b>
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
<b>Reference identification label</b>	<b>6ES7193-6LF30-0AW0</b>
10 sheets of 16 labels	
<b>Labeling strips</b>	<b>6ES7193-6LR10-0AA0</b>
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	
<b>Shield connection</b>	<b>6ES7193-6SC00-1AM0</b>
5 shield supports and 5 shield terminals, for direct connection	

## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - I/O modules - Communication

### CM IO-Link

#### Overview



- CM IO-Link communication module  
Serial communication module for connecting up to 4 IO-Link devices in accordance with IO-Link specification V1.0 and V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.0 and higher.
- Supported data transfer rates
  - COM1 (4.8 kbit/s)
  - COM2 (38.4 kbit/s)
  - COM3 (230.4 kbit/s)
- Expansion limits
  - Length of cable: Max. 20 m
  - Max. 32 bytes of input and output data per port
  - Max. 32 bytes of input and output data per module
- Supported ET 200SP system functions
  - Replacement without PG with automatic backup without the engineering tool of the IO-Link device parameters (V1.1 devices only) and the IO-Link master parameters by means of redundant saving of parameters to e-coding element
  - Reparameterization during operation
  - Identification data I&M
  - Firmware update
  - PROFlenergy
- Can be plugged into type A0 BaseUnits (BU) with automatic e-coding
- LED indicators
  - DIAG: Operating state indicator (green/red) of the module
  - C1..C4: Port status indicator (green) for Port 1, 2, 3 and 4
  - Q1..Q4: Channel status indicator (green) for Port 1, 2, 3 and 4
  - F1..F4: Port fault indicator (red) for Port 1, 2, 3 and 4
  - PWR: Supply voltage indicator (green)
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color-coding of the module class CM: silver
  - Hardware and firmware version
  - Complete article number
- Optional accessories
  - Labeling strips
  - Reference identification label
  - Color-coding plate with color code CC04
- Optional system-integrated shield connection

#### Overview of CM 4xIO-Link

Analog output	Article number	CC code	BU type	PU
CM 4xIO-Link	6ES7137-6BD00-0BA0	CC04	A0	1

**Overview** (continued)

## Overview of BaseUnits

BaseUnit	Article number	CC codes for process terminals	CC codes for AUX terminals	PU
<b>BU type A0</b> • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73	1
<b>BU type A0</b> • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73	10
<b>BU type A0</b> • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0DA0	CC01 to CC05	--	1
<b>BU type A0</b> • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2DA0	CC01 to CC05	--	10
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73	1
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73	10
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0BA0	CC01 to CC05	--	1
<b>BU type A0</b> • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2BA0	CC01 to CC05	--	10

**Technical specifications**

Article number	<b>6ES7137-6BD00-0BA0</b> ET 200SP, CM 4 X IO-LINK ST
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Power losses</b>	
Power loss, typ.	1 W
<b>Isochronous mode</b>	
equidistance	Yes
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes; The port diagnosis is available in the IO-Link mode only.
<b>Diagnostic messages</b>	
• Diagnostics	Yes
• Monitoring the supply voltage	Yes
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; one green LED for channel status Qn (SIO mode) and port status Cn (IO-Link mode) per channel
• for channel diagnostics	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED

Article number	<b>6ES7137-6BD00-0BA0</b> ET 200SP, CM 4 X IO-LINK ST
<b>Galvanic isolation</b>	
<b>Electrical isolation channels</b>	
• between the channels	No
• between the channels and the backplane bus	Yes
<b>Permissible potential difference</b>	
between different circuits	75 V DC/60 V AC (base isolation)
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Dimensions</b>	
Width	15 mm
<b>Weights</b>	
Weight, approx.	30 g

## I/O systems

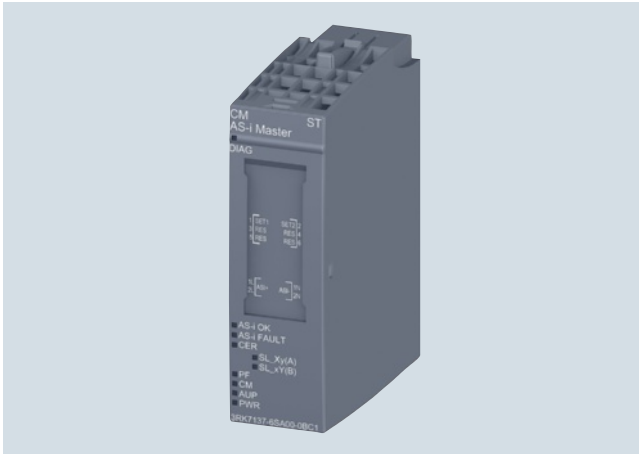
ET 200 systems for the control cabinet  
ET 200SP - I/O modules - Communication

### CM IO-Link

Ordering data	Article No.	Reference identification label	Article No.
<b>CM IO-Link Master V1.1 Standard communication module</b> Serial communication module for connecting up to 4 IO-Link devices, time-based IO, BU type A0, color code CC04	<b>6ES7137-6BD00-0BA0</b>	<b>Reference identification label</b> 10 sheets of 16 labels; for printing with thermal-transfer card printer or plotting unit	<b>6ES7193-6LF30-0AW0</b>
<b>Accessories</b>		<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AA0</b>
<b>Supported type A0 BaseUnits</b>		500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	<b>6ES7193-6LR10-0AG0</b>
<b>BU15-P16+A10+2D</b> BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	<b>6ES7193-6BP20-0DA0</b> <b>6ES7193-6BP20-2DA0</b>	1000 labeling strips DIN A4, light gray, cardboard, preperforated, for inscription with laser printer	<b>6ES7193-6LA10-0AA0</b>
<ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> </ul>		1000 labeling strips DIN A4, yellow, cardboard, preperforated, for inscription with laser printer	<b>6ES7193-6LA10-0AG0</b>
<b>BU15-P16+A0+2D</b> BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	<b>6ES7193-6BP00-0DA0</b> <b>6ES7193-6BP00-2DA0</b>	<b>Color-coding plates</b> Color code CC04, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 12), blue (terminals 13 to 16); 10 units	<b>6ES7193-6CP04-2MA0</b>
<ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> </ul>		Color code CC71, for 10 AUX terminals, BU type A0, yellow-green (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP71-2AA0</b>
<b>BU15-P16+A10+2B</b> BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	<b>6ES7193-6BP20-0BA0</b> <b>6ES7193-6BP20-2BA0</b>	Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP72-2AA0</b>
<ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> </ul>		Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	<b>6ES7193-6CP73-2AA0</b>
<b>BU15-P16+A0+2B</b> BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	<b>6ES7193-6BP00-0BA0</b> <b>6ES7193-6BP00-2BA0</b>		
<ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> </ul>			



## Overview



CM AS-i Master ST for SIMATIC ET 200SP

The CM AS-i Master ST communication module is designed for use in the SIMATIC ET 200SP distributed I/O system and has the following features:

- As many as 62 AS-Interface slaves can be connected
- Supports all AS-Interface master functions according to the AS-Interface Specification V3.0
- User-friendly configuration with graphic display of the AS-i line in TIA Portal V12.0 or in other systems by using GSD
- Supply via AS-Interface cable
- Suitable for AS-i Power24V and for AS-Interface with 30 V voltage
- Integrated ground-fault monitoring for the AS-Interface cable
- Through connection to AS-Interface and in combination with ET 200SP, the number of digital inputs and outputs available for the control system is greatly increased (max. 496 DI/496 DO on the AS-Interface per CM AS-i Master ST).
- Integrated analog value processing

**Basic unit: ET 200SP Distributed I/O System**

SIMATIC ET 200SP is a scalable and highly flexible distributed I/O system for connecting the process signals to a central control system via PROFIBUS or PROFINET.

Up to eight CM AS-i Master STs can be plugged into a SIMATIC ET 200SP with the IM 155-6 PN standard interface module.

For more information, see "SIMATIC ET 200SP Distributed I/O system" System Manual  
<http://support.automation.siemens.com/WW/view/en/58649293>

**Design**

The CM AS-i Master ST module has an ET 200SP module enclosure with a width of 20 mm. A C0 type BaseUnit (BU) is required for use in the ET 200SP.

The module has LED indicators for diagnostics, operation, AS-i voltage and AS-i slave status and offers informative front-side module inscription for

- Plain-text marking of the module type and function class
- 2D matrix code (article number and serial number)
- Connection diagram
- Color coding of the CM module type: light gray
- Hardware and firmware version
- Complete article number

**Function**

The CM AS-i Master ST supports all specified functions of the AS-Interface Specification V3.0.

The input/output values of the digital AS-i slaves can be activated via the cyclic process image. The values of the analog AS-i slaves can be attained via the cyclic process image (firmware V1.1 or higher) or via data record transfer.

If required, master calls can be performed with the command interface, e.g. read/write parameters, read/write configuration.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the control panel of the CM AS-i Master ST in STEP 7.

Expansions from firmware version V1.1

In order to implement modular machine concepts, the AS-i Slaves can be activated or deactivated via the PLC program (option handling). The configuration of AS-i slaves can be modified while being executed, thus enabling variable machine set-ups.

An existing AS-i installation can be read into the STEP 7 hardware configuration and then adapted and documented in the project. Analog values are transmitted via the cyclic process image, the length of which is adjustable and extendable up to 288 Bytes (depending on the interface module (IM) used).

Diagnostic information is accessed in the program by means of data record reading, process image, alarm messages or in STEP 7 in a graphical overview matrix. The new functions are available with the TIA Portal STEP 7 V13 SP1 or with STEP 7 V5.5 with HSP 2092 V3.01). Configuration is possible with SIMATIC CPUs S7-300 up to S7-1500 and with a SINUMERIK or other controller.

Safety note

The use of this product requires suitable protective measures (including network segmentation for IT security) in order to ensure safe plant operation; see  
<http://www.siemens.com/industrialsecurity>.

<sup>1)</sup> HSP 2092 see  
<https://support.industry.siemens.com/cs/ww/en/view/23183356>.



## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - I/O modules - Communication

### CM AS-i Master ST for SIMATIC ET 200SP

#### Overview (continued)

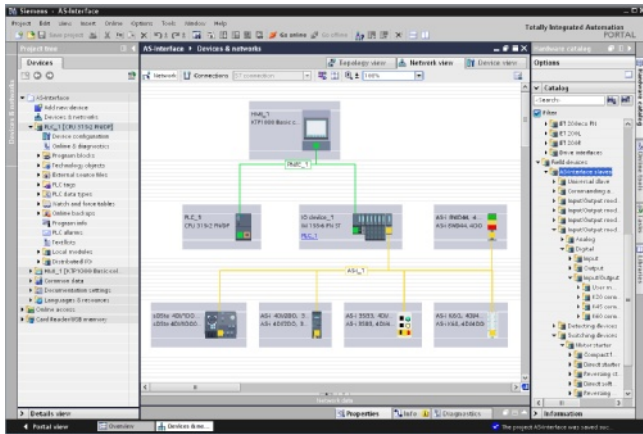
##### Configuration

The following software is required for configuration of the CM AS-i Master ST module:

- STEP 7 (classic) V5.5 SP3 HF4 or higher with HSP 2092 or HSP 2092 V3.0 (for firmware V1.1) or
- STEP 7 (TIA Portal) V12 or higher or V13 SP1 or higher (for firmware V1.1) or
- the GSD file of the ET 200SP with STEP 7 or another engineering tool

STEP 7 enables user-friendly configuration and diagnostics of the AS-i master and any connected slaves.

Alternatively, you can also apply the AS-Interface ACTUAL configuration as the DESIRED configuration at the "touch of a button" via the control panel integrated in the TIA Portal or an optional expansion button. Configuration with the GSD file is possible only with the button.



Configuration of an AS-Interface network with CM AS-i Master ST via TIA Portal

The CM AS-i Master ST module occupies up to 288 input bytes and up to 288 output bytes in the I/O data of the ET 200SP station. The I/O assignment depends on the configuration in STEP 7.

#### Ordering data

#### Article No.

##### CM AS-i Master ST communication module

**3RK7137-6SA00-0BC1**

- AS-Interface master for SIMATIC ET 200SP, can be plugged onto BaseUnit type C0
- Corresponds to AS-Interface Specification V3.0
- Dimensions (W x H x D / mm): 20 x 73 x 58

##### Accessories

##### BaseUnit BU20-P6+A2+4D

**6ES7193-6BP20-0DC0**

- BaseUnit (light), BU type C0
- Suitable for the CM AS-i Master ST module
- For connection of AS-Interface cable to the CM AS-i Master ST
- Beginning of an AS-i network, disconnection of AS-i voltage to the left-hand module

##### PROFINET interface module IM 155-6 PN Standard

Max. 32 I/O modules,  
Max. 256 bytes I/O data per station

**6ES7155-6AA00-0BNO**

- Including server module and bus adapter 2 x RJ45 (delivered without RJ45 plug)
- Including server module (bus adapter must be ordered separately, see below)

**6ES7155-6AU00-0BNO**

##### PROFINET interface module IM 155-6 PN High Feature

Max. 64 I/O modules,  
Max. 1440 bytes I/O data per station

**6ES7155-6AU00-0CNO**

- Including server module (bus adapter must be ordered separately, see below)

##### PROFIBUS interface module IM 155-6 DP High Feature

Max. 32 I/O modules,  
Max. 244 bytes I/O data per station

**6ES7155-6BA00-0CNO**

- Including server module and PROFIBUS connector

##### Bus adapters for PROFINET

For connection of the Ethernet cable to the PROFINET IM 155-6 PN interface module

- Connection 2 x RJ45 (supplied without RJ45 connector)
- Connection 2 x FC (FastConnect)

**6ES7193-6AR00-0AA0**

**6ES7193-6AF00-0AA0**

## Overview



- PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbit/s
- Expands the ET 200SP CPUs 1510SP-1 PN / 1512SP-1 PN by one PROFIBUS connection
- For communication with lower-level PROFIBUS devices at bandwidths of 9.6 kbit/s to 12 Mbit/s
- Communication services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication:
    - This makes it possible to establish communication between the ET 200SP CPU and other devices, for example those from the SIMATIC S7-300/400/1500 range.
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Data set routing

## Technical specifications

Article number	<b>6ES7545-5DA00-0AB0</b> ET 200SP, CM DP FOR ET 200SP CPU
<b>Product type designation</b>	
<b>Engineering with</b>	V13 Update 3
• STEP 7 TIA Portal can be configured/integrated as of version	
<b>Installation type/mounting</b>	
Rack mounting possible	No
Type of fitting, rail mounting	Yes; Standard - DIN rail
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
<b>Interfaces</b>	
<b>1st interface</b>	
<b>Interface types</b>	
- RS 485	Yes
<b>Protocols</b>	
- SIMATIC communication	Yes
- PROFIBUS DP master	Yes
- PROFIBUS DP slave	Yes
<b>RS 485</b>	
• Transmission rate, max.	12 Mbit/s
• Cable length, max.	100 m
<b>Protocols</b>	
<b>PROFIBUS DP master</b>	
<b>Services</b>	
- PG/OP communication	Yes
- S7 routing	Yes
- Data record routing	Yes
- Isochronous mode	No
- equidistance	No
- Number of DP slaves	125
- Activation/deactivation of DP slaves	Yes

Article number	<b>6ES7545-5DA00-0AB0</b> ET 200SP, CM DP FOR ET 200SP CPU
<b>PROFIBUS DP slave</b>	
• Transmission rate, max.	12 Mbit/s
• Automatic baud rate search	Yes
• Address area, max.	120
• User data per address area, max.	128 byte
<b>Services</b>	
- PG/OP communication	Yes; Only with active interface
- Routing	Yes; Only with active interface
- S7 communication	Yes; Only with active interface
- Direct data exchange (slave-to-slave communication)	Yes; No subscriber possible - only passive publisher
- DPV1	Yes
<b>Transfer memory</b>	
- Inputs	244 byte
- Outputs	244 byte
<b>Diagnostic messages</b>	
• Diagnostics	Yes
<b>Diagnostics indication LED</b>	
• for module diagnostics	Yes; green/red DIAG LED
<b>Galvanic isolation</b>	
between the backplane bus and interface	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
<b>Dimensions</b>	
Width	35 mm
Height	117 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	80 g

**I/O systems**

ET 200 systems for the control cabinet  
 ET 200SP - I/O modules - Communication

**CM DP for ET 200SP CPU****Ordering data****Article No.****Article No.****CM DP for ET 200SP CPU**

PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbit/s

**6ES7545-5DA00-0AB0****Accessories****Reference identification label**

10 sheets of 16 labels

**6ES7193-6LF30-0AW0****Labeling strips**

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

**6ES7193-6LR10-0AA0**

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

**6ES7193-6LR10-0AG0**

1000 labeling strips DIN A4, light gray, card, for inscription with laser printer

**6ES7193-6LA10-0AA0**

1000 labeling strips DIN A4, yellow, card, for inscription with laser printer

**6ES7193-6LA10-0AG0****PROFIBUS DP bus connector RS 485**

With 90° cable outlet, max. transfer rate 12 Mbit/s

- without PG interface
- with PG interface

**6ES7972-0BA12-0XA0****6ES7972-0BB12-0XA0**

With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbit/s

- without PG interface, 1 unit
- without PG interface, 100 units
- with PG interface, 1 unit
- with PG interface, 100 units

**6ES7972-0BA52-0XA0****6ES7972-0BA52-0XB0****6ES7972-0BB52-0XA0****6ES7972-0BB52-0XB0****FastConnect bus cable****6XV1830-0EH10**

Standard type with special design for quick mounting, 2-core, shielded, sold by the meter; max. delivery unit 1000 m, minimum ordering quantity 20 m

## Overview



- Low-cost Access Point, suitable for applications where the device is to be mounted in the control cabinet

**Product versions****SCALANCE W761-1 RJ45**

- A wireless card permanently installed in the device

## Technical specifications

Article number	<b>6GK5761-1FC00-0AA0</b> 6GK5761-1FC00-0AB0 <sup>1)</sup>
Product type designation	SCALANCE W761-1 RJ45
<b>Transmission rate</b>	
Transfer rate	
• with WLAN maximum	150 Mbit/s
• 1 for Industrial Ethernet	10 Mbit/s
• 2 for Industrial Ethernet	100 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
<b>Interfaces</b>	
Number of electrical connections	
• for network components or terminal equipment	1
• for power supply	1
• for redundant voltage supply	0
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	3-pole screw terminal
design of the removable storage	
• C-PLUG	No
• KEY-PLUG	No
<b>Interfaces wireless</b>	
Number of radio cards permanently installed	1
Number of electrical connections for external antenna(s)	1
Type of electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes

Article number	<b>6GK5761-1FC00-0AA0</b> 6GK5761-1FC00-0AB0 <sup>1)</sup>
Product type designation	SCALANCE W761-1 RJ45
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Consumed current	
• for DC at 24 V typical	0.15 A
Active power loss	
• for DC at 24 V typical	3.6 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP20

## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - I/O modules - Communication

### SCALANCE W761 RJ45 for use in the control cabinet

#### Technical specifications (continued)

Article number	<b>6GK5761-1FC00-0AA0</b> 6GK5761-1FC00-0AB0 <sup>1)</sup>
Product type designation	SCALANCE W761-1 RJ45
<b>Design, dimensions and weight</b>	
Width	50 mm
Height	114 mm
Depth	74 mm
Width of the enclosure without antenna	50 mm
Height of the enclosure without antenna	114 mm
Depth of the enclosure without antenna	74 mm
Net weight	0.13 kg
Mounting type	
• S7-300 rail mounting	No
• S7-1500 rail mounting	No
• wall mounting	No
<b>Wireless frequencies</b>	
Operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz
<b>Product properties, functions, components general</b>	
Product function Access Point Mode	Yes
Product function Client Mode	Yes
Number of SSIDs	1
Product function	
• Dual Client	No
• iPCF Access Point	No
• iPCF client	No
• iPCF-MC Access Point	No
• iPCF-MC client	No
<b>Product functions management, configuration</b>	
Number of manageable IP addresses in client	4
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via e-mail	Yes
• Configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• forced roaming with IWLAN	No
• WDS	Yes
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	Yes
Identification & maintenance function	
• I&MO - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes

Article number	<b>6GK5761-1FC00-0AA0</b> 6GK5761-1FC00-0AB0 <sup>1)</sup>
Product type designation	SCALANCE W761-1 RJ45
<b>Product functions Diagnosis</b>	
Product function	
• PROFINET IO diagnosis	Yes
• Link Check	No
• connection monitoring IP-Alive	No
• localization via Aeroscout	No
• SysLog	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
<b>Product functions VLAN</b>	
Product function	
• function VLAN with IWLAN	Yes
<b>Product functions DHCP</b>	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
<b>Product functions Redundancy</b>	
Protocol is supported	
• STP/RSTP	Yes
<b>Product functions Security</b>	
Product function	
• ACL - MAC-based	No
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported	
• SSH	Yes
<b>Product functions Time</b>	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes

## Technical specifications (continued)

Article number	<b>6GK5761-1FC00-0AA0</b> 6GK5761-1FC00-0AB0 <sup>1)</sup>
Product type designation	SCALANCE W761-1 RJ45
<b>Standards, specifications, approvals</b>	
Standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety from CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
• for hazardous zone from CSA and UL	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, CL. 1, Div. 2, GP. A,B,C,D, T4 / CL. 1, Zone 2, GP IIC
Certificate of suitability	
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• CCC	No
• E1 approval	No
• Railway application in accordance with EN 50155	No
• Fire protection in accordance with EN 45545-2	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: <a href="http://www.siemens.com/wireless-approvals">www.siemens.com/wireless-approvals</a>
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• Bureau Veritas (BV)	No
• Det Norske Veritas (DNV)	No
• Germanische Lloyd (GL)	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
<b>Accessories</b>	
accessories	24 V DC screw terminal included in scope of delivery

<sup>1)</sup> Wireless approval in the USA

## Ordering data

## Article No.

**SCALANCE W761 Access Points**

IWLAN Access Point with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbit/s; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of delivery: mounting hardware, 3-pin screw terminal for 24V DC; manual on CD-ROM; German/English

**SCALANCE W761-1 RJ45**

IWLAN Access Point with one built-in wireless interface

- National approvals for operation outside the USA
- National approvals for operation within the USA <sup>1)</sup>

**6GK5761-1FC00-0AA0****6GK5761-1FC00-0AB0****Accessories****IE FC RJ45 Plug 180 2 x 2**

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB10-2AA0****6GK1901-1BB10-2AB0****6GK1901-1BB10-2AE0****IE FC Standard Cable GP 2 x 2****6XV1840-2AH10**

4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m

**IE FC stripping tool****6GK1901-1GA00**

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

**Antennas and miscellaneous IWLAN accessories**

See Industrial Wireless LAN/ accessories, Catalog IK PI

<sup>1)</sup> Please note national approvals under <http://www.siemens.com/wireless-approvals>

## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - I/O modules - Communication

### SCALANCE W722 RJ45 for use in the control cabinet

#### Overview



- Low-cost Client Module, suitable for applications where the device is to be mounted in the control cabinet
- Equipped with iFeatures



ET 200SP station with SCALANCE W722 RJ45

#### Product versions

##### SCALANCE W722-1 RJ45

- A wireless card permanently installed in the device; suitable for establishing wireless connections with iFeatures

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#### Technical specifications

Article number	<b>6GK5722-1FC00-0AA0</b> 6GK5722-1FC00-0AB0 <sup>1)</sup>
Product type designation	SCALANCE W722-1 RJ45
<b>Transmission rate</b>	
Transfer rate	
• with WLAN maximum	150 Mbit/s
• 1 for Industrial Ethernet	10 Mbit/s
• 2 for Industrial Ethernet	100 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
<b>Interfaces</b>	
Number of electrical connections	
• for network components or terminal equipment	1
• for power supply	1
• for redundant voltage supply	0
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	3-pole screw terminal
design of the removable storage	
• C-PLUG	No
• KEY-PLUG	No
<b>Interfaces wireless</b>	
Number of radio cards permanently installed	1
Number of electrical connections for external antenna(s)	1
Type of electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes

Article number	<b>6GK5722-1FC00-0AA0</b> 6GK5722-1FC00-0AB0 <sup>1)</sup>
Product type designation	SCALANCE W722-1 RJ45
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Consumed current	
• for DC at 24 V typical	0.15 A
Active power loss	
• for DC at 24 V typical	3.6 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP20



## Technical specifications (continued)

Article number	<b>6GK5722-1FC00-0AA0</b> 6GK5722-1FC00-0AB0 <sup>1)</sup>
Product type designation	SCALANCE W722-1 RJ45
<b>Design, dimensions and weight</b>	
Width	50 mm
Height	114 mm
Depth	74 mm
Width of the enclosure without antenna	50 mm
Height of the enclosure without antenna	114 mm
Depth of the enclosure without antenna	74 mm
Net weight	0.13 kg
Mounting type	
• S7-300 rail mounting	No
• S7-1500 rail mounting	No
• wall mounting	No
<b>Wireless frequencies</b>	
Operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz
<b>Product properties, functions, components general</b>	
Product function Access Point Mode	No
Product function Client Mode	Yes
Product function	
• Dual Client	No
• iPCF client	Yes
• iPCF-MC Access Point	No
• iPCF-MC client	Yes
Number of iPCF-capable radio modules	1
<b>Product functions management, configuration</b>	
Number of manageable IP addresses in client	4
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via e-mail	Yes
• Configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• forced roaming with IWLAN	No
• WDS	No
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	No
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/location designation	Yes

Article number	<b>6GK5722-1FC00-0AA0</b> 6GK5722-1FC00-0AB0 <sup>1)</sup>
Product type designation	SCALANCE W722-1 RJ45
<b>Product functions Diagnosis</b>	
Product function	
• PROFINET IO diagnosis	Yes
• Link Check	No
• connection monitoring IP-Alive	No
• localization via Aeroscout	No
• SysLog	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
<b>Product functions VLAN</b>	
Product function	
• function VLAN with IWLAN	No
<b>Product functions DHCP</b>	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
<b>Product functions Security</b>	
Product function	
• ACL - MAC-based	No
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported	
• SSH	Yes
<b>Product functions Time</b>	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes



## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - I/O modules - Communication

### SCALANCE W722 RJ45 for use in the control cabinet

#### Technical specifications (continued)

Article number	<b>6GK5722-1FC00-0AA0</b> 6GK5722-1FC00-0AB0 <sup>1)</sup>
Product type designation	SCALANCE W722-1 RJ45
<b>Standards, specifications, approvals</b>	
Standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety from CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
• for hazardous zone from CSA and UL	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, CL. 1, Div. 2, GP. A,B,C,D, T4 / CL. 1, Zone 2, GP IIC
Certificate of suitability	
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• CCC	No
• E1 approval	No
• Railway application in accordance with EN 50155	No
• Fire protection in accordance with EN 45545-2	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: <a href="http://www.siemens.com/wireless-approvals">www.siemens.com/wireless-approvals</a>
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• Bureau Veritas (BV)	No
• Det Norske Veritas (DNV)	No
• Germanische Lloyd (GL)	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
<b>Accessories</b>	
accessories	24 V DC screw terminal included in scope of delivery

<sup>1)</sup> Wireless approval in the USA

#### Ordering data

#### Article No.

##### SCALANCE W722 Client Modules

IWLAN Ethernet Client Modules with iFeatures support and built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbit/s; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of delivery: mounting hardware, 3-pin screw terminal for 24V DC; manual on CD-ROM; German/English

##### SCALANCE W722-1 RJ45

For administration of the wireless connection with iFeatures from a connected device with Industrial Ethernet connection

- National approvals for operation outside the USA
- National approvals for operation within the USA<sup>1)</sup>

**6GK5722-1FC00-0AA0**

**6GK5722-1FC00-0AB0**

##### Accessories

##### IE FC RJ45 Plug 180 2 x 2

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

**6GK1901-1BB10-2AA0**

**6GK1901-1BB10-2AB0**

**6GK1901-1BB10-2AE0**

##### IE FC Standard Cable GP 2 x 2

**6XV1840-2AH10**

4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval  
Sold by the meter  
max. quantity 1000 m  
minimum order 20 m

##### IE FC Stripping Tool

**6GK1901-1GA00**

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

##### Antennas and miscellaneous IWLAN accessories

See Industrial Wireless LAN/ accessories

<sup>1)</sup> Please note national approvals under <http://www.siemens.com/wireless-approvals>

## Overview



- Low-cost Client Module, suitable for applications where the device is to be mounted in the control cabinet

**SCALANCE W721-1 RJ45**

- A wireless card permanently installed in the device

## Technical specifications

Article number	<b>6GK5721-1FC00-0AA0</b> 6GK5721-1FC00-0AB0 <sup>1)</sup>
Product type designation	SCALANCE W721-1 RJ45
<b>Transmission rate</b>	
Transfer rate	
• with WLAN maximum	150 Mbit/s
• 1 for Industrial Ethernet	10 Mbit/s
• 2 for Industrial Ethernet	100 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s
<b>Interfaces</b>	
Number of electrical connections	
• for network components or terminal equipment	1
• for power supply	1
• for redundant voltage supply	0
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	3-pole screw terminal
design of the removable storage	
• C-PLUG	No
• KEY-PLUG	No
<b>Interfaces wireless</b>	
Number of radio cards permanently installed	1
Number of electrical connections for external antenna(s)	1
Type of electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Consumed current	
• for DC at 24 V typical	0.15 A
Active power loss	
• for DC at 24 V typical	3.6 W

Article number	<b>6GK5721-1FC00-0AA0</b> 6GK5721-1FC00-0AB0 <sup>1)</sup>
Product type designation	SCALANCE W721-1 RJ45
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Width	50 mm
Height	114 mm
Depth	74 mm
Width of the enclosure without antenna	50 mm
Height of the enclosure without antenna	114 mm
Depth of the enclosure without antenna	74 mm
Net weight	0.13 kg
Mounting type	
• S7-300 rail mounting	No
• S7-1500 rail mounting	No
• wall mounting	No
<b>Wireless frequencies</b>	
Operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz
<b>Product properties, functions, components general</b>	
Product function Access Point Mode	No
Product function Client Mode	Yes
Product function	
• Dual Client	No
• iPCF client	No
• iPCF-MC client	No

## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - I/O modules - Communication

### SCALANCE W721 RJ45 for use in the control cabinet

#### Technical specifications (continued)

Article number	<b>6GK5721-1FC00-0AA0</b> 6GK5721-1FC00-0AB0 <sup>1)</sup>
Product type designation	SCALANCE W721-1 RJ45
<b>Product functions management, configuration</b>	
Number of manageable IP addresses in client	4
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via e-mail	Yes
• Configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• forced roaming with IWLAN	No
• WDS	No
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	No
Identification & maintenance function	
• I&MO - device-specific information	Yes
• I&M1 – higher-level designation/location designation	Yes
<b>Product functions Diagnosis</b>	
Product function	
• PROFINET IO diagnosis	Yes
• Link Check	No
• connection monitoring IP-Alive	No
• localization via Aeroscout	No
• SysLog	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
<b>Product functions VLAN</b>	
Product function	
• function VLAN with IWLAN	No
<b>Product functions DHCP</b>	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
<b>Product functions Security</b>	
Product function	
• ACL - MAC-based	No
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported	
• SSH	Yes

Article number	<b>6GK5721-1FC00-0AA0</b> 6GK5721-1FC00-0AB0 <sup>1)</sup>
Product type designation	SCALANCE W721-1 RJ45
<b>Product functions Time</b>	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes
<b>Standards, specifications, approvals</b>	
Standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety from CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
• for hazardous zone from CSA and UL	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, CL. 1, Div. 2, GP. A,B,C,D, T4 / CL. 1, Zone 2, GP IIC
Certificate of suitability	
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• CCC	No
• E1 approval	No
• Railway application in accordance with EN 50155	No
• Fire protection in accordance with EN 45545-2	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: <a href="http://www.siemens.com/wireless-approvals">www.siemens.com/wireless-approvals</a>
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• Bureau Veritas (BV)	No
• Det Norske Veritas (DNV)	No
• Germanische Lloyd (GL)	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
<b>Accessories</b>	
accessories	24 V DC screw terminal included in scope of delivery

<sup>1)</sup> Wireless approval in the USA

Ordering data	Article No.	Ordering data	Article No.
<b>SCALANCE W721 Client Modules</b> IWLAN Ethernet Client Modules with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbit/s; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of delivery: mounting hardware, 3-pin screw terminal for 24V DC; manual on CD-ROM; German/English		<b>Accessories</b> <b>IE FC RJ45 Plug 180 2 x 2</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface <ul style="list-style-type: none"> <li>• 1 pack = 1 unit</li> <li>• 1 pack = 10 units</li> <li>• 1 pack = 50 units</li> </ul>	
<b>SCALANCE W721-1 RJ45</b> For administration of the wireless connection from a connected device with Industrial Ethernet connection <ul style="list-style-type: none"> <li>• National approvals for operation outside the USA</li> <li>• National approvals for operation within the USA<sup>1)</sup></li> </ul>	<b>6GK5721-1FC00-0AA0</b>  <b>6GK5721-1FC00-0AB0</b>	<b>IE FC Standard Cable GP 2 x 2</b> 4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. quantity 1000 m, minimum order 20 m	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>  <b>6XV1840-2AH10</b>
		<b>IE FC Stripping Tool</b> Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>
		<b>Antennas and miscellaneous IWLAN accessories</b>	See Industrial Wireless LAN/ accessories

<sup>1)</sup> Please note national approvals under <http://www.siemens.com/wireless-approvals>

## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - Fail-safe I/O modules

### Digital F input modules

#### Overview

Digital fail-safe input module:

F-DI 8x24 V DC High Feature for BU type A0, color code CC01

Important features:

- 8-channel digital fail-safe input module for the ET 200SP
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 8 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete article number
- Optional labeling accessories
  - Labeling strips
  - Reference identification label
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe, both in PROFIBUS, and in PROFINET configurations. They can be used with all fail-safe SIMATIC S7 CPUs.

#### Technical specifications

Article number	<b>6ES7136-6BA00-0CA0</b> ET 200SP, EL-MOD., F-DI 8X24VDC HF
<b>Product type designation</b>	
<b>General information</b>	
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	V12
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -
• PROFINET as of GSD version/GSD revision	V2.31
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Encoder supply</b>	
Number of outputs	8
short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.8 A)
<b>Output current</b>	
• up to 60 °C, max.	0.3 A
<b>24 V encoder supply</b>	
• 24 V	Yes; min. L+ (-1.5 V)
• short-circuit protection	Yes
• Output current, max.	800 mA

Article number	<b>6ES7136-6BA00-0CA0</b> ET 200SP, EL-MOD., F-DI 8X24VDC HF
<b>Digital inputs</b>	
Number of digital inputs	8
m/p-reading	Yes; p-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+15 to +30V
<b>Input current</b>	
• for signal "1", typ.	3.7 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
- Parameterizable	Yes
<b>for counter/technological functions</b>	
- Parameterizable	No
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	500 m
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	No
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED

## Technical specifications (continued)

Article number	<b>6ES7136-6BA00-0CA0</b> ET 200SP, EL-MOD., F-DI 8X24VDC HF
<b>Galvanic isolation</b>	
<b>Electrical isolation channels</b>	
• between the channels and the backplane bus	Yes
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to EN ISO 13849-1:2008	PLe
• SIL according to IEC 61508	SIL 3
• Low demand mode: PFDavg	< 2.00E-05 1/h
• High demand/continuous mode: PFH	< 1.00E-09 1/h
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
<b>Dimensions</b>	
Width	15 mm
<b>Weights</b>	
Weight, approx.	49 g

## Ordering data

## Article No.

## Digital F input modules

F-DI 8x24 V DC High Feature,  
BU type A0, color code CC01**6ES7136-6BA00-0CA0**

## Supported BaseUnits

**BU15-P16+A0+2D**BU type A0; BaseUnit (light) with  
16 process terminals to the module;  
for starting a new load group  
(max. 10 A)

- 1 unit
- 10 units

**6ES7193-6BP00-0DA0**  
**6ES7193-6BP00-2DA0****BU15-P16+A0+2B**BU type A0; BaseUnit (dark) with  
16 process terminals to the module;  
for continuing the load group

- 1 unit
- 10 units

**6ES7193-6BP00-0BA0**  
**6ES7193-6BP00-2BA0****BU15-P16+A10+2D**BU type A0; BaseUnit (light) with  
16 process terminals (1...16) to the  
module and an additional 10 inter-  
nally jumpered AUX terminals  
(1 A to 10 A); for starting a new load  
group (max. 10 A)

- 1 unit
- 10 units

**6ES7193-6BP20-0DA0**  
**6ES7193-6BP20-2DA0****BU15-P16+A10+2B**BU type A0; BaseUnit (dark) with  
16 process terminals (1...16) to the  
module and an additional 10 inter-  
nally jumpered AUX terminals  
(1 A to 10 A); for continuing the load  
group

- 1 unit
- 10 units

**6ES7193-6BP20-0BA0**  
**6ES7193-6BP20-2BA0**

**I/O systems**

ET 200 systems for the control cabinet  
ET 200SP - Fail-safe I/O modules

**Digital F input modules**

Ordering data	Article No.	Article No.
<b>Accessories</b>		
<b>S7 Distributed Safety programming tool V5.4</b> Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 and higher  Floating license for 1 user  Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; e-mail address required for delivery	<b>6ES7833-1FC02-0YA5</b>  <b>6ES7833-1FC02-0YH5</b>	<b>Labeling strips</b>  500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer  500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer  1000 labeling strips DIN A4, light gray, card, for inscription with laser printer  1000 labeling strips DIN A4, yellow, card, for inscription with laser printer
<b>STEP 7 Safety Advanced V13 SP1</b> Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1  Floating license for 1 user  Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; e-mail address required for delivery	<b>6ES7833-1FA13-0YA5</b>  <b>6ES7833-1FA13-0YH5</b>	<b>BU cover</b>  For covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide
<b>Reference identification label</b>  10 sheets of 16 labels	<b>6ES7193-6LF30-0AW0</b>	<b>Shield connection</b>  5 shield supports and 5 shield terminals
		<b>Color-coding plates</b> • Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units  • Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units  • Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units  • Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units
		<b>E-coding element type F</b>  5 units, spare part

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

**Overview**

Digital fail-safe output module:  
F-DQ 4x24 V DC High Feature, BU type A0, color code CC01

Important features:

- 4-channel digital fail-safe output module for the ET 200SP
- Fail-safe 2-channel activation (sink/source output) by actuators
- Actuators can be controlled up to 2 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete article number
- Optional labeling accessories
  - Labeling strips
  - Reference identification label
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFI-safe, both in PROFIBUS, and in PROFINET configurations.
- They can be used with all fail-safe SIMATIC S7 CPUs.

**Technical specifications**

Article number	<b>6ES7136-6DB00-0CA0</b> ET 200SP, EL-MOD., F-DQ 4XDC 24V/2A
<b>Product type designation</b>	
<b>General information</b>	
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	V12
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -
• PROFINET as of GSD version/GSD revision	V2.31
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Digital outputs</b>	
Number of digital outputs	4
Digital outputs, configurable	Yes
short-circuit protection	Yes
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	typ. 2*47V
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	2 A
• on lamp load, max.	10 W
<b>Load resistance range</b>	
• lower limit	12 Ω
• upper limit	2 000 Ω
<b>Output voltage</b>	
• Type of output voltage	DC
• for signal *1*, min.	24 V; L+ (-0.5 V)
<b>Output current</b>	
• for signal *1* rated value	2 A
• for signal *0* residual current, max.	0.5 mA

Article number	<b>6ES7136-6DB00-0CA0</b> ET 200SP, EL-MOD., F-DQ 4XDC 24V/2A
<b>Switching frequency</b>	
• with resistive load, max.	30 Hz; Symmetrical
• with inductive load, max.	0.1 Hz; according to IEC 947-5-1, DC-13, symmetrical
• on lamp load, max.	10 Hz; Symmetrical
<b>Aggregate current of the outputs</b>	
• Current per channel, max.	2 A; Note derating data in the manual
• Current per module, max.	6 A; Note derating data in the manual
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	500 m
<b>Interrupts/diagnostics/status information</b>	
Substitute values connectable	No
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED



## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - Fail-safe I/O modules

### Digital F output modules

#### Technical specifications (continued)

Article number	<b>6ES7136-6DB00-0CA0</b> ET 200SP, EL-MOD., F-DQ 4XDC 24V/2A
<b>Galvanic isolation</b>	
<b>Electrical isolation channels</b>	
• between the channels and the backplane bus	Yes
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to EN ISO 13849-1:2008	PLe
• SIL according to IEC 61508	SIL 3
• Low demand mode: PFDavg	< 2.00E-05 1/h
• High demand/continuous mode: PFH	< 1.00E-09 1/h
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
<b>Dimensions</b>	
Width	15 mm
<b>Weights</b>	
Weight, approx.	57 g

#### Ordering data

**Digital F output modules**  
F-DQ 4x24 V DC High Feature,  
BU type A0, color code CC01

#### Article No.

**6ES7136-6DB00-0CA0**

#### Supported BaseUnits

##### BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

- 1 unit
- 10 units

**6ES7193-6BP00-0DA0**  
**6ES7193-6BP00-2DA0**

##### BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- 1 unit
- 10 units

**6ES7193-6BP00-0BA0**  
**6ES7193-6BP00-2BA0**

##### BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

- 1 unit
- 10 units

**6ES7193-6BP20-0DA0**  
**6ES7193-6BP20-2DA0**

##### BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

- 1 unit
- 10 units

**6ES7193-6BP20-0BA0**  
**6ES7193-6BP20-2BA0**

##### BU20-P12+A4+0B

BU type B0; BaseUnit (dark) with 12 process terminals (1...12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group

**6ES7193-6BP20-0BB0**

Ordering data	Article No.	Article No.
<b>Accessories</b>		
<b>S7 Distributed Safety programming tool V5.4</b> Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 and higher Floating license for 1 user Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; e-mail address required for delivery	<b>6ES7833-1FC02-0YA5</b> <b>6ES7833-1FC02-0YH5</b>	<b>Labeling strips</b> 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer <b>6ES7193-6LR10-0AA0</b> 500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer <b>6ES7193-6LR10-0AG0</b> 1000 labeling strips DIN A4, light gray, card, for inscription with laser printer <b>6ES7193-6LA10-0AA0</b> 1000 labeling strips DIN A4, yellow, card, for inscription with laser printer <b>6ES7193-6LA10-0AG0</b>
<b>STEP 7 Safety Advanced V13 SP1</b> Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1 Floating license for 1 user Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; e-mail address required for delivery	<b>6ES7833-1FA13-0YA5</b> <b>6ES7833-1FA13-0YH5</b>	<b>BU cover</b> For covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide <b>6ES7133-6CV15-1AM0</b> <b>6ES7133-6CV20-1AM0</b>
<b>Reference identification label</b> 10 sheets of 16 labels	<b>6ES7193-6LF30-0AW0</b>	<b>Shield connection</b> 5 shield supports and 5 shield terminals <b>6ES7193-6SC00-1AM0</b>
		<b>Color-coding plates</b> • Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units <b>6ES7193-6CP02-2MA0</b> • Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units <b>6ES7193-6CP71-2AA0</b> • Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units <b>6ES7193-6CP72-2AA0</b> • Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units <b>6ES7193-6CP73-2AA0</b>
		<b>E-coding element type F</b> 5 units, spare part <b>6ES7193-6EF00-1AA0</b>

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

## I/O systems

ET 200 systems for the control cabinet

ET 200SP - Fail-safe I/O modules

### Digital F output module relay

#### Overview

The digital F electronic module relay 1 F-RQ 24 V DC/24...230 V AC/5 A has the following characteristics:

- 1 relay output (2 NO contacts)
- Total output current 5 A
- Rated load voltage 24 V DC and 24...230 V AC
- The control circuit of the two safety relays must be routed from the outside to the respective terminals.

The attainable safety integrity level is SIL3 (IEC 61508) when the control of the F-RQ module is implemented via a fail-safe output (e.g. ET 200SP 4F-DQ 24 V DC/2 A PROFIsafe).

#### Technical specifications

Article number	<b>6ES7136-6RA00-0BF0</b> ET 200SP, F-RQ 1X24VDC/24...230VAC/5A ST
<b>Product type designation</b>	
<b>General information</b>	
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	V13
• STEP 7 can be configured/integrated as of version	V5.5 SP4 and higher
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
Rated value (DC)	24 V; Coil voltage
<b>Digital outputs</b>	
Number of digital outputs	1
Limitation of inductive shutdown voltage to	No
Controlling a digital input	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	5 A
• on lamp load, max.	25 W
<b>Switching frequency</b>	
• with resistive load, max.	2 Hz
• with inductive load, max.	0.1 Hz; See data in manual
• with inductive load (to IEC 60947-5-1, DC13), max.	0.1 Hz
• with inductive load (to IEC 60947-5-1, AC15), max.	2 Hz
<b>Total current of the outputs (per module)</b>	
<b>horizontal installation</b>	
- up to 40 °C, max.	5 A; Note derating data in the manual
- up to 50 °C, max.	4 A; Note derating data in the manual
- up to 60 °C, max.	3 A; Note derating data in the manual
<b>vertical installation</b>	
- up to 50 °C, max.	3 A; Note derating data in the manual

Article number	<b>6ES7136-6RA00-0BF0</b> ET 200SP, F-RQ 1X24VDC/24...230VAC/5A ST
<b>Relay outputs</b>	
• Number of relay outputs	1; 2 NO contacts
• Rated input voltage of relay coil L+ (DC)	24 V
• Current consumption of relays (coil current of all relays), max.	70 mA
• external protection for relay outputs	yes; 6 A, see data in manual
• Relay approved acc. to UL 508	Yes; Pilot Duty B300, R300
<b>Switching capacity of contacts</b>	
- with inductive load, max.	see additional description in the manual
- with resistive load, max.	see additional description in the manual
- Thermal continuous current, max.	5 A
- Switching current, min.	1 mA
- Switching current after exceeding 300 mA, min.	10 mA
- Switching current after exceeding 300 mA, max.	5 A
- rated switching voltage (DC)	24 V
- rated switching voltage (AC)	230 V
<b>Cable length</b>	
• shielded, max.	500 m; for load contacts
• Unshielded, max.	300 m; for load contacts
• Control cable (input), max.	10 m
<b>Diagnostic messages</b>	
• Diagnostics	yes, firmware update
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; green/red DIAG LED
• Channel status display	Yes; Green LED
<b>Galvanic isolation</b>	
<b>Electrical isolation channels</b>	
• between the channels and the backplane bus	Yes
<b>Isolation</b>	
Isolation checked with	2545V DC 2s (routine test)
Overvoltage category	III
<b>tested with</b>	
• between channels and backplane bus/supply voltage	DC 2545 V 2 s (routine test), impulse voltage test DC 7200 V / 5 positive and 5 negative pulses (type test)
• between backplane bus and supply voltage	707 V DC (type test)

# I/O systems

## ET 200 systems for the control cabinet

### ET 200SP - Fail-safe I/O modules

#### Digital F output module relay

Article number	<b>6ES7136-6RA00-0BF0</b> ET 200SP, F-RQ 1X24VDC/24...230VAC/5A ST
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	Yes
<b>Highest safety class achievable in safety mode</b>	
<ul style="list-style-type: none"> <li>Performance level according to EN ISO 13849-1:2008</li> <li>Category acc. to ISO 13849-1:2008</li> <li>SIL according to IEC 61508</li> <li>Low demand (PFD) acc. to SIL2</li> <li>Low demand mode: PFDavg</li> <li>High demand (PFH) acc. to SIL2</li> <li>High demand/continuous mode: PFH</li> </ul>	PL e 4 SIL 3 < 1.00E-04, function test 1x per year < 1.00E-05, function test 1x per month < 1.00E-08 1/h, function test 1x per year < 6.00E-09 1/h, function test 1x per month

Article number	<b>6ES7136-6RA00-0BF0</b> ET 200SP, F-RQ 1X24VDC/24...230VAC/5A ST
<b>Dimensions</b>	
Width	20 mm
<b>Weights</b>	
Weight, approx.	56 g

#### Ordering data

#### Article No.

#### Article No.

##### Digital F output module relay 1 F-RQ

BU type F0, relay output (2 NO contacts), total output current 5 A, load voltages 24 V DC and 24...230 V AC; can be used up to SIL 3 / Category 4/ PL e if controlled via F-DQ

**6ES7136-6RA00-0BF0**

##### Supported BaseUnits

##### BU20-P8+A4+0B

BU type F0; BaseUnit (dark) with 8 process terminals to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group

**6ES7193-6BP20-0BF0**

##### Accessories

##### S7 Distributed Safety programming tool V5.4

**Task:**  
Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco

**Requirement:**  
STEP 7 V5.3 SP3 and higher

Floating license for 1 user

**6ES7833-1FC02-0YA5**

Floating license for 1 user, license key download without software or documentation<sup>1)</sup>; e-mail address required for delivery

**6ES7833-1FC02-0YH5**

##### STEP 7 Safety Advanced V13 SP1

##### Task:

Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco

##### Requirement:

STEP 7 Professional V13 SP1

Floating license for 1 user

**6ES7833-1FA13-0YA5**

Floating license for 1 user, license key download without software or documentation<sup>1)</sup>; e-mail address required for delivery

**6ES7833-1FA13-0YH5**

##### Reference identification label

10 sheets of 16 labels

**6ES7193-6LF30-0AW0**

##### Labeling strips

500 labeling strips on roll, light gray

**6ES7193-6LR10-0AA0**

500 labeling strips on roll, yellow

**6ES7193-6LR10-0AG0**

1000 labeling strips DIN A4, light gray

**6ES7193-6LA10-0AA0**

1000 labeling strips DIN A4, yellow

**6ES7193-6LA10-0AG0**

##### BU cover

For covering empty slots (gaps); 5 units

- 20 mm wide

**6ES7133-6CV15-1AM0**

##### Shield connection

5 shield supports and 5 shield terminals

**6ES7193-6SC00-1AM0**

##### Color-coded labels

- Color code CC42, module-specific; for BaseUnit type F0; 10 units

**6ES7193-6CP42-2MB0**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - Fail-safe I/O modules

### Fail-safe special modules

#### Overview

Digital fail-safe power module:  
F-PM-E PPM 24 V DC/8 A for BU type C0, color code CC52

Important features:

- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Safety-related shutdown of output modules within the potential group of the F-PM-E
- Two fail-safe digital inputs, for reading of sensor information (1 or 2 channels)
- One fail-safe digital output onboard (ppm switching, up to 2 A, up to SIL 3/PL e)
- Fail-safe digital output and potential supply pp or pm switching can be parameterized
- Parameterizable onboard evaluation of the fail-safe inputs for control of the fail-safe digital outputs and of the potential group
- Digital standard output modules can be shut down up to PL d (ISO 13849) and SIL 2 (IEC 61508) (up to 8 A).
- Can be plugged into type C0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete article number
- Optional labeling accessories
  - Labeling strips
  - Reference identification label
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. They can be used with all fail-safe SIMATIC S7 CPUs.

#### Technical specifications

Article number	<b>6ES7136-6PA00-0BC0</b> ET 200SP, POWERMOD. F-PM-E PPM, DC24V
<b>Product type designation</b>	
<b>General information</b>	
<b>Product function</b>	<ul style="list-style-type: none"> <li>• I&amp;M data</li> </ul> Yes; I&M0 to I&M3
<b>Engineering with</b>	<ul style="list-style-type: none"> <li>• STEP 7 TIA Portal can be configured/integrated as of version</li> <li>• STEP 7 can be configured/integrated as of version</li> <li>• PROFIBUS as of GSD version/GSD revision</li> <li>• PROFINET as of GSD version/GSD revision</li> </ul> V12 V5.5 SP3 / - V2.3 V2.31
<b>Supply voltage</b>	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Input voltage</b>	
• Type of input voltage	DC
<b>Output voltage</b>	
Type of output voltage	DC
<b>Encoder supply</b>	
Number of outputs	2
short-circuit protection	Yes; Electronic (response threshold 0.7 A to 2.1 A)
<b>Output current</b>	
• up to 60 °C, max.	0.3 A
<b>24 V encoder supply</b>	
• 24 V	Yes; min. L+ (-1.5 V)
• short-circuit protection	Yes
• Output current, max.	600 mA
<b>Digital inputs</b>	
Number of digital inputs	2
m/p-reading	Yes; p-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+15 to +30V
<b>Input current</b>	
• for signal "1", typ.	3.7 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
- Parameterizable	Yes
<b>for counter/technological functions</b>	
- Parameterizable	No
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	500 m

**Technical specifications (continued)**

Article number	<b>6ES7136-6PA00-0BC0</b> ET 200SP, POWERMOD. F-PM-E PPM, DC24V
<b>Digital outputs</b>	
Number of digital outputs	1
Digital outputs, configurable	Yes
short-circuit protection	Yes
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	max. 1.5 V
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	8 A
• on lamp load, max.	100 W
<b>Load resistance range</b>	
• lower limit	3 Ω
• upper limit	2 000 Ω
<b>Output voltage</b>	
• for signal "1", min.	24 V; L+ (-0.5 V)
<b>Output current</b>	
• for signal "1" rated value	8 A
• for signal "0" residual current, max.	1.5 mA; PP-switching: max. 1.5 mA; PM-switching: max. 1 mA
<b>Switching frequency</b>	
• with resistive load, max.	10 Hz; Symmetrical
• with inductive load, max.	0.1 Hz; according to IEC 947-5-1, DC-13, symmetrical
• on lamp load, max.	4 Hz; Symmetrical
<b>Aggregate current of the outputs</b>	
• Current per channel, max.	8 A; Note derating data in the manual
• Current per module, max.	8 A; Note derating data in the manual
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	500 m

Article number	<b>6ES7136-6PA00-0BC0</b> ET 200SP, POWERMOD. F-PM-E PPM, DC24V
<b>Interrupts/diagnostics/ status information</b>	
Substitute values connectable	No
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Hardware interrupt	No
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED
<b>Galvanic isolation</b>	
<b>Electrical isolation channels</b>	
• between the channels and the backplane bus	Yes
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Standards, approvals, certificates</b>	
Suitable for safety functions	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to EN ISO 13849-1:2008	PLe
• SIL according to IEC 61508	SIL 3
• Low demand mode: PFDavg	< 2.00E-05 1/h
• High demand/continuous mode: PFH	< 1.00E-09 1/h
<b>Dimensions</b>	
Width	20 mm
Height	72 mm
Depth	55 mm
<b>Weights</b>	
Weight, approx.	70 g

**Ordering data**

**F-PM-E 24 V DC/8 A PPM  
Standard digital F power module**  
BU type C0, color code CC52.  
2 inputs, 1 output, SIL 3/Cat. 4/PL e

**Article No.****6ES7136-6PA00-0BC0****Type C0 BaseUnits****BU20-P6+A2+4D**

BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and an additional 2 AUX terminals; new load group

**6ES7193-6BP20-0DC0****Article No.****Accessories**

**Reference identification label**  
10 sheets of 16 labels

**6ES7193-6LF30-0AW0****Labeling strips**

1000 labeling strips DIN A4, yellow, card, for inscription with laser printer

**6ES7193-6LA10-0AG0****BU cover**

For covering empty slots (gaps); 5 units  
• 20 mm wide

**6ES7133-6CV20-1AM0****Shield connection**

5 shield supports and 5 shield terminals

**6ES7193-6SC00-1AM0****Color-coding plates**

• Color code CC52, module-specific, for 8 push-in terminals; 10 units

**6ES7193-6CP52-2MC0****E-coding element type F**

5 units, spare part

**6ES7193-6EF00-1AA0**

## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - Fail-safe I/O modules - Communication

### F-CM AS-i Safety ST for ET 200SP

#### Overview



F-CM AS-i Safety ST for SIMATIC ET 200SP

The FCM AS-i Safety ST fail-safe communication module supplements an AS-Interface network without additional wiring to produce a safety-related AS-i network.

Important features:

- Fail-safe communication module for the ET 200SP
  - 31 fail-safe input channels in the process image
  - 16 fail-safe output channels in the process image
  - Certified up to SIL 3 (IEC 62061/IEC 61508), PL e (EN ISO 13849-1)
  - Parameterization conforms with other fail-safe I/O modules of the ET 200SP
- The communication module supports PROFIsafe in PROFINET and PROFIBUS configurations. Can be used with fail-safe SIMATIC S7-300F/S7-416F CPUs and S7-1500F CPUs (TIA Portal V13 SP1 and higher with HSP 0070 V2.0).
- For reading up to 31 fail-safe AS-i input slaves
  - 2 sensor inputs/signals for each fail-safe AS-i input slave
  - Adjustable evaluation of sensor signals: 2-channel or 2 x 1-channel
  - Integrated discrepancy evaluation in the case of 2-channel signals
  - Integrated AND operation in the case of 2 x 1-channel signals
  - Input delay can be parameterized
  - Start-up test can be set
  - Sequence monitoring can be activated
- For control of up to 16 fail-safe AS-i output circuit groups
  - The output circuit groups are controlled independently of one another.
  - One output circuit group can act on one or more actuators (e.g. to switch drives simultaneously).
  - An actuator (e.g. a contactor) is interfaced via a fail-safe AS-i output module (e.g. safe SlimLine module S45F, Article No. 3RK1405-1SE15-0AA2; see [Catalog IC 10, Chapter 2 "Industrial communication"](#) → "ASIsafe" → "Fail-safe AS-Interface modules").
  - Simple fault acknowledgment via the process image
- Simple module replacement thanks to automatic importing of the safety parameters from the coding element

- Comprehensive diagnostic options
- Can be plugged onto type C1 or type C0 BaseUnits (BU)
- Supply via AS-Interface voltage
- 8 LED indicators for diagnostics, operating state, fault indication and supply voltage
- Informative front-side module inscription
  - Plain-text marking of the module type and function class
  - 2D matrix code (article number and serial number)
  - Connection diagram
  - Color coding of the CM module type: light gray
  - Hardware and firmware version
  - Complete article number
- Optional labeling accessories
  - Labeling strips
  - Reference identification label

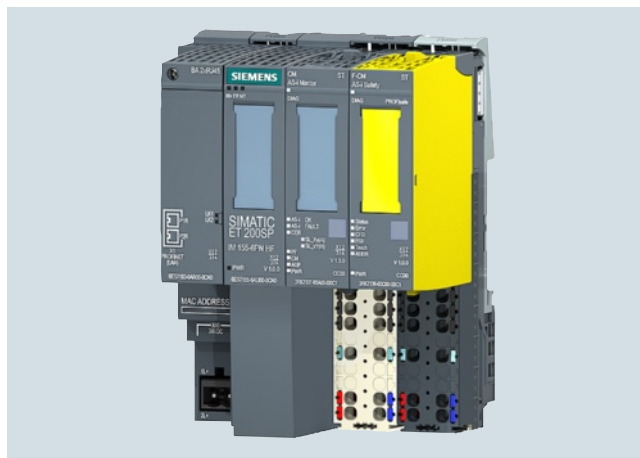
#### Design

The fail-safe F-CM AS-i Safety ST master has an ET 200SP module enclosure with a width of 20 mm.

One AS-i master according to the AS-i Specification V3.0 and fail-safe AS-i input slaves and/or fail-safe AS-i output modules are needed for operation. The CM AS-i Master ST communication module (Article No. 3RK7137-6SA00-0BC1; see [page 9/73](#)) is recommended as the AS-i master for the ET 200SP.

#### SIMATIC AS-i F-Link

The simple combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules in one ET 200SP station results in a powerful PROFIBUS or PROFINET/AS-i F-Link that can be expanded further on a modular basis.



SIMATIC AS-i F-Link: combination of an ET 200SP interface module, CM AS-i Master ST and F-CM AS-i Safety ST

With the digital and analog I/O modules of the ET 200SP, local inputs and outputs can be realized in the SIMATIC AS-i F-Link so as to ensure that the F-Link complies precisely with customer requirements. Expansion variants for almost every application are possible thanks to the selection of standard and fail-safe I/O modules.

Besides the single AS-i master, double, triple or generally multiple masters can be realized with or without fail-safe functionality.



**Overview** (continued)Supported BaseUnits

With the recommended combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules, the CM module is plugged onto a light type C0 BaseUnit and, directly on the right of it, the F-CM module is plugged onto a dark type C1 BaseUnit. The AS-i cable is connected only on the light BaseUnit of the CM module.

If the F-CM AS-i Safety ST module is not combined with the CM AS-i Master ST module, but another AS-i master is used instead, then the F-CM module is plugged onto a light type C0 BaseUnit. In this case, the AS-i cable is connected on the light BaseUnit of the F-CM module.

Safety note

The use of this product requires suitable protective measures (including network segmentation for IT security) in order to ensure safe plant operation; see <http://www.siemens.com/industrialsecurity>.

**Configuration**

The following software is required for configuration of the F-CM AS-i Safety ST module:

- STEP 7 (classic), V5.5 SP3 HF4 or higher with HSP 2093<sup>1)</sup> and Distributed Safety V5.4 SP5 or F-Configuration Pack SP11

or

- STEP 7 (TIA Portal) V13 or higher with HSP 0070<sup>2)</sup> and Safety Advanced V13.

For connection to S7-1500F you require STEP 7 V13 SP1.

When configuring with STEP 7 V13 SP1, the new version of the HSP 0070 V2.0 (or higher) is required.

Configuration and programming are done entirely in the STEP 7 user interface. No additional configuration software is needed for commissioning.

Data management – together with all other configuration data of the SIMATIC – is realized completely in the S7 project.

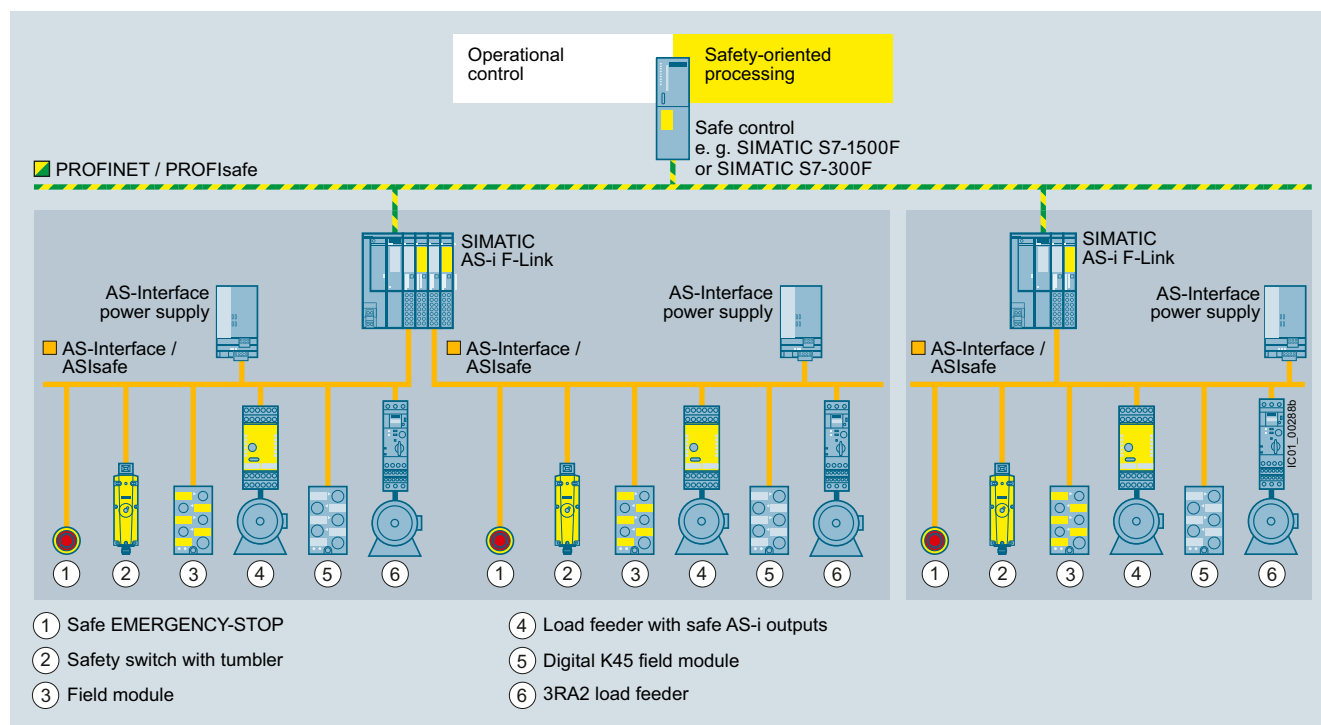
The input and output channels are assigned to the process image automatically and manual linking via configuration function blocks is not necessary.

If the F-CM AS-i Safety ST module is replaced, all necessary settings are automatically imported into the new module.

The F-CM AS-i Safety ST module occupies 16 input bytes and 8 output bytes in the I/O data of the ET 200SP station.

<sup>1)</sup> HSP 2093 see <https://support.industry.siemens.com/cs/ww/en/view/23183356>.

<sup>2)</sup> HSP 0070 see <https://support.industry.siemens.com/cs/ww/en/view/72341852>.



AS-Interface configuration with SIMATIC AS-i F-Link, consisting of an ET 200SP station with CM AS-i Master ST and F-CM AS-i Safety ST modules



## I/O systems

ET 200 systems for the control cabinet  
ET 200SP - Fail-safe I/O modules - Communication

### F-CM AS-i Safety ST for ET 200SP

Ordering data	Article No.		Article No.
<p><b>F-CM AS-i Safety ST communication modules</b></p> <ul style="list-style-type: none"> <li>• Fail-safe module for SIMATIC ET 200SP, can be plugged onto BaseUnit type C1 (alternatively type C0)</li> <li>• Operation requires an AS-i master, e.g. CM AS-i Master ST (see page 9/74).</li> <li>• Can be used up to SIL 3 (IEC 62061/IEC 61508), PL e (EN ISO 13849-1)</li> <li>• Coding element type F (included in scope of supply)</li> <li>• Dimensions (W x H x D / mm): 20 x 73 x 58</li> </ul>	<p><b>3RK7136-6SC00-0BC1</b></p>	<p><b>Accessories</b></p> <p><b>BaseUnit BU20-P6+A2+4B</b></p> <ul style="list-style-type: none"> <li>• BaseUnit (dark), BU type C1</li> <li>• Suitable for the F-CM AS-i Safety ST fail-safe module</li> <li>• Continuation of an AS-i network, connection with the AS-i voltage of the left-hand module</li> </ul> <p><b>Coding element type F (spare part)</b></p> <ul style="list-style-type: none"> <li>• For ET 200SP modules F-CM AS-i Safety ST, F-DI, F-DQ, F-PM-E</li> <li>• Packing unit 5 items</li> </ul> <p><b>More accessories</b></p>	<p><b>6ES7193-6BP20-0BC1</b></p> <p><b>6ES7193-6EF00-1AA0</b></p> <p>See page 9/74</p>

## Overview



With the BaseUnits, the ET 200SP offers a rugged and service-friendly design with permanent wiring:

- No tools needed for one-handed wiring using push-in terminals
- Outstanding access due to arrangement of measuring tap, spring NC contacts and cable entry in columns, while at the same time reducing the space required by 64%
- Fault-proof color coding of the spring NC contacts for better orientation in the terminal panel
- Replacement of I/O modules during operation without affecting the wiring
- Operation with module gaps (missing I/O module)
- Automatic coding of the I/O modules prevents destruction of the electronics if a module is accidentally inserted in the wrong slot during replacement
- High immunity to electromagnetic interference due to
  - self-assembling shielded backplane bus,
  - multi-layer conductor plate with shield levels for interference-free signal transmission from the terminal to the I/O module,
  - system-integrated, space-saving shield connection for quick installation.
- Self-assembling potential groups without external wiring or jumpers
- Replaceable terminal box
- Side-by-side latching of the BUs for high mechanical load capacity
- Optional module-specific color identification of the terminals according to the color code CC
- Actuation of the spring NC contacts with a standard screwdriver, with a blade width up to 3.5 mm

## Technical specifications

Article number	<b>6ES7193-6BP00-0BA0</b>	<b>6ES7193-6BP00-0BA1</b>	<b>6ES7193-6BP00-0BD0</b>	<b>6ES7193-6BP00-0DA0</b>	<b>6ES7193-6BP00-0DA1</b>
	BASEUNIT TYPE A0, BU15-P16+A0+2B	BASEUNIT TYPE A1, BU15-P16+A0+2B/T	BASEUNIT TYPE D0, BU20-P12+A0+0B	BASEUNIT TYPE A0, BU15-P16+A0+2D	BASEUNIT TYPE A1, BU15-P16+A0+2D/T
<b>Product type designation</b>					
<b>Dimensions</b>					
Width	15 mm	15 mm	20 mm	15 mm	15 mm
Height	117 mm	117 mm	117 mm	117 mm	117 mm
<b>Weights</b>					
Weight, approx.	40 g	40 g	47 g	40 g	40 g
Article number	<b>6ES7193-6BP40-0BA1</b>		<b>6ES7193-6BP40-0DA1</b>		
	BASEUNIT TYPE A1, BU15-P16+A0+12B/T		BASEUNIT TYPE A1, BU15-P16+A0+12D/T		
<b>Product type designation</b>					
<b>Dimensions</b>					
Width	15 mm		15 mm		
Height	141 mm		141 mm		
<b>Weights</b>					
Weight, approx.	50 g		50 g		
Article number	<b>6ES7193-6BP20-0BA0</b>	<b>6ES7193-6BP20-0BB0</b>	<b>6ES7193-6BP20-0DA0</b>	<b>6ES7193-6BP20-0DC0</b>	
	BASEUNIT TYPE A0, BU15-P16+A10+2B	BASEUNIT TYP B0, BU20-P12+A4+0B	BASEUNIT TYPE A0, BU15-P16+A10+2D	BASEUNIT TYP C0, BU20-P6+A2+4D	
<b>Product type designation</b>					
<b>Dimensions</b>					
Width	15 mm	20 mm	15 mm	20 mm	
Height	141 mm	117 mm	141 mm	117 mm	
<b>Weights</b>					
Weight, approx.	50 g	48 g	50 g	47 g	

**I/O systems**

ET 200 systems for the control cabinet  
ET 200SP

**BaseUnits****Ordering data****Article No.****Type A0 BaseUnits****BU15-P16+A10+2D**

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

- 1 unit
- 10 units

**6ES7193-6BP20-0DA0**  
**6ES7193-6BP20-2DA0**

**BU15-P16+A0+2D**

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

- 1 unit
- 10 units

**6ES7193-6BP00-0DA0**  
**6ES7193-6BP00-2DA0**

**BU15-P16+A10+2B**

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

- 1 unit
- 10 units

**6ES7193-6BP20-0BA0**  
**6ES7193-6BP20-2BA0**

**BU15-P16+A0+2B**

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- 1 unit
- 10 units

**6ES7193-6BP00-0BA0**  
**6ES7193-6BP00-2BA0**

**Type B0 BaseUnits****BU20-P12+A4+0B**

BU type B0; BaseUnit (dark) with 12 process terminals (1...12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group

**6ES7193-6BP20-0BB0**

**Type B1 BaseUnits****BU20-P12+A0+4B**

BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the load group; 1 unit

**6ES7193-6BP20-0BB1**

**Article No.****Type C0 BaseUnits****BU20-P6+A2+4D**

BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and an additional 2 AUX terminals; new load group

**6ES7193-6BP20-0DC0**

**Type D0 BaseUnits****BU20-P12+A0+0B**

BU type D0; BaseUnit (dark) with 12 push-in terminals, without AUX terminals, bridged to the left

**6ES7193-6BP00-0BD0**

**Type A1 BaseUnits (with temperature detection)****BU15-P16+A0+12D/T**

BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and additionally 2x5 internally jumpered add-on terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)

**6ES7193-6BP40-0DA1**

**BU15-P16+A0+2D/T**

BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

**6ES7193-6BP00-0DA1**

**BU15-P16+A0+12B/T**

BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered add-on terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group

**6ES7193-6BP40-0BA1**

**BU15-P16+A0+2B/T**

BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

**6ES7193-6BP00-0BA1**

**Type F0 BaseUnits****BU20-P8+A4+0B**

BU type F0; BaseUnit (dark) with 8 process terminals to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group

**6ES7193-6BP20-0BF0**

Ordering data	Article No.	Article No.
<b>Accessories</b>		
<b>Reference identification label</b> 10 sheets of 16 labels	<b>6ES7193-6LF30-0AW0</b>	<b>6ES7193-6CP01-2MA0</b>
<b>BU cover</b> for covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide	<b>6ES7133-6CV15-1AM0</b> <b>6ES7133-6CV20-1AM0</b>	<b>6ES7193-6CP02-2MA0</b> <b>6ES7193-6CP03-2MA0</b> <b>6ES7193-6CP04-2MA0</b>
<b>Shield connection</b> 5 shield supports and 5 shield terminals	<b>6ES7193-6SC00-1AM0</b>	<b>6ES7193-6CP71-2AA0</b> <b>6ES7193-6CP72-2AA0</b> <b>6ES7193-6CP73-2AA0</b> <b>6ES7193-6CP74-2AA0</b> <b>6ES7193-6CP81-2AB0</b> <b>6ES7193-6CP82-2AB0</b> <b>6ES7193-6CP83-2AB0</b> <b>6ES7193-6CP41-2MB0</b> <b>6ES7193-6CP84-2AC0</b> <b>6ES7193-6CP85-2AC0</b> <b>6ES7193-6CP86-2AC0</b>
		<b>Color-coded labels</b> <ul style="list-style-type: none"> <li>• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units</li> <li>• Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units</li> <li>• Color code CC03, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units</li> <li>• Color code CC04, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units</li> <li>• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units</li> <li>• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units</li> <li>• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units</li> <li>• Color code CC74, for 2x5 additional terminals, 5 x red, 5 x blue, for BU type A1, with push-in terminals; 10 units</li> <li>• Color code CC81, for 4 AUX terminals 1 A to 4 A, yellow/green, for BaseUnit type B0; 10 units</li> <li>• Color code CC82, for 4 AUX terminals 1 A to 4 A, red, for BaseUnit type B0; 10 units</li> <li>• Color code CC83, for 4 AUX terminals 1 A to 4 A, blue, for BaseUnit type B0; 10 units</li> <li>• Color code CC41, module-specific, for 12 push-in terminals; for BaseUnit type B1; 10 units</li> <li>• Color code CC84, for 2 AUX terminals 1 A to 2 A, yellow/green, for BaseUnit type C0; 10 units</li> <li>• Color code CC85, for 2 AUX terminals 1 A to 2 A, red, for BaseUnit type C0; 10 units</li> <li>• Color code CC86, for 2 AUX terminals 1 A to 2 A, blue, for BaseUnit type C0; 10 units</li> </ul>

## I/O systems

ET 200 systems for the control cabinet  
ET 200SP

### SIPLUS BaseUnits

#### Overview



With the BaseUnits, the ET 200SP offers a rugged and service-friendly design with permanent wiring:

- No tools needed for one-handed wiring using push-in terminals
- Outstanding access due to arrangement of measuring tap, spring NC contacts and cable entry in columns, while at the same time reducing the space required by 64%
- Fault-proof color coding of the spring NC contacts for better orientation in the terminal panel
- Replacement of I/O modules during operation without affecting the wiring
- Operation with module gaps (missing I/O module)
- Automatic coding of the I/O modules prevents destruction of the electronics if a module is accidentally inserted in the wrong slot during replacement
- High immunity to electromagnetic interference due to
  - self-assembling shielded backplane bus,
  - multi-layer conductor plate with shield levels for interference-free signal transmission from the terminal to the I/O module,
  - system-integrated, space-saving shield connection for quick installation.
- Self-assembling potential groups without external wiring or jumpers
- Replaceable terminal box
- Side-by-side latching of the BUs for high mechanical load capacity
- Optional module-specific color identification of the terminals according to the color code CC
- Actuation of the spring NC contacts with a standard screwdriver, with a blade width up to 3.5 mm

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

#### Technical specifications

Article number	6AG1193-6BP00-7BA0	6AG1193-6BP00-7DA0	6AG1193-6BP20-7BA0	6AG1193-6BP20-7DA0
Based on	6ES7193-6BP00-0BA0 SIPLUS ET200SP BU15-P16+A0+2B	6ES7193-6BP00-70A0 SIPLUS ET200SP BU15-P16+A0+2D	6ES7193-6BP20-0BA0 SIPLUS ET200SP BU15-P16+A10+2B	6ES7193-6BP20-0DA0 SIPLUS ET200SP BU15-P16+A10+2D
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

#### Technical specifications (continued)

Article number	<b>6AG1193-6BP00-7BA0</b>	<b>6AG1193-6BP00-7DA0</b>	<b>6AG1193-6BP20-7BA0</b>	<b>6AG1193-6BP20-7DA0</b>
Based on	<b>6ES7193-6BP00-0BA0</b> SIPLUS ET200SP BU15-P16+A0+2B	<b>6ES7193-6BP00-70A0</b> SIPLUS ET200SP BU15-P16+A0+2D	<b>6ES7193-6BP20-0BA0</b> SIPLUS ET200SP BU15-P16+A10+2B	<b>6ES7193-6BP20-0DA0</b> SIPLUS ET200SP BU15-P16+A10+2D
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
Article number	<b>6AG1193-6BP00-7BA1</b>	<b>6AG1193-6BP00-7DA1</b>	<b>6AG1193-6BP40-7BA1</b>	<b>6AG1193-6BP40-7DA1</b>
Based on	<b>6ES7193-6BP00-0BA1</b> SIPLUS ET200SP BU15-P16+A0+2B/T	<b>6ES7193-6BP00-0DA1</b> SIPLUS ET200SP BU15-P16+A0+2D/T	<b>6ES7193-6BP40-0BA1</b> SIPLUS ET200SP BU15-P16+A0+12B/T	<b>6ES7193-6BP40-0DA1</b> SIPLUS ET200SP BU15-P16+A0+12D/T
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**I/O systems**

ET 200 systems for the control cabinet

ET 200SP

**SIPLUS BaseUnits**

<b>Ordering data</b>	<b>Article No.</b>	<b>Ordering data</b>	<b>Article No.</b>
<b>SIPLUS BaseUnits type A0</b>		<b>SIPLUS BaseUnits type A1 (with temperature detection)</b>	
<b>BU15-P16+A0+2D</b> (Extended temperature range and medial exposure) BU type A0; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A)	<b>6AG1193-6BP00-7DA0</b>	<b>BU15-P16+A0+2D/T</b> (Extended temperature range and medial exposure) BU type A1; BaseUnit (light) with 16 process terminals to the module, for starting a new load group (max. 10 A)	<b>6AG1193-6BP00-7DA1</b>
<b>BU15-P16+A0+2B</b> (Extended temperature range and medial exposure) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	<b>6AG1193-6BP00-7BA0</b>	<b>BU15-P16+A0+2B/T</b> (Extended temperature range and medial exposure) BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	<b>6AG1193-6BP00-7BA1</b>
<b>BU15-P16+A10+2D</b> (Extended temperature range and medial exposure) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1A to 10A); for starting a new load group (max. 10 A)	<b>6AG1193-6BP20-7DA0</b>	<b>BU15-P16+A0+12D/T</b> (Extended temperature range and medial exposure) BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered AUX terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	<b>6AG1193-6BP40-7DA1</b>
<b>BU15-P16+A10+2B</b> (Extended temperature range and medial exposure) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1A to 10A); for continuing the load group	<b>6AG1193-6BP20-7BA0</b>	<b>BU15-P16+A0+12B/T</b> (Extended temperature range and medial exposure) BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally jumpered AUX terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	<b>6AG1193-6BP40-7BA1</b>
		<b>Accessories</b>	See SIMATIC ET 200SP BaseUnits, page 9/101

### Overview



BusAdapter BA 2xRJ45



BusAdapter BA 2xFC

Some interface modules of the SIMATIC ET 200SP have a universal PROFINET interface for BusAdapters. With the appropriate bus adapter, the type of connection can be adapted to the requirements of the respective application:

- For standard applications with a moderate mechanical and EMC load, the BusAdapter BA 2xRJ45 is used. It offers two sockets for standard RJ45 plugs.
- For machines and systems in which higher mechanical and/or EMC loads act on the devices, the BusAdapter BA 2xFC is recommended. In this case, the bus cables are connected directly by means of FastConnect terminals – similar to the PROFIBUS connector, proven in millions of applications. The technology is extremely quick to assemble and achieves 5 times better vibration resistance and also 5 times greater resistance to electromagnetic interference, when compared to RJ45 plug-in connectors.
- BusAdapters with connections for fiber-optic cables can be used to cover high potential differences between two stations and/or high EMC loads.

Another advantage of the BusAdapters: In order to repair defective RJ45 sockets or for subsequent conversion to the rugged FastConnect technology or a fiber-optic connection, only the adapter needs to be replaced.

The following interface modules offer a PROFINET connection via BusAdapter:

- IM 155-6PN Standard
- IM 155-6PN High Feature

### Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>BusAdapter BA 2xRJ45</b> For IM 155-6PN ST, HF	<b>6ES7193-6AR00-0AA0</b>	<b>BusAdapter BA SCRJ/RJ45</b> For IM 155-6PN HF; with media converter FOC-copper; 1 x SCRJ FO connection, 1 x RJ45 connection	<b>6ES7193-6AP20-0AA0</b>
<b>BusAdapter BA 2xFC</b> For IM 155-6PN ST, HF; for increased vibration and EMC loads	<b>6ES7193-6AF00-0AA0</b>	<b>BusAdapter BA SCRJ/FC</b> For IM 155-6PN HF; with media converter FOC-copper; 1 x SCRJ FO connection, 1 x FastConnect connection	<b>6ES7193-6AP40-0AA0</b>
<b>BusAdapter BA 2xSCRJ</b> For IM 155-6PN HF, fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of damping	<b>6ES7193-6AP00-0AA0</b>	<b>Reference identification label</b> 10 sheets of 16 labels; for printing with thermal-transfer card printer or plotting unit	<b>6ES7193-6LF30-0AW0</b>



## I/O systems

ET 200 systems for the control cabinet  
ET 200SP

### Accessories

#### Overview

##### Labeling strips

- Labeling strips for ET 200SP
- Can be used for the interface module, bus adapter, I/O module and BU cover

##### Reference identification labels



- For the labeling of ET 200SP components with a reference code (equipment identifier)
- Can be used for the interface module, I/O module, bus adapter and BU cover

##### BU covers

- Protective cover for empty slots of an ET 200SP
- For protecting the plug-in connectors of a BaseUnit without I/O module

##### Color-coded labels

- For module-specific identification of the potentials at the terminals of the BaseUnit
- For the prevention of wiring faults

##### Shield connection

- Simple, quick-mounting shield connection
- For space-saving and optimized connection of cable shields from EMC viewpoint

#### Ordering data

##### Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

**6ES7193-6LR10-0AA0**

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

**6ES7193-6LR10-0AG0**

1000 labeling strips DIN A4, light gray, card, for inscription with laser printer

**6ES7193-6LA10-0AA0**

1000 labeling strips DIN A4, yellow, card, for inscription with laser printer

**6ES7193-6LA10-0AG0**

##### Reference identification label

10 sheets of 16 labels

**6ES7193-6LF30-0AW0**

#### Ordering data

#### Article No.

##### BU cover

For covering empty slots (gaps); 5 units

- 15 mm wide
- 20 mm wide

**6ES7133-6CV15-1AM0**

**6ES7133-6CV20-1AM0**

##### Color-coded labels

- Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units

**6ES7193-6CP01-2MA0**

- Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units

**6ES7193-6CP02-2MA0**

- Color code CC03, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units

**6ES7193-6CP03-2MA0**

- Color code CC04, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units

**6ES7193-6CP04-2MA0**

- Color code CC05, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units

**6ES7193-6CP05-2MA0**

- Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units

**6ES7193-6CP71-2AA0**

- Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units

**6ES7193-6CP72-2AA0**

- Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units

**6ES7193-6CP73-2AA0**

- Color code CC74, for 2x5 additional terminals, 5 x red, 5 x blue, for BU type A1, with push-in terminals; 10 units

**6ES7193-6CP74-2AA0**

- Color code CC81, for 4 AUX terminals 1 A to 4 A, yellow/green, for BaseUnit type B0; 10 units

**6ES7193-6CP81-2AB0**

- Color code CC82, for 4 AUX terminals 1 A to 4 A, red, for BaseUnit type B0; 10 units

**6ES7193-6CP82-2AB0**

- Color code CC83, for 4 AUX terminals 1 A to 4 A, blue, for BaseUnit type B0; 10 units

**6ES7193-6CP83-2AB0**

- Color code CC41, module-specific, for 12 push-in terminals; for BaseUnit type B1; 10 units

**6ES7193-6CP41-2MB0**

- Color code CC84, for 2 AUX terminals 1 A to 2 A, yellow/green, for BaseUnit type C0; 10 units

**6ES7193-6CP84-2AC0**

- Color code CC85, for 2 AUX terminals 1 A to 2 A, red, for BaseUnit type C0; 10 units

**6ES7193-6CP85-2AC0**

- Color code CC86, for 2 AUX terminals 1 A to 2 A, blue, for BaseUnit type C0; 10 units

**6ES7193-6CP86-2AC0**

- Color code CC42, module-specific; for BaseUnit type F0; 10 units

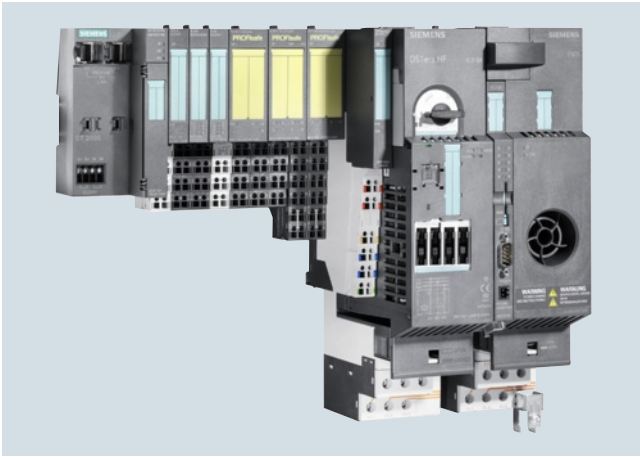
**6ES7193-6CP42-2MB0**

##### Shield connection

5 shield connections and 5 shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional ground

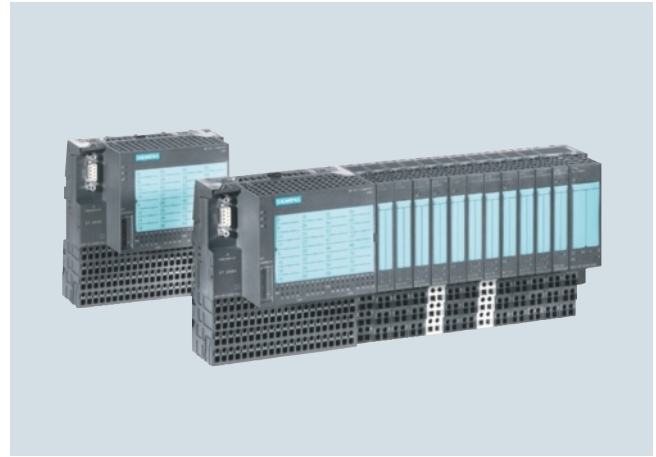
**6ES7193-6SC00-1AM0**

## Overview



### **SIMATIC ET 200S**

- Distributed I/O system to degree of protection IP20 with minimal wiring outlay, also for extremely time-critical tasks such as high-speed closed-loop controls
- Can be used with integrated S7-CPU as mini PLC:
  - also available as fail-safe PROFIsafe version
  - with optional lower-level PROFIBUS DP
- Bit-modular design for exact adaptation to the automation task in hand.
- Interface modules available with PROFIBUS DP or PROFINET interfaces
- Can be combined from digital and analog in/output modules, technology modules, motor starters and frequency converters for the control of drives up to 7.5 or 4 kW.
- Exchange of modules during operation (hot swapping), permanent wiring with multi-conductor connection
- Channel-specific diagnostics for high availability
- Can be supplied with integrated fiber optic interface if required
- Transmission rates up to 12 Mbit/s
- FastConnect using unstripped quick connection technology, screw or spring-loaded terminals
- Ex approval to Cat. 3 for Zone 2 acc. to ATEX 100 a
- Slot reservation with spare modules
- Fail-safe DI modules with safety-related signal processing according to PROFIsafe
- Option handling – for simplest management of machine options



### **SIMATIC ET 200S COMPACT**

- Block I/O to degree of protection IP20 with 32 channels, comprising terminal block and electronic block
- Discretely modular expansion to maximum of 128 channels or 12 modules
- The complete ET 200S module spectrum can be used (with the exception of PROFIsafe modules)
- Separation of terminal connections and electronics with permanent wiring
- Screw-type and spring-loaded terminal connections
- Standard terminal block with 2-wire connection system; 3-wire and 4-wire systems available using additional terminals
- Mounting on standard rail
- Hot swapping of expansion modules
- Communication via PROFIBUS
- Up to 100 byte inputs and outputs (address space)

## I/O systems

ET 200 systems for the control cabinet  
ET 200S

### Introduction

#### Technical specifications

General technical specifications	
Degree of protection	IP20
Ambient temperature	0 ... 60 °C
Vibration resistance	2 g continuously, 5 g temporarily (motor starter max. 2 g)
Maximum configuration (none of the limits listed below must be exceeded)	
• Number of modules per IM 151, max.	IM 151-1 BASIC: Up to 12 modules IM 151-1 COMPACT: Up to 12 modules IM 151-1 STANDARD: Up to 63 modules IM 151-1 HIGH-FEATURE: Up to 63 modules IM 151-7 CPU: Up to 63 modules IM 151-3 PN: Up to 63 modules
• Line width, max.	IM 151-1 BASIC: Up to 2 m IM 151-1 COMPACT: Up to 2 m IM 151-1 STANDARD: Up to 2 m IM 151-1 HIGH-FEATURE: Up to 2 m IM 151-7 CPU: Up to 1 m IM 151-3 PN: Up to 2 m
• User data length	Depending on the number and type of connected modules IM 151-1 BASIC: Up to 88 byte for inputs and outputs IM 151-1 COMPACT: Up to 100 byte for inputs and outputs IM 151-1 STANDARD: Up to 244 byte for inputs and outputs IM 151-1 HIGH-FEATURE: Up to 244 byte for inputs and outputs IM 151-7 CPU: Not relevant IM 151-3 PN: 256 byte
• Parameter length	Depending on the number and type of connected modules IM 151-1 BASIC: 198 byte IM 151-1 COMPACT: 218 byte IM 151-1 STANDARD: Up to 244 byte IM 151-1 HIGH-FEATURE: Up to 244 byte IM 151-7 CPU: Not relevant IM 151-3 PN: Not relevant
Requirements of the DP master system	
• PROFIBUS DP master	In accordance with EN 50170
• Parameter length	>32 byte, depending on the number and type of connected modules
• User data length	Depending on the number and type of connected modules
• Diagnostics length	17 ... 64 byte (adjustable)

General technical specifications	
<b>Standards and approvals</b>	
• PROFIBUS	EN 50170, Volume 2
• IEC 1131	IEC 1131, Part 2
• UL	acc. to UL508 standard, File No. E 116536/E 75310 (AC modules)
• C-Tick	AS/NZS 2064 (Class A)
• CSA	acc. to standard C22.2 No. 142, File No. LR 48323/LR 44226 (AC modules)
• cULus for hazardous locations	acc. to UL 508 standard, File No. E 116536 acc. to hazardous locations UL 1604, File no. E 222109 acc. to CSA C22.2 standard, No. 142
• FM	Standard Class No. 3611, Class I, Division 2, Group A, B, C, D, Class I, Zone 2, Group IIC (without motor starter and frequency converter)
• Shipbuilding	American Bureau of Shipping Bureau Veritas Det Norske Veritas Germanischer Lloyd Lloyds Register of Shipping Nippon Kaiji Kyokai (without motor starters and frequency converters)
• Ex approval Cat. 3 (for Zone 2 acc. to ATEX-100a)	EN 50021 (without frequency converters)

Within the context of converting SIMATIC from UL / CSA to cULus, the ET 200S modules will also be converted

## Overview



- Interface module for linking the ET 200S to PROFIBUS DP
- Handles all data exchange with the PROFIBUS DP master
- 6 variants:
  - IM151-1 BASIC (RS 485)
  - IM151-1 COMPACT 32DI 24VDC (RS 485)
  - IM151-1 COMPACT 16DI 24VDC / 16DO 24VDC/0.5A (RS 485)
  - IM151-1 STANDARD (RS 485)
  - IM151-1 STANDARD (FO)
  - IM151-1 HIGH FEATURE (RS 485)
- Delivery including connection module

The main differences between the IM151-1 variants:

	<b>IM151-1 BASIC</b>	<b>IM151-1 COMPACT</b>	<b>IM151-1 STANDARD</b>	<b>IM151-1 FO STANDARD</b>	<b>IM151-1 HIGH FEATURE</b>
Article number 6ES7151-	1CA00-0AB0	1CA00-1BL00 1CA00-3BL00	1AA05-0AB0	1AB05-0AB0	1BA02-0AB0
Integral I/O	-	32 DI 16DI / 16 DO	-	-	-
Maximum number of I/O modules	12	12	63	63	63
Maximum station width	2 m	2 m	2 m	1 m	2 m
Maximum number of parameters	198 bytes	218 bytes	244 bytes	244 bytes	244 bytes
Maximum address space for inputs and outputs	88 bytes each	100 bytes each	244 bytes	128 bytes	Depending on the DP master: 244 bytes or not relevant
Maximum diagnostics length	6 to 43 bytes	6 to 44 bytes	6 to 122 bytes	6 to 64 bytes	6 to 128 bytes
Protocol	DP V0	DP V0	DP V0 and DP V1	DP V0	DP V0 and DP V1
DP connection type	RS 485	RS 485	RS 485	Fiber-optic cable	RS 485
Firmware update	No	No	Yes	No	Yes
Option handling	No	No	Yes	Yes	Yes
Isochronous mode	No	No	No	No	Yes
Maximum address volume per module	8 bytes	8 bytes	32 bytes	8 bytes	32 bytes
Identification data	No	No	Yes	No	Yes
Use of fail-safe modules (PROFIsafe)	No	No	No	No	Yes
I-slave-to-slave communication	No	No	No	No	Yes

**I/O systems**

ET 200 systems for the control cabinet

ET 200S - Interface modules

**IM 151-1****Technical specifications**

Article number	<b>6ES7151-1CA00-1BL0</b> ET 200S COMPACT, 32DI STD, DC24V, 3MS	<b>6ES7151-1CA00-3BL0</b> ET 200S COMPACT, 16DI/16DO STD, DC24V
<b>Product type designation</b>		
<b>General information</b>		
Vendor identification (VendorID)		8200H
<b>Supply voltage</b>		
<b>Load voltage 1L+</b>		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes
<b>Input current</b>		
from supply voltage 1L+, max.	100 mA; 100	100 mA
<b>Address area</b>		
<b>Addressing volume</b>		
• Inputs	100 byte	100 byte
• Outputs	100 byte	100 byte
<b>Digital inputs</b>		
Number of digital inputs	32	16
<b>Input voltage</b>		
• Type of input voltage	DC	DC
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5V	-30 to +5V
• for signal "1"	13 to 30V	13 to 30V
<b>Input current</b>		
• for signal "1", typ.	4 mA; At 24 V min. 2 mA	3 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>		
- at "0" to "1", min.	3 ms	3 ms
- at "0" to "1", max.	3 ms	3 ms
<b>Cable length</b>		
• Unshielded, max.	1 000 m	1 000 m
<b>Digital outputs</b>		
Number of digital outputs	0	16
short-circuit protection		Yes
Limitation of inductive shutdown voltage to		L+ (-55 to -60 V)
Controlling a digital input		Yes
<b>Switching capacity of the outputs</b>		
• on lamp load, max.		5 W
<b>Output current</b>		
• for signal "1" permissible range for 0 to 60 °C, min.		7 mA
• for signal "0" residual current, max.		0.5 mA
<b>Output delay with resistive load</b>		
• "0" to "1", max.		0.5 ms
• "1" to "0", max.		1.3 ms
<b>Switching frequency</b>		
• with resistive load, max.		100 Hz
• with inductive load, max.		2 Hz
• on lamp load, max.		10 Hz
<b>Aggregate current of outputs (per group)</b>		
<b>all mounting positions</b>		
- up to 60 °C, max.		2 A
<b>Cable length</b>		
• Unshielded, max.		1 000 m

#### Technical specifications (continued)

Article number	<b>6ES7151-1CA00-1BL0</b> ET 200S COMPACT, 32DI STD, DC24V, 3MS	<b>6ES7151-1CA00-3BL0</b> ET 200S COMPACT, 16DI/16DO STD, DC24V
<b>Encoder</b>		
<b>Connectable encoders</b>		
<ul style="list-style-type: none"> <li>2-wire sensor</li> <li>- Permissible quiescent current (2-wire sensor), max.</li> </ul>		Yes 1.5 mA
<b>Interfaces</b>		
Interface physics, RS 485	Yes	Yes
Interface physics, FOC	No	No
<b>PROFINET IO</b>		
<ul style="list-style-type: none"> <li>Transmission rate, max.</li> </ul>		12 Mbit/s
<b>PROFIBUS DP</b>		
<ul style="list-style-type: none"> <li>Output current, max.</li> <li>Transmission procedure</li> <li>Direct data exchange (slave-to-slave communication)</li> </ul>	RS 485 Yes	80 mA RS 485 Yes
<b>Cable length</b>		
- Cable length, max.	1 200 m	1 200 m
<b>Protocols</b>		
PROFINET IO	No	No
PROFIBUS DP	Yes	Yes
<b>Protocols (Ethernet)</b>		
<ul style="list-style-type: none"> <li>TCP/IP</li> </ul>	No	No
<b>Isochronous mode</b>		
Isochronous operation (application synchronized up to terminal)	No	No
<b>Interrupts/diagnostics/status information</b>		
<b>Alarms</b>		
<ul style="list-style-type: none"> <li>Alarms</li> </ul>	No	No
<b>Diagnostic messages</b>		
<ul style="list-style-type: none"> <li>Diagnostic functions</li> </ul>	Yes	Yes
<b>Diagnostics indication LED</b>		
<ul style="list-style-type: none"> <li>Run mode RUN (green)</li> <li>Group error SF (red)</li> <li>Status indicator digital output (green)</li> <li>Status indicator digital input (green)</li> <li>Monitoring 24 V voltage supply ON (green)</li> <li>Connection to network LINK (green)</li> <li>Transmit/receive RX/TX (yellow)</li> </ul>	Yes Yes Yes Yes Yes No No	Yes Yes Yes Yes Yes No No
<b>Galvanic isolation</b>		
between backplane bus and electronics		No
between supply voltage and electronics		No
<b>Galvanic isolation digital inputs</b>		
<ul style="list-style-type: none"> <li>Galvanic isolation digital inputs</li> </ul>		No
<b>Galvanic isolation digital outputs</b>		
<ul style="list-style-type: none"> <li>Galvanic isolation digital outputs</li> </ul>		Yes
<b>Isolation</b>		
Isolation checked with	500 V DC	500 V DC
<b>Degree and class of protection</b>		
Degree of protection to EN 60529		
<ul style="list-style-type: none"> <li>IP20</li> </ul>	Yes	Yes
<b>Connection method</b>		
Inputs/outputs		Screw-type and spring-loaded terminals, permanent wiring; 3 and 4-wire connection

## I/O systems

ET 200 systems for the control cabinet

ET 200S - Interface modules

### IM 151-1

#### Technical specifications (continued)

Article number	<b>6ES7151-1CA00-1BL0</b> ET 200S COMPACT, 32DI STD, DC24V, 3MS	<b>6ES7151-1CA00-3BL0</b> ET 200S COMPACT, 16DI/16DO STD, DC24V		
<b>Dimensions</b>				
Width	120 mm	120 mm		
Height	81 mm	81 mm		
Depth	758 mm; 58	58 mm		
<b>Weights</b>				
Weight, approx.	230 g; EB only			
Article number	<b>6ES7151-1AA05-0AB0</b> ET200S, IM151-1 STD, 12MBIT/S	<b>6ES7151-1AB05-0AB0</b> ET200S, INTERFACE MODULE IM151-1 FO	<b>6ES7151-1BA02-0AB0</b> ET200S, INTERF.MOD. IM151-1 HF, 12MBIT/S	<b>6ES7151-1CA00-0AB0</b> ET200S, IM151-1 BASIC, 12MBIT/S
<b>Product type designation</b>				
<b>General information</b>				
Vendor identification (VendorID)	806Ah	806Bh		80F3h
<b>Supply voltage</b>				
<b>Mains buffering</b>				
• Mains/voltage failure stored energy time	20 ms	20 ms	20 ms	No
<b>Input current</b>				
from supply voltage 1L+, max.	200 mA	200 mA	200 mA	70 mA
<b>Output current</b>				
Current output to backplane bus (DC 5 V), max.		700 mA		
<b>Power losses</b>				
Power loss, typ.	3.3 W	3.3 W	3.3 W	1.5 W
<b>Address area</b>				
<b>Addressing volume</b>				
• Inputs	244 byte	244 byte	244 byte	88 byte
• Outputs	244 byte	244 byte	244 byte	88 byte
<b>Interfaces</b>				
Interface physics, RS 485	Yes; 9-pin sub D socket		Yes	Yes; 9-pin sub D socket
Interface physics, FOC		Yes; 4 x Simplex socket		
<b>PROFIBUS DP</b>				
• Output current, max.	80 mA			80 mA
• Transmission rate, max.	12 Mbit/s; 9,6 / 19,2 / 45,45 / 93,75 / 187,5 / 500 kbit/s; 1,5 / 3 / 6 / 12 Mbit/s	12 Mbit/s; 9,6 / 19,2 / 45,45 / 93,75 / 187,5 / 500 kbit/s; 1,5 / 12 Mbit/s	12 Mbit/s	12 Mbit/s; 9,6 / 19,2 / 45,45 / 93,75 / 187,5 / 500 kbit/s; 1,5 / 3 / 6 / 12 Mbit/s
• Transmission procedure	RS 485			
• SYNC capability	Yes	Yes	Yes	Yes
• FREEZE capability	Yes	Yes	Yes	Yes
• Direct data exchange (slave-to-slave communication)	Yes	Yes	Yes	Yes
<b>Cable length</b>				
- Cable length, max.	1 200 m	2 m		
<b>Protocols</b>				
PROFIBUS DP	Yes	Yes	Yes	Yes
<b>Isochronous mode</b>				
Isochronous operation (application synchronized up to terminal)	No	No	Yes	No
<b>Interrupts/diagnostics/status information</b>				
<b>Alarms</b>				
• Alarms	Yes	Yes	Yes	No
<b>Diagnostic messages</b>				
• Diagnostic functions	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>				
• Bus fault BF (red)	Yes	Yes	Yes	Yes
• Group error SF (red)	Yes	Yes	Yes	Yes
• Monitoring 24 V voltage supply ON (green)	Yes	Yes	Yes	Yes

**Technical specifications** (continued)

Article number	<b>6ES7151-1AA05-0AB0</b> ET200S, IM151-1 STD, 12MBIT/S	<b>6ES7151-1AB05-0AB0</b> ET200S, INTERFACE MODULE IM151-1 FO	<b>6ES7151-1BA02-0AB0</b> ET200S, INTERF.MOD. IM151-1 HF, 12MBIT/S	<b>6ES7151-1CA00-0AB0</b> ET200S, IM151-1 BASIC, 12MBIT/S
<b>Galvanic isolation</b>				
between backplane bus and electronics	No	No	No	No
between electronic block and PROFIBUS DP	Yes		Yes	Yes
between supply voltage and electronics	No	No	No	No
<b>Permissible potential difference</b>				
between different circuits	75V DC/60V AC	500 V DC	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>				
Isolation checked with	500 V DC	57V DC/60V AC	500 V DC	500 V DC
<b>Standards, approvals, certificates</b>				
CE mark	Yes		Yes	
UL approval	Yes		Yes	
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	0 °C		0 °C	
• max.	60 °C		60 °C	
<b>Dimensions</b>				
Width	45 mm	45 mm	45 mm	45 mm
Height	119.5 mm	119.5 mm	119.5 mm	119.5 mm
Depth	75 mm	75 mm	75 mm	75 mm
<b>Weights</b>				
Weight, approx.	150 g	150 g	150 g	150 g

**Ordering data**

	<b>Article No.</b>		<b>Article No.</b>
<b>IM 151-1 BASIC interface module</b> for ET 200S; transfer rates up to 12 Mbit/s; max. 12 power, electronic and motor start modules can be connected; bus connection via 9-pin sub D incl. termination module	<b>6ES7151-1CA00-0AB0</b>	<b>IM 151-1 STANDARD interface module</b> for ET 200S; transfer rates up to 12 Mbit/s; data volumes 244 bytes each for inputs and outputs, max. 63 power, electronic and motor start modules can be connected; bus connection via 9-pin sub D incl. termination module	<b>6ES7151-1AA05-0AB0</b>
<b>IM 151-1 COMPACT 32 DI 24 V DC interface module</b> for ET 200S; transfer rates up to 12 Mbit/s; max. 32 digital inputs, can be expanded by max. 12 power, electronic and motor start modules; bus connection via 9-pin sub D incl. termination module	<b>6ES7151-1CA00-1BL0</b>	<b>IM 151-1 FO STANDARD interface module</b> for ET 200S, transfer rates up to 12 Mbit/s; data volumes 244 bytes each for inputs and outputs; max. 63 power, electronic and starter modules can be connected; bus connection via integrated fiber-optic cable incl. termination module	<b>6ES7151-1AB05-0AB0</b>
<b>IM 151-1 COMPACT 16 DI 24 V DC / 16 DO 24 V/0.5 A interface module</b> for ET 200S; transfer rates up to 12 Mbit/s; max. 16 digital inputs and 16 digital outputs, can be expanded by max. 12 power, electronic and motor start modules; bus connection via 9-pin sub D incl. termination module	<b>6ES7151-1CA00-3BL0</b>	<b>IM 151-1 HIGH FEATURE interface module</b> for ET 200S; transfer rate up to 12 Mbit/s; data volumes 244 bytes each for I/O, up to 63 modules can be connected; connection of PROFI-safe modules, isochronous mode; bus connection via 9-pin sub D incl. termination module	<b>6ES7151-1BA02-0AB0</b>



## I/O systems

ET 200 systems for the control cabinet  
ET 200S - Interface modules

### IM 151-1

Ordering data	Article No.	Article No.
<b>Accessories</b>		
<b>TM-C120S terminal module</b> Terminal module for ET 200S COMPACT, screw-type terminals	<b>6ES7193-4DL10-0AA0</b>	
<b>TM-C120C terminal module</b> Terminal module for ET 200S COMPACT, spring-loaded terminals	<b>6ES7193-4DL00-0AA0</b>	
<b>TE-U120S4x10 add-on terminal</b> Add-on terminal for TM-C120x terminal modules of ET 200S COMPACT; screw-type terminals for 3-wire connection; please order two for 4-wire connection Can also be attached to TM-E/TM-P, provided at least 120 mm of the construction width attains the same overall height as the terminal module	<b>6ES7193-4FL10-0AA0</b>	
<b>TE-U120C4x10 add-on terminal</b> Add-on terminal for TM-C120x terminal modules of ET 200S COMPACT; spring-loaded terminals for 3-wire connection; please order two for 4-wire connection Can also be attached to TM-E/TM-P, provided at least 120 mm of the construction width attains the same overall height as the terminal module	<b>6ES7193-4FL00-0AA0</b>	
<b>ET 200S distributed I/O system manuals</b> are available on the Internet as PDF files: <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a>		
<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)	<b>6ES7998-8XC01-8YE0</b>	
<b>SIMATIC Manual Collection – Update service for 1 year</b> Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>	
		<b>PROFIBUS DP bus connector RS 485</b> With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbit/s Without PG interface • 1 unit • 100 units With PG interface • 1 unit • 100 units
		<b>100 Simplex connectors</b> For plastic fiber-optic cable incl. 5 polishing sets
		<b>50 plug adapters</b> For 2 Simplex connectors each
		<b>Label sheets DIN A4 (10 pieces)</b> Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules • petrol • red • yellow • light beige
		<b>Label sheets DIN A4 (10 pieces)</b> Can be used for ET 200S COMPACT. Each sheet has 10 labeling strips • beige • yellow • red • petrol
		<b>Termination module</b> as spare part for ET 200S
		<b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage • with push-in terminals • with screw-type terminals
		<b>SIMATIC S5, 35 mm DIN rail</b> • Length: 483 mm for 19" cabinets • Length: 530 mm for 600 mm cabinets • Length: 830 mm for 900 mm cabinets • Length: 2 m
		<b>6ES7972-0BA52-0XA0</b> <b>6ES7972-0BA52-0XB0</b> <b>6ES7972-0BB52-0XA0</b> <b>6ES7972-0BB52-0XB0</b> <b>6GK1901-0FB00-0AA0</b> <b>6ES7195-1BE00-0XA0</b> <b>6ES7193-4BH00-0AA0</b> <b>6ES7193-4BD00-0AA0</b> <b>6ES7193-4BB00-0AA0</b> <b>6ES7193-4BA00-0AA0</b> <b>6ES7193-4BA10-0AA0</b> <b>6ES7193-4BB10-0AA0</b> <b>6ES7193-4BD10-0AA0</b> <b>6ES7193-4BH10-0AA0</b> <b>6ES7193-4JA00-0AA0</b> <b>6ES7193-4JB00-0AA0</b> <b>6ES7193-4JB50-0AA0</b> <b>6ES5710-8MA11</b> <b>6ES5710-8MA21</b> <b>6ES5710-8MA31</b> <b>6ES5710-8MA41</b>

## Overview



- Interface module for linking the ET 200S to PROFINET
- Handles all data exchange with the PROFINET IO Controller
- 3 versions:
  - IM151-3 PN STANDARD
  - IM151-3 PN HIGH FEATURE and IM 151-3 PN FO: supports, in contrast to the STANDARD version, the operation of PROFI-safe F modules
- With integrated 2-port switch for line topology
- Delivery including connecting module

Note:

Micro Memory Card required for operation depending on the configuration.

## Technical specifications

Article number	6ES7151-3AA23-0AB0	6ES7151-3BA23-0AB0
	ET200S, IM151-3 PN ST INTERFACEMODULE	ET200S, IM151-3 PN HF INTERFACEMODULE
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Mains buffering</b>		
• Mains/voltage failure stored energy time		20 ms
<b>Input current</b>		
from supply voltage 1L+, max.		200 mA
<b>Power losses</b>		
Power loss, typ.		3.3 W
<b>Address area</b>		
<b>Addressing volume</b>		
• Inputs		256 byte
• Outputs		256 byte
<b>Interfaces</b>		
<b>PROFINET IO</b>		
• Number of PROFINET interfaces		1
• Autocrossing		Yes
• Automatic detection of transmission speed		Yes
• Transmission rate, max.		100 Mbit/s
• Services		Ping; arp; LLDP; network diagnostics (SNMP) / MIB-2, reset SNMP parameters to factory settings; prioritized startup; media redundancy MRP; shared device
• RJ 45		Yes
<b>1st interface</b>		
<b>Functionality</b>		
• PROFINET IO Device		Yes
<b>PROFINET IO Device Services</b>		
- Isochronous mode		Yes
- IRT		Yes
- PROFIenergy		Yes
- Prioritized startup		Yes
- Shared device		Yes
- Number of IO controllers with shared device, max.		2

**I/O systems**

ET 200 systems for the control cabinet

ET 200S - Interface modules

**IM 151-3 PN****Technical specifications** (continued)

Article number	<b>6ES7151-3AA23-0AB0</b> ET200S, IM151-3 PN ST INTERFACEMODULE	<b>6ES7151-3BA23-0AB0</b> ET200S, IM151-3 PN HF INTERFACEMODULE
<b>Protocols</b>		
PROFINET IO	Yes	Yes
IRT		Yes
MRP		Yes
<b>Protocols (Ethernet)</b>		
• SNMP		Yes
• LLDP		Yes
• ping		Yes
• ARP		Yes
<b>Interrupts/diagnostics/ status information</b>		
<b>Alarms</b>		
• Alarms		Yes
<b>Diagnostic messages</b>		
• Diagnostic functions		Yes
<b>Diagnostics indication LED</b>		
• Bus fault BF (red)		Yes
• Group error SF (red)		Yes
• Monitoring 24 V voltage supply ON (green)		Yes
• Connection to network LINK (green)		Yes
<b>Galvanic isolation</b>		
between backplane bus and electronics		No
between supply voltage and electronics		No
between Ethernet and electronics		Yes
<b>Permissible potential difference</b>		
between different circuits		75V DC/60V AC
<b>Isolation</b>		
Isolation checked with		500 V
<b>Standards, approvals, certificates</b>		
CE mark		Yes
UL approval		Yes
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.		0 °C
• max.		60 °C
<b>Dimensions</b>		
Width	60 mm	60 mm
Height	119.5 mm	119.5 mm
Depth	75 mm	75 mm; with mounting rail
<b>Weights</b>		
Weight, approx.		150 g

**Ordering data****Article No.****Article No.****IM 151-3 PN interface module**

for ET 200S; transfer rates up to 100 Mbit/s; data volume depends on the number of modules inserted, up to 63 modules can be connected, bus connection through RJ45

**6ES7151-3AA23-0AB0****IM 151-3 PN PROFINET High Feature interface module**

for ET 200S; transfer rate up to 100 Mbit/s; max. 63 modules up to 2 m wide can be connected; bus connection via RJ45, incl. termination module

**6ES7151-3BA23-0AB0****IM 151-3 FO interface module**

for ET 200S; with 2 PROFINET FO-interfaces and integrated 2-port switch, max. 63 modules up to 2 m wide can be connected, incl. termination module

**6ES7151-3BB23-0AB0**

Ordering data	Article No.	Article No.
<b>Accessories</b>		
<b>Industrial Ethernet FC RJ45 Plug 90</b>		
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 90° cable outlet		
1 unit	<b>6GK1901-1BB20-2AA0</b>	
10 units	<b>6GK1901-1BB20-2AB0</b>	
50 units	<b>6GK1901-1BB20-2AE0</b>	
<b>Industrial Ethernet FastConnect installation cables</b>		
FastConnect standard cable	<b>6XV1840-2AH10</b>	
FastConnect trailing cable	<b>6XV1840-3AH10</b>	
FastConnect marine cable	<b>6XV1840-4AH10</b>	
<b>Termination Kits</b>		
SC RJ POF Plug Assembly case for on-site assembly of SC RJ plugs consisting of stripping tool, kevlar cutter, microscope, abrasive paper, grinding support	<b>6GK1900-0ML00-0AA0</b>	
IE SC RJ POF Plug Screw-in plug for on-site assembly to POF fiber optic cable (1 pack = 20 units)	<b>6GK1900-0MB00-0AC0</b>	
IE SC RJ Refill Set POF Refill set for Termination Kit SC RJ POF Plug, consisting of abrasive paper and grinding plate (set of 5)	<b>6GK1900-0MN00-0AA0</b>	
SC RJ PCF Plug Assembly case for on-site assembly of SC RJ plugs consisting of stripping tool, buffer stripping tool, kevlar cutter, fiber breaking tool, microscope	<b>6GK1900-0NL00-0AA0</b>	
Industrial Ethernet SC RJ PCF Plug Screw-in plug for on-site assembly to PCF fiber optic cable (1 pack = 10 units)	<b>6GK1900-0NB00-0AC0</b>	
<b>Industrial Ethernet FastConnect stripping tool</b>	<b>6GK1901-1GA00</b>	
<b>MMC 64 KB</b> <sup>1)</sup>	<b>6ES7953-8LF30-0AA0</b>	
For storing the device name		
<b>MMC 128 KB</b> <sup>1)</sup>	<b>6ES7953-8LG30-0AA0</b>	
For storing the device name		
<b>MMC 512 KB</b> <sup>1)</sup>	<b>6ES7953-8LJ30-0AA0</b>	
For storing the device name		
<b>MMC 2 MB</b> <sup>1)</sup>	<b>6ES7953-8LL31-0AA0</b>	
For storing the device name and/or firmware update		
<b>MMC 4 MB</b> <sup>1)</sup>	<b>6ES7953-8LM31-0AA0</b>	
For storing the device name and/or firmware update		
<b>MMC 8 MB</b> <sup>1)</sup>	<b>6ES7953-8LP31-0AA0</b>	
For storing the device name and/or firmware update		
		<b>ET 200S distributed I/O system manuals</b>
		are available on the Internet as PDF files: <a href="http://www.siemens.com/simatic-docu">http://www.siemens.com/simatic-docu</a>
		<b>SIMATIC Manual Collection</b>
		Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)
		<b>SIMATIC Manual Collection – Update service for 1 year</b>
		Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates
		<b>Label sheets DIN A4 (10 pieces)</b>
		Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules
		<ul style="list-style-type: none"> <li>• petrol</li> <li>• red</li> <li>• yellow</li> <li>• light beige</li> </ul>
		<b>Termination module</b>
		as spare part for ET 200S
		<b>Power supply connector</b>
		Spare part; for connecting the 24 V DC supply voltage
		<ul style="list-style-type: none"> <li>• with push-in terminals</li> <li>• with screw-type terminals</li> </ul>
		<b>DIN rail 35 mm</b>
		<ul style="list-style-type: none"> <li>• Length: 483 mm for 19" cabinets</li> <li>• Length: 530 mm for 600 mm cabinets</li> <li>• Length: 830 mm for 900 mm cabinets</li> <li>• Length: 2 m</li> </ul>
		<b>Industrial Ethernet Switches</b>
		Managed Industrial Ethernet Switches; Isochronous real time, LED diagnostics, fault signaling contact with SET button, redundant power supply
		<ul style="list-style-type: none"> <li>• SCALANCE X202-2P IRT; 2 x 10/100 Mbit/s RJ45 ports, 2 x 100 Mbit/s POF/PCF SC RJ</li> <li>• SCALANCE X201-3P IRT; 1 x 10/100 Mbit/s RJ45 ports, 3 x 100 Mbit/s POF/PCF SC RJ</li> <li>• SCALANCE X200-4P IRT; 4 x 100 Mbit/s POF/PCF SC RJ</li> </ul>

<sup>1)</sup> For operating the IM 151-3, an MMC is essential

## I/O systems

ET 200 systems for the control cabinet

ET 200S - Interface modules

### SIPLUS IM 151-1

#### Overview



- Interface module for linking the ET 200S to PROFIBUS DP
- Handles all data exchange with the PROFIBUS DP master

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

#### Technical specifications

Article number	6AG1151-1AA05-7AB0	6AG1151-1BA02-2AB0
Based on	6ES7151-1AA05-0AB0 SIPLUS ET200S IM 151-1 STANDARD	6ES7151-1BA02-0AB0 SIPLUS ET200S IM151 HF
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.		-25 °C; = Tmin
• max.		60 °C; = Tmax
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation in corrosive atmospheres!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

#### Ordering data

##### SIPLUS IM 151-1 STANDARD interface module

(extended temperature range and medial exposure)

for ET 200S; transfer rates up to 12 Mbit/s; data volumes 244 bytes each for inputs and outputs, max. 63 power, electronic and motor start modules can be connected; bus connection via 9-pin D-sub incl. termination module

#### Article No.

6AG1151-1AA05-7AB0

##### SIPLUS IM 151-1 HIGH FEATURE interface module

(extended temperature range and medial exposure)

for ET 200S; transfer rate up to 12 Mbit/s; data volumes 244 bytes each for inputs and outputs, up to 63 modules can be connected; connection of PROFIsafe modules, isochronous mode (clock synchronization); bus connection via 9-pin Sub-D incl. terminating module

#### Article No.

6AG1151-1BA02-2AB0

#### Accessories

See SIMATIC IM 151-1, page 9/114

### Overview



- Interface module for linking the ET 200S PROFINET
- Handles all data exchange with the PROFINET IO controller
- IM 151-3 PN STANDARD
- With integrated 2-port switch for line topology

Micro Memory Card required for operation of CPU.

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

### Technical specifications

Article number	6AG1151-3AA23-2AB0	6AG1151-3AA23-7AB0
Based on	6ES7151-3AA23-0AB0 SIPLUS ET200S IM151-3 ST	6ES7151-3AA23-0AB0 SIPLUS ET200S IM151-3 ST
<b>Product type designation</b>		
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax	70 °C; = Tmax
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**I/O systems**

ET 200 systems for the control cabinet

ET 200S - Interface modules

**SIPLUS IM 151-3PN**

Ordering data	Article No.		Article No.
<p><b>SIPLUS IM 151-3 PN interface module</b></p> <p>(extended temperature range and medial exposure)</p> <p>for ET 200S; transfer rates up to 100 Mbit/s; data volume depends on the number of modules inserted, up to 63 modules can be connected, bus connection through RJ45</p>	<p><b>6AG1151-3AA23-2AB0</b></p>	<p><b>SIPLUS IM 151-3 PN PROFINET High Feature interface module</b></p> <p>(extended temperature range and medial exposure)</p> <p>for ET 200S; transfer rate up to 100 Mbit/s; max. 63 modules up to 2 m wide can be connected; bus connection via RJ45, incl. termination module</p> <p><b>Accessories</b></p>	<p><b>6AG1151-3BA23-7AB0</b></p> <p>See SIMATIC IM 151-3 PN interface module, page 9/117</p>

## Overview



- For monitoring and, depending on the version, fusing the load and sensor supply voltage
- Can be plugged onto TM-P terminal modules with automatic coding.
- Diagnostics message for voltage and blown fuse (can be switched off via configuration)
- PM-E 24 V DC Standard
  - load voltage diagnostics
- PM-E 24 V DC High Feature
  - load voltage and reverse voltage diagnostics
  - with status information
  - option handling (only in combination with the IM 151-1 Standard, IM 151-1 FO Standard and IM 151-1 High Feature)
- PM-E 24 to 48 V DC
  - load voltage diagnostics
  - with status information
  - option handling (only in combination with the IM 151-1 Standard, IM 151-1 FO Standard and IM 151-1 High Feature)
- PM-E 24 V DC to 230 V AC
  - power module for universal use
  - with integral replaceable fuse
  - with status information
  - option handling (only in combination with the IM 151-1 Standard, IM 151-1 FO Standard and IM151-1 High Feature)

## Technical specifications

Article number	6ES7138-4CA01-0AA0	6ES7138-4CB11-0AB0
	ET200S, POWER MODULE PM-E, 24V DC	ET200S, POWERMOD.PM-E;DC24-48V/AC24-230V
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	
• short-circuit protection	No; external (e.g. automatic circuit breaker), tripping characteristic C	
• Reverse polarity protection	Yes	
<b>Input current</b>		
from load voltage 1L+ (without load), max.	4 mA	
<b>Current carrying capacity</b>		
up to 60 °C, max.	10 A	
<b>Power losses</b>		
Power loss, typ.	0.1 W	
<b>Interrupts/diagnostics/status information</b>		
<b>Diagnostic messages</b>		
• Diagnostics	Yes	
• Missing load voltage	Yes	
<b>Diagnostics indication LED</b>		
• Rated load voltage PWR (green)	Yes	
• Group error SF (red)	Yes	
<b>Parameter</b>		
Remark	3 byte	
Missing load voltage	Disable / enable	
<b>Galvanic isolation</b>		
primary/secondary	Yes; between rated load voltage and backplane bus, between power modules	
<b>Isolation</b>		
Isolation checked with	500 V DC	
<b>Dimensions</b>		
Width	15 mm	15 mm
Height	81 mm	81 mm
Depth	52 mm	52 mm
<b>Weights</b>		
Weight, approx.	35 g	



**I/O systems**

ET 200 systems for the control cabinet

ET 200S - I/O modules

**Power modules for PM-E electronic modules****Technical specifications** (continued)

Article number	<b>6ES7138-4CA50-0AB0</b>	<b>6ES7138-4CA60-0AB0</b>
	ET200S, POWERMOD. PM-E, DC 24-48V	ET200S, POWERMOD. PM-E HF, DC24V
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated values	24 to 48 V DC	
• short-circuit protection	No; external (e.g. automatic circuit breaker), tripping characteristic B, C	
• Reverse polarity protection	Yes	
<b>Input current</b>		
from load voltage 1L+ (without load), max.	12 mA	
<b>Current carrying capacity</b>		
up to 60 °C, max.	10 A	
<b>Power losses</b>		
Power loss, typ.	500 mW	
<b>Interrupts/diagnostics/status information</b>		
<b>Diagnostic messages</b>		
• Diagnostics	Yes	
• Missing load voltage	Yes	
<b>Diagnostics indication LED</b>		
• Rated load voltage PWR (green)	Yes	
• Group error SF (red)	Yes	
<b>Parameter</b>		
Remark	3 byte	
Missing load voltage	Disable / enable	
<b>Galvanic isolation</b>		
primary/secondary	Yes; between rated load voltage and backplane bus, between power modules	
<b>Isolation</b>		
Isolation checked with	500 V DC	
<b>Dimensions</b>		
Width	15 mm	15 mm
Height	81 mm	81 mm
Depth	52 mm	52 mm
<b>Weights</b>		
Weight, approx.	35 g	

Ordering data	Article No.	Accessories	Article No.
<b>PM-E 24 V DC Standard power module</b> <sup>1)</sup> For electronic modules; with diagnostics 1 unit 5 units	<b>6ES7138-4CA01-0AA0</b> <b>6ES7138-4CA01-1AA0</b>	<b>Label sheets DIN A4 (10 pieces)</b> Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules • petrol • red • yellow • light beige	<b>6ES7193-4BH00-0AA0</b> <b>6ES7193-4BD00-0AA0</b> <b>6ES7193-4BB00-0AA0</b> <b>6ES7193-4BA00-0AA0</b>
<b>PM-E 24 V DC High Feature power module</b> <sup>1)</sup> For electronic modules; with diagnostics	<b>6ES7138-4CA60-0AB0</b>		
<b>PM-E 24 to 48 V DC power module</b> For electronic modules; with diagnostics, with status bit "load voltage" present 1 unit 5 units	<b>6ES7138-4CA50-0AB0</b> <b>6ES7138-4CA50-1AB0</b>		
<b>PM-E 24 to 48 V DC, 42 to 230 V AC power module</b> For electronic modules; with diagnostics and fuse	<b>6ES7138-4CB11-0AB0</b>		

<sup>1)</sup> Can be used for all electronic and technology modules except  
 2 DI 120 V AC / 2 DI 230 V AC / 2 DO 120/230 V AC

### Selection tool for terminal modules

Power modules	TM-P terminal modules for power modules			
Screw-type terminal type designation	TM-P15S23-A1	TM-P15S23-A0	TM-P15S22-01	TM-P30S44-A0
Article number 6ES7193...	4CC20-0AA0	4CD20-0AA0	4CE00-0AA0	4CK20-0AA0
Spring-loaded terminal type designation	TM-P15C23-A1	TM-P15C23-A0	TM-P15C22-01	TM-P30C44-A0
Article number 6ES7193...	4CC30-0AA0	4CD30-0AA0	4CE10-0AA0	4CK30-0AA0
FastConnect type designation	TM-P15N23-A1	TM-P15N23-A0	TM-P15N22-01	Soon to come
Article number 6ES7193...	4CC70-0AA0	4CD70-0AA0	4CE60-0AA0	
PM-E 24 V DC	•	•	•	
PM-E 24 to 48 V DC	•	•	•	
PM-E 24 V DC/120/230 V AC	•	•	•	
PM-E F 24 V DC PROFIsafe				•

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - I/O modules

### SIPLUS power modules for PM-E electronic modules

#### Overview



- For monitoring and, depending on the version, fusing the load and sensor supply voltage
- Can be plugged onto TM-P terminal modules with automatic coding
- Diagnostics message for voltage and blown fuse (can be switched off via configuration)
- Fail-safe PM-E F PROFIsafe power module for safely switching off sequentially plugged-in 24 V DC to 10 A digital output modules or external loads; 3 additional integrated fail-safe 24 V DC/2 A outputs
- PM-E 24 to 48 V DC
  - with status information and diagnostics "Load voltage present"
  - for option handling
- PM-E 24 V DC to 230 V AC
  - power module for universal use
  - for option handling

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

#### Technical specifications

Article number	6AG1138-4CA01-2AA0	6AG1138-4CB11-2AB0	6AG1138-4CA50-2AB0
Based on	6ES7138-4CA01-0AA0 SIPLUS DP PM-E ET200S	6ES7138-4CA50-0AB0 SIPLUS ET200S PM-E DC/AC	6ES7138-4CB11-0AB0 SIPLUS ET200S PM 24V-48V
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-40 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>			
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIPLUS power modules for PM-E electronic modules**

Ordering data	Article No.	Article No.
<b>SIPLUS PM-E power modules</b> (extended temperature range and medial exposure)		
<b>PM-E 24 V DC power module</b> <sup>1)</sup> For electronic modules; with diagnostics	<b>6AG1138-4CA01-2AA0</b>	
<b>PM-E 24 to 48 V DC power module</b> For electronic modules; with diagnostics; with status bit "load voltage" present	<b>6AG1138-4CA50-2AB0</b>	
		<b>PM-E 24 to 48 V DC, 24 to 230 V AC power module</b> For electronic modules; with diagnostics and fuse
		<b>Accessories</b> See SIMATIC PM-E power modules, page 9/123

<sup>1)</sup> Can be used for all electronic and technology modules except  
2 DI 120 V AC / 2 DI 230 V AC / 2 DO 120/230 V AC

**Selection tool for terminal modules**

Power modules	Terminal modules TM-P for power modules			
Screw-type terminal type designation	TM-P15S23-A1	TM-P15S23-A0	TM-P15S22-01	TM-P30S44-A0
Article number 6ES7193...	4CC20-0AA0	4CD20-0AA0	4CE00-0AA0	4CK20-0AA0
Spring-loaded terminal type designation	TM-P15C23-A1	TM-P15C23-A0	TM-P15C22-01	TM-P30C44-A0
Article number 6ES7193...	4CC30-0AA0	4CD30-0AA0	4CE10-0AA0	4CK30-0AA0
FastConnect type designation	TM-P15N23-A1	TM-P15N23-A0	TM-P15N22-01	Soon to come
Article number 6ES7193...	4CC70-0AA0	4CD70-0AA0	4CE60-0AA0	
PM-E 24 V DC	•	•	•	
PM-E 24 to 48 V DC	•	•	•	
PM-E 24 V DC/120/230 V AC	•	•	•	
PM-E F 24 V DC PROFIsafe				•

## I/O systems

ET 200 systems for the control cabinet  
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### Spare modules

#### Overview



- Applicable only on IM 151-1 Standard interface modules as of 6ES7151-1AA04-0AB0 and IM 151-1 High Feature as of 6ES7151-1BA02-0AB0
- Suitable for all TM-E terminal modules (15 mm and 30 mm construction width)
- Reserves one slot for any electronic module. The reserve module is inserted into the reserved slot of the ET 200S configuration.
- Terminal module can be wired up for the function to be used later
- The reserve module has no connection to the terminals of the TM-E terminal module. The TM-E terminal module can therefore be completely wired up and prepared for its future purpose.
- Parameterizable diagnostic response with IM 151-1 STANDARD and IM 151-1 HIGH FEATURE
- Facilitates retrofitting of I/O modules during operation
- Options can be released via the PLC program without the need for re-engineering

#### Technical specifications

Article number	6ES7138-4AA01-0AA0	6ES7138-4AA11-0AA0
	ET200S, RESERVE MODULE , 15MM, 5PCS	ET200S, RESERVE MODULE, 30MM, 1PC
<b>Product type designation</b>		
<b>Installation type/mounting</b>		
Wall mounting/direct mounting possible	Yes	Yes
<b>Power losses</b>		
Power loss, typ.	0.025 W	0.025 W
<b>Address area</b>		
<b>Occupied address area</b>		
• Inputs	according to configured module	according to configured module
<b>Digital inputs</b>		
Number of digital inputs	0	0
<b>Interrupts/diagnostics/status information</b>		
<b>Diagnostic messages</b>		
• Diagnostic functions	No	No
<b>Diagnostics indication LED</b>		
• Status indicator digital input (green)	No	No
<b>Parameter</b>		
Remark	according to configured module	according to configured module
<b>Dimensions</b>		
Width	15 mm	30 mm
Height	81 mm	81 mm
Depth	52 mm	52 mm
<b>Weights</b>		
Weight, approx.	33 g	55 g

#### Ordering data

#### Article No.

##### Reserve modules for ET 200S

- for reserving unused slots
- 15 mm overall width (5 units)
  - 30 mm overall width (1 unit)

6ES7138-4AA01-0AA0  
6ES7138-4AA11-0AA0

## Overview

- Potential isolation module with 4 outputs
- Output current 5 A per output / 10 A per module
- Nominal load voltage: According to the load voltage on the power module of this load voltage group
- Is suitable for all terminal modules TM-E (construction width 15 mm)

## Technical specifications

Potential isolation module	6ES7138-4FD00-0AA0
<b>Module-specific specifications</b>	
Supported synchronous operation	no
Number of outputs	4
Cable length	
• Unshielded	max. 600 m
• Shielded	max. 1000 m
Parameter length	1 byte
<b>Voltages, Currents, Potentials</b>	
Nominal load voltage L+ (from power module)	24 ... 48 V DC; 24 AC ... 230 V
• Polarity reversal protection	no
Total current of the outputs (per module)	max. 10 A
Potential isolation	
• Between the channels	no
• Between the channels and backplane bus	Yes
Permissible potential difference	
• Between the supply voltage and the backplane bus	75 V DC, 240 V AC
Isolation tested	
• Between the supply voltage and the backplane bus	500 V DC, 1500 V AC
Diagnostic alarm	no
<b>Data for selecting an actuator</b>	
Short-circuit protection for the output	No, possible via PM-E or external
<b>Dimensions and weight</b>	
Dimensions W × H × D (mm, the total dimensions depend on the selected terminal module)	15 × 81 × 52
Weight	Approx. 33 g

## Ordering data

## Article No.

### Potential isolation module for ET 200S

for preparing the load voltage on additional terminals, 15 mm construction width, 1 piece

6ES7138-4FD00-0AA0

### Accessories for labeling

#### Label sheets DIN A4 (10 pieces)

Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules

- petrol
- red
- yellow
- light beige

6ES7193-4BH00-0AA0  
6ES7193-4BD00-0AA0  
6ES7193-4BB00-0AA0  
6ES7193-4BA00-0AA0

## I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

### Digital electronic modules

#### Overview



- 2, 4 and 8-channel digital inputs and outputs for the ET 200S
- Can be plugged onto TM-E terminal modules with automatic coding.
- High-feature versions for enhanced plant availability, additional functions and comprehensive diagnostics
- Hot swapping of modules possible

#### Technical specifications

Article number	6ES7131-4BB01-0AA0	6ES7131-4BB01-0AB0	6ES7131-4BD01-0AA0	6ES7131-4BD01-0AB0	6ES7131-4BD51-0AA0	6ES7131-4BF00-0AA0
	ET200S, EL-MOD., 2DI ST, DC 24V, 5PCS.	ET200S, EL-MOD., 2DI HF, DC 24V, 5PCS.	ET200S, EL-MOD., 4DI ST., DC 24V, 5PCS.	ET200S, EL-MOD., 4DI HF, DC 24V, 5PC.	ET200S, EL-MOD., 4DI HF, DC 24V, 5PCS.	ET200S, ELEKTRONIC MODULE, 8DI DC 24V
<b>Product type designation</b>						
<b>Supply voltage</b>						
Rated value (DC)						
• 24 V DC	Yes; From power module	Yes; From power module	Yes; From power module	Yes; From power module	Yes; From power module	Yes
permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V	20.4 V	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	28.8 V	28.8 V	28.8 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes	Yes
<b>Input current</b>						
from backplane bus 3.3 V DC, max.	10 mA	10 mA	10 mA	10 mA		10 mA
from supply voltage L+, max.	Dependent on encoder	Dependent on encoder	Dependent on encoder	Dependent on encoder	Dependent on encoder	Dependent on encoder
<b>Encoder supply</b>						
Number of outputs						0; no encoder supply
Type of output voltage	min. L+ (-0.5 V), under load	min. L+ (-0.5 V), under load	min. L+ (-0.5 V), under load	min. L+ (-0.5 V), under load	max. M +0.5 V, under load	
short-circuit protection		Yes; Electronic		Yes; Electronic		
<b>Output current</b>						
• nominal	500 mA	500 mA	500 mA	500 mA	500 mA	
<b>Power losses</b>						
Power loss, typ.	0.4 W	0.4 W	0.7 W	0.7 W	0.7 W	1.2 W
<b>Address space per module</b>						
• with packing	2 bit	2 bit	4 bit	4 bit	4 bit	
• without packing	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte

#### Technical specifications (continued)

Article number	<b>6ES7131-4BB01-0AA0</b> ET200S, EL-MOD., 2DI ST, DC 24V, 5PCS.	<b>6ES7131-4BB01-0AB0</b> ET200S, EL-MOD., 2DI HF, DC 24V, 5PCS.	<b>6ES7131-4BD01-0AA0</b> ET200S, EL-MOD., 4DI ST., DC 24V, 5PCS.	<b>6ES7131-4BD01-0AB0</b> ET200S, EL-MOD., 4DI HF, DC 24V, 5PC.	<b>6ES7131-4BD51-0AA0</b> ET200S, EL-MOD., 4DI HF, DC 24V, 5PCS.	<b>6ES7131-4BF00-0AA0</b> ET200S, ELEKTRONIC MODULE, 8DI DC 24V
<b>Digital inputs</b>						
Number of digital inputs	2	2	4	4	4	8
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes	Yes	Yes; 2-wire sensors connectable
<b>Number of simultaneously controllable inputs</b>						
• Number of simultaneously controllable inputs						8
<b>Input voltage</b>						
• Type of input voltage	DC	DC	DC	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V
• for signal "0"	-30 to +5V	-30 to +5V	-30 to +5V	-30 to +5V	-5 to +30V	-30 to +5V
• for signal "1"		+11 to +30V		+11 to +30V	-15 to -30 V	
<b>Input current</b>						
• for signal "1", typ.	7 mA; at 24 V	8 mA	7 mA; at 24 V	8 mA	7 mA; at 24 V	5 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>						
- Parameterizable	No	Yes; 0.1 / 0.5 / 3 / 15 ms	No	Yes; 0.1 / 0.5 / 3 / 15 ms	No	No
- at "0" to "1", min.	2 ms; typically 3 ms	0.05 / 0.4 / 2.7 / 14.85	2 ms; typically 3 ms	0.05 / 0.4 / 2.7 / 14.85	2 ms; typically 3 ms	2 ms
- at "0" to "1", max.	4.5 ms	0.15 / 0.6 / 3.3 / 15,15	4.5 ms	0.15 / 0.6 / 3.3 / 15,15	4.5 ms	4.5 ms
- at "1" to "0", min.	2 ms; typically 3 ms	0.05 / 0.4 / 2.7 / 14.85	2 ms; typically 3 ms	0.05 / 0.4 / 2.7 / 14.85	2 ms; typically 3 ms	2 ms
- at "1" to "0", max.	4.5 ms	0.15 / 0.6 / 3.3 / 15,15	4.5 ms	0.15 / 0.6 / 3.3 / 15,15	4.5 ms	4.5 ms
<b>Cable length</b>						
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m
<b>Encoder</b>						
<b>Connectable encoders</b>						
• 2-wire sensor	Yes	Yes	Yes	Yes	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA	1.5 mA	1.5 mA	1.5 mA
<b>Isochronous mode</b>						
Isochronous operation (application synchronized up to terminal)						Yes; TWE = 3000 us
<b>Diagnostic messages</b>						
• Diagnostic functions	No	Yes	No	Yes	No	No
• Short circuit		Yes; Short-circuit of outputs to ground; module by module		Yes; Short-circuit of outputs to ground; module by module		
<b>Diagnostics indication LED</b>						
• Group error SF (red)	No	Yes	No	Yes	No	
• Status indicator digital input (green)	Yes; per channel	Yes; per channel	Yes; per channel	Yes; per channel	Yes; per channel	Yes
<b>Parameter</b>						
Remark	1 byte	3 byte	1 byte	3 byte	1 byte	3-byte parameter (not accessible for the user)
Diagnosis: short circuit		Disable / enable		Disable / enable		



## I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

### Digital electronic modules

#### Technical specifications (continued)

Article number	<b>6ES7131-4BB01-0AA0</b> ET200S, EL-MOD., 2DI ST, DC 24V, 5PCS.	<b>6ES7131-4BB01-0AB0</b> ET200S, EL-MOD., 2DI HF, DC 24V, 5PCS.	<b>6ES7131-4BD01-0AA0</b> ET200S, EL-MOD., 4DI ST., DC 24V, 5PCS.	<b>6ES7131-4BD01-0AB0</b> ET200S, EL-MOD., 4DI HF, DC 24V, 5PC.	<b>6ES7131-4BD51-0AA0</b> ET200S, EL-MOD., 4DI HF, DC 24V, 5PCS.	<b>6ES7131-4BF00-0AA0</b> ET200S, ELEKTRONIC MODULE, 8DI DC 24V
<b>Galvanic isolation</b>						
<b>Galvanic isolation digital inputs</b>						
• between the channels	No	No	No	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes	Yes
<b>Permissible potential difference</b>						
between different circuits	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>						
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC
<b>Dimensions</b>						
Width	15 mm	15 mm	15 mm	15 mm	15 mm	15 mm
Height	81 mm	81 mm	81 mm	81 mm	81 mm	81 mm
Depth	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm
<b>Weights</b>						
Weight, approx.	35 g	35 g	35 g	35 g	35 g	35 g
Article number	<b>6ES7131-4CD02-0AB0</b> ET200S, EL-MOD., 4DI, UC 24-48V, 5 PCS	<b>6ES7131-4EB00-0AB0</b> ET200S, EL-MOD., 2DI, AC 120V, 5PCS.	<b>6ES7131-4FB00-0AB0</b> ET200S, EL-MOD., 2DI, AC 230V, 5PCS.	<b>6ES7131-4RD02-0AB0</b> ET200S, EL-MOD., 4DI DC 24V NAMUR	<b>6ES7131-4BF50-0AA0</b> ET200S, 8DI SOURCE OUTPUT DC24V	
<b>Product type designation</b>						
<b>Supply voltage</b>						
Rated value (DC)						
• 24 V DC				Yes		Yes; From power module
permissible range, lower limit (DC)				20.4 V		20.4 V
permissible range, upper limit (DC)				28.8 V		28.8 V
Rated value (AC)						
• 120 V AC		Yes; From power module				
• 230 V AC			Yes			
Reverse polarity protection						Yes
<b>Input current</b>						
from backplane bus 3.3 V DC, max.		6 mA	6 mA			
from supply voltage L+, max.						Dependent on encoder
from supply voltage L1, max.		Dependent on encoder	Dependent on encoder			
<b>Encoder supply</b>						
Number of outputs				1		
Type of output voltage				min. 8.2 V, loaded		
short-circuit protection				Yes; Electronic		
<b>Output current</b>						
• nominal				45 mA		
<b>Power losses</b>						
Power loss, typ.		0.5 W	0.7 W	1.6 W		1.2 W
<b>Address space per module</b>						
• with packing		2 bit	2 bit	4 bit		
• without packing		1 byte	1 byte	1 byte		

#### Technical specifications (continued)

Article number	<b>6ES7131-4CD02-0AB0</b> ET200S, EL-MOD., 4DI, UC 24-48V, 5 PCS	<b>6ES7131-4EB00-0AB0</b> ET200S, EL-MOD., 2DI, AC 120V, 5PCS.	<b>6ES7131-4FB00-0AB0</b> ET200S, EL-MOD., 2DI, AC 230V, 5PCS.	<b>6ES7131-4RD02-0AB0</b> ET200S, EL-MOD., 4DI DC 24V NAMUR	<b>6ES7131-4BF50-0AA0</b> ET200S, 8DI SOURCE OUTPUT DC24V
<b>Digital inputs</b>					
Number of digital inputs		2	2	4	8
Number of NAMUR inputs				4	
Parallel switching of inputs				No	
Input characteristic curve in accordance with IEC 61131, type 1		Yes	Yes		Yes
<b>Number of simultaneously controllable inputs</b>					
• Number of simultaneously controllable inputs				4	
<b>Input voltage</b>					
• Type of input voltage		AC	AC	DC	DC
• Rated value (AC)		120 V	230 V		
• Rated value (DC)					24 V
• for signal "0"		0V AC to 20V AC	0V AC to 40V AC		-5 to +30V
• for signal "1"		79 to 132 V AC	164V AC to 264V AC		-15 to -30 V
• Frequency range		47 ... 63 Hz	47 ... 63 Hz		
<b>Input current</b>					
• for signal "1", typ.		3 mA; 3 to 9 mA	5 mA; 5 to 15mA		6 mA; at 24 V
<b>for 10 k switched contact</b>					
- for signal "0"				0.35 to 1.2 mA	
- for signal "1"				2.1 to 7 mA	
<b>for unswitched contact</b>					
- for signal "0", max. (permissible quiescent current)				0.5 mA	
- for signal "1"				typ. 8 mA	
<b>for NAMUR encoders</b>					
- for signal "0"				0.35 to 1.2 mA	
- for signal "1"				2.1 to 7 mA	
<b>Input delay (for rated value of input voltage)</b>					
<b>for standard inputs</b>					
- Parameterizable					No
- at "0" to "1", min.		15 ms	15 ms		2 ms
- at "0" to "1", max.				4.6 μs	4.5 ms
- at "1" to "0", min.		25 ms	45 ms		2 ms
- at "1" to "0", max.				4.6 μs	4.5 ms
<b>Cable length</b>					
• shielded, max.		1 000 m	1 000 m	200 m	1 000 m
• Unshielded, max.		600 m	600 m		600 m
<b>Encoder</b>					
<b>Connectable encoders</b>					
• 2-wire sensor		No	No		Yes
- Permissible quiescent current (2-wire sensor), max.		1 mA	2 mA		1.5 mA
<b>Isochronous mode</b>					
Isochronous operation (application synchronized up to terminal)		No	No		Yes
<b>Interrupts/diagnostics/status information</b>					
<b>Alarms</b>					
• Diagnostic alarm				Yes; can be set	
• Hardware interrupt				No	
<b>Diagnostic messages</b>					
• Diagnostic functions		No	No	Yes; Diagnostic alarm	No
• Diagnostic information readable				Yes	
• Short circuit		No	No		
<b>Diagnostics indication LED</b>					
• Group error SF (red)				Yes	No
• Status indicator digital input (green)		Yes; per channel	Yes; per channel	Yes; per channel	Yes; per channel

## I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

### Digital electronic modules

#### Technical specifications (continued)

Article number	<b>6ES7131-4CD02-0AB0</b> ET200S, EL-MOD., 4DI, UC 24-48V, 5 PCS	<b>6ES7131-4EB00-0AB0</b> ET200S, EL-MOD., 2DI, AC 120V, 5PCS.	<b>6ES7131-4FB00-0AB0</b> ET200S, EL-MOD., 2DI, AC 230V, 5PCS.	<b>6ES7131-4RD02-0AB0</b> ET200S, EL-MOD., 4DI DC 24V NAMUR	<b>6ES7131-4BF50-0AA0</b> ET200S, 8DI SOURCE OUTPUT DC24V	
<b>Parameter</b>						
Remark		3 byte	3 byte	12 byte	3 byte	
<b>Galvanic isolation</b>						
<b>Galvanic isolation digital inputs</b>						
• between the channels		No	No	No	No	
• between the channels and the backplane bus		Yes	Yes	Yes	Yes	
• between the channels and the load voltage L+				Yes		
<b>Permissible potential difference</b>						
between different circuits				75V DC/60V AC	75V DC/60V AC	
between M internally and the inputs		1500 V AC	1500 V AC			
<b>Isolation</b>						
Isolation checked with		2500 V DC	4000 VDC	500 V DC	500 V DC	
<b>Dimensions</b>						
Width		15 mm	15 mm	15 mm	15 mm	
Height		81 mm	81 mm	81 mm	81 mm	
Depth		52 mm	52 mm	52 mm	52 mm	
<b>Weights</b>						
Weight, approx.		31 g	31 g	35 g	35 g	
Article number	<b>6ES7132-4BB01-0AB0</b> ET200S, EL-MOD., 2DO HF,DC24V, 0.5A, 5PC	<b>6ES7132-4BB01-0AA0</b> ET200S, EL-MOD., 2DO ST,DC24V, 0.5A, 5PC	<b>6ES7132-4BB31-0AB0</b> ET200S, EL-MOD., 2DO HF, DC 24V, 2A, 5PC	<b>6ES7132-4BB31-0AA0</b> ET200S, EL-MOD., 2DO ST, DC 24V, 2A, 5PC	<b>6ES7132-4BD00-0AB0</b> ET200S, EL-MOD., 4DO HF,DC24V, 0.5A,5PCS	<b>6ES7132-4BD02-0AA0</b> ET200S, EL-MOD., 4DO ST,DC24V, 0.5A,5PCS
<b>Product type designation</b>						
<b>Supply voltage</b>						
Reverse voltage protection	Yes; when using the same load voltage as on the power module	Yes; when using the same load voltage as on the power module	Yes; when using the same load voltage as on the power module	Yes; when using the same load voltage as on the power module	Yes; when using the same load voltage as on the power module	Yes; when using the same load voltage as on the power module
<b>Load voltage L+</b>						
• Rated value (DC)	24 V; From power module	24 V; From power module	24 V; From power module	24 V; From power module	24 V; From power module	24 V; From power module
• Reverse polarity protection	Yes; polarity reversal can lead to the digital outputs being connected through	Yes; polarity reversal can lead to the digital outputs being connected through	Yes; polarity reversal can lead to the digital outputs being connected through	Yes; polarity reversal can lead to the digital outputs being connected through	Yes; polarity reversal can lead to the digital outputs being connected through	Yes; polarity reversal can lead to the digital outputs being connected through
<b>Input current</b>						
from load voltage L+ (without load), max.	5 mA; Per channel	5 mA; per module	5 mA; Per channel	5 mA; Per channel	5 mA; Per channel	10 mA; Per channel
from backplane bus 3.3 V DC, max.	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA
<b>Power losses</b>						
Power loss, typ.	0.4 W	0.4 W	1.4 W	1.4 W		0.8 W
<b>Address area</b>						
<b>Address space per module</b>						
• with packing	2 bit	2 bit	2 bit	2 bit	4 bit	4 bit
• without packing	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte

### Technical specifications (continued)

Article number	<b>6ES7132-4BB01-0AB0</b> ET200S, EL-MOD., 2DO HF,DC24V, 0.5A, 5PC	<b>6ES7132-4BB01-0AA0</b> ET200S, EL-MOD., 2DO ST,DC24V, 0.5A, 5PC	<b>6ES7132-4BB31-0AB0</b> ET200S, EL-MOD., 2DO HF, DC 24V, 2A, 5PC	<b>6ES7132-4BB31-0AA0</b> ET200S, EL-MOD., 2DO ST, DC 24V, 2A, 5PC	<b>6ES7132-4BD00-0AB0</b> ET200S, EL-MOD., 4DO HF,DC24V, 0.5A,5PCS	<b>6ES7132-4BD02-0AA0</b> ET200S, EL-MOD., 4DO ST,DC24V, 0.5A,5PCS
<b>Digital outputs</b>						
Number of digital outputs	2	2	2	2	4	4
short-circuit protection	Yes	Yes	Yes	Yes	Yes	Yes
• Response threshold, typ.	1,5 A	0.7 to 1.8 A	4 A	2.8 to 7.2 A	0.7 to 1.5 A	1 to 1.5 A
Limitation of inductive shutdown voltage to	-55 to -60 V, typ. L+( )	-55 to -60 V, typ. L+( )	-55 to -60 V, typ. L+( )	-55 to -60 V, typ. L+( )	-55 to -60 V, L+( )	(L+) -55 to -60 V
Controlling a digital input	Yes	Yes	Yes	Yes	Yes	Yes
<b>Switching capacity of the outputs</b>						
• on lamp load, max.	2.5 W	5 W	5 W	10 W	5 W	5 W
<b>Load resistance range</b>						
• lower limit	48 Ω	48 Ω	12 Ω	12 Ω	48 Ω	48 Ω
• upper limit	3 400 Ω	3 400 Ω	3 400 Ω	3 400 Ω	3 400 Ω	3 400 Ω
<b>Output voltage</b>						
• for signal "1", min.	L+ (-1 V)	L+ (-1 V)	L+ (-1 V)	L+ (-1 V)	L+ (-1 V)	L+ (-1 V)
<b>Output current</b>						
• for signal "1" rated value	0.5 A	0.5 A	2 A	2 A	0.5 A	0.5 A
• for signal "1" permissible range for 0 to 60 °C, min.	7 mA	7 mA	7 mA	7 mA	7 mA	7 mA
• for signal "1" permissible range for 0 to 60 °C, max.	600 mA	600 mA	2.4 A	2.4 A	600 mA	600 mA
• for signal "0" residual current, max.	0.3 mA	0.3 mA	0.5 mA	0.5 mA	0.3 mA	0.3 mA
<b>Output delay with resistive load</b>						
• "0" to "1", max.	100 μs	200 μs	100 μs	200 μs	100 μs	45 μs; Typical value
• "1" to "0", max.	400 μs	1.3 ms	400 μs	1.3 ms	300 μs	90 μs; Typical value
<b>Parallel switching of 2 outputs</b>						
• for increased power	No	No	No	No	No	No
• for redundant control of a load	Yes; per module	Yes; per module	Yes; per module	Yes; per module	Yes; per module	Yes; per module
<b>Switching frequency</b>						
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	800 Hz
• with inductive load, max.	2 Hz	2 Hz	2 Hz; 0,5 H	2 Hz; 0,5 H	2 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz
<b>Aggregate current of outputs (per group)</b>						
<b>all mounting positions</b>						
- up to 60 °C, max.	1 A	1 A	4 A	4 A	2 A	2 A
<b>Cable length</b>						
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m
<b>Isochronous mode</b>						
Isochronous operation (application synchronized up to terminal)	Yes	No	Yes	No	Yes	Yes
<b>Interrupts/diagnostics/status information</b>						
Substitute values connectable	Yes; 0/1		Yes; 0/1			
<b>Diagnostic messages</b>						
• Diagnostic functions	Yes; Can be read out	No	Yes; Can be read out	No	Yes	No
• Wire break	Yes; channel by channel		Yes; channel by channel			
• Short circuit	Yes; channel by channel		Yes; channel by channel		Yes; Module-wise	
<b>Diagnostics indication LED</b>						
• Group error SF (red)	Yes		Yes		Yes; SF-LED (red)	
• Status indicator digital output (green)	Yes	Yes	Yes	Yes	Yes; Per channel	Yes

**I/O systems**

ET 200 systems for the control cabinet

ET 200S - I/O modules

**Digital electronic modules****Technical specifications (continued)**

Article number	<b>6ES7132-4BB01-0AB0</b> ET200S, EL-MOD., 2DO HF,DC24V, 0.5A, 5PC	<b>6ES7132-4BB01-0AA0</b> ET200S, EL-MOD., 2DO ST,DC24V, 0.5A, 5PC	<b>6ES7132-4BB31-0AB0</b> ET200S, EL-MOD., 2DO HF, DC 24V, 2A, 5PC	<b>6ES7132-4BB31-0AA0</b> ET200S, EL-MOD., 2DO ST, DC 24V, 2A, 5PC	<b>6ES7132-4BD00-0AB0</b> ET200S, EL-MOD., 4DO HF,DC24V, 0.5A,5PCS	<b>6ES7132-4BD02-0AA0</b> ET200S, EL-MOD., 4DO ST,DC24V, 0.5A,5PCS
<b>Parameter</b>						
Remark	3 byte	1 byte	3 byte	1 byte		1 byte
Diagnosis: wire break	Disable / enable		Disable / enable			
Diagnosis: short circuit	Disable / enable		Disable / enable			
Behavior on CPU/Master STOP, channel-wise	Substitute a value/ keep last value		Substitute a value/ keep last value			
<b>Galvanic isolation</b>						
<b>Galvanic isolation digital outputs</b>						
• between the channels	No	No	No	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes	Yes
<b>Isolation</b>						
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC
<b>Dimensions</b>						
Width	15 mm	15 mm	15 mm	15 mm	15 mm	15 mm
Height	81 mm	81 mm	81 mm	81 mm	81 mm	81 mm
Depth	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm
<b>Weights</b>						
Weight, approx.	40 g	40 g	40 g	40 g	40 g	40 g
Article number	<b>6ES7132-4BF00-0AB0</b> ET200S, ELECTR.MODULE 8DO HF DC24V/0,5A			<b>6ES7132-4BF00-0AA0</b> ET200S, ELEKTRONIC MODULE 8DO DC24V/0,5A		
<b>Product type designation</b>						
<b>Supply voltage</b>						
Reverse voltage protection	Yes; when using the same load voltage as on the power module			Yes		
<b>Load voltage L+</b>						
• Rated value (DC)	24 V; From power module			24 V		
• Reverse polarity protection	Yes; polarity reversal can lead to the digital outputs being connected through			Yes		
<b>Input current</b>						
from load voltage L+ (without load), max.	5 mA; Per channel			5 mA; Per channel		
from backplane bus 3.3 V DC, max.	10 mA			10 mA		
<b>Power losses</b>						
Power loss, typ.				1.5 W		
<b>Address area</b>						
<b>Address space per module</b>						
• with packing	Not relevant					
• without packing	1 byte			1 byte		

#### Technical specifications (continued)

Article number	<b>6ES7132-4BF00-0AB0</b> ET200S, ELECTR.MODULE 8DO HF DC24V/0,5A	<b>6ES7132-4BF00-0AA0</b> ET200S, ELEKTRONIC MODULE 8DO DC24V/0,5A
<b>Digital outputs</b>		
Number of digital outputs	8	8
short-circuit protection	Yes	Yes
• Response threshold, typ.	0.7 to 1.9 A	o.k.
Limitation of inductive shutdown voltage to	L+ -(47 to 60 V)	o.k.
Controlling a digital input	Yes	Yes
<b>Switching capacity of the outputs</b>		
• on lamp load, max.	5 W	5 W
<b>Load resistance range</b>		
• lower limit	48 Ω	48 Ω
• upper limit	3 400 Ω	3 400 Ω
<b>Output voltage</b>		
• for signal "1", min.	L+ (-1.0 V)	o.k.
<b>Output current</b>		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "1" permissible range for 0 to 60 °C, min.	7 mA	7 mA
• for signal "1" permissible range for 0 to 60 °C, max.	600 mA	600 mA
• for signal "0" residual current, max.	0.3 mA	0.3 mA
<b>Output delay with resistive load</b>		
• "0" to "1", max.	300 μs	300 μs
• "1" to "0", max.	600 μs	600 μs
<b>Parallel switching of 2 outputs</b>		
• for increased power	No	No
• for redundant control of a load	Yes; per module	Yes
<b>Switching frequency</b>		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz
<b>Aggregate current of outputs (per group)</b>		
<b>all mounting positions</b> - up to 60 °C, max.		4 A
<b>horizontal installation</b> - up to 60 °C, max.		4 A
<b>vertical installation</b> - up to 40 °C, max.		4 A; At 55 °C and 24 V DC
<b>Cable length</b>		
• shielded, max.	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m
<b>Isochronous mode</b>		
Isochronous operation (application synchronized up to terminal)	Yes	Yes; jitter incumbered < 100us
<b>Interrupts/diagnostics/status information</b>		
<b>Diagnostic messages</b>		
• Diagnostic functions	Yes	No
• Short circuit	Yes; Module-wise	
<b>Diagnostics indication LED</b>		
• Group error SF (red)	Yes; SF-LED (red)	
• Status indicator digital output (green)	Yes; Per channel	Yes

## I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

### Digital electronic modules

#### Technical specifications (continued)

Article number	<b>6ES7132-4BF00-0AB0</b> ET200S, ELECTR.MODULE 8DO HF DC24V/0,5A		<b>6ES7132-4BF00-0AA0</b> ET200S, ELEKTRONIC MODULE 8DO DC24V/0,5A		
<b>Parameter</b>					
Remark	1 byte		3-byte parameter (not accessible for the user)		
<b>Galvanic isolation</b>					
<b>Galvanic isolation digital outputs</b>					
• between the channels	No		No		
• between the channels and the backplane bus	Yes		Yes		
<b>Isolation</b>					
Isolation checked with	500 V DC		500 V DC		
<b>Dimensions</b>					
Width	15 mm		15 mm		
Height	81 mm		81 mm		
Depth	52 mm		52 mm		
<b>Weights</b>					
Weight, approx.	40 g		40 g		
Article number	<b>6ES7132-4BD30-0AB0</b> ET200S, EL-MOD., 4DO HF, DC24V, 2A, 5PCS	<b>6ES7132-4BD32-0AA0</b> ET200S, EL-MOD., 4DO ST, DC24V, 2A, 5PCS	<b>6ES7132-4FB01-0AB0</b> ET200S, ELECT. MOD., 2DO, AC 230V, 5PCS	<b>6ES7132-4HB01-0AB0</b> ET200S, EL-MOD., 2RO, DC24VAC230V, 5A,5PCS	<b>6ES7132-4HB12-0AB0</b> ET200S, EL-MOD., 2RO, DC48V/AC230V, 5A,5PCS
<b>Product type designation</b>					
<b>Supply voltage</b>					
Reverse voltage protection	Yes; when using the same load voltage as on the power module	Yes; when using the same load voltage as on the power module	Yes; when using the same load voltage as on the power module		
<b>Load voltage L+</b>					
• Rated value (DC)	24 V; From power module	24 V; From power module		24 V; From power module	24 V; From power module
• Reverse polarity protection	Yes; polarity reversal can lead to the digital outputs being connected through	Yes		Yes	Yes
<b>Load voltage L1</b>					
• permissible range, lower limit (AC)			24 V; From power module		
• permissible range, upper limit (AC)			230 V		
<b>Input current</b>					
from load voltage L+ (without load), max.	5 mA; Per channel	10 mA; Per channel	30 mA	30 mA	30 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA	18 mA	10 mA	10 mA
<b>Power losses</b>					
Power loss, typ.	1.6 W	1.6 W	4 W	0.6 W	0.6 W
<b>Address area</b>					
<b>Address space per module</b>					
• with packing	4 bit	4 bit	2 bit	2 bit	2 bit
• without packing	1 byte	1 byte	1 byte	1 byte	1 byte

#### Technical specifications (continued)

Article number	<b>6ES7132-4BD30-0AB0</b> ET200S, EL-MOD., 4DO HF, DC24V, 2A, 5PCS	<b>6ES7132-4BD32-0AA0</b> ET200S, EL-MOD., 4DO ST, DC24V, 2A, 5PCS	<b>6ES7132-4FB01-0AB0</b> ET200S, ELECT. MOD., 2DO, AC 230V, 5PCS	<b>6ES7132-4HB01-0AB0</b> ET200S, EL-MOD., 2RO, DC24VAC230V, 5A,5PCS	<b>6ES7132-4HB12-0AB0</b> ET200S, EL-MOD., 2RO,DC48V/AC230V, 5A,5PCS
<b>Digital outputs</b>					
Number of digital outputs	4	4	2	2	2
short-circuit protection	Yes	Yes	Yes	No	No
• Response threshold, typ.	5 to 10 A	2.8 to 7.2 A			
Limitation of inductive shutdown voltage to	L+ (-37 to 41V)	Typ. L+ (-55 to -60 V)	-55 to -60 V	No	No
Controlling a digital input	Yes	Yes	Yes; possible	Yes	Yes
<b>Switching capacity of the outputs</b>					
• on lamp load, max.		10 W	100 W		
<b>Load resistance range</b>					
• lower limit	12 Ω	12 Ω			
• upper limit	3 400 Ω	3 400 Ω			
<b>Output voltage</b>					
• for signal "1", min.	L+ (-1.0 V)	L+ (-1.0 V)	L+ (-1.5 V)		
<b>Output current</b>					
• for signal "1" rated value	2 A	2 A	2 A	5 A	5 A
• for signal "1" permissible range for 0 to 60 °C, min.	7 mA	7 mA	0.1 mA		
• for signal "1" permissible range for 0 to 60 °C, max.	2.4 A	2.4 A	2.2 A		
• for signal "1" minimum load current				8 mA	8 mA
• for signal "0" residual current, max.	0.5 mA	0.5 mA	3 mA		
<b>Output delay with resistive load</b>					
• "0" to "1", max.	250 μs	50 μs; Typ. 45 μs	15 ms		
• "1" to "0", max.	400 μs	120 μs; Typ. 90 μs	15 ms		
<b>Parallel switching of 2 outputs</b>					
• for increased power	No	No	No		
• for redundant control of a load	Yes; per module	Yes; per module	Yes; per module		
<b>Switching frequency</b>					
• with resistive load, max.	100 Hz	1 000 Hz	10 Hz	2 Hz	2 Hz
• with inductive load, max.	2 Hz	2 Hz; At 0.5 H	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	10 Hz	10 Hz	1 Hz	2 Hz	2 Hz
<b>Aggregate current of outputs (per group)</b>					
<b>all mounting positions</b>					
- up to 40 °C, max.			2 A		
- up to 50 °C, max.			1.5 A		
- up to 60 °C, max.		4 A	1 A		
<b>horizontal installation</b>					
- up to 60 °C, max.	4 A				
<b>vertical installation</b>					
- up to 40 °C, max.	4 A; At 55 °C and 24 V DC	4 A; At 55 °C and 24 V DC			
<b>Relay outputs</b>					
<b>Switching capacity of contacts</b>					
- Thermal continuous current, max.				5 A	5 A
<b>Cable length</b>					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m
<b>Isochronous mode</b>					
Isochronous operation (application synchronized up to terminal)	Yes	Yes		No	No



## I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

### Digital electronic modules

#### Technical specifications (continued)

Article number	<b>6ES7132-4BD30-0AB0</b> ET200S, EL-MOD., 4DO HF, DC24V, 2A, 5PCS	<b>6ES7132-4BD32-0AA0</b> ET200S, EL-MOD., 4DO ST, DC24V, 2A, 5PCS	<b>6ES7132-4FB01-0AB0</b> ET200S, ELECT. MOD., 2DO, AC 230V, 5PCS	<b>6ES7132-4HB01-0AB0</b> ET200S, EL-MOD., 2RO, DC24VAC230V, 5A,5PCS	<b>6ES7132-4HB12-0AB0</b> ET200S, EL-MOD., 2RO, DC48V/AC230V, 5A,5PCS
<b>Interrupts/diagnostics/ status information</b>					
Substitute values connectable				Yes; 0/1	Yes; 0/1
<b>Diagnostic messages</b>					
• Diagnostic functions	Yes	No	No	No	No
• Short circuit	Yes; Module-wise				
<b>Diagnostics indication LED</b>					
• Group error SF (red)	Yes; SF-LED (red)				
• Status indicator digital output (green)	Yes; Per channel	Yes	Yes	Yes	Yes
<b>Parameter</b>					
Remark		1 byte	3 byte		
Behavior on CPU/Master STOP, channel-wise			Substitute a value/ keep last value, 0/1	Substitute a value/ keep last value	Substitute a value/ keep last value
<b>Galvanic isolation</b>					
<b>Galvanic isolation digital outputs</b>					
• between the channels	No	No	No	Yes	Yes
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes
• between the channels and the load voltage L+				Yes	Yes
<b>Isolation</b>					
Isolation checked with	500 V DC	500 V DC	2500 V DC		
<b>tested with</b>					
• Channels against backplane bus and load voltage L+				1500 V AC	1500 V AC
• Load voltage L+ against backplane bus				500 V DC	500 V DC
<b>Extended ambient conditions</b>					
• Relative to ambient temperature-atmospheric pressure-installation altitude				Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Dimensions</b>					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	81 mm	81 mm	81 mm	81 mm	81 mm
Depth	52 mm	52 mm	52 mm	52 mm	52 mm
<b>Weights</b>					
Weight, approx.	40 g	40 g	37 g	50 g	50 g

#### Technical specifications (continued)

Article number	<b>6ES7132-4BF50-0AA0</b> ET200S, 8DO SINK OUTPUT DC24V/0,5A	<b>6ES7132-4BD50-0AA0</b> ET200S,4DO SINK OUTPUT DC24V/0,5A , 5PCS	<b>6ES7132-4HB50-0AB0</b> ET200S,2RO,DC48V/AC230V, MANUAL ACTUATION
<b>Product type designation</b>			
<b>Supply voltage</b>			
Reverse voltage protection	Yes; when using the same correctly polarized load voltage as on the power module	Yes; when using the same load voltage as on the power module	
<b>Load voltage L+</b>			
• Rated value (DC)	24 V; From power module	24 V; From power module	24 V; From power module
• Reverse polarity protection	Yes	Yes	Yes
<b>Input current</b>			
from load voltage L+ (without load), max.	5 mA	5 mA; Per channel	30 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA	10 mA
<b>Power losses</b>			
Power loss, typ.	1.5 W	0.8 W	0.6 W
<b>Address area</b>			
<b>Address space per module</b>			
• with packing		4 bit	2 bit
• without packing	1 byte	1 byte	1 byte
<b>Digital outputs</b>			
Number of digital outputs	8	4	2
short-circuit protection	Yes	Yes	No
• Response threshold, typ.	1,5 A		
Limitation of inductive shutdown voltage to	Typ. 47 V		No
Controlling a digital input	Yes	Yes	Yes
<b>Switching capacity of the outputs</b>			
• on lamp load, max.	5 W	5 W	
<b>Load resistance range</b>			
• lower limit	48 Ω	48 Ω	
• upper limit	3 400 Ω	3 400 Ω	
<b>Output voltage</b>			
• for signal "1", min.	Max. 1 V	1 V	
<b>Output current</b>			
• for signal "1" rated value	0.5 A	0.5 A	5 A
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA	5 mA	
• for signal "1" permissible range for 0 to 60 °C, max.	700 mA	700 mA	
• for signal "1" minimum load current			8 mA
• for signal "0" residual current, max.	5 μA	5 μA	
<b>Output delay with resistive load</b>			
• "0" to "1", max.	300 μs	300 μs	
• "1" to "0", max.	600 μs	600 μs	
<b>Parallel switching of 2 outputs</b>			
• for increased power	No	No	
• for redundant control of a load	Yes; per module	Yes; per module	
<b>Switching frequency</b>			
• with resistive load, max.	100 Hz	100 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	10 Hz	10 Hz	2 Hz
<b>Aggregate current of outputs (per group)</b>			
<b>all mounting positions</b>			
- up to 60 °C, max.	4 A	2 A	
<b>Relay outputs</b>			
<b>Switching capacity of contacts</b>			
- Thermal continuous current, max.			5 A
<b>Cable length</b>			
• shielded, max.	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m

**I/O systems**

ET 200 systems for the control cabinet

ET 200S - I/O modules

**Digital electronic modules****Technical specifications (continued)**

Article number	<b>6ES7132-4BF50-0AA0</b> ET200S, 8DO SINK OUTPUT DC24V/0,5A	<b>6ES7132-4BD50-0AA0</b> ET200S,4DO SINK OUTPUT DC24V/0,5A , 5PCS	<b>6ES7132-4HB50-0AB0</b> ET200S,2RO,DC48V/AC230V, MANUAL ACTUATION
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)	Yes	Yes	No
<b>Interrupts/diagnostics/ status information</b>			
Substitute values connectable			Yes; 0/1
<b>Diagnostic messages</b>			
• Diagnostic functions	No	No	No
<b>Diagnostics indication LED</b>			
• Status indicator digital output (green)	Yes	Yes	Yes
<b>Parameter</b>			
Remark	3 byte	1 byte	
Behavior on CPU/Master STOP, channel-wise			Substitute a value/keep last value
<b>Galvanic isolation</b>			
<b>Galvanic isolation digital outputs</b>			
• between the channels	No	No	Yes
• between the channels and the backplane bus	Yes	Yes	Yes
• between the channels and the load voltage L+			Yes
<b>Isolation</b>			
Isolation checked with	500 V DC	500 V DC	
<b>tested with</b>			
• Channels against backplane bus and load voltage L+			1500 V AC
• Load voltage L+ against backplane bus			500 V DC
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude			Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Dimensions</b>			
Width	15 mm	15 mm	15 mm
Height	81 mm	81 mm	81 mm
Depth	52 mm	52 mm	52 mm
<b>Weights</b>			
Weight, approx.	40 g	40 g	50 g

Ordering data	Article No.	Article No.
<b>Digital input modules</b>		<b>Accessories</b>
Ordering unit 5 items		<b>Label sheets DIN A4 (10 pieces)</b>
• 2 DI 24 V DC Standard	<b>6ES7131-4BB01-0AA0</b>	Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules
• 2 DI 24 V DC High Feature	<b>6ES7131-4BB01-0AB0</b>	• petrol
• 4 DI 24 V DC Standard	<b>6ES7131-4BD01-0AA0</b>	• red
• 4 DI 24 V DC High Feature	<b>6ES7131-4BD01-0AB0</b>	• yellow
• 2 DI 120 V AC	<b>6ES7131-4EB00-0AB0</b>	• light beige
• 2 DI 230 V AC	<b>6ES7131-4FB00-0AB0</b>	
• 4 DI 24 to 48 V UC	<b>6ES7131-4CD02-0AB0</b>	
• 4 DI 24 V DC SOURCE INPUT	<b>6ES7131-4BD51-0AA0</b>	
Ordering unit 1 item		
• 4 DI 24 V DC NAMUR	<b>6ES7131-4RD02-0AB0</b>	
• 8 DI 24 V DC Standard	<b>6ES7131-4BF00-0AA0</b>	
• 8 DI, 24 V DC, Standard SOURCE INPUT	<b>6ES7131-4BF50-0AA0</b>	
Ordering unit 100 items		
• 8 DI 24 V DC Standard	<b>6ES7131-4BF00-4AA0</b>	
<b>Digital output modules</b>		
Ordering unit 5 items		
• 2 DO 24 V DC/0.5 A Standard	<b>6ES7132-4BB01-0AA0</b>	
• 2 DO 24 V DC/0.5 A High Feature	<b>6ES7132-4BB01-0AB0</b>	
• 2 DO 24 V DC/2 A Standard	<b>6ES7132-4BB31-0AA0</b>	
• 2 DO 24 V DC/2 A High Feature	<b>6ES7132-4BB31-0AB0</b>	
• 4 DO 24 V DC/0.5 A Standard	<b>6ES7132-4BD02-0AA0</b>	
• 4 DO, 24 V DC/0.5 A, Standard SOURCE OUTPUT	<b>6ES7132-4BD50-0AA0</b>	
• 4 DO 24 V DC/0.5 A High Feature	<b>6ES7132-4BD00-0AB0</b>	
• 8 DO 24 V DC/0.5 A High Feature	<b>6ES7132-4BF00-0AB0</b>	
• 4 DO 24 V DC/2 A Standard	<b>6ES7132-4BD32-0AA0</b>	
• 4 DO 24 V DC/2 A High Feature	<b>6ES7132-4BD30-0AB0</b>	
• 2 DO 24 to 230 V AC/2 A	<b>6ES7132-4FB01-0AB0</b>	
• 2 DO 24 V DC to 230 V AC/5 A relay, NO contact	<b>6ES7132-4HB01-0AB0</b>	
• 2 DO 24...48 V DC/5 A, 24...230 V AC/5 A relay, changeover contact	<b>6ES7132-4HB12-0AB0</b>	
Ordering unit 1 item		
• 2 DO 24...48 V DC/5 A, 24...230 V AC/5 A relay, changeover contact, with manual operation	<b>6ES7132-4HB50-0AB0</b>	
• 8 DO 24 V DC/0.5 A Standard	<b>6ES7132-4BF00-0AA0</b>	
• 8 DO, 24 V DC/0.5 A, Standard SINK OUTPUT	<b>6ES7132-4BF50-0AA0</b>	
Ordering unit 100 items		
• 8 DO 24 V DC/0.5 A Standard	<b>6ES7132-4BF00-4AA0</b>	

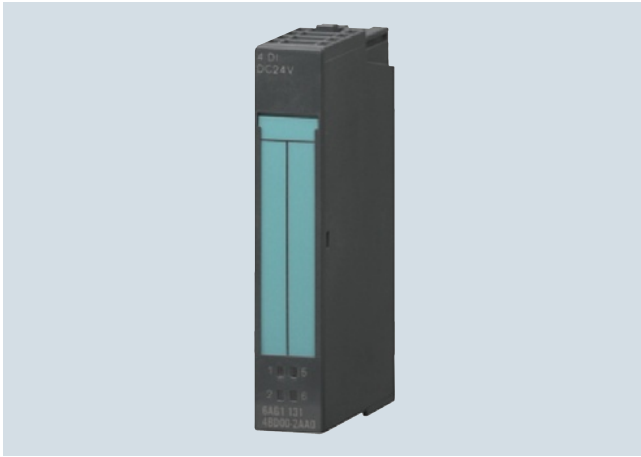
## I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

### SIPLUS digital electronic modules

#### Overview



- 2, 4 and 8-channel digital inputs and outputs for the ET 200S
- Can be plugged onto TM-E terminal modules with automatic coding
- High-feature versions for enhanced plant availability, additional functions and comprehensive diagnostics
- Hot swapping of modules possible

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For further technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

#### Technical specifications

Article number	6AG1131-4BD01-2AA0	6AG1131-4BD01-7AB0	6AG1131-4BF00-7AA0	6AG1131-4BF50-7AA0
Based on	6ES7131-4BD01-0AA0 SIPLUS DP 4DI ET200S	6ES7131-4BD01-0AB0 SIPLUS ET200S EM 4 DI HIGH FEATURES	6ES7131-4BF00-0AA0 SIPLUS ET200S EM 8 DI	6ES7131-4BF50-0AA0 SIPLUS ET200S EM 8 DI DC24V
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	-40 °C; = Tmin
• max.	60 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)		Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation in corrosive atmospheres!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Technical specifications (continued)**

Article number	<b>6AG1132-4BB01-2AB0</b>	<b>6AG1132-4BB31-7AB0</b>	<b>6AG1132-4BD02-7AA0</b>	<b>6AG1132-4BD32-2AA0</b>
Based on	<b>6ES7132-4BB01-0AB0</b> SIPLUS DP 2DO HF ET200S	<b>6ES7132-4BB31-0AB0</b> SIPLUS ET200S 2DO HIGH FEATURE	<b>6ES7132-4BD02-0AA0</b> SIPLUS ET200S 4DO (1VE = 5 STUECK)	<b>6ES7132-4BD32-0AA0</b> SIPLUS_ET200S_4DO DC24V/2A
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**I/O systems**

ET 200 systems for the control cabinet

ET 200S - I/O modules

**SIPLUS digital electronic modules****Technical specifications (continued)**

Article number	<b>6AG1132-4BF00-7AA0</b>	<b>6AG1132-4BF50-7AA0</b>	<b>6AG1132-4HB01-2AB0</b>	<b>6AG1132-4HB12-2AB0</b>
Based on	<b>6ES7132-4BF00-0AA0</b> SIPLUS ET200S EM 8 DO	<b>6ES7132-4BF50-0AA0</b> SIPLUS ET200S EM 8 DO DC24V/0.5A	<b>6ES7132-4HB01-0AB0</b> SIPLUS ET200S 2DORLY 24-48VDC 230VAC/5A	<b>6ES7132-4HB12-0AB0</b> SIPLUS ET200S 2DORLY 24-48VDC 230VAC/5A
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	-40 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
<b>Relative humidity</b>				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Ordering data	Article No.	Accessories	Article No.
<b>SIPLUS digital input modules</b> (extended temperature range and medial exposure) Ordering unit 5 units <ul style="list-style-type: none"> <li>• 4 DI 24 V DC Standard</li> <li>• 4 DI 24 V DC High Feature</li> <li>• 8 DI 24 V DC Standard</li> </ul> Ordering unit 1 unit <ul style="list-style-type: none"> <li>• 8 DI 24 V DC Source Input</li> </ul>	<b>6AG1131-4BD01-2AA0</b> <b>6AG1131-4BD01-7AB0</b> <b>6AG1131-4BF00-7AA0</b>  <b>6AG1131-4BF50-7AA0</b>	<b>Accessories</b>  See SIMATIC ET 200S digital electronic module, page 9/141	
<b>SIPLUS digital output modules</b> (extended temperature range and medial exposure) Ordering unit 5 units <ul style="list-style-type: none"> <li>• 2 DO 24 V DC/0.5 A High Feature</li> <li>• 2 DO 24 V DC/2 A High Feature</li> <li>• 4 DO 24 V DC/0.5 A Standard</li> <li>• 4 DO 24 V DC/2 A Standard</li> <li>• 2 DO 24 V DC to 230 V AC/5 A relay, NO contact</li> <li>• 2 DO 24...48 V DC/5 A, 24...230 V AC/5 A relay, changeover contact</li> </ul> Ordering unit 1 unit <ul style="list-style-type: none"> <li>• 8 DO 24 V DC/0.5 A Standard</li> <li>• 8 DO, 24 V DC/0.5 A, Standard SOURCE OUTPUT</li> </ul>	<b>6AG1132-4BB01-2AB0</b> <b>6AG1132-4BB31-7AB0</b> <b>6AG1132-4BD02-7AA0</b> <b>6AG1132-4BD32-2AA0</b> <b>6AG1132-4HB01-2AB0</b>  <b>6AG1132-4HB12-2AB0</b>  <b>6AG1132-4BF00-7AA0</b> <b>6AG1132-4BF50-7AA0</b>		



## I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

### Analog electronic modules

#### Overview



- Analog inputs and outputs for the ET 200S
- Can be plugged onto TM-E terminal modules with automatic coding
- High-feature variants with enhanced performance, precision and resolution
- High-speed variants with extremely fast, isochronous cycle times.
- Hot swapping of modules possible

#### Note:

Consult the configuring guide for selection of the appropriate TM-E terminal modules.

#### Technical specifications

Article number	6ES7134-4FB01-0AB0	6ES7134-4LB02-0AB0	6ES7134-4GB01-0AB0	6ES7134-4GB52-0AB0
	ET200S, EL-MOD., 2AI STD U, +/-10V,1-5V	ET200S, EL-MOD., 2AI U HF, +/-10V, 1..5V	ET200S, EL-MOD., 2AI STD I-2DMU, 0-20MA,	ET200S, EL-MOD., 2AI HS I-2DMU, 0-20MA,
<b>Product type designation</b>				
<b>Supply voltage</b>				
<b>Load voltage L+</b>				
<ul style="list-style-type: none"> <li>• Rated value (DC)</li> <li>• short-circuit protection</li> <li>• Reverse polarity protection</li> </ul>	24 V; From power module	24 V	24 V; From power module	24 V
	Yes	Yes	Yes; Destruction limit 35 mA per channel	Yes
<b>Input current</b>				
from load voltage L+ (without load), max.	30 mA	55 mA	80 mA	225 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA	10 mA	10 mA
<b>Output voltage</b>				
<b>Power supply to the transmitters</b>				
<ul style="list-style-type: none"> <li>• present</li> <li>• short-circuit proof</li> </ul>		No		Yes
				Yes
<b>Power losses</b>				
Power loss, typ.	0.6 W	0.85 W	0.6 W	2.5 W
<b>Address area</b>				
<b>Address space per module</b>				
<ul style="list-style-type: none"> <li>• Address space per module, max.</li> </ul>	4 byte	4 byte	4 byte	4 byte
<b>Analog inputs</b>				
Number of analog inputs	2	2	2	2
permissible input voltage for voltage input (destruction limit), max.	35 V; 35 V continuous; 75 V for max. 1 ms (mark to space ratio 1:20)	35 V; 35 V continuous; 75 V for max. 1 ms		
permissible input current for current input (destruction limit), max.			40 mA	
Cycle time (all channels) max.	Number of active channels per module x basic conversion time	0.5 ms; 0.5 ms for 2 channels without noise suppression, 18 / 21 ms per channel with noise suppression	Number of active channels per module x basic conversion time	0.25 ms
<b>Input ranges</b>				
<ul style="list-style-type: none"> <li>• Voltage</li> <li>• Current</li> <li>• Thermocouple</li> <li>• Resistance thermometer</li> <li>• Resistance</li> </ul>	Yes	Yes	No	No
	No	No	Yes	Yes
	No	No	No	No
	No	No	No	No
	No	No	No	No

#### Technical specifications (continued)

Article number	6ES7134-4FB01-0AB0 ET200S, EL-MOD., 2AI STD U, +/-10V,1-5V	6ES7134-4LB02-0AB0 ET200S, EL-MOD., 2AI U HF, +/-10V, 1..5V	6ES7134-4GB01-0AB0 ET200S, EL-MOD., 2AI STD I-2DMU, 0-20mA,	6ES7134-4GB52-0AB0 ET200S, EL-MOD., 2AI HS I-2DMU, 0-20MA,
<b>Input ranges (rated values), voltages</b>				
• 1 V to 5 V	Yes	Yes		
• Input resistance (1 V to 5 V)		800 kΩ		
• -10 V to +10 V	Yes	Yes		
• Input resistance (-10 V to +10 V)		800 kΩ		
• -5 V to +5 V	Yes	Yes		
• Input resistance (-5 V to +5 V)		800 kΩ		
<b>Input ranges (rated values), currents</b>				
• 0 to 20 mA				Yes
• Input resistance (0 to 20 mA)				106 Ω
• 4 mA to 20 mA			Yes; on 50 ohms	Yes
<b>Cable length</b>				
• shielded, max.	200 m	200 m	200 m	200 m
<b>Analog value creation</b>				
Measurement principle	integrating		integrating	
<b>Integration and conversion time/ resolution per channel</b>				
• Resolution with overrange (bit including sign), max.	14 bit; +/-10 V: 13 bits + sign, +/-5 V: 13 bits + sign; 1 to 5 V: 13 bits	16 bit; 0 to 5 V: 15 bits, +/-10 V: 16 bits, +/-5 V: 16 bits	13 bit; 4 to 20 mA: 13 bits	16 bit
• Integration time, parameterizable		Yes		
• Integration time (ms)	16,7 / 20 ms		16,7 / 20 ms	
• Interference voltage suppression for interference frequency f1 in Hz		60 / 50 Hz / no		
• Conversion time (per channel)	65 ms; 55 / 65 ms	0.04 ms; Without noise suppression 17/20 ms per channel with error	65 ms; 55 / 65 ms	
<b>Smoothing of measured values</b>				
• Parameterizable	Yes; In four stages by means of digital filtering	Yes; In 4 stages: 1 x, 4 x, 16 x, 32 x cycle time	Yes; In four stages by means of digital filtering	Yes
• Step: None	Yes; 1 x cycle time	Yes; 1 x	Yes; 1 x cycle time	Yes; 1
• Step: low	Yes; 4 x cycle time	Yes; 4 x	Yes; 4 x cycle time	Yes; 4
• Step: Medium	Yes; 32 x cycle time	Yes; 16 x	Yes; 32 x cycle time	Yes; 16
• Step: High	Yes; 64 x cycle time	Yes; 32 x	Yes; 64 x cycle time	Yes; 32
<b>Encoder</b>				
<b>Connection of signal encoders</b>				
• for voltage measurement		Yes		
• for current measurement as 2-wire transducer - Burden of 2-wire transmitter, max.			750 Ω	Yes
<b>Errors/accuracies</b>				
Linearity error (relative to input range), (+/-)	0.01 %	0.01 %	0.01 %	0.03 %
Temperature error (relative to input range), (+/-)	0.01 %/K	0.003 %/K	0.005 %/K	0.01 %/K
Crosstalk between the inputs, min.	-50 dB	-100 dB	-50 dB	50 dB
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.05 %	0.01 %	0.05 %	0.1 %
<b>Operational limit in overall temperature range</b>				
• Voltage, relative to input area, (+/-)	0.6 %	0.1 %; 0.2% without interference frequency suppression		
• Current, relative to input area, (+/-)			0.6 %	0.3 %

## I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

### Analog electronic modules

#### Technical specifications (continued)

Article number	6ES7134-4FB01-0AB0 ET200S, EL-MOD., 2AI STD U, +/-10V,1-5V	6ES7134-4LB02-0AB0 ET200S, EL-MOD., 2AI U HF, +/-10V, 1..5V	6ES7134-4GB01-0AB0 ET200S, EL-MOD., 2AI STD I-2DMU, 0-20MA,	6ES7134-4GB52-0AB0 ET200S, EL-MOD., 2AI HS I-2DMU, 0-20MA,
<b>Basic error limit (operational limit at 25 °C)</b>				
• Voltage, relative to input area, (+/-)	0.4 %	0.05 %; 0.1% without interference frequency suppression	0.4 %	0.2 %
• Current, relative to input area, (+/-)				
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>				
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB	90 dB	70 dB	
• common mode voltage (USS < 2.5 V) , min.	90 dB	100 dB		
<b>Isochronous mode</b>				
Isochronous operation (application synchronized up to terminal)	No	Yes	No	Yes
<b>Interrupts/diagnostics/ status information</b>				
<b>Alarms</b>				
• Hardware interrupt		Yes		Yes
<b>Diagnostic messages</b>				
• Diagnostic functions		Yes		Yes
• Wire break	Yes; Measuring range 1 to 5 V only	Yes; Measuring range 1 to 5 V only	Yes	Yes; at 4 to 20 mA
• Group error	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>				
• Group error SF (red)	Yes	Yes	Yes	Yes
<b>Parameter</b>				
Remark	4 byte	12 bytes, 4 bytes in compatibility mode	4 byte	
Diagnosis: wire break	Disable / enable (only in measuring range 1 to 5 V)			At 4 to 20 mA
Measurement type/range	deactivated / +/-5 V / 1 to 5 V / +/-10 V	deactivated / +/-5 V / 1 to 5 V / +/-10 V	deactivated / 4 to 20 mA	4 to 20 mA, 0 to 20 mA
Interference frequency suppression				No
Group diagnostics	Disable / enable	Disable / enable	Disable / enable	1
Overflow/underflow	Disable / enable	Disable / enable	Disable / enable	1
<b>Galvanic isolation</b>				
<b>Galvanic isolation analog inputs</b>				
• between the channels	No	No; however, increased permissible potential difference between the inputs.	No	No
• between the channels and the backplane bus	Yes	Yes	Yes	Yes
• between the channels and the load voltage L+	Yes	Yes	No	Yes
<b>Permissible potential difference</b>				
between the inputs (UCM)		140V DC/100V AC		
between inputs and MANA (UCM)	2 V AC PP			
between MANA and M internally (UISO)	75V DC/60V AC			75V DC/60V AC
<b>Isolation</b>				
Isolation checked with	500 V DC	500 V DC	500 V DC	
<b>Dimensions</b>				
Width	15 mm	15 mm	15 mm	15 mm
Height	81 mm	81 mm	81 mm	81 mm
Depth	52 mm	52 mm	52 mm	52 mm
<b>Weights</b>				
Weight, approx.	40 g	45 g	40 g	

#### Technical specifications (continued)

Article number	<b>6ES7134-4GB11-0AB0</b> ET200S, EL-MOD., 2AI STD I-4DMU, 0-20MA,	<b>6ES7134-4MB02-0AB0</b> ET200S, EL-MOD., 2AI HF I, +/-20MA	<b>6ES7134-4GD00-0AB0</b> ET200S, EL-MOD., 4AI STANDARD I 2-WIRE	<b>6ES7134-4FB52-0AB0</b> ET200S, EL-MOD., 2AI HS U, +/-10V, 15BIT	<b>6ES7134-4GB62-0AB0</b> ET200S, EL-MOD., 2AI HS I-4WIRE, 0-20MA
<b>Product type designation</b>					
<b>Supply voltage</b>					
<b>Load voltage L+</b>					
• Rated value (DC)	24 V; From power module	24 V	24 V; From power module	24 V	24 V
• short-circuit protection					Yes
• Reverse polarity protection		Yes	Yes	Yes	Yes
<b>Input current</b>					
from load voltage L+ (without load), max.	30 mA	48 mA	125 mA	80 mA	80 mA; without load
from backplane bus 3.3 V DC, max.	10 mA	10 mA	10 mA	10 mA	10 mA
<b>Output voltage</b>					
<b>Power supply to the transmitters</b>					
• present		Yes	Yes		Yes
• short-circuit proof		Yes	Yes; approx. 200 mA for module		Yes
<b>Encoder supply</b>					
Number of outputs					2
Type of output voltage					24 V
short-circuit protection					Yes
<b>Output current</b>					
• nominal					80 mA; Per channel
• permissible range					0 to 90 mA
<b>Power losses</b>					
Power loss, typ.	0.6 W	1.2 W	0.6 W	1.9 W	1.9 W
<b>Address area</b>					
<b>Address space per module</b>					
• Address space per module, max.	4 byte	4 byte	8 byte	4 byte	4 byte
<b>Analog inputs</b>					
Number of analog inputs	2	2	4	2	2
permissible input voltage for voltage input (destruction limit), max.				35 V; Permanent	
permissible input current for current input (destruction limit), max.	40 mA	50 mA	30 mA; limited electronically		30 mA
Cycle time (all channels) max.	Number of active channels per module x basic conversion time	0.5 ms; 0.5 ms for 2 channels without noise suppression, 18 / 21 ms per channel with noise suppression	40 ms; 33 to 40 ms	250 µs	250 µs
<b>Input ranges</b>					
• Voltage	No	No	No	Yes	No
• Current	Yes	Yes	Yes	No	Yes
• Thermocouple	No	No	No	No	No
• Resistance thermometer	No	No	No	No	No
• Resistance	No	No	No	No	No

## I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

### Analog electronic modules

#### Technical specifications (continued)

Article number	6ES7134-4GB11-0AB0 ET200S, EL-MOD., 2AI STD I-4DMU, 0-20MA,	6ES7134-4MB02-0AB0 ET200S, EL-MOD., 2AI HF I, +/-20MA	6ES7134-4GD00-0AB0 ET200S, EL-MOD., 4AI STANDARD I 2-WIRE	6ES7134-4FB52-0AB0 ET200S, EL-MOD., 2AI HS U, +/-10V, 15BIT	6ES7134-4GB62-0AB0 ET200S, EL-MOD., 2AI HS I-4WIRE, 0-20MA
<b>Input ranges (rated values), voltages</b>					
• 1 V to 5 V				Yes	
• Input resistance (1 V to 5 V)				120 kΩ	
• -10 V to +10 V				Yes	
• Input resistance (-10 V to +10 V)				120 kΩ	
• -2.5 V to +2.5 V				Yes	
• Input resistance (-2.5 V to +2.5 V)				120 kΩ	
• -5 V to +5 V				Yes	
• Input resistance (-5 V to +5 V)				120 kΩ	
<b>Input ranges (rated values), currents</b>					
• 0 to 20 mA					Yes
• Input resistance (0 to 20 mA)					106 Ω
• -20 mA to +20 mA	Yes; 50 Ohm	Yes			Yes
• 4 mA to 20 mA	Yes; 50 Ohm	Yes	Yes; Into 25 Ohm		Yes
<b>Cable length</b>					
• shielded, max.	200 m	200 m	200 m	200 m	200 m
<b>Analog value creation</b>					
Measurement principle	integrating	Sigma Delta	integrating		
<b>Integration and conversion time/ resolution per channel</b>					
• Resolution with overrange (bit including sign), max.	14 bit; +/-20 mA: 14 bits, 4 to 20 mA: 13 bits	16 bit; as required	13 bit; 4 to 20 mA: 13 bits	16 bit; 15 bits: 1 to 5 V; +/-2.5 V; 16 bits: +/-10 V; +/-5 V	16 bit
• Integration time, parameterizable		Yes	Yes		
• Integration time (ms)	16,7 / 20 ms		16,67 / 20 ms		
• Interference voltage suppression for interference frequency f1 in Hz		60 / 50 Hz / no			
• Conversion time (per channel)	65 ms; 55 / 65 ms	0.04 ms; Without noise suppression 17/20 ms per channel with error			
<b>Smoothing of measured values</b>					
• Parameterizable	Yes; In four stages by means of digital filtering	Yes; In 4 stages: 1 x, 4 x, 16 x, 32 x cycle time	Yes; in 4 stages	Yes	Yes
• Step: None	Yes; 1 x cycle time	Yes; 1 x	Yes; 1 x cycle time	Yes; 1 x cycle time	Yes; 1 x cycle time
• Step: low	Yes; 4 x cycle time	Yes; 4 x	Yes; 4 x cycle time	Yes; 4 x cycle time	Yes; 4 x cycle time
• Step: Medium	Yes; 32 x cycle time	Yes; 16 x	Yes; 16 x cycle time	Yes; 16 x cycle time	Yes; 16 x cycle time
• Step: High	Yes; 64 x cycle time	Yes; 32 x	Yes; 32 x cycle time	Yes; 32 x cycle time	Yes; 32 x cycle time
<b>Encoder</b>					
<b>Connection of signal encoders</b>					
• for voltage measurement				Yes	
• for current measurement as 2-wire transducer					No
- Burden of 2-wire transmitter, max.	750 Ω	750 Ω	750 Ω		

**Technical specifications (continued)**

Article number	<b>6ES7134-4GB11-0AB0</b> ET200S, EL-MOD., 2AI STD I-4DMU, 0-20MA,	<b>6ES7134-4MB02-0AB0</b> ET200S, EL-MOD., 2AI HF I, +/-20MA	<b>6ES7134-4GD00-0AB0</b> ET200S, EL-MOD., 4AI STANDARD I 2-WIRE	<b>6ES7134-4FB52-0AB0</b> ET200S, EL-MOD., 2AI HS U, +/-10V, 15BIT	<b>6ES7134-4GB62-0AB0</b> ET200S, EL-MOD., 2AI HS I-4WIRE, 0-20MA
<b>Errors/accuracies</b>					
Linearity error (relative to input range), (+/-)	0.01 %	0.03 %	0.01 %	0.03 %	0.03 %
Temperature error (relative to input range), (+/-)	0.005 %/K	0.003 %/K	0.003 %/K	0.01 %/K	0.01 %/K
Crosstalk between the inputs, min.	-50 dB	-100 dB	-50 dB	-50 dB	-50 dB
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.05 %	0.01 %	0.05 %	0.1 %	0.1 %
<b>Operational limit in overall temperature range</b>					
• Voltage, relative to input area, (+/-)				0.3 %	
• Current, relative to input area, (+/-)	0.6 %	0.1 %; 0.2% without interference frequency suppression	0.4 %		0.3 %
<b>Basic error limit (operational limit at 25 °C)</b>					
• Voltage, relative to input area, (+/-)				0.2 %	
• Current, relative to input area, (+/-)	0.4 %	0.05 %; 0.1% without interference frequency suppression	0.3 %		0.2 %
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, <math>f1 =</math> interference frequency</b>					
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB	90 dB	70 dB		
• common mode voltage (USS < 2.5 V), min.		100 dB			
<b>Isochronous mode</b>					
Isochronous operation (application synchronized up to terminal)	No	Yes	No	Yes	Yes
<b>Interrupts/diagnostics/status information</b>					
<b>Alarms</b>					
• Hardware interrupt		Yes		Yes	Yes
<b>Diagnostic messages</b>					
• Diagnostic functions		Yes	Yes; Can be read out	Yes	Yes
• Diagnostic information readable				Yes	Yes
• Wire break	Yes; Measuring range 4 to 20 mA only	Yes; Measuring range 4 to 20 mA only	Yes; Measuring range 1 to 5 V only	Yes; at 1 to 5 V	Yes; Measuring range 4 to 20 mA only
• Group error	Yes	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>					
• Group error SF (red)	Yes	Yes	Yes	Yes	Yes
<b>Parameter</b>					
Remark	4 byte	12 bytes, 4 bytes in compatibility mode	7 byte	12 bytes, 4 bytes in compatibility mode	
Diagnosis: wire break	Disable / enable (only in measuring range 4 to 20 mA)	Disable / enable	1		At 4 to 20 mA
Measurement type/range	deactivated / +/-20 mA / 4 to 20 mA	deactivated / +/-20 mA / 4 to 20 mA	1	Deactivated / +/-5 V / 1 to 5 V / +/-10 V / +/-2.5 V	4 to 20 mA, 0 to 20 mA, +/-20 mA
Group diagnostics	Disable / enable	Disable / enable	1	Disable / enable	Yes
Overflow/underflow	Disable / enable	Disable / enable	1	Disable / enable	Yes

## I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

### Analog electronic modules

#### Technical specifications (continued)

Article number	<b>6ES7134-4GB11-0AB0</b> ET200S, EL-MOD., 2AI STD I-4DMU, 0-20MA,	<b>6ES7134-4MB02-0AB0</b> ET200S, EL-MOD., 2AI HF I, +/-20MA	<b>6ES7134-4GD00-0AB0</b> ET200S, EL-MOD., 4AI STANDARD I 2-WIRE	<b>6ES7134-4FB52-0AB0</b> ET200S, EL-MOD., 2AI HS U, +/-10V, 15BIT	<b>6ES7134-4GB62-0AB0</b> ET200S, EL-MOD., 2AI HS I-4WIRE, 0-20MA
<b>Galvanic isolation</b>					
<b>Galvanic isolation analog inputs</b>					
• between the channels	No	No; however, increased permissible potential difference between the inputs.	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes
• between the channels and the load voltage L+	No	Yes	No	Yes	Yes
<b>Permissible potential difference</b>					
between MANA and M internally (UISO)					75V DC/60V AC
<b>Isolation</b>					
Isolation checked with	500 V DC		500 V DC	500 V DC	
<b>Dimensions</b>					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	81 mm	81 mm	81 mm	81 mm	81 mm
Depth	52 mm	52 mm	52 mm	52 mm	52 mm
<b>Weights</b>					
Weight, approx.	40 g	45 g	40 g	45 g	45 g
Article number	<b>6ES7134-4JB01-0AB0</b> ET200S, EL-MOD., 2AI TC, +/-80MV, 15BIT	<b>6ES7134-4JB51-0AB0</b> ET200S, EL-MOD., 2/4 AI RTD STANDARD	<b>6ES7134-4JD00-0AB0</b> ET200S, EL-MOD., 4AI TC, +/-80MV, 15BIT	<b>6ES7134-4NB01-0AB0</b> ET200S, EL-MOD., 2AI TC HF, 15BIT	<b>6ES7134-4NB51-0AB0</b> ET200S, EL-MOD., 2AI RTD HF, 15BIT
<b>Product type designation</b>					
<b>Supply voltage</b>					
<b>Load voltage L+</b>					
• Rated value (DC)	24 V; From power module	24 V; From power module	24 V; From power module	24 V; From power module	24 V; From power module
• Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
<b>Input current</b>					
from load voltage L+ (without load), max.	30 mA	30 mA	30 mA	30 mA	30 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA	10 mA	10 mA	10 mA
<b>Output voltage</b>					
<b>Power supply to the transmitters</b>					
• present		Yes			
• short-circuit proof		Yes			
<b>Power losses</b>					
Power loss, typ.	0.6 W	0.6 W	0.6 W	0.6 W	0.6 W
<b>Address area</b>					
<b>Address space per module</b>					
• Address space per module, max.	4 byte	8 byte	8 byte	4 byte	4 byte

#### Technical specifications (continued)

Article number	<b>6ES7134-4JB01-0AB0</b> ET200S, EL-MOD., 2AI TC, +/-80mV, 15BIT	<b>6ES7134-4JB51-0AB0</b> ET200S, EL-MOD., 2/4 AI RTD STANDARD	<b>6ES7134-4JD00-0AB0</b> ET200S, EL-MOD., 4AI TC, +/-80mV, 15BIT	<b>6ES7134-4NB01-0AB0</b> ET200S, EL-MOD., 2AI TC HF, 15BIT	<b>6ES7134-4NB51-0AB0</b> ET200S, EL-MOD., 2AI RTD HF, 15BIT
<b>Analog inputs</b>					
Number of analog inputs	2	4; 2 for 3 or 4-wire connection	4	2	2
permissible input voltage for voltage input (destruction limit), max.	10 V; Permanent	9 V	10 V; Permanent	20 V; +/-20 V, continuous	9 V
Constant measurement current for resistance-type transmitter, typ.		1.67 mA			1.25 mA
Cycle time (all channels) max.	Number of active channels per module x basic conversion time	Number of active channels per module x basic conversion time	Number of active channels per module x basic conversion time	Number of active channels per module x basic conversion time	Number of active channels per module x basic conversion time
Technical unit for temperature measurement adjustable	No	No	No	Yes	Yes
<b>Input ranges</b>					
• Voltage	Yes	No	Yes	Yes	No
• Current	No	No	No	No	No
• Thermocouple	Yes	No	Yes	Yes	No
• Resistance thermometer	No	Yes	No	No	Yes
• Resistance	No	Yes	No	No	Yes
<b>Input ranges (rated values), voltages</b>					
• -80 mV to +80 mV	Yes		Yes	Yes	
• Input resistance (-80 mV to +80 mV)	1 MΩ		1 MΩ	1 MΩ	
<b>Input ranges (rated values), thermoelements</b>					
• Type B	Yes		Yes	Yes	
• Input resistance (Type B)	1 MΩ		1 MΩ	1 MΩ	
• Type C				Yes	
• Input resistance (Type C)				1 MΩ	
• Type E	Yes		Yes	Yes	
• Input resistance (Type E)	1 MΩ		1 MΩ	1 MΩ	
• Type J	Yes		Yes	Yes	
• Input resistance (type J)	1 MΩ		1 MΩ	1 MΩ	
• Type K	Yes		Yes	Yes	
• Input resistance (Type K)	1 MΩ		1 MΩ	1 MΩ	
• Type L	Yes		Yes	Yes	
• Input resistance (Type L)	1 MΩ		1 MΩ	1 MΩ	
• Type N	Yes		Yes	Yes	
• Input resistance (Type N)	1 MΩ		1 MΩ	1 MΩ	
• Type R	Yes		Yes	Yes	
• Input resistance (Type R)	1 MΩ		1 MΩ	1 MΩ	
• Type S	Yes		Yes	Yes	
• Input resistance (Type S)	1 MΩ		1 MΩ	1 MΩ	
• Type T	Yes		Yes	Yes	
• Input resistance (Type T)	1 MΩ		1 MΩ	1 MΩ	



## I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

### Analog electronic modules

#### Technical specifications (continued)

Article number	6ES7134-4JB01-0AB0 ET200S, EL-MOD., 2AI TC, +/-80MV, 15BIT	6ES7134-4JB51-0AB0 ET200S, EL-MOD., 2/4 AI RTD STANDARD	6ES7134-4JD00-0AB0 ET200S, EL-MOD., 4AI TC, +/-80MV, 15BIT	6ES7134-4NB01-0AB0 ET200S, EL-MOD., 2AI TC HF, 15BIT	6ES7134-4NB51-0AB0 ET200S, EL-MOD., 2AI RTD HF, 15BIT
<b>Input ranges (rated values), resistance thermometer</b>					
• Cu 10					Yes
• Input resistance (Cu 10)					10 MΩ
• Ni 100		Yes; Standard/climate			Yes
• Input resistance (Ni 100)		2 000 kΩ			10 MΩ
• Ni 1000					Yes
• Input resistance (Ni 1000)					10 MΩ
• Ni 120					Yes
• Input resistance (Ni 120)					10 MΩ
• Ni 200					Yes
• Input resistance (Ni 200)					10 MΩ
• Ni 500					Yes
• Input resistance (Ni 500)					10 MΩ
• Pt 100		Yes; Standard/climate			Yes
• Input resistance (Pt 100)		2 000 kΩ			10 MΩ
• Pt 1000					Yes
• Input resistance (Pt 1000)					10 MΩ
• Pt 200					Yes
• Input resistance (Pt 200)					10 MΩ
• Pt 500					Yes
• Input resistance (Pt 500)					10 MΩ
<b>Input ranges (rated values), resistors</b>					
• 0 to 150 ohms		Yes			Yes
• Input resistance (0 to 150 ohms)		2 000 kΩ			10 MΩ
• 0 to 300 ohms		Yes			Yes
• Input resistance (0 to 300 ohms)		2 000 kΩ			10 MΩ
• 0 to 600 ohms		Yes			Yes
• Input resistance (0 to 600 ohms)		2 000 kΩ			10 MΩ
• 0 to 3000 ohms					Yes
• Input resistance (0 to 3000 ohms)					10 MΩ
<b>Thermocouple (TC)</b>					
<b>Temperature compensation</b>					
- internal temperature compensation	Not possible		Not possible	Yes; possible with TM-E15S24-AT, TM-E15C24-AT	Yes
- external temperature compensation with compensations socket	Yes; possible, one external compensating box per channel		Yes; possible, one external compensating box per channel	Yes; one external compensating box per channel	
<b>Characteristic linearization</b>					
• Parameterizable	Yes; Type B, E, J, K, L, N, R, S, T to IEC 584	Yes; for Pt100, Ni100	Yes; Type B, E, J, K, L, N, R, S, T to IEC 584	Yes	Yes; for Ptxxx, Nixxx
- for thermocouples				Type B, C, E, J, K, L, N, R, S, T to IEC 584	
- for resistance thermometer		Pt100 (standard, climatic range), Ni100 (standard, climatic range)			Ptxxx, Nixxx
<b>Cable length</b>					
• shielded, max.	50 m	200 m	50 m	50 m	200 m

**Technical specifications (continued)**

Article number	<b>6ES7134-4JB01-0AB0</b> ET200S, EL-MOD., 2AI TC, +/-80MV, 15BIT	<b>6ES7134-4JB51-0AB0</b> ET200S, EL-MOD., 2/4 AI RTD STANDARD	<b>6ES7134-4JD00-0AB0</b> ET200S, EL-MOD., 4AI TC, +/-80MV, 15BIT	<b>6ES7134-4NB01-0AB0</b> ET200S, EL-MOD., 2AI TC HF, 15BIT	<b>6ES7134-4NB51-0AB0</b> ET200S, EL-MOD., 2AI RTD HF, 15BIT
<b>Analog value creation</b>					
Measurement principle	integrating	integrating	integrating	integrating	integrating (Sigma-Delta)
<b>Integration and conversion time/ resolution per channel</b>					
<ul style="list-style-type: none"> <li>Resolution with overrange (bit including sign), max.</li> </ul>	16 bit; 15 bits + sign	16 bit; 150 ohms: 14 bits; 300, 600 ohms: 15 bits, Pt100, Ni100: 16 bits	16 bit; 15 bits + sign	16 bit	16 bit; for Pt100, Ni100, Ni120, Pt200, Ni200, Pt 500, Ni 500, Pt1000, Ni1000, Cu10: 15 bits + sign; for 150, 300, 600, 3000 ohms: 15 bits; for PTC: 1 bits
<ul style="list-style-type: none"> <li>Integration time, parameterizable</li> <li>Integration time (ms)</li> <li>Conversion time (per channel)</li> </ul>	Yes 16,7 / 20 ms 65 s; 55 / 65 ms (additional 20 ms on activated wire-break test)	Yes 16,7 / 20 ms 66 / 80 ms; additional conversion time for diagnostic wire break test	Yes 16,7 / 20 ms 65 ms; 55 / 65 ms (additional 20 ms on activated wire-break test)	Yes 16,7 / 20 ms 66 ms; 66 / 80 ms; additional conversion time for diagnostic wire break test	Yes 16,7 / 20 ms Basic conversion time incl. integration time: 50 / 60 ms; additional conversion time for diagnostics of wire break test: 5 / 5 ms; additional conversion time for line compen- sation with 3-wire connection: 50 / 60 ms
<b>Smoothing of measured values</b>					
<ul style="list-style-type: none"> <li>Parameterizable</li> <li>Step: None</li> <li>Step: low</li> <li>Step: Medium</li> <li>Step: High</li> </ul>	Yes; In four stages by means of digital filtering Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; In four stages by means of digital filtering Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; In four stages by means of digital filtering Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; In four stages by means of digital filtering Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; In four stages by means of digital filtering Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time
<b>Encoder</b>					
<b>Connection of signal encoders</b>					
<ul style="list-style-type: none"> <li>for voltage measurement</li> <li>for resistance measurement with two-wire connection</li> <li>for resistance measurement with three-wire connection</li> <li>for resistance measurement with four-wire connection</li> </ul>	Yes	Yes	Yes		Yes  Yes; internal compen- sation of the line resis- tances Yes

## I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

### Analog electronic modules

#### Technical specifications (continued)

Article number	<b>6ES7134-4JB01-0AB0</b> ET200S, EL-MOD., 2AI TC, +/-80MV, 15BIT	<b>6ES7134-4JB51-0AB0</b> ET200S, EL-MOD., 2/4 AI RTD STANDARD	<b>6ES7134-4JD00-0AB0</b> ET200S, EL-MOD., 4AI TC, +/-80MV, 15BIT	<b>6ES7134-4NB01-0AB0</b> ET200S, EL-MOD., 2AI TC HF, 15BIT	<b>6ES7134-4NB51-0AB0</b> ET200S, EL-MOD., 2AI RTD HF, 15BIT
<b>Errors/accuracies</b>					
Linearity error (relative to input range), (+/-)	0.01 %	0.01 %	0.01 %	0.01 %	0.01 %
Temperature error (relative to input range), (+/-)	0.005 %/K	0.005 %/K	0.005 %/K	0.005 %/K	0.0009 %/K
Crosstalk between the inputs, min.	-50 dB	-50 dB	-50 dB	-50 dB	-50 dB
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.05 %	0.05 %	0.05 %	0.05 %	0.05 %
<b>Operational limit in overall temperature range</b>					
• Voltage, relative to input area, (+/-)	0.6 %		0.6 %	0.1 %; +/-1.5 K for thermocouples, +/-7 K for thermocouples type C, +/-2.5 K with static thermal state (ambient temperature change < 0.3 K/min)	
• Resistance thermometer, relative to input area, (+/-)		0.6 %			Resistance-type transmitter: +/-0.1%; Pt100, Pt200, Pt500, Pt1000 standard: +/-1.0 K; Pt100, Pt200, Pt500, Pt1000 climate: +/-0.25 K; Ni100, Ni120, Ni200, Ni500, Ni1000 standard and climate: +/-0.4 K; Cu10 +/-1.5 K
<b>Basic error limit (operational limit at 25 °C)</b>					
• Voltage, relative to input area, (+/-)	0.4 %		0.4 %	0.05 %; +/-1 K with thermocouples, +/-5 K with thermocouples type C, +/-1.5 K with static thermal state (ambient temperature change < 0.3 K/min)	
• Resistance thermometer, relative to input area, (+/-)		0.4 %			Resistance-type transmitter: +/-0.05%; Pt100, Pt200, Pt500, Pt1000 standard: +/-0.6 K; Pt100, Pt200, Pt500, Pt1000 climate: +/-0.13 K; Ni100, Ni120, Ni200, Ni500, Ni1000 standard and climate: +/-0.2 K; Cu10 +/-1 K
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, <math>f1 = \text{interference frequency}</math></b>					
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB	70 dB	70 dB	70 dB	70 dB
• common mode voltage (USS < 2.5 V), min.	90 dB	90 dB	90 dB	90 dB	90 dB

**Technical specifications (continued)**

Article number	<b>6ES7134-4JB01-0AB0</b> ET200S, EL-MOD., 2AI TC, +/-80MV, 15BIT	<b>6ES7134-4JB51-0AB0</b> ET200S, EL-MOD., 2/4 AI RTD STANDARD	<b>6ES7134-4JD00-0AB0</b> ET200S, EL-MOD., 4AI TC, +/-80MV, 15BIT	<b>6ES7134-4NB01-0AB0</b> ET200S, EL-MOD., 2AI TC HF, 15BIT	<b>6ES7134-4NB51-0AB0</b> ET200S, EL-MOD., 2AI RTD HF, 15BIT
<b>Isochronous mode</b>					
Isochronous operation (application synchronized up to terminal)	No	No	No		No
<b>Diagnostic messages</b>					
• Diagnostic functions	Yes; Can be read out	Yes; Can be read out	Yes; Can be read out		
• Diagnostic information readable	Yes		Yes		
• Wire break	Yes; A break in the wire is only detected for thermocouples	Yes	Yes; A break in the wire is only detected for thermocouples	Yes; only thermo-couples	Yes
• Group error	Yes	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>					
• Group error SF (red)	Yes	Yes	Yes	Yes	Yes
<b>Parameter</b>					
Remark	4 byte		4 byte	4 byte	7 byte
Diagnosis: wire break	Disable / enable (wire break is detected only in thermocouples)	Disable / enable	Disable / enable (wire break is detected only in thermocouples)	Disable / enable (wire break is detected only in thermocouples)	Disable / enable
Measurement type/range	Deactivated/ +/- 80 mV/ TC-EL Type T (Cu-CuNi)/ TC-EL Type K (NiCr-Ni)/ TC-EL Type B (PtRh-PtRh)/ TC-EL Type c (Wer-Wer) TC-EL Type N (NiCrSi-NiSi)/ TC-EL Type E (NiCr-CuNi)/ TC-EL Type R (PtRh-Pt)/ TC-EL Type S (PtRh-Pt)/ TC-EL Type J (Fe-Cu-Ni)/ TC	deactivated/ 150 ohms/; 300 ohms/ 600 ohms/ Pt100 climatic/ Pt100 standard; Ni100 standard / Ni100 climatic, 2, 3 or 4-wire	Deactivated/ +/- 80 mV/ TC-EL Type T (Cu-CuNi)/ TC-EL Type K (NiCr-Ni)/ TC-EL Type B (PtRh-PtRh)/ TC-EL Type c (Wer-Wer) TC-EL Type N (NiCrSi-NiSi)/ TC-EL Type E (NiCr-CuNi)/ TC-EL Type R (PtRh-Pt)/ TC-EL Type S (PtRh-Pt)/ TC-EL Type J (Fe-Cu-Ni)/ TC	Deactivated/ +/- 80 mV/ TC-EL Type T (Cu-CuNi)/ TC-EL Type K (NiCr-Ni)/ TC-EL Type B (PtRh-PtRh)/ TC-EL Type c (Wer-Wer) TC-EL Type N (NiCrSi-NiSi)/ TC-EL Type E (NiCr-CuNi)/ TC-EL Type R (PtRh-Pt)/ TC-EL Type S (PtRh-Pt)/ TC-EL Type J (Fe-Cu-Ni)/ TC	Deactivated/ 150 Ohm / 300 Ohm / 600 Ohm / Pt100/Pt200/Pt500/ Pt1000 each standard or climate range / Ni100/Ni120/Ni200/ Ni500/Ni1000 each standard or climate range / Cu10 each standard or climate range / PTC
Group diagnostics	Disable / enable	Disable / enable	Disable / enable	Disable / enable	Disable / enable
Overflow/underflow	Disable / enable	Disable / enable	Disable / enable	Disable / enable	Disable / enable
Comparison point	none / RTD		none / RTD	none / yes, internal	
Comparison point number	None / 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8		None / 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8		
Unit	Celsius		Celsius	Celsius / Fahrenheit	
<b>Galvanic isolation</b>					
<b>Galvanic isolation analog inputs</b>					
• between the channels	No	No	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes	Yes	Yes
• between the channels and the load voltage L+	Yes	Yes	Yes	Yes	Yes
<b>Permissible potential difference</b>					
between inputs and MANA (UCM)	2 V AC PP		2 V AC PP	140V DC/100V AC	
between MANA and M internally (UISO)	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>					
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC
<b>Dimensions</b>					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	81 mm	81 mm	81 mm	81 mm	81 mm
Depth	52 mm	52 mm	52 mm	52 mm	52 mm
<b>Weights</b>					
Weight, approx.	40 g	40 g	40 g	40 g	40 g

**I/O systems**

ET 200 systems for the control cabinet

ET 200S - I/O modules

**Analog electronic modules****Technical specifications (continued)**

Article number	<b>6ES7135-4FB01-0AB0</b> ET200S, EL-MOD., 2AO U, +/-10V, 1-5V	<b>6ES7135-4FB52-0AB0</b> ET200S, EL-MOD., 2AO U, +/-10V, 1-5V	<b>6ES7135-4LB02-0AB0</b> ET200S, EL-MOD., 2AO HF U, +/-10V, 1-5V
<b>Product type designation</b>			
<b>Supply voltage</b>			
<b>Load voltage L+</b>			
• Rated value (DC)	24 V; From power module	24 V; From power module	24 V
• Reverse polarity protection	Yes	Yes	Yes
<b>Input current</b>			
from load voltage L+ (without load), max.	130 mA	100 mA	80 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA	10 mA
<b>Power losses</b>			
Power loss, max.	2 W	2 W	1.2 W
<b>Address area</b>			
<b>Address space per module</b>			
• Address space per module, max.	4 byte	4 byte	4 byte
<b>Analog outputs</b>			
Number of analog outputs	2	2	2
Voltage output, short-circuit protection	Yes	Yes	Yes
Voltage output, short-circuit current, max.	25 mA	25 mA	25 mA
Cycle time (all channels) max.	1.5 ms	0.25 ms	0.5 ms; At max. 0.5 µF
<b>Output ranges, voltage</b>			
• 1 V to 5 V	Yes	Yes	Yes; -5 to +5 V also implemented
• -10 V to +10 V	Yes	Yes; +/-5V as well	Yes
<b>Connection of actuators</b>			
• for voltage output two-wire connection	Yes; Without compensation of the line resistances	Yes; Without compensation of the line resistances	Yes
• for voltage output four-wire connection	Yes	Yes	Yes
<b>Load impedance (in rated range of output)</b>			
• with voltage outputs, min.	1 kΩ	1 kΩ	1 kΩ
• with voltage outputs, capacitive load, max.	1 µF	1 µF; 0.1 µF for Twa=0.1 ms	0.5 µF
<b>Destruction limits against externally applied voltages and currents</b>			
• Voltages at the outputs towards MANA	15 V; max. 15 V continuous; 75 V for max. 1 s (mark to space ratio 1:20)	15 V; Max. 15 V for max. 5 hours, 75 V for max. 1 s	15 V; as required
• Current, max.	50 mA; DC	30 mA; DC	
<b>Cable length</b>			
• shielded, max.	200 m	200 m; Max. 20 m for TWA 100 µs	200 m; 100m if Twa < 2ms

**Technical specifications (continued)**

Article number	<b>6ES7135-4FB01-0AB0</b> ET200S, EL-MOD., 2AO U, +/-10V, 1-5V	<b>6ES7135-4FB52-0AB0</b> ET200S, EL-MOD., 2AO U, +/-10V, 1-5V	<b>6ES7135-4LB02-0AB0</b> ET200S, EL-MOD., 2AO HF U, +/-10V, 1-5V
<b>Analog value creation</b>			
<b>Integration and conversion time/ resolution per channel</b>			
• Resolution with overrange (bit including sign), max.	14 bit; 1 to 5 V: 12 bits, +/-10 V: 13 bits + sign	16 bit; 1 to 5 V: 14 bits, +/-10 V: 15 bit + sign, +/-5 V: 14 bits + sign	16 bit; 15 bits + sign
<b>Settling time</b>			
• for resistive load	0.1 ms	0.05 ms	0.2 ms
• for capacitive load	0.5 ms	0.05 ms	0.5 ms; At max. 0.5 µF
• for inductive load	0.5 ms	0.05 ms	0.5 ms
<b>Errors/accuracies</b>			
Output ripple (based on output area, bandwidth 0 to 50 kHz), (+/-)	0.02 %	0.02 %	0.02 %
Linearity error (relative to output range), (+/-)	0.02 %	0.03 %	0.01 %
Temperature error (relative to output range), (+/-)	0.01 %/K	0.01 %/K	
Crosstalk between the outputs, min.		60 dB	60 dB
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.05 %	0.03 %	0.01 %
<b>Operational limit in overall temperature range</b>			
• Voltage, relative to output area, (+/-)	0.4 %	0.2 %	0.1 %
<b>Basic error limit (operational limit at 25 °C)</b>			
• Voltage, relative to output area, (+/-)	0.2 %	0.01 %	0.05 %
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)		Yes	Yes
<b>Interrupts/diagnostics/ status information</b>			
Substitute values connectable	Yes; 0 to 65535 (range of values must be within the rated range)	Yes; 0 to 65535 (range of values must be within the rated range)	Yes
<b>Diagnostic messages</b>			
• Diagnostic functions		Yes	
• Diagnostic information readable		Yes	Yes
• Wire break		No	
• Short circuit	Yes	Yes	Yes
• Group error	Yes	Yes	Yes
<b>Diagnostics indication LED</b>			
• Group error SF (red)	Yes	Yes	Yes
<b>Parameter</b>			
Remark	7 byte	7	7 byte
Output type/range	deactivated / 1 to 5 V / +/- 10 V	deactivated / 1 to 5 V / +/- 10 V / +/- 5 V	deactivated / 1 to 5 V / +/- 10 V / +/- 5 V
Diagnosis: short circuit	Disable / enable	Disable / enable	Disable / enable
Interference frequency suppression			No
Group diagnostics	Disable / enable	Disable / enable	Disable / enable
Behavior on CPU/Master STOP	Output current and de-energized/ substitute a value/keep last value	Output current and de-energized/ substitute a value/keep last value	Output current and de-energized/ substitute a value/keep last value

## I/O systems

ET 200 systems for the control cabinet

ET 200S - I/O modules

### Analog electronic modules

#### Technical specifications (continued)

Article number	<b>6ES7135-4FB01-0AB0</b> ET200S, EL-MOD., 2AO U, +/-10V, 1-5V	<b>6ES7135-4FB52-0AB0</b> ET200S, EL-MOD., 2AO U, +/-10V, 1-5V	<b>6ES7135-4LB02-0AB0</b> ET200S, EL-MOD., 2AO HF U, +/-10V, 1-5V
<b>Galvanic isolation</b>			
<b>Galvanic isolation analog outputs</b>			
• between the channels	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes
• between the channels and the load voltage L+	Yes	Yes	Yes
<b>Permissible potential difference</b>			
between MANA and M internally (UISO)	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>			
Isolation checked with			500 V DC
<b>Dimensions</b>			
Width	15 mm	15 mm	15 mm
Height	81 mm	81 mm	81 mm
Depth	52 mm	52 mm	52 mm
<b>Weights</b>			
Weight, approx.	40 g	40 g	40 g
Article number	<b>6ES7135-4GB01-0AB0</b> ET200S, EL-MOD., 2AO I, +/-20MA, 4-20MA	<b>6ES7135-4MB02-0AB0</b> ET200S, EL-MOD., 2AO I HF, +/-20MA, 4-20MA	<b>6ES7135-4GB52-0AB0</b> ET200S, EL-MOD., 2AO I, +/-20MA, 4-20MA
<b>Product type designation</b>			
<b>Supply voltage</b>			
<b>Load voltage L+</b>			
• Rated value (DC)	24 V; From power module	24 V	24 V
• Reverse polarity protection	Yes	Yes	Yes
<b>Input current</b>			
from load voltage L+ (without load), max.	150 mA	80 mA	150 mA; With load
from backplane bus 3.3 V DC, max.	10 mA	10 mA	10 mA
<b>Power losses</b>			
Power loss, max.	2 W	1.2 W	2.4 W; Typical
<b>Address area</b>			
<b>Address space per module</b>			
• Address space per module, max.	4 byte	4 byte	4 byte
<b>Analog outputs</b>			
Number of analog outputs	2	2	2
Current output, no-load voltage, max.	18 V	18 V	18 V
Cycle time (all channels) max.	1.5 ms	0.5 ms	250 µs
<b>Output ranges, current</b>			
• -20 mA to +20 mA	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes
<b>Connection of actuators</b>			
• for current output two-wire connection	Yes	Yes	Yes
• for current output four-wire connection	No	No	
<b>Load impedance (in rated range of output)</b>			
• with current outputs, max.	500 Ω	500 Ω	500 Ω
• with current outputs, inductive load, max.	1 mH	1 mH	1 mH; for TWA 100µs
<b>Destruction limits against externally applied voltages and currents</b>			
• Voltages at the outputs towards MANA	15 V; max. 15 V continuous; 75 V for max. 1 s (mark to space ratio 1:20)		
• Current, max.	50 mA; DC	50 mA	15 mA; Max. 15 V / 5 hours (higher voltages not permissible even briefly)
<b>Cable length</b>			
• shielded, max.	200 m	200 m; 100m if Twa < 2ms	200 m; Max. 20 m for TWA 100 µs

#### Technical specifications (continued)

Article number	<b>6ES7135-4GB01-0AB0</b> ET200S, EL-MOD., 2AO I, +/-20mA, 4-20mA	<b>6ES7135-4MB02-0AB0</b> ET200S, EL-MOD., 2AO I HF, +/-20mA, 4-20mA	<b>6ES7135-4GB52-0AB0</b> ET200S, EL-MOD., 2AO I, +/-20mA, 4-20mA
<b>Analog value creation</b>			
<b>Integration and conversion time/ resolution per channel</b>			
• Resolution with overrange (bit including sign), max.	14 bit; 4 to 20 mA: 13 bits, +/-20 mA: 14 bits	16 bit	16 bit
<b>Settling time</b>			
• for resistive load	0.1 ms	0.3 ms	0.05 ms
• for capacitive load	0.5 ms	1 ms	0.05 ms; at a load of up to 500 ohms/100 nF and a max. cable length of 20 m
• for inductive load	0.5 ms	0.5 ms	0.05 ms
<b>Errors/accuracies</b>			
Output ripple (based on output area, bandwidth 0 to 50 kHz), (+/-)	0.02 %	0.02 %	0.02 %
Linearity error (relative to output range), (+/-)	0.02 %	0.01 %	0.03 %; with resistive load
Temperature error (relative to output range), (+/-)	0.01 %/K	0.003 %/K	0.01 %/K
Crosstalk between the outputs, min.		60 dB	-60 dB
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.05 %	0.01 %	0.03 %
<b>Operational limit in overall temperature range</b>			
• Current, relative to output area, (+/-)	0.5 %	0.1 %	0.2 %; Specified value applies to loads from 200 to 350 Ohm, deviating opera- tional limits for loads up to 200 Ohm and from 350 to 500 Ohm with up to 0.4%
<b>Basic error limit (operational limit at 25 °C)</b>			
• Current, relative to output area, (+/-)	0.3 %	0.05 %	0.1 %; Specified value applies for loads from 200 to 350 ohms, deviating basic error limits for loads up to 200 ohms and from 350 to 500 ohms with up to 0.3%
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)		Yes	Yes
<b>Interrupts/diagnostics/ status information</b>			
Substitute values connectable	Yes; 0 to 65535 (range of values must be within the rated range)	Yes	Yes
<b>Diagnostic messages</b>			
• Diagnostic functions			Yes
• Diagnostic information readable		Yes	Yes
• Wire break	Yes	Yes	Yes
• Group error	Yes	Yes	Yes
<b>Diagnostics indication LED</b>			
• Group error SF (red)	Yes	Yes	Yes



**I/O systems**

ET 200 systems for the control cabinet

ET 200S - I/O modules

**Analog electronic modules****Technical specifications** (continued)

Article number	<b>6ES7135-4GB01-0AB0</b> ET200S, EL-MOD., 2AO I, +/-20MA, 4-20MA	<b>6ES7135-4MB02-0AB0</b> ET200S, EL-MOD., 2AO I HF, +/-20MA, 4-20MA	<b>6ES7135-4GB52-0AB0</b> ET200S, EL-MOD., 2AO I, +/-20MA, 4-20MA
<b>Parameter</b>			
Remark	7 byte	7 byte	7 byte
Output type/range	deactivated / +/-20 mA / 4 to 20 mA	deactivated / +/-20 mA / 4 to 20 mA	deactivated / +/-20 mA / 4 to 20 mA
Diagnosis: wire break	Disable / enable	Disable / enable	Disable / enable
Interference frequency suppression		Disable / enable	Disable / enable
Group diagnostics	Disable / enable	Disable / enable	Disable / enable
Behavior on CPU/Master STOP	Output current and de-energized/ substitute a value/keep last value	Output current and de-energized/ substitute a value/keep last value	Output current and de-energized/ substitute a value/keep last value
<b>Ex(i) characteristics</b>			
<b>Max. values of output circuits (per channel)</b>			
• U <sub>o</sub> (output no-load voltage), max.	18 V		
<b>Galvanic isolation</b>			
<b>Galvanic isolation analog outputs</b>			
• Galvanic isolation analog outputs		Yes	Yes
• between the channels	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes
• between the channels and the load voltage L+	Yes	Yes	Yes
<b>Permissible potential difference</b>			
between MANA and M internally (UISO)	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>			
Isolation checked with		500 V DC	500 V DC
<b>Dimensions</b>			
Width	15 mm	15 mm	15 mm
Height	81 mm	81 mm	81 mm
Depth	52 mm	52 mm	52 mm
<b>Weights</b>			
Weight, approx.	40 g	40 g	45 g

Ordering data	Article No.	Article No.
<p><b>Analog input modules</b></p> <p>Ordering unit 1 item</p> <ul style="list-style-type: none"> <li>• 2 AI U High Speed</li> <li>• 2 AI U Standard</li> <li>• 2 AI U High Feature</li> <li>• 2 AI I Standard 2-wire</li> <li>• 2 AI I High Speed 2-wire</li> <li>• 2 AI High Speed 4-wire</li> <li>• 2 AI I Standard 4-wire</li> <li>• 2 AI I High Feature 2-wire/4-wire (15 bits + sign)</li> <li>• 2 AI RTD standard</li> <li>• 2 AI TC Standard</li> <li>• 2 AI RTD High Feature</li> <li>• 2 AI TC High Feature</li> <li>• 4 AI Standard 2-wire</li> <li>• 4 AI TC Standard</li> </ul>	<p>6ES7134-4FB52-0AB0</p> <p>6ES7134-4FB01-0AB0</p> <p>6ES7134-4LB02-0AB0</p> <p>6ES7134-4GB01-0AB0</p> <p>6ES7134-4GB52-0AB0</p> <p>6ES7134-4GB62-0AB0</p> <p>6ES7134-4GB11-0AB0</p> <p>6ES7134-4MB02-0AB0</p> <p>6ES7134-4JB51-0AB0</p> <p>6ES7134-4JB01-0AB0</p> <p>6ES7134-4NB51-0AB0</p> <p>6ES7134-4NB01-0AB0</p> <p>6ES7134-4GD00-0AB0</p> <p>6ES7134-4JD00-0AB0</p>	<p><b>Accessories for labeling</b></p> <p><b>Label sheets DIN A4 (10 pieces)</b></p> <p>Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules</p> <ul style="list-style-type: none"> <li>• petrol</li> <li>• red</li> <li>• yellow</li> <li>• light beige</li> </ul> <p><b>Accessories for system-integrated shield connection</b></p> <p><b>Shield connection element</b></p> <p>Ordering unit 5 items</p> <p>For plugging into TM-E and TM-P</p> <p><b>Shield clamps</b></p> <p>Ordering unit 5 items</p> <p>For 3 × 10 mm busbars</p> <p><b>Grounding terminal</b></p> <p>Ordering unit 1 item</p> <p>For cable cross-sections up to 25 mm<sup>2</sup></p> <p><b>3 × 10 mm busbars</b></p> <p>Ordering unit 1 item</p>
		<p>6ES7193-4BH00-0AA0</p> <p>6ES7193-4BD00-0AA0</p> <p>6ES7193-4BB00-0AA0</p> <p>6ES7193-4BA00-0AA0</p> <p>6ES7193-4GA00-0AA0</p> <p>6ES7193-4GB00-0AA0</p> <p>8WA2868</p> <p>8WA2842</p>
<p><b>Analog output modules</b></p> <p>Ordering unit 1 item</p> <ul style="list-style-type: none"> <li>• 2 AO U Standard</li> <li>• 2 AO U High Speed</li> <li>• 2 AO U High Feature</li> <li>• 2 AO I Standard</li> <li>• 2 AO I High Speed</li> <li>• 2 AO I High Feature</li> </ul>	<p>6ES7135-4FB01-0AB0</p> <p>6ES7135-4FB52-0AB0</p> <p>6ES7135-4LB02-0AB0</p> <p>6ES7135-4GB01-0AB0</p> <p>6ES7135-4GB52-0AB0</p> <p>6ES7135-4MB02-0AB0</p>	

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - I/O modules

### SIPLUS analog electronic modules

#### Overview



- Analog inputs and outputs for the ET 200S
- Can be plugged onto TM-E terminal modules with automatic coding
- High-speed variants with extremely short isochronous cycle times
- Hot swapping of modules possible

#### Notes:

Consult the configuring guide for selection of the appropriate TM-E terminal modules.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

SIPLUS analog electronic module 2 AI U Standard	
<b>Article number</b>	<b>6AG1134-4FB01-2AB0</b>
<b>BasedOn Article No.</b>	<b>6ES7134-4FB01-0AB0</b>
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS analog electronic module 2 AI High Speed	
<b>Article No.</b>	<b>6AG1134-4GB52-2AB0</b>
<b>BasedOn Article No.</b>	<b>6ES7134-4GB52-0AB0</b>
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS analog electronic module 2 AI I Standard 2-wire	
<b>Article No.</b>	<b>6AG1134-4GB01-2AB0</b>
<b>BasedOn Article No.</b>	<b>6ES7134-4GB01-0AB0</b>
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS analog electronic module 4 AI I Standard 2-wire	
<b>Article No.</b>	<b>6AG1134-4GD00-2AB0</b>
<b>BasedOn Article No.</b>	<b>6ES7134-4GD00-0AB0</b>
Ambient temperature range	-25 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS analog electronic module 2 AI I Standard 4-wire	
<b>Article No.</b>	<b>6AG1134-4GB11-2AB0</b>
<b>BasedOn Article No.</b>	<b>6ES7134-4GB11-0AB0</b>
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS analog electronic module 2 AI RTD	
<b>Article No.</b>	<b>6AG1134-4JB51-7AB0</b>
<b>BasedOn Article No.</b>	<b>6ES7134-4JB51-0AB0</b>
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS analog electronic module 2 AI I High Feature	
<b>Article No.</b>	<b>6AG1134-4MB02-2AB0</b>
<b>BasedOn Article No.</b>	<b>6ES7134-4MB02-0AB0</b>
Ambient temperature range	-25 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

SIPLUS analog electronic module 2 AI RTD High Feature	
<b>Article No.</b>	<b>6AG1134-4NB51-2AB0</b>
<b>BasedOn Article No.</b>	<b>6ES7134-4NB51-0AB0</b>
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

#### Overview (continued)

<b>SIPLUS analog electronic module 2 AI TC High Feature</b>	
<b>Article No.</b>	<b>6AG1134-4NB01-7AB0</b>
<b>BasedOn Article No.</b>	<b>6ES7134-4NB01-0AB0</b>
Ambient temperature range	0 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

<b>SIPLUS analog electronic module 2 AO U Standard</b>	
<b>Article No.</b>	<b>6AG1135-4FB01-2AB0</b>
<b>BasedOn Article No.</b>	<b>6ES7135-4FB01-0AB0</b>
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

<b>SIPLUS analog electronic module 2 AO U High Feature</b>	
<b>Article No.</b>	<b>6AG1135-4LB02-7AB0</b>
<b>BasedOn Article No.</b>	<b>6ES7135-4LB02-0AB0</b>
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

<b>SIPLUS analog electronic module 2 AO I Standard</b>	
<b>Article No.</b>	<b>6AG1135-4GB01-2AB0</b>
<b>BasedOn Article No.</b>	<b>6ES7135-4GB01-0AB0</b>
Ambient temperature range	-25 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For further technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

**I/O systems**

ET 200 systems for the control cabinet

ET 200S - I/O modules

**SIPLUS analog electronic modules****Technical specifications**

Article number	<b>6AG1134-4FB01-2AB0</b> SIPLUS ET200S 2AI STANDARD U	<b>6AG1134-4GB01-2AB0</b> SIPLUS_ET200S 2AI I/2 WIRE STANDARD	<b>6AG1134-4GB11-2AB0</b> SIPLUS_ET200S_2AI	<b>6AG1134-4GB52-2AB0</b> SIPLUS ET200S 2AI HIGH SPEED
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
• Min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
<b>Extended ambient conditions</b>				
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
- With condensation, max.	100 %; incl. condensation / frost permitted (no commis- sioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commis- sioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commis- sioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commis- sioning under condensation conditions)
<b>Resistance</b>				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation in corrosive atmospheres!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused inter- faces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused inter- faces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused inter- faces during operation!

#### Technical specifications (continued)

Article number	<b>6AG1134-4GD00-2AB0</b> SIPLUS_ET200S 4 AI I 2WIRE	<b>6AG1134-4JB51-7AB0</b> SIPLUS_ET200S 2AI RTD	<b>6AG1134-4MB02-2AB0</b> SIPLUS_ET200S EM 2 AE I HF	<b>6AG1134-4NB01-7AB0</b> SIPLUS_ET200S 2 AI TC HF	<b>6AG1134-4NB51-2AB0</b> SIPLUS_ET200S 2 AI RTD HF
<b>Ambient conditions</b>					
<b>Ambient temperature in operation</b>					
• Min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	0 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax
<b>Extended ambient conditions</b>					
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>					
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>					
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation in corrosive atmospheres!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**I/O systems**

ET 200 systems for the control cabinet  
ET 200S - I/O modules

**SIPLUS analog electronic modules****Technical specifications (continued)**

Article number	<b>6AG1135-4FB01-2AB0</b> SIPLUS ET200S EM 2AO U	<b>6AG1135-4GB01-2AB0</b> SIPLUS_ET200S 2AO I STANDARD	<b>6AG1135-4LB02-7AB0</b> SIPLUS ET200S 2AO U HIGH FEATURE
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax
<b>Extended ambient conditions</b>			
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>			
- With condensation, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation in corrosive atmospheres!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****SIPLUS analog input modules**

(extended temperature range and medial exposure)

- 2 AI U Standard
- 2 AI I Standard 2-wire
- 2 AI I Standard 4-wire
- 2 AI I High Feature 2-wire/4-wire (15 bits + sign)
- 2 AI High Speed 2-wire
- 4 AI Standard 2-wire
- 2 AI RTD Standard
- 2 AI RTD High Feature
- 2 AI TC High Feature

**SIPLUS analog output modules**

- 2 AO U Standard
- 2 AO U High Feature
- 2 AO I Standard

**Article No.**

**6AG1134-4FB01-2AB0**  
**6AG1134-4GB01-2AB0**  
**6AG1134-4GB11-2AB0**  
**6AG1134-4MB02-2AB0**  
  
**6AG1134-4GB52-2AB0**  
**6AG1134-4GD00-2AB0**  
**6AG1134-4JB51-7AB0**  
**6AG1134-4NB51-2AB0**  
**6AG1134-4NB01-7AB0**

**6AG1135-4FB01-2AB0**  
**6AG1135-4LB02-7AB0**  
**6AG1135-4GB01-2AB0**

**Article No.****Accessories**

See SIMATIC ET 200S analog electronics modules, page 9/163

## Overview



- 1-channel module for connecting SSI sensors to the ET 200S
- For position detection and simple positioning tasks
- With two comparison operations with specifiable comparison values (standard mode)
- With a digital input for latching actual values (standard mode)
- Can be plugged into TM-E terminal module with automatic coding
- Fast mode for high-speed acquisition of encoder values (e.g. for drive controls)
- Module replacement possible during operation and when live (hot swapping)
- Simple parameterization without additional software

Note:

We supply positioning systems and prepared connection cables for counting and positioning functions as SIMODRIVE Sensors or Motion Connect 500 (also visit <http://www.siemens.com/simatic-technology>)

## Technical specifications

Article number	<b>6ES7138-4DB03-0AB0</b>
	ET200S, EL-MOD., 1SSI 25BIT/1MHZ
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes
<b>Input current</b>	
from load voltage L+ (without load), max.	40 mA
<b>Encoder supply</b>	
<b>24 V encoder supply</b>	
• 24 V	Yes
• short-circuit protection	Yes
• Output current, max.	500 mA
<b>Absolute encoder (SSI) encoder supply</b>	
• Absolute encoder (SSI)	Yes
• Type of output voltage	L+ (-0.8 V)
• Output current, max.	500 mA
• short-circuit protection	Yes
<b>Power losses</b>	
Power loss, typ.	1 W
<b>Hardware configuration</b>	
<b>Module exchange</b>	
• Hot swapping the IM-DP	Yes
• Module exchange under process voltage	Yes
<b>Digital inputs</b>	
Number of digital inputs	1
<b>Input voltage</b>	
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	9 mA
<b>Cable length</b>	
• shielded, max.	50 m

Article number	<b>6ES7138-4DB03-0AB0</b>
	ET200S, EL-MOD., 1SSI 25BIT/1MHZ
<b>Encoder</b>	
Number of connectable encoders, max.	1
<b>Connectable encoders</b>	
• Absolute encoder (SSI)	Yes
<b>Encoder signals, absolute encoder (SSI)</b>	
• Message frame length, parameterizable	13, 14, 16, 21, 24 & 25 bit
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	320 m; At 125 kHz
• Monoflop time	16/32/48/64 μs
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
• Status indicator digital input (green)	Yes
• Status indicator backward counting (green)	Yes
• Status indicator forward counting (green)	Yes
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• Galvanic isolation digital inputs	No; same potential with L+ and SSI
<b>Galvanic isolation counter</b>	
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	No
<b>Dimensions</b>	
Width	15 mm
Height	81 mm
Depth	52 mm
<b>Weights</b>	
Weight, approx.	40 g



**I/O systems**

ET 200 systems for the control cabinet

ET 200S - I/O modules - Technology modules

**SSI module**

<b>Ordering data</b>	<b>Article No.</b>	<b>Accessories</b>	<b>Article No.</b>
<b>SSI module</b> For connecting absolute encoders with an SSI interface	<b>6ES7138-4DB03-0AB0</b>	<b>Label sheets DIN A4 (10 pieces)</b> Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules <ul style="list-style-type: none"> <li>• petrol</li> <li>• red</li> <li>• yellow</li> <li>• light beige</li> </ul>	<b>6ES7193-4BH00-0AA0</b> <b>6ES7193-4BD00-0AA0</b> <b>6ES7193-4BB00-0AA0</b> <b>6ES7193-4BA00-0AA0</b>
		<b>Signal cable</b> Preassembled for SSI absolute encoder 6FX2001-5, without D-Sub connector, UL/DESINA. For length code, see page 5/142.	<b>6FX5002-2CC12-....</b>

## Overview



- 2-channel pulse generator and timer module for ET 200S
- For controlling final control elements, valves, heating elements, etc.
- Pulse-width modulation (PWM)
- Pulse trains
- Pulse chains
- Frequency output
- Time-precise switching signals to 24 V DC output
- Measurement of output current
- Isochronous mode

## Technical specifications

Article number	<b>6ES7138-4DD01-0AB0</b> ET200S, EL-MOD., 2 PULSE
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V; From power module
• Reverse polarity protection	Yes
<b>Input current</b>	
from load voltage L+ (without load), max.	40 mA
from backplane bus 3.3 V DC, max.	10 mA
<b>Encoder supply</b>	
Type of output voltage	L+ (-0.8 V)
short-circuit protection	Yes
<b>Output current</b>	
• nominal	500 mA
<b>Power losses</b>	
Power loss, typ.	1.8 W
<b>Digital inputs</b>	
Number of digital inputs	2
Input characteristic curve in accordance with IEC 61131, type 2	Yes
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "1", typ.	9 mA
<b>Input delay (for rated value of input voltage)</b>	
• Input frequency (with a time delay of 0.1 ms), max.	20 kHz
• Minimum pulse width for program reactions	100 µs
<b>Cable length</b>	
• shielded, max.	100 m

Article number	<b>6ES7138-4DD01-0AB0</b> ET200S, EL-MOD., 2 PULSE
<b>Digital outputs</b>	
Number of digital outputs	2
short-circuit protection	Yes
• Response threshold, typ.	10 A
Limitation of inductive shutdown voltage to	L+ (-50 to -65 V)
Accuracy of pulse duration	+/- (time period x 100 ppm), +/-100 µs with a load <= 50 ohms
minimum pulse duration	100 µs
Controlling a digital input	Yes
<b>Switching capacity of the outputs</b>	
• on lamp load, max.	10 W
<b>Output voltage</b>	
• for signal "1", min.	L+ (-1 V)
<b>Output current</b>	
• for signal "1" rated value	2 A
• for signal "1" permissible range for 0 to 60 °C, min.	7 mA
• for signal "1" permissible range for 0 to 60 °C, max.	2 A
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	100 µs
• "1" to "0", max.	200 µs
<b>Switching frequency</b>	
• with resistive load, max.	5 kHz
• with inductive load, max.	2 Hz
• on lamp load, max.	10 Hz
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
<b>Encoder</b>	
<b>Connectable encoders</b>	
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	2 mA

**I/O systems**

ET 200 systems for the control cabinet  
 ET 200S - I/O modules - Technology modules

**2 PULSE pulse generator****Technical specifications** (continued)

Article number	<b>6ES7138-4DD01-0AB0</b> ET200S, EL-MOD., 2 PULSE
<b>Interrupts/diagnostics/ status information</b>	
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes
• Status indicator digital input (green)	Yes
<b>Pulse generator</b>	
Number of channels	2; 1 digital input and 1 digital output per channel
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• between the channels	No
• between the channels and the backplane bus	Yes
<b>Galvanic isolation digital outputs</b>	
• between the channels	No
• between the channels and the backplane bus	Yes

Article number	<b>6ES7138-4DD01-0AB0</b> ET200S, EL-MOD., 2 PULSE
<b>Permissible potential difference</b> between different circuits	75V DC/60V AC
<b>Isolation</b>	
Isolation checked with	500 V DC
<b>Dimensions</b>	
Width	15 mm
Height	81 mm
Depth	52 mm
<b>Weights</b>	
Weight, approx.	40 g

**Ordering data****Article No.****2 PULSE pulse generator and timer module**

For ET 200S

**6ES7138-4DD01-0AB0****Article No.****Accessories****Label sheets DIN A4 (10 pieces)**

Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules

- petrol
- red
- yellow
- light beige

**6ES7193-4BH00-0AA0**  
**6ES7193-4BD00-0AA0**  
**6ES7193-4BB00-0AA0**  
**6ES7193-4BA00-0AA0**

## Overview



- 2-channel pulse generator and timer module for ET 200S
- For controlling final control elements, valves, heating elements, etc.
- Pulse-width modulation (PWM)
- Pulse trains
- Pulse chains
- Frequency output
- Precision-timed switching signals to 24 V DC output
- Measurement of output current
- Isochronous mode

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

<b>SIPLUS pulse generator and timer module 2PULSE</b>	
<b>Article No.</b>	<b>6AG1138-4DD01-7AB0</b>
<b>Article No. based on</b>	<b>6ES7138-4DD01-0AB0</b>
Ambient temperature range	-25 ... +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical specifications of the standard product apply except for the ambient conditions.
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

<b>Ordering data</b>	<b>Article No.</b>
<b>SIPLUS 2 PULSE pulse generator and timer module</b>	<b>6AG1138-4DD01-7AB0</b>
for ET 200S	
<b>Accessories</b>	
<b>Label sheets DIN A4 (10 units)</b>	
Each sheet contains 60 label strips for I/O modules and 20 label strips for interface modules	
• petrol	<b>6ES7193-4BH00-0AA0</b>
• red	<b>6ES7193-4BD00-0AA0</b>
• yellow	<b>6ES7193-4BB00-0AA0</b>
• light beige	<b>6ES7193-4BA00-0AA0</b>

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - I/O modules - Technology modules

### 1STEP stepper module

#### Overview



- 1-channel module for ET 200S for controlled positioning of a stepper motor
- Operating modes: absolute and relative positioning, reference point approach, set reference point and speed mode
- Connection of power units with pulse/direction interface by means of 5 V differential signals up to 510 kHz
- External stop with/without ramp via digital input
- Status display and error indication via LEDs:  
Errors during positioning and statuses of the digital inputs are indicated by means of LEDs and displayed at the interface to the master
- Isochronous mode

#### Technical specifications

Article number	<b>6ES7138-4DC01-0AB0</b> ET200S, EL-MOD., 1 STEP 5V/204KHZ
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
<b>Power losses</b>	
Power loss, typ.	1.5 W
<b>Digital inputs</b>	
Number of digital inputs	2
Functions	Reference cams, pulse suppression, external stop, limit switch
Repeat frequency, max.	100 Hz
Input characteristic curve in accordance with IEC 61131, type 2	Yes
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V (-15% / +20%)
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	9 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
- at "0" to "1", max.	4 ms
- at "1" to "0", max.	4 ms
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	600 m

Article number	<b>6ES7138-4DC01-0AB0</b> ET200S, EL-MOD., 1 STEP 5V/204KHZ
<b>Encoder</b>	
<b>Connectable encoders</b>	
• 2-wire sensor	Yes
<b>Interrupts/diagnostics/ status information</b>	
<b>Diagnostics indication LED</b>	
• Description	1 green LED for status indication "Ready for positioning jobs"
• Positioning mode POS (green)	Yes
• Group error SF (red)	Yes
• Status indicator digital input (green)	Yes
<b>Drive technology</b>	
Cable length, max.	100 m; twisted and shielded in pairs
<b>Step-by-step controllers</b>	
Connection for stepper motors	Differential signals for pulses (PULSE, notPULSE) and direction (DIR, notDIR) to RS422
Number of stepper motor channels	1
<b>Dimensions</b>	
Width	15 mm
Height	81 mm
Depth	52 mm
<b>Weights</b>	
Weight, approx.	40 g

Ordering data	Article No.	Accessories	Article No.
<b>1STEP stepper module</b> for simple positioning tasks with stepper motor axes	<b>6ES7138-4DC01-0AB0</b>	<b>Label sheets DIN A4 (10 pieces)</b> Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules <ul style="list-style-type: none"> <li>• petrol</li> <li>• red</li> <li>• yellow</li> <li>• light beige</li> </ul>	<b>6ES7193-4BH00-0AA0</b> <b>6ES7193-4BD00-0AA0</b> <b>6ES7193-4BB00-0AA0</b> <b>6ES7193-4BA00-0AA0</b>

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - I/O modules - Technology modules

### 1 POS U positioning module

#### Overview



- The positioning module 1 POS U is a single-channel positioning module for ET 200S for positioning of adjusting and operating axes
- For controlled positioning by means of digital outputs according to the rapid traverse/creep speed principle
- With position value recording for
  - Incremental encoders with 5 V differential signals or 24 V signals or for SSI encoders
  - Dosing operation (single evaluation of encoder signal A only)
- Reference point approach, set actual value
- Parameter change during operation
  - Switchover difference
  - Switch-off difference
- Functions
  - Jog:
    - Direct specification of control signals by the master
  - Travel:
    - Absolute or relative
  - Axes:
    - For linear and rotary axes
  - Latch function:
    - Saving the current actual value by setting a digital input

#### Note

We offer position measuring systems and preassembled connecting cables for counting and positioning functions under the names SIMODRIVE Sensor or Motion Connect 500.

#### Technical specifications

Article number	<b>6ES7138-4DL00-0AB0</b> ET200S, EL-MOD., 1 POS U, INC./SSI-ENC.
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes
<b>Input current</b>	
from load voltage L+ (without load), max.	55 mA
from backplane bus 3.3 V DC, max.	10 mA
<b>Encoder supply</b>	
<b>5 V encoder supply</b>	
• 5 V	No
<b>24 V encoder supply</b>	
• 24 V	Yes
• short-circuit protection	Yes
• Output current, max.	500 mA
<b>Absolute encoder (SSI) encoder supply</b>	
• Absolute encoder (SSI)	Yes
• Type of output voltage	L+ (-0.8 V)
• Output current, max.	500 mA
• short-circuit protection	Yes
<b>Power losses</b>	
Power loss, typ.	2 W

Article number	<b>6ES7138-4DL00-0AB0</b> ET200S, EL-MOD., 1 POS U, INC./SSI-ENC.
<b>Digital inputs</b>	
Input characteristic curve in accordance with IEC 61131, type 2	Yes
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	9 mA
<b>Cable length</b>	
• Unshielded, max.	50 m
<b>Digital outputs</b>	
short-circuit protection	Yes
• Response threshold, typ.	0.7 to 1.8 A
Limitation of inductive shutdown voltage to	Yes; L+ (-55 to 60 V)
Controlling a digital input	Yes
<b>Switching capacity of the outputs</b>	
• on lamp load, max.	5 W
<b>Output voltage</b>	
• Rated value (DC)	24 V
• for signal "0", max.	3 V
• for signal "1", min.	L+ (-1 V)
<b>Output current</b>	
• for signal "1" permissible range for 0 to 60 °C, min.	7 mA
• for signal "1" permissible range for 0 to 60 °C, max.	600 mA
• for signal "0" residual current, max.	0.3 mA

## Technical specifications (continued)

Article number	<b>6ES7138-4DL00-0AB0</b> ET200S, EL-MOD., 1 POS U, INC./SSI-ENC.
<b>Output delay with resistive load</b>	
• "0" to "1", max.	typically 150 µs
• "1" to "0", max.	typically 150 µs
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• with inductive load, max.	2 Hz
• on lamp load, max.	10 Hz
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
<b>Encoder</b>	
Number of connectable encoders, max.	1
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes
• 2-wire sensor	Yes; Type 2
<b>Encoder signals, incremental encoder (symmetrical)</b>	
<b>Encoder signal 5 V</b>	
- Signal level	to RS-422
- Terminating resistor	330 Ω
- Differential input voltage, min.	1 V
- Input frequency, max.	500 kHz
- Cable length, shielded, max.	50 m
<b>Encoder signal 24 V</b>	
- Rated value 24 V DC	Yes
- Input voltage for signal "0"	5 V
- Input voltage for signal "1"	30 V
- Input current for signal "0", max. (permissible quiescent current)	2 mA
- Input current for signal "1", typ.	9 mA
- Input frequency, max.	100 kHz
- Cable length, shielded, max.	50 m

Article number	<b>6ES7138-4DL00-0AB0</b> ET200S, EL-MOD., 1 POS U, INC./SSI-ENC.
<b>Encoder signals, absolute encoder (SSI)</b>	
• Cable length, shielded, max.	320 m at 125 kHz, 160 m at 250 kHz, 60 m at 500 kHz, 20 m at 1 MHz, 8 m at 2 MHz, twisted in pairs and shielded
• Monoflop time	64 µs
<b>Updating the encoder value</b>	
- Telegram runtime at 13 bit, min.	7 µs
- Telegram runtime at 25 bit, min.	13 µs
<b>Response times</b>	
Update time of the feedback messages	1 ms
Latch	In the case of incremental encoders: typ. 400 ms; in the case of SSI encoders: typ. 400 ms + age of the encoder value:
Response time at switchover/switchoff time	In the case of incremental encoders: output delay + 30 µs; in the case of SSI encoders: output delay + message frame runtime + 30 ms
<b>Interrupts/diagnostics/status information</b>	
<b>Diagnostics indication LED</b>	
• Actual value falling DN (green)	Yes
• Actual value rising UP (green)	Yes
• Positioning mode POS (green)	Yes
• Group error SF (red)	Yes
• Status indicator digital input (green)	Yes
<b>Galvanic isolation</b>	
between backplane bus and all other circuit components	Yes
between the channels and backplane bus	Yes
<b>Dimensions</b>	
Width	30 mm
Height	81 mm
Depth	52 mm
<b>Weights</b>	
Weight, approx.	65 g

## Ordering data

## Article No.

## 1 POS U positioning module

6ES7138-4DL00-0AB0

Single-channel positioning module for ET 200S for positioning of operating and positioning axes



## I/O systems

ET 200 systems for the control cabinet  
ET 200S - I/O modules - Technology modules

### 1 COUNT 24 V/100 kHz counter module

#### Overview



- 1-channel 32-bit intelligent counter module for universal count tasks and time-based measuring tasks
- For the direct connection of 24 V incremental sensors or initiators
- Comparison function with predefinable comparison values
- Integrated digital output to output the reaction when the comparison value is attained
- Can be plugged into TM-E terminal module with automatic coding
- Module replacement possible during operation and under power (hot swapping)
- Simple parameterization without additional software

#### Note:

Siemens is now able to offer distance measuring systems and pre-assembled connecting cables for counting and positioning functions in the product ranges SIMODRIVE Sensor and Motion Connect 500.

#### Technical specifications

Article number	<b>6ES7138-4DA04-0AB0</b> ET200S, EL-MOD., COUNTER 100KHZ, 24V DC
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes
<b>Input current</b>	
from load voltage L+ (without load), max.	42 mA
from backplane bus 3.3 V DC, max.	10 mA
<b>Encoder supply</b>	
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	500 mA
<b>Power losses</b>	
Power loss, typ.	1 W
<b>Hardware configuration</b>	
<b>Module exchange</b>	
• Hot swapping the IM-DP	Yes
• Module exchange under process voltage	Yes

Article number	<b>6ES7138-4DA04-0AB0</b> ET200S, EL-MOD., COUNTER 100KHZ, 24V DC
<b>Digital inputs</b>	
Number of digital inputs	1
Functions	Gate control, synchronization, latch function
Input characteristic curve in accordance with IEC 61131, type 2	Yes
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	9 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at "0" to "1", max.	2.5 µs; Filter off: 2.5 µs (200 kHz), filter on: 25 µs (20 kHz)
<b>Cable length</b>	
• shielded, max.	100 m; Filter 20 kHz: 100 m, filter 200 kHz: 50 m

## Technical specifications (continued)

Article number	<b>6ES7138-4DA04-0AB0</b> ET200S, EL-MOD., COUNTER 100KHZ, 24V DC
<b>Digital outputs</b>	
Number of digital outputs	1
short-circuit protection	Yes
• Response threshold, typ.	2.6 A to 4 A
Limitation of inductive shutdown voltage to	L+ (-50 to -60 V)
Controlling a digital input	Yes
<b>Switching capacity of the outputs</b>	
• on lamp load, max.	5 W
<b>Output voltage</b>	
• Rated value (DC)	24 V
• for signal "0", max.	3 V
• for signal "1", min.	L+ (-1 V)
<b>Output current</b>	
• for signal "1" permissible range for 0 to 40 °C, min.	5 mA
• for signal "1" permissible range for 0 to 40 °C, max.	2 000 mA
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.	500 mA; 1000 mA at 50 °C
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	100 µs
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• with inductive load, max.	2 Hz
• on lamp load, max.	10 Hz
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
<b>Encoder</b>	
Number of connectable encoders, max.	1
<b>Connectable encoders</b>	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 2-wire sensor	Yes

Article number	<b>6ES7138-4DA04-0AB0</b> ET200S, EL-MOD., COUNTER 100KHZ, 24V DC
<b>Interrupts/diagnostics/status information</b>	
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes
• Status indicator digital input (green)	Yes
• Status indicator backward counting (green)	Yes
• Status indicator forward counting (green)	Yes
<b>Integrated Functions</b>	
<b>Measuring functions</b>	
<b>Measuring range</b>	
- Frequency measurement, min.	0.1 Hz
- Frequency measurement, max.	100 kHz
- Period measurement, min.	10 µs
- Period measurement, max.	120 s
- Velocity measurement, min.	1 1/min
- Velocity measurement, max.	25 000 1/min
<b>Counter</b>	
Number of counter inputs	1; 32 Bit
Minimum pulse width	2.5 µs; Filter off: 2.5 µs (200 kHz), filter on: 25 µs (20 kHz)
<b>Parameter</b>	
Remark	16 byte
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• Galvanic isolation digital inputs	No; only opposite shielding
<b>Galvanic isolation counter</b>	
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	No
<b>Dimensions</b>	
Width	15 mm
Height	81 mm
Depth	52 mm
<b>Weights</b>	
Weight, approx.	40 g

**I/O systems**

ET 200 systems for the control cabinet  
 ET 200S - I/O modules - Technology modules

**1 COUNT 24 V/100 kHz counter module**

Ordering data	Article No.	Article No.
<b>1 COUNT 24 V/100 kHz counter module</b>	<b>6ES7138-4DA04-0AB0</b>	
For universal counting and measuring tasks with ET 200S		
<b>Accessories</b>		
<b>Label sheets DIN A4 (10 pieces)</b>		
Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules		
<ul style="list-style-type: none"> <li>• petrol</li> <li>• red</li> <li>• yellow</li> <li>• light beige</li> </ul>	<b>6ES7193-4BH00-0AA0</b> <b>6ES7193-4BD00-0AA0</b> <b>6ES7193-4BB00-0AA0</b> <b>6ES7193-4BA00-0AA0</b>	
<b>Shield connection element</b>	<b>6ES7193-4GA00-0AA0</b>	
For TM-P and TM-E terminal modules, as fixing for busbars 3 x 10 mm, 5 items		
<b>Shield clamps</b>	<b>6ES7193-4GB00-0AA0</b>	
For connecting braided cable shields to the busbar, 5 items		
		<b>SIMODRIVE sensor incremental encoder</b>
		Externally mounted encoder, optical, incremental with HTL level, operating voltage 10 to 30 V
		<ul style="list-style-type: none"> <li>• With synchronous flange, universal axial/radial cable outlet with connector           <ul style="list-style-type: none"> <li>- 100 pulses/revolution <b>6FX2001-4DA10</b></li> <li>- 500 pulses/revolution <b>6FX2001-4DA50</b></li> <li>- 1000 pulses/revolution <b>6FX2001-4DB00</b></li> <li>- 2500 pulses/revolution <b>6FX2001-4DC50</b></li> </ul> </li> <li>• With synchronous flange, radial flange outlet           <ul style="list-style-type: none"> <li>- 100 pulses/revolution <b>6FX2001-4FA10</b></li> <li>- 500 pulses/revolution <b>6FX2001-4FA50</b></li> <li>- 1000 pulses/revolution <b>6FX2001-4FB00</b></li> <li>- 2500 pulses/revolution <b>6FX2001-4FC50</b></li> </ul> </li> <li>• With synchronous flange, axial flange outlet           <ul style="list-style-type: none"> <li>- 100 pulses/revolution <b>6FX2001-4HA10</b></li> <li>- 500 pulses/revolution <b>6FX2001-4HA50</b></li> <li>- 1000 pulses/revolution <b>6FX2001-4HB00</b></li> <li>- 2500 pulses/revolution <b>6FX2001-4HC50</b></li> </ul> </li> <li>• With clamping flange, universal axial/radial cable outlet with connector           <ul style="list-style-type: none"> <li>- 100 pulses/revolution <b>6FX2001-4NA10</b></li> <li>- 500 pulses/revolution <b>6FX2001-4NA50</b></li> <li>- 1000 pulses/revolution <b>6FX2001-4NB00</b></li> <li>- 2500 pulses/revolution <b>6FX2001-4NC50</b></li> </ul> </li> <li>• With clamping flange, radial flange outlet           <ul style="list-style-type: none"> <li>- 100 pulses/revolution <b>6FX2001-4QA10</b></li> <li>- 500 pulses/revolution <b>6FX2001-4QA50</b></li> <li>- 1000 pulses/revolution <b>6FX2001-4QB00</b></li> <li>- 2500 pulses/revolution <b>6FX2001-4QC50</b></li> </ul> </li> <li>• With clamping flange, axial flange outlet           <ul style="list-style-type: none"> <li>- 100 pulses/revolution <b>6FX2001-4SA10</b></li> <li>- 500 pulses/revolution <b>6FX2001-4SA50</b></li> <li>- 1000 pulses/revolution <b>6FX2001-4SB00</b></li> <li>- 2500 pulses/revolution <b>6FX2001-4SC50</b></li> </ul> </li> </ul>
		<b>Signal cable</b>
		Preassembled for HTL and TTL encoder, without Sub-D connector, UL/DESINA. For length code, see page 5/142.
		<b>6FX5002-2CA12-....</b>

## Overview



- Single-channel, intelligent 32-bit counter module for universal counting and measuring tasks
- For direct connection of 24 V incremental encoders or initiators
- Comparison functions with definable comparison values
- Integrated digital output for output of the response on reaching the comparison value
- Can be plugged onto TM-E terminal modules with automatic coding
- Hot swapping of modules possible
- Simple parameterization without additional software

Notes:

We offer position measuring systems and pre-assembled connecting cables for counting and positioning functions under the names SIMODRIVE Sensor or Motion Connect 500.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For further technical documentation on SIPLUS, see: <http://www.siemens.com/siplus-extreme>

## Technical specifications

Article number	<b>6AG1138-4DA04-2AB0</b>
Based on	<b>6ES7138-4DA04-0AB0</b> SIPLUS_ET200S 1COUNT 24V
<b>Ambient conditions</b>	
<b>Extended ambient conditions</b>	
<ul style="list-style-type: none"> <li>• Relative to ambient temperature-atmospheric pressure-installation altitude</li> </ul>	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation	100%, condensation/frost permissible. No commissioning if condensation present.
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

## Ordering data

Ordering data	Article No.
<b>SIPLUS 1 COUNT 24 V/100 kHz counter module</b> (extended temperature range and medial exposure) For universal counting and measuring tasks with ET 200S	<b>6AG1138-4DA04-2AB0</b>
<b>Accessories</b>	See SIMATIC 1 COUNT 24 V/100 kHz counter module, page 9/180

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - I/O modules - Technology modules

### 1 COUNT 5 V/500 kHz counter module

#### Overview



- 1-channel 32-bit intelligent counter module for universal count tasks and time-based measuring tasks
- For direct connection of 5 V incremental encoders (RS 422)
- Comparison function with predefinable comparison values
- 2 integrated digital outputs to output the response upon reaching the comparison value
- Can be plugged into TM-E terminal module with automatic coding
- Module replacement possible during operation and under power (hot swapping)
- Simple parameterization without additional software

#### Note:

Siemens is now able to offer distance measuring systems and pre-assembled connecting cables for counting and positioning functions in the product ranges SIMODRIVE Sensor and Motion Connect 500.

#### Technical specifications

Article number	<b>6ES7138-4DE02-0AB0</b> ET200S, EL-MOD., 1 COUNT 5V/500KHZ
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes
<b>Input current</b>	
from load voltage L+ (without load), max.	45 mA
from backplane bus 3.3 V DC, max.	10 mA
<b>Encoder supply</b>	
<b>24 V encoder supply</b>	
• 24 V	Yes; L+ (-0.8 V)
• short-circuit protection	Yes
• Output current, max.	500 mA
<b>Power losses</b>	
Power loss, typ.	2 W
<b>Hardware configuration</b>	
<b>Module exchange</b>	
• Hot swapping the IM-DP	Yes
• Module exchange under process voltage	Yes

Article number	<b>6ES7138-4DE02-0AB0</b> ET200S, EL-MOD., 1 COUNT 5V/500KHZ
<b>Digital inputs</b>	
Number of digital inputs	1
Functions	Gate control, synchronization, latch function
Input characteristic curve in accordance with IEC 61131, type 2	Yes
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	9 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
- at "0" to "1", max.	2.5 μs
<b>Cable length</b>	
• shielded, max.	50 m

## Technical specifications (continued)

Article number	<b>6ES7138-4DE02-0AB0</b> ET200S, EL-MOD., 1 COUNT 5V/500KHZ
<b>Digital outputs</b>	
Number of digital outputs	2
short-circuit protection	Yes
• Response threshold, typ.	2.6 A to 4 A
Limitation of inductive shutdown voltage to	L+ (-50 to -60 V)
Controlling a digital input	Yes
<b>Switching capacity of the outputs</b>	
• on lamp load, max.	10 W
<b>Output voltage</b>	
• Rated value (DC)	24 V
• for signal "0", max.	3 V
• for signal "1", min.	L+ (-1 V)
<b>Output current</b>	
• for signal "1" rated value	2 A
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.	2.4 A
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	100 µs
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• with inductive load, max.	2 Hz
• on lamp load, max.	10 Hz
<b>Cable length</b>	
• shielded, max.	1 000 m
• Unshielded, max.	600 m
<b>Encoder</b>	
Number of connectable encoders, max.	1
<b>Connectable encoders</b>	
• Incremental encoder (symmetrical)	Yes
<b>Encoder signals, incremental encoder (symmetrical)</b>	
• Trace mark signals	A, notA, B, notB, A and B offset by 90°
• Zero mark signal	N, notN
• Input signal	5 V difference signal (phys. RS 422)
• Input frequency, max.	650 kHz
• Cable length, shielded, max.	50 m; > 500 kHz: 30 m

Article number	<b>6ES7138-4DE02-0AB0</b> ET200S, EL-MOD., 1 COUNT 5V/500KHZ
<b>Interrupts/diagnostics/status information</b>	
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes
• Status indicator digital input (green)	Yes
• Status indicator backward counting (green)	Yes
• Status indicator forward counting (green)	Yes
• Synchronization SYN (green)	Yes
<b>Integrated Functions</b>	
<b>Measuring functions</b>	
<b>Measuring range</b>	
- Frequency measurement, min.	0.1 Hz
- Frequency measurement, max.	100 kHz
- Period measurement, min.	10 µs
- Period measurement, max.	120 s
- Velocity measurement, min.	1 1/min
- Velocity measurement, max.	25 000 1/min
<b>Counter</b>	
Number of counter inputs	1; 32 Bit
<b>Parameter</b>	
Remark	16 byte
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• Galvanic isolation digital inputs	No; only opposite shielding
<b>Galvanic isolation counter</b>	
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	No
<b>Dimensions</b>	
Width	30 mm
Height	81 mm
Depth	52 mm
<b>Weights</b>	
Weight, approx.	65 g

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - I/O modules - Technology modules

### 1 COUNT 5 V/500 kHz counter module

Ordering data	Article No.	Article No.
<b>1 COUNT 5 V/500 kHz counter module</b> For universal counting and measuring tasks with ET 200S	<b>6ES7138-4DE02-0AB0</b>	
<b>Accessories</b>		
<b>Label sheets DIN A4 (10 pieces)</b> Each sheet contains 60 labeling strips for I/O modules and 20 labeling strips for interface modules		
<ul style="list-style-type: none"> <li>petrol</li> <li>red</li> <li>yellow</li> <li>light beige</li> </ul>	<b>6ES7193-4BH00-0AA0</b> <b>6ES7193-4BD00-0AA0</b> <b>6ES7193-4BB00-0AA0</b> <b>6ES7193-4BA00-0AA0</b>	
<b>Shield connection element</b> For TM-P and TM-E terminal modules, as fixing for busbars 3 x 10 mm, 5 items	<b>6ES7193-4GA00-0AA0</b>	
<b>Shield clamps</b> For connecting braided cable shields to the busbar, 5 items	<b>6ES7193-4GB00-0AA0</b>	
<b>SIMODRIVE Incremental shaft encoder</b> With RS 422 (TTL), operating voltage 10 to 30 V		
<ul style="list-style-type: none"> <li>With synchronous flange, universal axial/radial cable outlet with connector               <ul style="list-style-type: none"> <li>500 pulses/revolution</li> <li>1000 pulses/revolution</li> <li>1024 pulses/revolution</li> <li>1250 pulses/revolution</li> <li>1500 pulses/revolution</li> <li>2000 pulses/revolution</li> <li>2048 pulses/revolution</li> <li>2500 pulses/revolution</li> <li>3600 pulses/revolution</li> <li>5000 pulses/revolution</li> </ul> </li> <li>With synchronous flange, radial flange outlet               <ul style="list-style-type: none"> <li>500 pulses/revolution</li> <li>1000 pulses/revolution</li> <li>1024 pulses/revolution</li> <li>1250 pulses/revolution</li> <li>1500 pulses/revolution</li> <li>2000 pulses/revolution</li> <li>2048 pulses/revolution</li> <li>2500 pulses/revolution</li> <li>3600 pulses/revolution</li> <li>5000 pulses/revolution</li> </ul> </li> </ul>	<b>6FX2001-2DA50</b> <b>6FX2001-2DB00</b> <b>6FX2001-2DB02</b> <b>6FX2001-2DB25</b> <b>6FX2001-2DB50</b> <b>6FX2001-2DC00</b> <b>6FX2001-2DC04</b> <b>6FX2001-2DC50</b> <b>6FX2001-2DD60</b> <b>6FX2001-2DF00</b>	<ul style="list-style-type: none"> <li>With synchronous flange, axial flange outlet               <ul style="list-style-type: none"> <li>500 pulses/revolution</li> <li>1000 pulses/revolution</li> <li>1024 pulses/revolution</li> <li>1250 pulses/revolution</li> <li>1500 pulses/revolution</li> <li>2000 pulses/revolution</li> <li>2048 pulses/revolution</li> <li>2500 pulses/revolution</li> <li>3600 pulses/revolution</li> <li>5000 pulses/revolution</li> </ul> </li> <li>With clamping flange, universal axial/radial cable outlet with connector               <ul style="list-style-type: none"> <li>500 pulses/revolution</li> <li>1000 pulses/revolution</li> <li>1024 pulses/revolution</li> <li>1250 pulses/revolution</li> <li>1500 pulses/revolution</li> <li>2000 pulses/revolution</li> <li>2048 pulses/revolution</li> <li>2500 pulses/revolution</li> <li>3600 pulses/revolution</li> <li>5000 pulses/revolution</li> </ul> </li> <li>With clamping flange, radial flange outlet               <ul style="list-style-type: none"> <li>500 pulses/revolution</li> <li>1000 pulses/revolution</li> <li>1024 pulses/revolution</li> <li>1250 pulses/revolution</li> <li>1500 pulses/revolution</li> <li>2000 pulses/revolution</li> <li>2048 pulses/revolution</li> <li>2500 pulses/revolution</li> <li>3600 pulses/revolution</li> <li>5000 pulses/revolution</li> </ul> </li> <li>With clamping flange, axial flange outlet               <ul style="list-style-type: none"> <li>500 pulses/revolution</li> <li>1000 pulses/revolution</li> <li>1024 pulses/revolution</li> <li>1250 pulses/revolution</li> <li>1500 pulses/revolution</li> <li>2000 pulses/revolution</li> <li>2048 pulses/revolution</li> <li>2500 pulses/revolution</li> <li>3600 pulses/revolution</li> <li>5000 pulses/revolution</li> </ul> </li> </ul>
		<b>6FX2001-2HA50</b> <b>6FX2001-2HB00</b> <b>6FX2001-2HB02</b> <b>6FX2001-2HB25</b> <b>6FX2001-2HB50</b> <b>6FX2001-2HC00</b> <b>6FX2001-2HC04</b> <b>6FX2001-2HC50</b> <b>6FX2001-2HD60</b> <b>6FX2001-2HF00</b>
		<b>6FX2001-2NA50</b> <b>6FX2001-2NB00</b> <b>6FX2001-2NB02</b> <b>6FX2001-2NB25</b> <b>6FX2001-2NB50</b> <b>6FX2001-2NC00</b> <b>6FX2001-2NC04</b> <b>6FX2001-2NC50</b> <b>6FX2001-2ND60</b> <b>6FX2001-2NF00</b>
		<b>6FX2001-2QA50</b> <b>6FX2001-2QB00</b> <b>6FX2001-2QB02</b> <b>6FX2001-2QB25</b> <b>6FX2001-2QB50</b> <b>6FX2001-2QC00</b> <b>6FX2001-2QC04</b> <b>6FX2001-2QC50</b> <b>6FX2001-2QD60</b> <b>6FX2001-2QF00</b>
		<b>6FX2001-2SA50</b> <b>6FX2001-2SB00</b> <b>6FX2001-2SB02</b> <b>6FX2001-2SB25</b> <b>6FX2001-2SB50</b> <b>6FX2001-2SC00</b> <b>6FX2001-2SC04</b> <b>6FX2001-2SC50</b> <b>6FX2001-2SD60</b> <b>6FX2001-2SF00</b>
		<b>Signal cable</b> Preassembled for HTL and TTL encoder, without Sub-D connector, UL/DESINA. For length code, see page 5/142.
		<b>6FX5002-2CA12-....</b>

## Overview



- 1-channel module for serial data communication via point-to-point link
- For message frames max. 224 bytes long
- RS 232C, RS 422, RS 485
- 2 versions
  - ASCII and 3964(R) protocols
  - Modbus and USS protocols
- Configuration via GSD file or STEP 7 (from V5.1)

## Technical specifications

Article number	6ES7138-4DF01-0AB0	6ES7138-4DF11-0AB0
	ET 200S, EL-MOD., 1SI,RS 232/422/485,3964R	ET 200S, EL-MOD.,1SI,RS 232/422/485 MODBUS
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
<b>Input current</b>		
from backplane bus 3.3 V DC, max.	10 mA	10 mA
from backplane bus 24 V DC, max.	80 mA; Typ. 20 mA	80 mA
<b>Power losses</b>		
Power loss, typ.	1.2 W	1.2 W
<b>Memory</b>		
Standard blocks	5 100 byte; S_SEND 2700, S_RCV 2400, S_XON 2600, S_RTS 2600, S_V24 2700, S_VSTAT 1800, S_VSET 1800	11 100 byte; Modbus: S_SEND 2700, S_RCV 2400, S_MODB 6000; USI: S_SEND 2700, S_RCV 2400, S_USST 1900, S_USSR 2600, S_USSI 1500
<b>Interfaces</b>		
Number of interfaces	1	1
RS 422/RS485	Yes; RS-422 signals: 5 (TxD(A), RxD(A), TxD(B), RxD(B), PE); RS-485 signals: 3 (R/T(A), R/T(B), PE)	Yes; RS-422 signals: 5 (TxD(A), RxD(A), TxD(B), RxD(B), PE); RS-485 signals: 3 (R/T(A), R/T(B), PE)
RS 232, cable length, shielded, max.	15 m	15 m
RS 422/485, cable length, shielded, max.	1 200 m	1 200 m
<b>Point-to-point</b>		
• RS 232C	Yes; RS 232C signals: 8 (TxD, RxD, RTS, CTS, DTR, DSR, DCD, PE)	Yes; RS 232C signals: 8 (TxD, RxD, RTS, CTS, DTR, DSR, DCD, PE)



**I/O systems**

ET 200 systems for the control cabinet  
 ET 200S - I/O modules - Technology modules

**1SI interface module****Technical specifications (continued)**

Article number	<b>6ES7138-4DF01-0AB0</b> ET 200S, EL-MOD., 1SI,RS 232/422/485,3964R	<b>6ES7138-4DF11-0AB0</b> ET 200S, EL-MOD., 1SI,RS 232/422/485 MODBUS
<b>Integrated protocol driver</b>		
- 3964 (R)	Yes	
- ASCII	Yes	
- MODBUS		Yes
- Transmission speed, Modbus protocol, max.		115.2 kbit/s; half duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s
- USS		Yes
- Transmission speed, USS protocol, max.		115.2 kbit/s; half duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s
<b>Telegram length, max.</b>		
- 3964 (R)	224 byte	
- ASCII	224 byte	
<b>Transmission speed, RS 422/485</b>		
- with 3964 (R) protocol, max.	115.2 kbit/s; half duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s	
- with ASCII protocol, max.	115.2 kbit/s; Full duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s	
<b>Transmission speed, RS232</b>		
- with 3964 (R) protocol, max.	115.2 kbit/s; half duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s	
- with ASCII protocol, max.	115.2 kbit/s; Full duplex: 110, 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 76,800, 115,200 bit/s	
<b>Character frame (adjustable)</b>		
- Bits per character	7 or 8	8
- Number of start/stop bits	1 or 2	1 or 2 (USS only 1)
- Bits per character frame	10	10 or 11 (USS only 11 bits)
- Parity	none, odd, even, any	none, odd, even (USI even only)
<b>Number of bytes per PLC sampling cycle</b>		
- Data quantity per PLC sampling cycle, receiving	32 byte; with IM151-1 Standard as of 6ES7151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7151-1BA01-0AB0; otherwise 8 bytes	32 byte; with IM151-1 Standard as of 6ES7151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7151-1BA01-0AB0; otherwise 8 bytes
- Data quantity per PLC sampling cycle, transmitting	32 byte; with IM151-1 Standard as of 6ES7151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7151-1BA01-0AB0; otherwise 8 bytes	32 byte; with IM151-1 Standard as of 6ES7151-1AA04-0AB0; with IM151-1 High Feature as of 6ES7151-1BA01-0AB0; otherwise 8 bytes
<b>Interrupts/diagnostics/status information</b>		
<b>Diagnostics indication LED</b>		
• Receive RxD (green)	Yes	Yes
• Transmit TxD (green)	Yes	Yes
• Group error SF (red)	Yes	Yes

## Technical specifications (continued)

Article number	6ES7138-4DF01-0AB0	6ES7138-4DF11-0AB0
	ET 200S, EL-MOD., 1SI,RS 232/422/485,3964R	ET 200S, EL-MOD.,1SI,RS 232/422/485 MODBUS
<b>Galvanic isolation</b>		
<b>Electrical isolation interface</b>		
• between 422/485 and internal power supply	Yes	Yes
• between RS 232 and internal power supply	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	0 °C	0 °C
• max.	60 °C	60 °C
<b>Storage/transport temperature</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Dimensions</b>		
Width	15 mm	15 mm
Height	81 mm	81 mm
Depth	52 mm	52 mm
<b>Weights</b>		
Weight, approx.	50 g	50 g

## Ordering data

## Article No.

## Article No.

## 1 SI interface module

- ASCII and 3964(R) protocols
- Modbus and USS protocols

6ES7138-4DF01-0AB0  
6ES7138-4DF11-0AB0

## Accessories

**TM-E15S26-A1 terminal module** 6ES7193-4CA40-0AA0

Ordering unit 5 items

**TM-E15C26-A1 terminal module** 6ES7193-4CA50-0AA0

Ordering unit 5 items

**TM-E15N24-A1 terminal module** 6ES7193-4CA80-0AA0

Ordering unit 5 items

**TM-E15S24-01 terminal module** 6ES7193-4CB20-0AA0

Ordering unit 5 items

**TM-E15C24-01 terminal module** 6ES7193-4CB30-0AA0

Ordering unit 5 items

**TM-E15N24-01 terminal module** 6ES7193-4CB70-0AA0

Ordering unit 5 items

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - I/O modules - Technology modules

### SIPLUS 1 SI interface module

#### Overview



- 1-channel module for serial data communication via point-to-point link
- For message frames max. 200 bytes long
- RS 232C, RS 422, RS 485
- 2 versions
  - ASCII and 3964 (R) protocols
  - Modbus and USS protocols
- Configuration via GSD file or STEP 7 (from V5.1)

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

#### Technical specifications

Article number	6AG1138-4DF01-7AB0	6AG1138-4DF11-7AB0
Based on	6ES7138-4DF01-0AB0 SIPLUS ET 200S EM ET 1SI	6ES7138-4DF11-0AB0 SIPLUS ET 200S EM 1SI RS 232/422
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax	70 °C; = Tmax
<b>Storage/transport temperature</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Extended ambient conditions</b>		
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>		
- With condensation, max.	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<b>Resistance</b>		
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

#### Ordering data

#### Article No.

<b>1 SI interface module</b> (extended temperature range and medial exposure)	
• ASCII and 3964(R) protocols • Modbus and USS protocols	6AG1138-4DF11-7AB0 6AG1138-4DF01-7AB0
<b>Accessories</b>	See SIMATIC 1 SI interface module, page 9/187

## Overview



SIWAREX CS is a versatile weighing module for all simple weighing and force measuring tasks. The compact module is easy to install in all SIMATIC automation systems. Data can be accessed directly in the SIMATIC.

## Technical specifications

<b>SIWAREX CS</b>	
<b>Integration in automation systems</b>	
<ul style="list-style-type: none"> <li>• S7-400, S7-300, C7</li> <li>• IM151-7 CPU</li> <li>• Automation systems from other manufacturers (possible with limitations)</li> </ul>	Through ET 200S Through backplane bus Through ET 200S
<b>Communication interfaces</b>	SIMATIC S7 (ET 200S backplane bus), RS 232, TTY
<b>Connection of remote display (via serial TTY interface)</b>	Display for weight value
<b>Adjustment of scales settings</b>	Using SIMATIC S7/C7 IM151-7 CPU or SIWATOOL CS PC parameter assignment software (RS 232)
<b>Measuring accuracy</b>	
Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K	0.05 %
Internal resolution	65 535
Data format of weight values	2 byte (fixed-point)
<b>Number of measurements/second</b>	50
<b>Digital filter</b>	0.05 ... 5 Hz (in 7 steps), mean value filter
<b>Weighing functions</b>	
Weight values	Gross, net
Limit values	2 (min./max.)
Zero setting function	Per command
Tare function	Per command
Tare specification	Per command
<b>Load cells</b>	Strain gages in 4-wire or 6-wire system

<b>Load cell powering</b>	
Supply voltage $U_s$ (rated value)	6 V DC typ.
Max. supply current	≤ 68 mA
Permissible load impedance	
• $R_{Lmin}$	> 87 Ω
• $R_{Lmax}$	< 4 010 Ω
With SIWAREX IS Ex interface:	
• $R_{Lmin}$	> 87 Ω
• $R_{Lmax}$	< 4010 Ω
<b>Load cell characteristic</b>	1 mV/V to 4 mV/V
<b>Permissible range of measuring signal (at greatest set characteristic value)</b>	-2.4 ... +26.4 mV
<b>Max. distance of load cells</b>	1 000 m
<b>Intrinsically-safe load cell powering</b>	Optional (SIWAREX IS Ex interface)
<b>External load cell powering</b>	Possible up to 24 V
<b>Connection to load cells in Ex zone 1</b>	Optionally via SIWAREX IS Ex interface
<b>Ex approvals zone 2 and safety</b>	ATEX 95, FM, cUL <sub>US</sub> Haz. Loc.
<b>Auxiliary power supply</b>	
Rated voltage	24 V DC
Max. current consumption	150 mA
<b>IP degree of protection to EN 60529; IEC 60529</b>	IP20
<b>Climatic requirements</b>	
$T_{min}$ (IND) to $T_{max}$ (IND) (operating temperature)	
• Vertical installation	-10 ... +60 °C (14 ... 140 °F)
• Horizontal installation	-10 ... +40 °C (14 ... 104 °F)
<b>EMC requirements according to</b>	EN 61326, EN 45501 NAMUR NE21, Part 1
<b>Dimensions</b>	80 x 125 x 130 mm (3.15 x 4.92 x 5.12 inch)

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - I/O modules - Technology modules

### SIWAREX CS

Ordering data	Article No.	Article No.
<b>SIWAREX CS</b> Weighing electronics for scales in SIMATIC ET 200S	<b>7MH4910-0AA01</b>	
<b>SIWAREX CS Manual</b> Available in a range of languages Free download on the Internet at: <a href="http://www.siemens.com/weighing-technology">http://www.siemens.com/weighing-technology</a>		
<b>SIWAREX CS "Getting started"</b> Sample software shows beginners how to program the scales in STEP 7. Free download on the Internet at: <a href="http://www.siemens.com/weighing-technology">http://www.siemens.com/weighing-technology</a>		
<b>Configuration package SIWAREX CS on CD-ROM for SIMATIC S7, version V5.4 or higher</b> • Software for SIWATOOL CS scale adjustment (in a range of languages) • Manuals available on CD (in a range of languages) • SIWAREX CS "Getting started"	<b>7MH4910-0AK01</b>	
<b>SIWATOOL cable</b> From SIWAREX U/CS with serial PC interface, for 9-pin PC interfaces (RS 232), length 3 m (9.84 ft)	<b>7MH4607-8CA</b>	
<b>Installation material (mandatory)</b>		
<b>Terminal module</b> TM-E 30 mm (1.18 inch) wide (required for each SIWAREX module)	<b>6ES7193-4CG20-0AA0</b> or compatible	
<b>Shield contact element</b> Contents 5 items, sufficient for 5 cables	<b>6ES7193-4GA00-0AA0</b>	
<b>Shield connection terminal</b> Contents: 5 items, sufficient for 5 cables Note: one shield connection terminal is required each for the • scales connection and • TTY interface or • RS 232 interface	<b>6ES7193-4GB00-0AA0</b>	
<b>N busbar, galvanized</b> 3 x 10 mm (0.12 x 0.39 inch), 1.0 m (3.28 ft) long	<b>8WA2842</b>	
<b>Feeder terminal for N busbar</b>	<b>8WA2868</b>	
<b>Remote displays (option)</b> The digital remote displays can be connected directly to the SIWAREX CS through the TTY interface. <u>The following remote display can be used:</u> S102 Siebert Industrieelektronik GmbH P.O. Box 1180 66565 Eppelborn Germany Tel.: +49 6806/980-0 Fax: +49 6806/980-999 Internet: <a href="http://www.siebertgroup.com/en">http://www.siebertgroup.com/en</a> Detailed information available from manufacturer.		
<b>Accessories</b>		
<b>SIWAREX JB junction box, aluminium housing</b> For connecting up to 4 load cells in parallel, and for connecting several junction boxes		<b>7MH4710-1BA</b>
<b>SIWAREX JB junction box, stainless steel housing</b> For connecting up to 4 load cells in parallel		<b>7MH4710-1EA</b>
<b>Ex interface, type SIWAREX IS</b> With ATEX approval, but <b>without UL or FM approval</b> for intrinsically-safe connection of load cells, including manual, suitable for the SIWAREX U, CS, MS, FTA, FTC and CF weighing modules, Approved for use in the EU. • With short-circuit current < 199 mA DC • With short-circuit current < 137 mA DC		<b>7MH4710-5BA</b> <b>7MH4710-5CA</b>
<b>Cable (optional)</b>		
<b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath</b> To connect SIWAREX U, CS, MS, FTA, FTC and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JB's, for fixed laying, occasional bending permitted, 10.8 mm (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-40 ... +176 °F)		<b>7MH4702-8AG</b>
<b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath</b> To connect the junction box (JB) or extension box (EB) in a potentially explosive atmosphere to the Ex interface (Ex I), for fixed laying, occasional bending permitted, blue PVC insulating sheath, approx. 10.8 mm (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-40 ... +176 °F)		<b>7MH4702-8AF</b>
<b>Cable LiYCY 4 x 2 x 0.25 mm<sup>2</sup></b> For TTY (connect 2 pairs of conductors in parallel), for connection of a remote display		<b>7MH4407-8BD0</b>

## Overview



SIWAREX CF is a transmitter for connecting strain-gauge sensors for tasks such as measuring force and torque. The compact module is easy to install in all SIMATIC automation systems. Complete data access to the current measured values is then possible via the SIMATIC.

## Technical specifications

<b>SIWAREX CF</b>	
<b>Integration in automation systems</b>	
S7-400, S7-300, C7	Through ET 200S
Automation systems from other vendors	Possible through ET 200S with IM 151-1
<b>Communication interfaces</b>	SIMATIC S7 (ET 200S backplane bus), 8 bytes, I/O area
<b>Module parameterization</b>	Not required (module is pre-parameterized)
<b>Measuring properties</b>	
Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K	≤0.15 %
Signal resolution	14 bits plus 1 bit sign
<b>Number of measurements/second</b>	50
<b>Low-pass filter</b>	Without or 2 Hz
<b>Sensors</b>	In accordance with the principle of expansion measurement (full bridge) 4-wire connection

<b>Sensor feed</b>	
Supply voltage, short-circuit-proof	6 V DC ± 5 %
Permissible sensor resistance	
• $R_{Lmin}$	> 250 Ω
• $R_{Lmax}$	< 4010 Ω
<b>Permissible sensor cell coefficient</b>	Up to 4 mV/V
<b>Permissible range of the measuring signal</b>	-25.2 ... +25.2 mV
<b>Auxiliary power supply</b>	
Rated voltage	24 V DC
Max. current consumption	150 mA
Current consumption on backplane bus	Typ. 10 mA
<b>Connection to sensors in Ex zone 1</b>	Optionally via SIWAREX IS Ex interface
<b>Ex approval zone 2 and safety</b>	ATEX 95, cUL <sub>US</sub> Haz. Loc.
<b>IP degree of protection to EN 60529; IEC 60529</b>	IP20
<b>Climatic requirements</b> $T_{min}$ (IND) to $T_{max}$ (IND) (operating temperature)	
• Vertical installation	0 ... +60 °C
• Horizontal installation	0 ... +40 °C
<b>EMC requirements according to</b>	NAMUR NE21, Part 1 89/386/EEC
<b>Dimensions</b>	30 x 80 x 50 mm (1.18 x 3.15 x 1.97 inch)

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - I/O modules - Technology modules

### SIWAREX CF

Ordering data	Article No.	Article No.
<b>SIWAREX CF</b> Weighing module for strain-gauge sensors in SIMATIC ET 200S (SIWAREX CF configuring package not required)	<b>7MH4920-0AA01</b>	
<b>SIWAREX CF manual</b> • German • English Free download on the Internet at: <a href="http://www.siemens.com/weighing">http://www.siemens.com/weighing</a>		
<b>SIWAREX CF "Getting started"</b> Sample software for easy acquaintance with programming in STEP 7. Free download on the Internet at: <a href="http://www.siemens.com/weighing-technology">http://www.siemens.com/weighing-technology</a>		
<b>Installation material (mandatory)</b>		
<b>Terminal module</b> TM-E 30 mm (1.18 inch) wide (required for each SIWAREX module)	<b>6ES7193-4CG20-0AA0</b> or compatible	
<b>Shield contact element</b> Contents 5 items, sufficient for 5 cables	<b>6ES7193-4GA00-0AA0</b>	
<b>Shield connection terminal</b> Contents: 5 items, sufficient for 5 cables One shield terminal element is required per sensor cable	<b>6ES7193-4GB00-0AA0</b>	
<b>N busbar, galvanized</b> 3 mm x 10 mm (0.12 in. x 0.39 in.), 1.5 m (4.92 ft.) long	<b>8WA2842</b>	
<b>Feeder terminal for N busbar</b>	<b>8WA2868</b>	
		<b>Accessories</b>
		<b>SIWAREX EB extension box</b> for extending sensor cables
		<b>Ex interface, type SIWAREX IS</b> With ATEX approval, but <b>without UL or FM approvals</b> , for intrinsically-safe connection of load cells, including manual, suitable for the SIWAREX U, CS, MS, FTA, FTC and CF weighing modules. Approved for use in the EU. <ul style="list-style-type: none"> <li>• With short-circuit current &lt; 199 mA DC</li> <li>• With short-circuit current &lt; 137 mA DC</li> </ul>
		<b>Cable (optional)</b>
		<b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath</b> for connecting SIWAREX U, CS, MS, FTA, FTC and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JBs, for fixed laying, occasional bending permitted, 10.8 mm (0.43 in.) outer diameter, for ambient temperature -40 to +80 °C (-40 ... +176 °F)
		<b>7MH4710-2AA</b>  <b>7MH4710-5BA</b>  <b>7MH4710-5CA</b>  <b>7MH4702-8AG</b>

### Overview



- Mechanical modules as receptacles for the electronic modules
- For setting up permanent wiring via build-as-you-go voltage buses
- Keyed connection technology to ensure an enhanced vibration resistance of up to 5 g
- Different variants for accepting power modules and electronic modules
- Replaceable terminal box (even within the station network)
- Automatic coding of the electronics modules
- Build-as-you-go shielding of the backplane bus for high data security
- Color coding facility for the terminals and for identifying the slot numbers
- Alternatively available with screw-type or spring-loaded terminals as well as with no-strip fast connection system "FastConnect" for up to 60 % quicker process wiring

### Ordering data

#### TM-P terminal modules for PM-E power modules

##### TM-P15S23-A1

2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals

Ordering unit 1 item

**6ES7193-4CC20-0AA0**

Ordering unit 5 items

**6ES7193-4CC20-1AA0**

##### TM-P15C23-A1

2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals

Ordering unit 1 item

**6ES7193-4CC30-0AA0**

Ordering unit 5 items

**6ES7193-4CC30-1AA0**

##### TM-P15N23-A1

**6ES7193-4CC70-0AA0**

Ordering unit 1 item  
2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect

##### TM-P15S23-A0

2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals

Ordering unit 1 item

**6ES7193-4CD20-0AA0**

Ordering unit 5 items

**6ES7193-4CD20-1AA0**

##### TM-P15C23-A0

2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals

Ordering unit 1 item

**6ES7193-4CD30-0AA0**

Ordering unit 5 items

**6ES7193-4CD30-1AA0**

### Article No.

##### TM-P15N23-A0

**6ES7193-4CD70-0AA0**

Ordering unit 1 item  
2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, FastConnect

##### TM-P15S22-01

2 x 2 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals

Ordering unit 1 item

**6ES7193-4CE00-0AA0**

Ordering unit 5 items

**6ES7193-4CE00-1AA0**

##### TM-P15C22-01

2 x 2 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals

Ordering unit 1 item

**6ES7193-4CE10-0AA0**

Ordering unit 5 items

**6ES7193-4CE10-1AA0**

##### TM-P15N22-01

**6ES7193-4CE60-0AA0**

Ordering unit 1 item  
2 x 2 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect

##### TM-P30S44-A0

**6ES7193-4CK20-0AA0**

Ordering unit 1 item  
7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals for PM-E F PROFIsafe

##### TM-P30C44-A0

**6ES7193-4CK30-0AA0**

Ordering unit 1 item  
7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals for PM-E F PROFIsafe



**I/O systems**

ET 200 systems for the control cabinet

ET 200S - I/O modules

**Terminal modules for power and electronic modules**

Ordering data	Article No.	Ordering data	Article No.
<b>TM-E terminal modules for electronic modules<sup>1)</sup></b>		<b>TM-E15C26-A1</b>	<b>6ES7193-4CA50-0AA0</b>
<b>TM-E15S24-A1</b> Ordering unit 5 items 2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	<b>6ES7193-4CA20-0AA0</b>	Ordering unit 5 items 2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	
<b>TM-E15C24-A1</b> Ordering unit 5 items 2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	<b>6ES7193-4CA30-0AA0</b>	<b>TM-E15N24-A1</b> Ordering unit 5 items 2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect	<b>6ES7193-4CA70-0AA0</b>
<b>TM-E15S24-01</b> Ordering unit 5 items 2 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	<b>6ES7193-4CB20-0AA0</b>	<b>TM-E15N26-A1</b> Ordering unit 5 items 2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect	<b>6ES7193-4CA80-0AA0</b>
<b>TM-E15C24-01</b> Ordering unit 5 items 2 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	<b>6ES7193-4CB30-0AA0</b>	<b>TM-E30S44-01</b> Ordering unit 1 item 4 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	<b>6ES7193-4CG20-0AA0</b>
<b>TM-E15S23-01</b> Ordering unit 5 items 2 x 3 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	<b>6ES7193-4CB00-0AA0</b>	<b>TM-E30C44-01</b> Ordering unit 1 item 4 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	<b>6ES7193-4CG30-0AA0</b>
<b>TM-E15C23-01</b> Ordering unit 5 items 2 x 3 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	<b>6ES7193-4CB10-0AA0</b>	<b>TM-E30S46-A1</b> Ordering unit 1 item 4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	<b>6ES7193-4CF40-0AA0</b>
<b>TM-E15N23-01</b> Ordering unit 5 items 2 x 3 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect	<b>6ES7193-4CB60-0AA0</b>	<b>TM-E30C46-A1</b> Ordering unit 1 item 4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	<b>6ES7193-4CF50-0AA0</b>
<b>TM-E15N24-01</b> Ordering unit 5 items 2 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect	<b>6ES7193-4CB70-0AA0</b>	<b>TM-E15S24-AT</b> Ordering unit 1 item for internal temperature compensation with 2 AI TC High Feature, screw-type terminal	<b>6ES7193-4CL20-0AA0</b>
<b>TM-E15S26-A1</b> Ordering unit 5 items 2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	<b>6ES7193-4CA40-0AA0</b>	<b>TM-E15C24-AT</b> Ordering unit 1 item for internal temperature compensation with 2 AI TC High Feature, spring-loaded terminals	<b>6ES7193-4CL30-0AA0</b>

1) Observe project planning help for selecting the suitable TM-E and TM-P

Ordering data	Article No.	Ordering data	Article No.
<b>Accessories for shield connection</b>		<b>Accessories for coding</b>	
<b>Shield connection element</b> Ordering unit 5 pieces for plugging into TM-E and TM-P	<b>6ES7193-4GA00-0AA0</b>	<b>Color coding plates</b> Ordering unit 200 pieces for TM-P, TM-E	
<b>Shield clamps</b> Ordering unit 5 pieces for busbar 3 × 10 mm	<b>6ES7193-4GB00-0AA0</b>	<ul style="list-style-type: none"> <li>• white</li> <li>• yellow</li> <li>• yellow/green</li> <li>• red</li> <li>• blue</li> <li>• brown</li> <li>• turquoise</li> </ul>	<b>6ES7193-4LA20-0AA0</b> <b>6ES7193-4LB20-0AA0</b> <b>6ES7193-4LC20-0AA0</b> <b>6ES7193-4LD20-0AA0</b> <b>6ES7193-4LF20-0AA0</b> <b>6ES7193-4LG20-0AA0</b> <b>6ES7193-4LH20-0AA0</b>
<b>Grounding terminal</b> Ordering unit 1 item for cable cross-sections up to 25 mm <sup>2</sup>	<b>8WA2868</b>	<b>Labels, inscribed</b> Ordering unit 1 set	
<b>3 × 10 mm busbars</b> Ordering unit 1 item	<b>8WA2842</b>	200 items for slot numbering (1 to 20) 10 ×	<b>8WA8861-0AB</b>
		200 items for slot numbering (1 to 40) 5 ×	<b>8WA8861-0AC</b>
		100 items for slot numbering, inscription in plain text	<b>8WA8848-0XA</b>
		<b>Labels, blank</b>	
		200 items for slot numbering	<b>8WA8848-2AY</b>

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - I/O modules

### SIPLUS terminal modules for power and electronic modules

#### Overview



- Mechanical modules as receptacles for the electronics modules
- For setting up permanent wiring via build-as-you-go voltage buses
- Positive-fit connection technology to ensure enhanced vibration resistance of up to 5 g
- Different versions as receptacles for power modules and electronics modules
- Replaceable terminal box (even within the station network)
- Automatic coding of the electronics modules
- Build-as-you-go shielding of the backplane bus for high data security
- Color coding facility for the terminals and for identifying the slot numbers
- Alternatively available with screw-type or spring-loaded terminals as well as with no-strip fast connection system "FastConnect" for up to 60% quicker process wiring

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

<b>SIPLUS DP TM-P12S23-A0</b>	
<b>Article number</b>	<b>6AG1193-4CD20-2AA0</b>
<b>BasedOn Article No.</b>	<b>6ES7193-4CD20-0AA0</b>
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

<b>SIPLUS DP TM-P15C23-A1</b>	
<b>Article No.</b>	<b>6AG1193-4CD30-2AA0</b>
<b>BasedOn Article No.</b>	<b>6ES7193-4CD30-0AA0</b>
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

<b>SIPLUS DP TM-P15C22-01</b>	
<b>Article No.</b>	<b>6AG1193-4CE10-2AA0</b>
<b>BasedOn Article No.</b>	<b>6ES7193-4CE10-0AA0</b>
Ambient temperature range	-40 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

<b>SIPLUS DP TM-E15C23-01</b>	
<b>Article No.</b>	<b>6AG1193-4CB10-7AA0</b>
<b>BasedOn Article No.</b>	<b>6ES7193-4CB10-0AA0</b>
Ambient temperature range	0 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

<b>SIPLUS DP TM-E15N24-01</b>	
<b>Article No.</b>	<b>6AG1193-4CB70-7AA0</b>
<b>BasedOn Article No.</b>	<b>6ES7193-4CB70-0AA0</b>
Ambient temperature range	-40 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

#### SIPLUS terminal modules for power and electronic modules

#### Overview (continued)

<b>SIPLUS DP TM-E15C24-A1</b>	
<b>Article No.</b>	<b>6AG1193-4CA30-2AA0</b>
<b>BasedOn Article No.</b>	<b>6ES7193-4CA30-0AA0</b>
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

<b>SIPLUS DP TM-E15C24-A1</b>	
<b>Article No.</b>	<b>6AG1193-4CB30-2AA0</b>
<b>BasedOn Article No.</b>	<b>6ES7193-4CB30-0AA0</b>
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

<b>SIPLUS DP TM-E15S26-A1</b>	
<b>Article No.</b>	<b>6AG1193-4CA40-2AA0</b>
<b>BasedOn Article No.</b>	<b>6ES7193-4CA40-0AA0</b>
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

<b>SIPLUS DP TM-E15C26-A1</b>	
<b>Article No.</b>	<b>6AG1193-4CA50-2AA0</b>
<b>BasedOn Article No.</b>	<b>6ES7193-4CA50-0AA0</b>
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

<b>SIPLUS DP TM-E30C44-01</b>	
<b>Article No.</b>	<b>6AG1193-4CG30-2AA0</b>
<b>BasedOn Article No.</b>	<b>6ES7193-4CG30-0AA0</b>
Ambient temperature range	-25 ... +60 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

<b>SIPLUS DP TM-E30C46-A1</b>	
<b>Article No.</b>	<b>6AG1193-4CF50-7AA0</b>
<b>BasedOn Article No.</b>	<b>6ES7193-4CF50-0AA0</b>
Ambient temperature range	-40 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

<b>SIPLUS DP TM-E15C24-AT</b>	
<b>Article No.</b>	<b>6AG1193-4CL30-7AA0</b>
<b>BasedOn Article No.</b>	<b>6ES7193-4CL30-0AA0</b>
Ambient temperature range	0 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. in sulfur chloride atmosphere).
Technical data	The technical data are identical with those of the BasedOn modules.

<b>Ambient conditions</b>	
Relative humidity	5 ... 100 % Condensation permissible
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Conformity with EN 60721-3-3, Class 3C4 incl. salt mist and ISA-S71.04 severity level G1; G2; G3; GX <sup>1)2)</sup>
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including conductive sand, dust <sup>2)</sup>
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

<sup>1)</sup> ISA-S71.04 severity level GX: Long-term load: SO<sub>2</sub> < 4.8 ppm; H<sub>2</sub>S < 9.9 ppm; Cl < 0.2 ppm; HCl < 0.66 ppm; HF < 0.12 ppm; NH<sub>3</sub> < 49 ppm; O<sub>3</sub> < 0.1 ppm; NO<sub>x</sub> < 5.2 ppm limit value (max. 30 min/d); SO<sub>2</sub> < 17.8 ppm; H<sub>2</sub>S < 49.7 ppm; Cl < 1.0 ppm; HCl < 3.3 ppm; HF < 2.4 ppm; NH<sub>3</sub> < 247 ppm; O<sub>3</sub> < 1.0 ppm; NO<sub>x</sub> < 10.4 ppm

<sup>2)</sup> The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

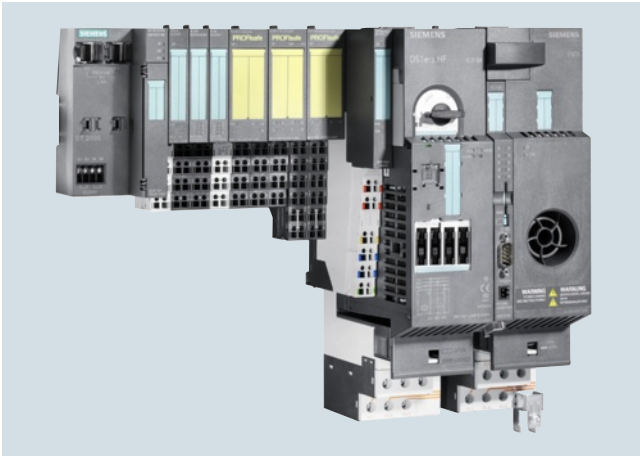
For further technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - I/O modules

### SIPLUS terminal modules for power and electronic modules

Ordering data	Article No.	Article No.
<b>TM-P terminal modules for PM-E power modules</b>		<b>Accessories for shield connection</b>
(extended temperature range and medial exposure)		<b>Shield connection element</b> <b>6ES7193-4GA00-0AA0</b>
<b>SIPLUS ET 200S TM-P15C23-A0</b>	<b>6AG1193-4CD20-2AA0</b>	Ordering unit: 5 units For plugging into TM-E and TM-P
Ordering unit: 1 unit 2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw connection		<b>Shield clamps</b> <b>6ES7193-4GB00-0AA0</b>
<b>SIPLUS ET 200S TM-P15C23-A0</b>	<b>6AG1193-4CD30-2AA0</b>	Ordering unit: 5 units For busbar 3 x 10 mm
Ordering unit: 1 unit 2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals		<b>Ground terminal</b> <b>8WA2868</b>
<b>SIPLUS ET 200S TM-P15C22-01</b>	<b>6AG1193-4CE10-2AA0</b>	Ordering unit: 1 unit For cable cross-sections up to 25 mm <sup>2</sup>
Ordering unit: 1 unit 2 x 2 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		<b>Busbars 3 x 10 mm</b> <b>8WA2842</b>
		Ordering unit: 1 unit
<b>TM-E terminal modules for electronics modules</b>		<b>Accessories for coding</b>
(extended temperature range and medial exposure)		<b>Color coding plates</b>
<b>SIPLUS ET 200S TM-E15C23-01</b>	<b>6AG1193-4CB10-7AA0</b>	Ordering unit: 200 units for TM-P, TM-E
Ordering unit: 5 units 2 x 3 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		<ul style="list-style-type: none"> <li>• White <b>6ES7193-4LA20-0AA0</b></li> <li>• Yellow <b>6ES7193-4LB20-0AA0</b></li> <li>• Yellow/green <b>6ES7193-4LC20-0AA0</b></li> <li>• Red <b>6ES7193-4LD20-0AA0</b></li> <li>• Blue <b>6ES7193-4LF20-0AA0</b></li> <li>• Brown <b>6ES7193-4LG20-0AA0</b></li> <li>• Turquoise <b>6ES7193-4LH20-0AA0</b></li> </ul>
<b>SIPLUS ET 200S TM-E15N24-01</b>	<b>6AG1193-4CB70-7AA0</b>	<b>Labels, inscribed</b>
Ordering unit: 5 units 2 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, FastConnect		Ordering unit: 1 set
<b>SIPLUS ET 200S TM-E15C24-A1</b>	<b>6AG1193-4CA30-2AA0</b>	200 units for slot numbering (1 to 20) 10 x <b>8WA8861-0AB</b>
Ordering unit: 5 units 2 x 4 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		200 units for slot numbering (1 to 40) 5 x <b>8WA8861-0AC</b>
<b>SIPLUS ET 200S TM-E15C24-01</b>	<b>6AG1193-4CB30-2AA0</b>	<b>Labels, blank</b>
Ordering unit: 5 units 2 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		200 units for slot numbering <b>8WA8848-2AY</b>
<b>SIPLUS ET 200S TM-E15S26-A1</b>	<b>6AG1193-4CA40-2AA0</b>	
Ordering unit: 5 units 2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals		
<b>SIPLUS ET 200S TM-E15C26-A1</b>	<b>6AG1193-4CA50-2AA0</b>	
Ordering unit: 5 units 2 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		
<b>SIPLUS ET 200S TM-E30C44-01</b>	<b>6AG1193-4CG30-2AA0</b>	
Ordering unit: 1 unit 4 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		
<b>SIPLUS ET 200S TM-E30C46-A1</b>	<b>6AG1193-4CF50-7AA0</b>	
Ordering unit: 1 units 4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals		
<b>SIPLUS ET 200S TM-E15C24-AT</b>	<b>6AG1193-4CL30-7AA0</b>	
Ordering unit: 1 unit For internal temperature compensation with 2 AI TC High Feature, spring-loaded terminals		

**Overview**

The fail-safe SIMATIC S7 CPUs, plus the fail-safe signal modules of SIMATIC ET 200S / ET200 / 200pro / ET200eco and ET200M have been specially developed for distributed applications in manufacturing systems. Thanks to the discrete structure of the F I/Os, safety technology is only applied where actually required. The new system replaces conventional electromechanical components, such as:

- Freely programmable safe linking of sensors to actuators;
- Selective safe shutdown of actuators;
- Hybrid configurations of F modules (F stands for fail-safe) and standard modules in a station;
- Single-bus concept, F signals and standard signals are transferred over one bus medium (PROFIBUS DP, PROFINET).

**Totally Integrated Automation (TIA)**

Safety technology (Safety Integrated) is a component of Totally Integrated Automation resulting in the total integration of safety and standard automation (SIMATIC S7).

Whereas today, standard automation (conventional PLCs) and safety automation (electromechanics) are still separate, these two worlds are growing closer together to form one uniform, integrated overall system.

Siemens can therefore present itself as a complete supplier for automation engineering for which safety technology is part of the standard automation and uniformity exists throughout the complete system.

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - Fail-safe I/O modules

### PM-E F PROFIsafe F power modules

#### Overview



Fail-safe PM-E F PROFIsafe power modules for safety shutdown of standard digital output modules.

- Up to 2 fail-safe digital outputs onboard (source/sink outputs, up to 2A, up to SIL3/Cat. 4)
- The standard digital output modules can be shut down up to PL e according to ISO 13849.1 and SIL 2 (IEC 61508) (up to 10 A). The following modules can be used down-circuit of the power modules.
  - 2DO / 0.5 A ST, 6ES7132-4BB01-0AA0
  - 2 DO / 2 A ST, 6ES7132-4BB31-0AA0
  - 2 DO / 0.5 A HF, 6ES7132-4BB01-0AB0
  - 2 DO / 2 A HF, 6ES7132-4BB31-0AB0
  - 4 DO / 0.5 A ST, 6ES7132-4BD01-0AA0
  - 4 DO / 2 A ST, 6ES7132-4BD31-0AA0

The modules support PROFIsafe, both in PROFIBUS, and in PROFINET configurations. They can be used with all fail-safe SIMATIC S7-CPU's.

#### Technical specifications

Article number	6ES7138-4CF03-0AB0	6ES7138-4CF42-0AB0
	ET200S, POWERMOD. PM-E F PM, DC24V	ET200S, POWERMOD. PM-E F PP, DC24V
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	No	No
<b>Input current</b>		
from load voltage L+ (without load), max.	typ. 100 mA	typ. 100 mA
from backplane bus 24 V DC, max.	28 mA	28 mA
<b>Current carrying capacity</b>		
up to 30 °C, max.		10 A
up to 40 °C, max.	10 A	8 A
up to 60 °C, max.	6 A	7 A
<b>Power losses</b>		
Power loss, typ.	4 W	4 W
<b>Address area</b>		
<b>Address space per module</b>		
• without packing	5 byte; Input and output in each case	5 byte; Input and output in each case
<b>Digital inputs</b>		
<b>Cable length</b>		
• shielded, max.	200 m	200 m
• Unshielded, max.	200 m	200 m
<b>Digital outputs</b>		
Number of digital outputs	2	1; Relays
short-circuit protection	Yes; Electronic	No
• Response threshold, typ.	Response threshold (short-circuit): 5 to 12 A; response threshold (external short-circuit to ground): 5 to 12 A; response threshold (external short-circuit to P potential): 25 to 45 A	
Limitation of inductive shutdown voltage to	L+ (-2x 47 V)	
Controlling a digital input	No	Yes

**Technical specifications (continued)**

Article number	<b>6ES7138-4CF03-0AB0</b> ET200S, POWERMOD. PM-E F PM, DC24V	<b>6ES7138-4CF42-0AB0</b> ET200S, POWERMOD. PM-E F PP, DC24V
<b>Switching capacity of the outputs</b> • on lamp load, max.	10 W	100 W
<b>Load resistance range</b> • lower limit • upper limit	12 Ω 1 kΩ	
<b>Output voltage</b> • for signal "1", min.	L+ (-2,0 V), current sourcing switch: L+ (-1,5 V), voltage drop on current sinking switch: max. 0.5 V	
<b>Output current</b> • for signal "1" rated value • for signal "1" permissible range for 0 to 60 °C, min. • for signal "1" permissible range for 0 to 60 °C, max. • for signal "0" residual current, max.	2 A 20 mA 2.4 A 0.5 mA	
<b>Parallel switching of 2 outputs</b> • for increased power • for redundant control of a load	No No	
<b>Switching frequency</b> • with resistive load, max. • with inductive load, max. • on lamp load, max.	30 Hz 0.1 Hz 10 Hz	2 Hz 0.1 Hz; with inductive load to IEC 947-5-1, DC-13 / AC-15 2 Hz
<b>Aggregate current of outputs (per group)</b> <b>horizontal installation</b> - up to 40 °C, max. - up to 55 °C, max. - up to 60 °C, max. <b>vertical installation</b> - up to 40 °C, max.	10 A 7 A 6 A 6 A	10 A 8 A 7 A 8 A
<b>Relay outputs</b> <b>Switching capacity of contacts</b> - at ohmic load, up to 50 °C, max.	10 A	10 A
<b>Cable length</b> • shielded, max. • Unshielded, max.	200 m 200 m	



**I/O systems**

ET 200 systems for the control cabinet

ET 200S - Fail-safe I/O modules

**PM-E F PROFIsafe F power modules****Technical specifications** (continued)

Article number	<b>6ES7138-4CF03-0AB0</b> ET200S, POWERMOD. PM-E F PM, DC24V	<b>6ES7138-4CF42-0AB0</b> ET200S, POWERMOD. PM-E F PP, DC24V
<b>Interrupts/diagnostics/ status information</b>		
<b>Diagnostic messages</b>		
• Diagnostic functions	Yes	Yes
• Diagnostic information readable	Yes	Yes
• Diagnostics	Yes	
• Wire break	Yes	No
• Short circuit	Yes	Yes
• Missing load voltage	Yes	Yes
<b>Diagnostics indication LED</b>		
• Rated load voltage PWR (green)	Yes	Yes
• Group error SF (red)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
<b>Galvanic isolation</b>		
<b>Galvanic isolation digital outputs</b>		
• between the channels	No	No
• between the channels and the backplane bus	Yes	Yes
• between the channels and the load voltage L+	No	No
<b>Isolation</b>		
Isolation checked with	500 V DC	500 V DC
<b>tested with</b>		
• Channels against backplane bus and load voltage L+	500 V DC	500 V DC
<b>Standards, approvals, certificates</b>		
<b>Highest safety class achievable in safety mode</b>		
• acc. to EN 954	4	4
• SIL according to IEC 61508	Up to SIL 3	With Std-DO: Max. SIL 2, without Std-DO max. SIL 3 depending on configuration
<b>Dimensions</b>		
Width	30 mm	30 mm
Height	81 mm	81 mm
Depth	52 mm	52 mm
<b>Weights</b>		
Weight, approx.	88 g	80 g

Ordering data	Article No.	Ordering data	Article No.
<b>PM-E F pm PROFIsafe power module, 24 V DC</b> For safe shutdown of digital output modules	6ES7138-4CF03-0AB0	<b>S7 Distributed Safety programming tool V5.4</b> Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 and higher	
<b>PM-E F pp PROFIsafe power module, 24 V DC</b> For safe shutdown of digital output modules	6ES7138-4CF42-0AB0	Floating license	<b>6ES7833-1FC02-0YA5</b>
<b>Accessories</b>		Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; e-mail address required for delivery	<b>6ES7833-1FC02-0YH5</b>
<b>IM 151-1 HIGH FEATURE interface module</b> For ET 200S; transfer rate up to 12 Mbit/s; data volumes 244 bytes each for I/O, up to 63 modules can be connected; connection of PROFIsafe modules, isochronous mode; bus connection via 9-pin Sub-D incl. terminating module	6ES7151-1BA02-0AB0	<b>S7 Distributed Safety Upgrade</b> From V5.x to V5.4; floating license for 1 user	<b>6ES7833-1FC02-0YE5</b>
<b>IM 151-3 PN HF interface module</b> For ET 200S; transfer rate up to 100 Mbit/s; max. 63 I/O modules up to 2 m wide can be connected; 2 x bus connection via RJ45 connector, incl. terminating module	6ES7151-3BA23-0AB0	<b>STEP 7 Safety Advanced V13 SP1</b> Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1	
<b>IM 151-3 PN FO interface module</b> For ET 200S; 2 PROFINET FO interfaces, integrated 2-port switch, max. 63 I/O modules up to 2 m wide can be connected, incl. terminating module	6ES7151-3BB23-0AB0	Floating license for 1 user	<b>6ES7833-1FA13-0YA5</b>
<b>Terminal modules for power modules</b>		Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; e-mail address required for delivery	<b>6ES7833-1FA13-0YH5</b>
<b>TM-P30S44-A0</b> Ordering unit 1 item 7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals for PM-E F PROFIsafe	6ES7193-4CK20-0AA0	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, five languages: S7-200/300/400, C7, LOGO!, SIMATIC DP, PC, PG, STEP 7, engineering software, runtime software, PCS 7, SIMATIC HMI, SIMATIC NET	<b>6ES7998-8XC01-8YE0</b>
<b>TM-P30C44-A0</b> Ordering unit 1 item 7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals for PM-E F PROFIsafe	6ES7193-4CK30-0AA0	<b>SIMATIC Manual Collection update service for 1 year</b>	<b>6ES7998-8XC01-8YE2</b>

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - Fail-safe I/O modules

### F electronic modules

#### Overview



F electronic modules are digital inputs/outputs for the fail-safe SIMATIC S7 systems.

#### Fail-safe digital input module

- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 2 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508) and PL e (ISO 13849)

#### Fail-safe digital output module

- Fail-safe 2-channel activation (sink/source output) by actuators
- Actuators can be driven by up to 2 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)

#### Fail-safe digital hybrid module

- 4 fail-safe inputs/3 fail-safe outputs
- Certified up to SIL 2 (IEC 61508) and PL d (ISO 13849)

The modules support PROFIsafe, both in PROFIBUS, and in PROFINET configurations.

They can be used with all fail-safe SIMATIC S7 CPUs.

#### Technical specifications

Article number	<b>6ES7138-4FA05-0AB0</b>
	ET200S, EL-MOD., 4/8 F-DI, DC 24V
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Encoder supply</b>	
Number of outputs	2
Type of output voltage	min. L+ (-1.5 V)
short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.8 A)
<b>Output current</b>	
• nominal	300 mA
• permissible range	0 to 300 mA
<b>Address area</b>	
<b>Occupied address area</b>	
• Inputs	6 byte
• Outputs	4 byte
<b>Digital inputs</b>	
Number of digital inputs	8; 8 (one-channel); 4 (two-channel)
Input characteristic curve in accordance with IEC 61131, type 1	Yes
<b>Number of simultaneously controllable inputs</b>	
• Number of simultaneously controllable inputs	8
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
<b>Input current</b>	
• for signal "1", typ.	3.7 mA

Article number	<b>6ES7138-4FA05-0AB0</b>
	ET200S, EL-MOD., 4/8 F-DI, DC 24V
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
- Parameterizable	Yes
- at "0" to "1", min.	0.3 ms
- at "0" to "1", max.	17 ms
- at "1" to "0", min.	0.3 ms
- at "1" to "0", max.	17 ms
<b>Cable length</b>	
• shielded, max.	500 m
• Unshielded, max.	500 m
<b>Encoder</b>	
<b>Connectable encoders</b>	
• 2-wire sensor	No
- Permissible quiescent current (2-wire sensor), max.	0.6 mA; max.
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Short circuit	Yes
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
• Status indicator digital input (green)	Yes
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	No

## Technical specifications (continued)

Article number	<b>6ES7138-4FA05-0AB0</b> ET200S, EL-MOD., 4/8 F-DI, DC 24V
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
• SIL according to IEC 61508	SIL 2 (single-channel), SIL 3 (two-channel)
<b>Dimensions</b>	
Width	30 mm
Height	81 mm
Depth	52 mm
<b>Weights</b>	
Weight, approx.	78 g
Article number	<b>6ES7138-4FB04-0AB0</b> ET200S, EL-MOD., 4 F-DO, DC 24V/2A
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	No
<b>Input current</b>	
from load voltage L+ (without load), max.	typ. 100 mA
from backplane bus 3.3 V DC, max.	28 mA
<b>Digital outputs</b>	
Number of digital outputs	4
short-circuit protection	Yes
Limitation of inductive shutdown voltage to	Typ. (2L+) -47 V
Controlling a digital input	No
<b>Switching capacity of the outputs</b>	
• on lamp load, max.	10 W
<b>Load resistance range</b>	
• lower limit	12 Ω
• upper limit	1 kΩ
<b>Output voltage</b>	
• for signal "1", min.	L+ (-2,0 V), current sourcing switch; L+ (-1,5 V), voltage drop on current sinking switch: max. 0.5 V
<b>Output current</b>	
• for signal "1" rated value	2 A
• for signal "1" permissible range for 0 to 60 °C, min.	20 mA
• for signal "1" permissible range for 0 to 60 °C, max.	2.4 A
• for signal "0" residual current, max.	0.5 mA; P- and M-switching
<b>Parallel switching of 2 outputs</b>	
• for increased power	No
• for redundant control of a load	No
<b>Switching frequency</b>	
• with resistive load, max.	30 Hz; Symmetrical
• with inductive load, max.	0.1 Hz; Symmetrical
• on lamp load, max.	10 Hz; Symmetrical
<b>horizontal installation</b>	
- up to 40 °C, max.	6 A
- up to 55 °C, max.	5 A
- up to 60 °C, max.	4 A
<b>vertical installation</b>	
- up to 40 °C, max.	4 A
<b>Cable length</b>	
• shielded, max.	500 m
• Unshielded, max.	500 m

Article number	<b>6ES7138-4FB04-0AB0</b> ET200S, EL-MOD., 4 F-DO, DC 24V/2A
<b>Interrupts/diagnostics/status information</b>	
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
• Wire break	Yes
• Short circuit	Yes
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital outputs</b>	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	No
<b>Isolation tested with</b>	
• Load voltage L+ against backplane bus	2545 V DC
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
• SIL according to IEC 61508	SIL 3
<b>Dimensions</b>	
Width	30 mm
Height	81 mm
Depth	52 mm
<b>Weights</b>	
Weight, approx.	85 g
Article number	<b>6ES7138-4FC01-0AB0</b> ET200S, EL-MOD., 4 F-DI/3 F-DO, DC 24V/2A
<b>Product type designation</b>	
<b>Supply voltage</b>	
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Digital inputs</b>	
Number of digital inputs	4
<b>Input voltage</b>	
• Type of input voltage	DC
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
• SIL according to IEC 61508	2
<b>Dimensions</b>	
Width	30 mm
Height	81 mm
Depth	52 mm

## I/O systems

ET 200 systems for the control cabinet

ET 200S - Fail-safe I/O modules

### F electronic modules

Ordering data	Article No.	Article No.
<b>4/8 F-DI PROFIsafe 24 V DC electronic module</b> 30 mm wide, up to PL e according to ISO 13849.1	6ES7138-4FA05-0AB0	
<b>4 F-DO PROFIsafe 24 V DC/2A electronic module</b> 30 mm wide, up to PL e according to ISO 13849.1	6ES7138-4FB04-0AB0	
<b>4 F-DI / 3 F-DO PROFIsafe 24 V DC/2A electronic module</b> 30 mm wide, up to PL e according to ISO 13849.1 / SIL 2 (IEC 62061)	6ES7138-4FC01-0AB0	
<b>Accessories</b>		
<b>Terminal modules for electronic modules</b>	See F terminal modules	
<b>IM 151-1 High Feature interface module</b> For ET 200S; transmission rate up to 12 Mbit/s; max. 63 modules can be connected, with isochronous mode, bus connection via 9-pin Sub-D connector incl. terminating module	6ES7151-1BA02-0AB0	
<b>IM 151-3 PN HF interface module</b> For ET 200S; transfer rate up to 100 Mbit/s; max. 63 I/O modules up to 2 m wide can be connected; 2 x bus connection via RJ45 connector, incl. terminating module	6ES7151-3BA23-0AB0	
<b>IM 151-3 PN FO interface module</b> For ET 200S; 2 PROFINET FO interfaces, integrated 2-port switch, max. 63 I/O modules up to 2 m wide can be connected, incl. terminating module	6ES7151-3BB23-0AB0	
		<b>S7 Distributed Safety programming tool V5.4</b> Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 and higher Floating license Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; e-mail address required for delivery
		<b>S7 Distributed Safety Upgrade</b> From V5.x to V5.4; floating license for 1 user
		<b>STEP 7 Safety Advanced V13 SP1</b> Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1 Floating license for 1 user Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; e-mail address required for delivery
		<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)
		<b>SIMATIC Manual Collection – Update service for 1 year</b> Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Overview



The digital F electronic module relay 1 F-RO 24 V DC / 5 A 24 to 230 V AC / 5A has the following characteristics:

- 1 relay output (2 NO contacts)
- Output current 5 A
- Rated load voltage 24 V DC and 24 to 230 V AC
- The control circuit of the two safety relays must be routed from the outside to the respective terminals.

The attainable safety integrity level is SIL 3 (IEC 61508), when the control of the F-RO module is implemented via a fail-safe output (e.g. EM 4F-DO 24 V DC/2A PROFIsafe).

## Technical specifications

Article number	<b>6ES7138-4FR00-0AA0</b> ET200S, 1 F-RO DC24V/5A AC24..230V/5A
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V; Supply via fail-safe output, e.g. of an F-DO
<b>Input current</b>	
from load voltage L+ (without load), max.	100 mA; from control voltage
from backplane bus 3.3 V DC, max.	10 mA
<b>Power losses</b>	
Power loss, typ.	2.1 W
<b>Address area</b>	
<b>Address space per module</b>	
• with packing	2 bit
• without packing	1 byte
<b>Digital outputs</b>	
Number of digital outputs	1
short-circuit protection	No
Controlling a digital input	Yes
<b>Output current</b>	
• for signal *1* rated value	5 A
• for signal *1* minimum load current	5 mA
<b>Switching frequency</b>	
• with resistive load, max.	2 Hz
• with inductive load, max.	0.1 Hz
<b>horizontal installation</b>	
- up to 40 °C, max.	8 A
- up to 55 °C, max.	6 A; At 50 °C
- up to 60 °C, max.	5 A; up to max. 24.8 V
<b>vertical installation</b>	
- up to 40 °C, max.	6 A

Article number	<b>6ES7138-4FR00-0AA0</b> ET200S, 1 F-RO DC24V/5A AC24..230V/5A
<b>Relay outputs</b>	
<b>Switching capacity of contacts</b>	
- Thermal continuous current, max.	5 A
<b>Cable length</b>	
• shielded, max.	200 m
• Unshielded, max.	200 m
<b>Diagnostics indication LED</b>	
• Status indicator digital output (green)	Yes
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital outputs</b>	
• between the channels	Yes
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	Yes; between channels and control voltage
<b>Standards, approvals, certificates</b>	
<b>Highest safety class achievable in safety mode</b>	
• acc. to EN 954	4
• SIL according to IEC 61508	Up to SIL 3
<b>Dimensions</b>	
Width	30 mm
Height	81 mm
Depth	52 mm
<b>Weights</b>	
Weight, approx.	90 g

## I/O systems

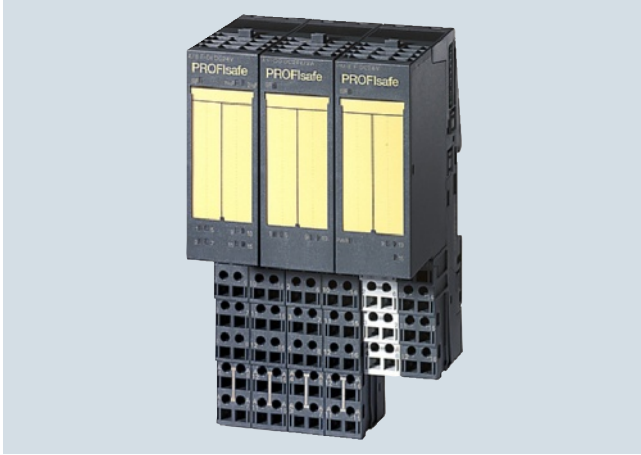
ET 200 systems for the control cabinet  
ET 200S - Fail-safe I/O modules

### F electronic module relays

Ordering data	Article No.	Article No.
<b>1 F-RO F electronic module relay</b> Relay output (2 NO contacts), output current 5 A, load voltages DC 24 V and AC 24 ... 230 V, can be used at up to Category 4/SIL3, if controlled via F-DO	<b>6ES7138-4FR00-0AA0</b>	
<b>Accessories</b>		
<b>Terminal modules for electronic modules</b>	See F terminal modules	
<b>IM 151-1 High Feature interface module</b> For ET 200S; transmission rate up to 12 Mbit/s; max. 63 modules can be connected, with isochronous mode, bus connection via 9-pin Sub-D connector incl. terminating module	<b>6ES7151-1BA02-0AB0</b>	
<b>IM 151-3 PN HF interface module</b> For ET 200S; transfer rate up to 100 Mbit/s; max. 63 I/O modules up to 2 m wide can be connected; 2 x bus connection via RJ45 connector, incl. terminating module	<b>6ES7151-3BA23-0AB0</b>	
<b>IM 151-3 PN FO interface module</b> For ET 200S; 2 PROFINET FO interfaces, integrated 2-port switch, max. 63 I/O modules up to 2 m wide can be connected, incl. terminating module	<b>6ES7151-3BB23-0AB0</b>	
		<b>S7 Distributed Safety programming tool V5.4</b> Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 and higher Floating license <b>6ES7833-1FC02-0YA5</b> <b>6ES7833-1FC02-0YH5</b> Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; e-mail address required for delivery
		<b>S7 Distributed Safety Upgrade</b> From V5.x to V5.4; floating license for 1 user <b>6ES7833-1FC02-0YE5</b>
		<b>STEP 7 Safety Advanced V13 SP1</b> Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1 Floating license for 1 user <b>6ES7833-1FA13-0YA5</b> <b>6ES7833-1FA13-0YH5</b> Floating license for 1 user, license key download without software or documentation <sup>1)</sup> ; e-mail address required for delivery
		<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication) <b>6ES7998-8XC01-8YE0</b>
		<b>SIMATIC Manual Collection – Update service for 1 year</b> Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates <b>6ES7998-8XC01-8YE2</b>

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

### Overview



- Mechanical modules as receptacles for the electronic modules
- For setting up permanent wiring through self-configuring voltage buses
- Keyed connection technology to ensure an enhanced vibration resistance of up to 5 g
- Different versions to accommodate power modules and electronic modules
- Replaceable terminal box (even within the station network)
- Automatic coding of the electronic modules
- Self-shielding of the backplane bus for high data security
- Color coding facility for the terminals and for identifying the slot numbers
- Alternatively available with screw-type or spring-loaded terminals
- For up to 60 % faster process wiring also with FastConnect connection method (av. soon)

### Ordering data

#### F-terminal modules for power modules

##### TM-P15S23-A1

2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals

Ordering unit 1 item

**6ES7193-4CC20-0AA0**

Ordering unit 5 items

**6ES7193-4CC20-1AA0**

##### TM-P15C23-A1

2 x 3 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals

Ordering unit 1 item

**6ES7193-4CC30-0AA0**

Ordering unit 5 items

**6ES7193-4CC30-1AA0**

##### TM-P15S23-A0

2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals

Ordering unit 1 item

**6ES7193-4CD20-0AA0**

Ordering unit 5 items

**6ES7193-4CD20-1AA0**

##### TM-P15C23-A0

2 x 3 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals

Ordering unit 1 item

**6ES7193-4CD30-0AA0**

Ordering unit 5 items

**6ES7193-4CD30-1AA0**

### Article No.

##### TM-P15S22-01

2 x 2 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals

Ordering unit 1 item

**6ES7193-4CE00-0AA0**

Ordering unit 5 items

**6ES7193-4CE00-1AA0**

##### TM-P15C22-01

2 x 2 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals

Ordering unit 1 item

**6ES7193-4CE10-0AA0**

Ordering unit 5 items

**6ES7193-4CE10-1AA0**

##### TM-P30S44-A0

Ordering unit 1 item  
7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, screw-type terminals for PM-E F PROFIsafe

**6ES7193-4CK20-0AA0**

##### TM-P30C44-A0

Ordering unit 1 item  
7 x 2 terminals, terminal access to AUX1 bus, AUX1 interrupted to the left, spring-loaded terminals for PM-E F PROFIsafe

**6ES7193-4CK30-0AA0**



## I/O systems

ET 200 systems for the control cabinet

ET 200S - Fail-safe I/O modules

### F terminal modules

Ordering data	Article No.	Ordering data	Article No.
<b>F-terminal modules for electronic modules</b>		<b>Accessories</b>	
<b>TM-E30S44-01</b> Ordering unit 1 item 4 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	<b>6ES7193-4CG20-0AA0</b>	<b>Color coding plates</b> Ordering unit 200 pieces for TM-P, TM-E • white • yellow • yellow/green • red • blue • brown • turquoise	<b>6ES7193-4LA20-0AA0</b> <b>6ES7193-4LB20-0AA0</b> <b>6ES7193-4LC20-0AA0</b> <b>6ES7193-4LD20-0AA0</b> <b>6ES7193-4LF20-0AA0</b> <b>6ES7193-4LG20-0AA0</b> <b>6ES7193-4LH20-0AA0</b>
<b>TM-E30C44-01</b> Ordering unit 1 item 4 x 4 terminals, no terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	<b>6ES7193-4CG30-0AA0</b>	<b>Grounding terminal</b> Ordering unit 1 item For cable cross-sections up to 25 mm <sup>2</sup>	<b>8WA2868</b>
<b>TM-E30S46-A1</b> Ordering unit 1 item 4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, screw-type terminals	<b>6ES7193-4CF40-0AA0</b>	<b>3 x 10 mm busbars</b> Ordering unit 1 item	<b>8WA2842</b>
<b>TM-E30C46-A1</b> Ordering unit 1 item 4 x 6 terminals, terminal access to AUX1 bus, AUX1 interconnected to the left, spring-loaded terminals	<b>6ES7193-4CF50-0AA0</b>	<b>Labels, inscribed</b> Ordering unit 1 set • 200 items for slot numbering (1 to 20) 10 x • 200 items for slot numbering (1 to 40) 5 x • 100 items for slot numbering, inscription in plain text	<b>8WA8861-0AB</b> <b>8WA8861-0AC</b> <b>8WA8848-0XA</b>
		<b>Labels, blank</b> 200 items for slot numbering	<b>8WA8848-2AY</b>

## Overview



Digital inputs/outputs for the fail-safe SIMATIC S7 systems

Fail-safe digital input module

- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 2 internal sensor supplies (incl. test function) onboard

Fail-safe digital output module

- Fail-safe 2-channel activation (sink/source output) by actuators
- Actuators can be controlled up to 2 A

All modules are certified up to Cat. 4 (EN 954-1) and up to SIL 3 (IEC 61508).

The modules support PROFIsafe, in both PROFIBUS and PROFINET configurations.

They can be used with all fail-safe SIMATIC S7-CPU's.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

## Technical specifications

Article number	<b>6AG1138-4FA05-2AB0</b>
Based on	<b>6ES7138-4FA05-0AB0</b> SIPLUS ET200S EM F-DI 24V PROFISAFE
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C
• max.	60 °C
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
• At cold restart, min.	-25 °C
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Article number	<b>6AG1138-4FB04-2AB0</b>
Based on	<b>6ES7138-4FB04-0AB0</b> SIPLUS ET200S EM F-DO 24V PROFISAFE
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C
• max.	60 °C
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
• At cold restart, min.	-25 °C
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**I/O systems**

ET 200 systems for the control cabinet

ET 200S - Fail-safe I/O modules

**SIPLUS F electronic modules**

<b>Ordering data</b>	<b>Article No.</b>		<b>Article No.</b>
<b>SIPLUS F electronic modules</b> (extended temperature range and medial exposure)		<b>Accessories</b>	See SIMATIC F electronic modules, page 9/210
<b>4/8 F DI PROFIsafe 24 V DC            electronic module</b> 30 mm construction width, up to Category 4 (EN 954-1)	<b>6AG1138-4FA05-2AB0</b>		
<b>4 F-DO PROFIsafe 24 V DC/2 A            electronic module</b> 30 mm construction width, up to Category 4 (EN 954-1)	<b>6AG1138-4FB04-2AB0</b>		

## Overview



The electronic module 4SI IO-Link is an IO-Link master and supports the easy integration of sensors and actuators from different manufacturers in the multifunctional, distributed I/O system SIMATIC ET 200S on a total of four ports.

## Features

- Up to four IO-Link devices can be connected to each IO-Link master module (three-wire connection). 3RA6 compact starters or load feeders with 3RA27 function modules can even be bundled in groups of four devices each at an IO-Link port. This means that up to 16 load feeders can be connected to the controller at an IO-Link master module.
- Up to 4 standard sensors (2-wire/3-wire connection) can be connected.
- The electronic module 4SI IO-Link is 15 mm in width and can be used with the following universal terminal modules:
  - TM-E15S26-A1 (screw terminal)
  - TM-E15C26-A1 (spring-loaded terminal)
  - TM-E15N26-A1 (FastConnect)
- Supports firmware update (STEP 7 V5.4 SP4 and higher)
- Corresponds to IO-Link specification V1.0

## Ordering data

**4SI IO-Link electronic module**  
IO-Link master, screw terminal,  
spring-loaded terminal or  
FastConnect connection method

## Article No.

**6ES7138-4GA50-0AB0**

## Article No.

## Accessories

## Universal terminal module for ET 200S

- TM-E15S26-A1  
with screw terminal
- TM-E15C26-A1  
with spring-loaded terminal
- TM-E15N26-A1  
with FastConnect

**6ES7193-4CA40-0AA0**

**6ES7193-4CA50-0AA0**

**6ES7193-4CA80-0AA0**

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - IO-Link master modules

### 4SI SIRIUS electronic module

#### Overview



The electronic module 4SI SIRIUS supports easy, cost-effective connection of SIRIUS switching devices with IO-Link to the multifunctional, distributed I/O system SIMATIC ET 200S on a total of four ports.

#### Features

- Up to 4 SIRIUS devices can be connected to the 4 ports of each 4SI SIRIUS electronic module. 3RA6 compact starters or load feeders with 3RA27 function modules can even be bundled in groups of 4 devices each at an IO-Link port. This means that up to 16 load feeders can be connected to the controller at an IO-Link master module.
- The electronic module 4SI SIRIUS is 15 mm in width and can be used with the following universal terminal modules:
  - TM-E15S26-A1 (screw terminal)
  - TM-E15C26-A1 (spring-loaded terminal)
  - TM-E15N26-A1 (FastConnect)
- Supports firmware updates (STEP 7 V5.4 SP5 and higher)
- Corresponds to IO-Link specification V1.0

#### Ordering data

##### 4SI SIRIUS electronic module

For the connection of SIRIUS switching devices to ET 200S; 4 ports. Screw terminal, spring-loaded terminal, or FastConnect connection method

#### Article No.

**3RK1005-0LB00-0AA0**

#### Article No.

##### Accessories

##### Universal terminal module for ET 200S

- TM-E15S26-A1 with screw terminal
- TM-E15C26-A1 with spring-loaded terminal
- TM-E15N26-A1 with FastConnect

**6ES7193-4CA40-0AA0**

**6ES7193-4CA50-0AA0**

**6ES7193-4CA80-0AA0**

##### ET 200S manual for 4SI SIRIUS electronic module

Note:  
<http://support.automation.siemens.com/WW/view/en/37856470>

## Overview

### ET 200S motor starters in the ET 200S I/O system

The SIMATIC ET 200S is the multifunctional and bit-modular I/O system in degree of protection IP20 for exact adaptation to the automation task.

Interface modules (IM) are used for connecting the ET 200S to PROFIBUS DP or PROFINET. If interface modules with integrated S7-CPU are used, the ET 200S can act as a miniature controller.

The ET 200S is designed for combining with a large range of digital and analog input or output modules, technology modules, IO-Link master modules, pneumatic connections, or motor starters and frequency converters for the control of drives.

In addition to the standard versions, SIPLUS versions are available both for interface modules and I/O modules. They can be

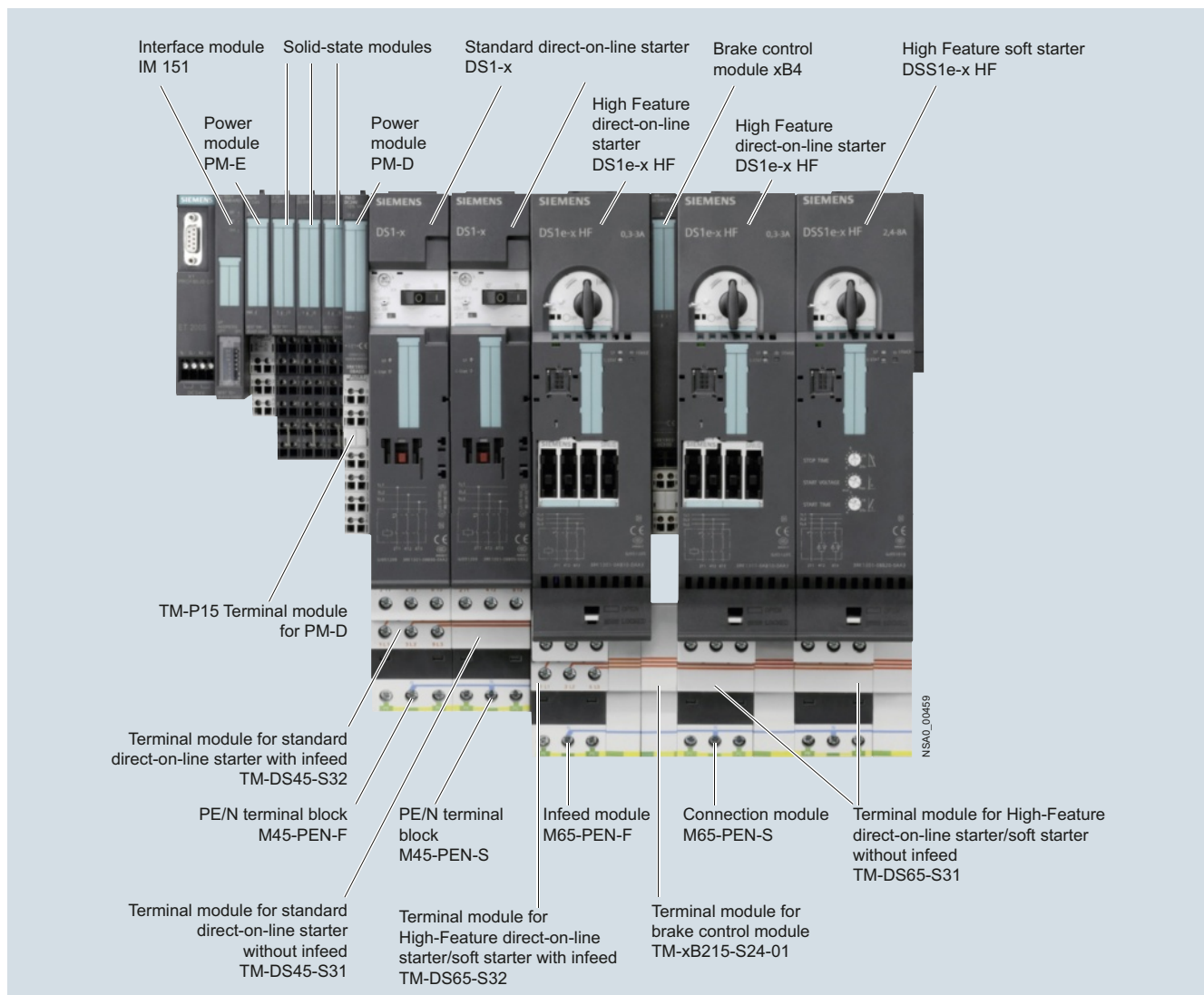
used for an extended temperature range and increased medial loads.

Device replacement is easy and quick thanks to permanent wiring and automatic re-parameterization.

Hot swapping, i.e. the disconnection and connection of modules without prior isolation, ensures high availability of the automation system along with extensive diagnostics information.

The ET 200S motor starters are connected to the control system and parameterized through the fieldbus using either PROFIBUS or PROFINET via IM modules – available in both standard and safety-related versions.

With the ET 200S motor starters, any AC loads can be protected and switched. The communication interface makes them ideal for operation in distributed control cabinets or control enclosures.



Interaction of ET 200S motor starter components in the ET 200S I/O system

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - Motor starters and Safety motor starters

### General data

#### Motor starter versions

The ET 200S motor starters are available as direct-on-line, reversing or soft starter versions:

- **Standard motor starters** up to 5.5 kW (direct-on-line and reversing starters)
- **High Feature motor starters** up to 7.5 kW (direct-on-line, reversing and direct-on-line soft starters)
- **Failsafe motor starters** up to 7.5 kW (direct-on-line and reversing starters)
  - Properties of the High Feature motor starter
  - Failsafe functionality

#### Innovation of the ET 200S High Feature motor starters

The ET 200S High Feature motor starters have undergone radical innovation and now support the acyclic services on PROFIBUS and PROFINET as well as PROFlenergy on PROFINET. They are now:

- Even more flexible – flexible assignment of parameters
- Even better integrated in TIA (Totally Integrated Automation)
- Even more transparent – through comprehensive diagnostic data records
- Even more anticipatory – through maintenance functions
- Energy-efficient – through PROFlenergy

#### Basic functionality of the ET 200S motor starters

All versions of the ET 200S motor starters have the following functionality. Any additional specific functionality is described for the respective versions.

- Fully pre-wired motor starters for switching and protecting any AC loads up to 7.5 kW at 400 V AC and 500 V AC
- With self-assembling 40/50 A power bus, i.e. the load voltage is only fed in once for a group of motor starters
- All control supply voltages connected only once, i.e. when modules are added they are automatically connected to the next module
- Hot swapping is permissible
- Inputs and outputs for activating and signaling the states are already integrated
- Control of the motor starter from the control system and of the diagnostics status via the cyclic process image
- Diagnostics capability for active monitoring of the switching and protection functions
- The signal states in the process image of the motor starter provide information about protective devices (short circuit or overload), the switching states of contactor(s) or soft starters, and system faults.
- Interface for controlling an expansion module, e.g. brake control module xB1 ... xB4 for controlling mechanical brakes in three-phase motors for 24 V DC and 500 V DC.
- Brake Control Module xB5 and xB6 for 400 V AC
- Can be combined with safety technology for use in safety-related system components (IEC 62061 and ISO 13849-1).

#### Mounting

As the motor starters are fully pre-wired, up to 80 % of the wiring outlay can be saved. The control cabinets can be assembled far more quickly and compactly.

Expansions are easily possible through the subsequent adding of terminal modules. With their terminal block design (10 mm<sup>2</sup>), the latter also do away with the distribution wiring otherwise required. Through the permanent wiring and the "hot swapping" function (disconnection and connection during operation) a motor starter can be replaced within seconds if necessary. The motor starters are therefore recommendable in particular for applications with special demands on availability.

#### Parameterization and configuration

Configuration is made easier by the bit-modular structure.

When using the ET 200S motor starters, the list of parts per load feeder is reduced to two main items: The passive terminal module and the motor starter. This makes the ET 200S ideal for modular machine concepts as well.

All ET 200S motor starters are set up without fuses. Contactors and soft starters are activated through the integrated outputs. The inputs of the motor starters evaluate the signal states of the protective devices (short circuit or overload), the switching states of contactor(s) or soft starters, and system faults.

The motor starter protector signaling is freely programmable with regard to group fault signals (group fault at motor starter protector "Off"/group fault signal at motor starter protector "Off" only in case of "On" command from the motor starter).

#### Brake control modules and optional digital inputs and outputs

With one of the optional brake control modules (xB1-xB6), which is butt-mounted to the right of a motor starter, it is possible to control a mechanical holding brake on a three-phase motor from the process image of the motor starter.

Motors with 24 V DC brakes (xB1, xB3) as well as motors with 500 V DC brakes (xB2, xB4) can be controlled using the brake control modules xB1-xB4.

The modules xB5 (without digital input) and xB6 (with two digital inputs) have been added to the range in order to control a mechanical holding brake with a rated operational voltage of 400 V AC. A further motor brake voltage commonly found on the market is thus supported.

The 24 V DC brakes have an external supply and can be released independently of the switching state of the motor starter. By contrast the 500 V DC brakes and the 400 V AC brakes usually have a direct supply from the terminal board of the motor through a rectifier module and therefore cannot be released when the motor starter is switched off. These brakes cannot be used in combination with the DSS1e-x motor starter (soft starter).

The outputs of the Brake Control Modules can also be used for other purposes, e.g. for controlling DC valves.

With two digital inputs available on the brake control modules (xB3, xB4, xB6) and another two digital inputs available on the optional control module it is possible to realize autonomous special functions which work independently of the bus and the higher-level control system, e.g. as a quick stop on gate valve controls. The signals of these digital inputs are in the process image and are reported to the control system.

#### Power supply through terminal modules

Power is supplied through the terminal modules for motor starters:

- The auxiliary voltages are fed in only once via the PM-D or PM-DFx power module which must be connected to the left of the first motor starter.
- The load voltage is fed in at the first (left) TM-xxxxS32 terminal module of a motor starter. The other TM-xxxxS31 terminal modules are automatically supplied with power through the integrated power bus when they are mounted side by side. If the power bus is utilized to its full capacity of 40 A for Standard motor starters or 50 A for High Feature motor starters, a new supply must be fed in through an additional TM-xxxxS32 terminal module.



**TM-DS and TM-RS terminal modules for motor starters**

- Mechanical modules in which the motor starter and expansion modules are inserted
- For constructing the permanent wiring and self-assembling voltage bus
- For connecting the motor connection cables
- Positive-locking connection to ensure enhanced vibration resistance

Terminal modules are purely mechanical components for accommodating the ET 200S I/O modules. The self-assembling voltage buses integrated into the terminal modules reduce the wiring outlay to the single infeed (both of auxiliary and load voltage). All modules following on the right are automatically supplied upon plugging the terminal modules together. The rugged design and keyed connection technology enables use in harsh industrial conditions.

The TM-DS and TM-RS terminal modules are available in various versions for the Standard motor starters and the High Feature motor starters.

Terminal modules with the suffix "-S32"

- The terminal modules with the suffix "-S32" have connection terminals for feeding into the integrated 40A/50A power bus and connection terminals for the motor connection cable. They are mounted at the beginning (left) of a power bus segment.
- To configure a new load group, another "-S32" terminal module is plugged in.
- The "-S32" terminal modules are supplied with three caps for closing the power bus contacts on the final terminal module of a segment.
- Optionally expandable with PE/N modules

Terminal modules with the suffix "-S31"

- The terminal modules with the suffix "-S31" only have connection terminals for the motor connection cable. These terminal modules follow on the right after a "-S32" terminal module.
- Optionally expandable with PE/N modules

All connection terminals of the terminal modules for motor starters are equipped with powerful 10 mm<sup>2</sup> screw terminals.

**Power modules** (page 9/227)

PM-D power modules are used for monitoring the two 24 V DC auxiliary voltages for the group of motor starters following on the right or for supplying power to the group of frequency converters following on the right.

**TM-P terminal modules for PM-D power modules** (page 9/228)

- Connection using screw terminals
- Light colored enclosure for visual distinction
- Always before the first TM-DS/TM-RS

**ET 200S Safety motor starters with integrated safety technology**

The safety-related, communication-capable ET 200S motor starters offer the right solution for every safety application. The range extends from the simple local safety solution through to the user-friendly version with PROFIsafe, which can be used in conjunction with a safe control system (see "Safety Modules local and PROFIsafe", page 9/232).

The safety technology is an integral part and is therefore pre-wired at the factory.

The ET 200S Safety Motor Starter Solutions comprise:

- Safety modules (page 9/233)
- Standard motor starters (page 9/221)
- High Feature motor starters (page 9/224)
- Failsafe motor starters (page 9/229)

**System configuration with ET 200S motor starters**

When constructing an ET 200S station with motor starters a distinction can be made between the following configurations:

- Conventional ET 200S motor starter solution consisting of:
  - PM-D module
  - Standard motor starter or High Feature motor starter
- ET 200S Safety Motor Starter Solution local (page 9/232)
- ET 200S Safety Motor Starter Solutions PROFIsafe (page 9/236)

**SIRIUS motor starter block library for SIMATIC PCS 7**

With the SIRIUS motor starter PCS 7 block library, SIRIUS ET 200S motor starters (direct and reversing starters, direct-on-line soft starters) can be easily and simply integrated into the SIMATIC PCS 7 process control system. The SIRIUS motor starter PCS 7 function block library contains the diagnostics and driver blocks corresponding with the diagnostics and driver concept of SIMATIC PCS 7 as well as the elements required for operation and monitoring (symbols and faceplates), see [Catalog IC 10, Chapter 14 "Parameterizing, Configuration and Visualization with SIRIUS"](#).

**Configuration tool for ET 200S station**

The "TIA Selection Tool" enables the fast and accurate selection of SIMATIC hardware. It is available as a configurator in the Siemens Industry Mall free of charge. Combine your stations (e.g. S7-1200, S7-300, S7-400, S7-400H) and select the desired distributed I/O (e.g. ET 200S, ET 200pro). You can transfer the parts list you receive to the Industry Mall shopping cart and place your order quickly, conveniently and with no problems.

You can find detailed information about the ET 200S system at:

[www.siemens.com/ET200S](http://www.siemens.com/ET200S)

Here you will find a link to the TIA Selection Tool.



## I/O systems

ET 200 systems for the control cabinet  
ET 200S - Motor starters and Safety motor starters

### General data



SIMATIC ET 200S

Standard motor starters

SIMATIC ET 200S

High Feature motor starters<sup>1)</sup>

#### Device functions (firmware features)

##### Slave on the bus

Fieldbus ✓ Dependent on interface module

##### Parameterization

PROFIBUS/PROFINET data records -- ✓

Parameterization using data record start up -- ✓

##### Diagnosis

Acyclic through data records -- ✓

Diagnostic interrupt support ✓

Diagnostics using PROFIBUS/PROFINET -- ✓ See manual<sup>2)</sup>

##### Process image

Process image ✓ 3/30 ✓ 16/70

Address area required per module ✓ 4 bits ✓ 2 bytes

##### Data channels

Manual mode local interface -- ✓ Through module

Motor Starter ES via local interface -- ✓ Starting end of 2011

Motor Starter ES via bus -- ✓ Starting end of 2011

##### Data records (acyclic)

Parameterization -- ✓

Support for PROFlenergy profile -- ✓ Measurement of motor current and disconnection in idle times

Diagnostics -- ✓

Measured values -- ✓

Statistics -- ✓

Commands -- ✓

Min/max pointer -- ✓

Logbook -- ✓

Device identification -- ✓

I&M data -- ✓

##### Inputs

Number ✓ Maximum 2, via xB3, xB4, xB6 ✓ Maximum 4, 2 via xB3, xB4, xB6 and 2 via module 2DI 24 V DC COM

• Of which in the process image -- ✓ 4

Input action ✓ End position on left, right ✓ Parameterizable: Flexible

Quick Stop -- ✓ Parameterizable

##### Outputs

Number ✓ Internal, for controlling the brake module

Output action ✓ Brake

##### Brake output with additional module

Motor brake voltage: brake module ✓ 24 V DC: xB1/xB3, 500 V DC: xB2/xB4, 400 V AC: xB5/xB6

##### Motor protection

Overload protection ✓ Thermal, range 1:1.3 ✓ Solid-state, wide range 1:10

Overload warning -- Tripping only ✓

Short-circuit protection ✓ Motor starter protector ✓

Full motor protection --

Motor protection response in case of overload Thermal motor model response -- ✓ Parameterizable: disconnection without restart, disconnection with restart, warning

Automatic reset --

Temperature sensor --

Emergency start function -- (✓ with Control Unit 3RK1903-OCG00) ✓

✓ Function available

-- Function not available

<sup>1)</sup> The specified device functions apply in full only to the new -.AB4 starters.

<sup>2)</sup> <http://support.automation.siemens.com/WWW/view/en/6008567>



SIMATIC ET 200S

Standard motor starters

SIMATIC ET 200S

High Feature motor starters

**Device functions (firmware features)****Device functions**

Repair switch	✓	Rocker switch	✓	Motor starter protector
Motor starter protector signaling	✓		✓	Parameterizable
Lower current limit monitoring	--		✓	Parameterizable, increment 3.125 %, 18.75 ... 100 %
Upper current limit monitoring	--		✓	Parameterizable, increment 3.125 %, 50 ... 400 %
Zero current detection	--		✓	Parameterizable: warning, disconnection
Stall protection/disconnecting the blocking current	--		✓	Parameterizable
Asymmetry	✓		✓	Parameterizable: warning, disconnection
Load type	--		✓	Parameterizable: 1 and 3-phase
Tripping class	✓	CLASS 10	✓	Parameterizable for DS1e-x, RS1e-x: CLASS 5 (10a), 10, 15, 20 for DSS1e-x: CLASS 5 (10a), 10 (only at 0.3 ... 3 A)
Protection against voltage failure	✓		✓	Parameterizable: activated/deactivated

**Local diagnostics functions using LEDs**

"C-STAT" switching status	✓	Red/green/yellow LEDs
"SF" group fault	✓	Red LEDs
"DEVICE" device status	--	✓ Red/green/yellow LEDs

**Auxiliary switches for enabling circuit of the ET 200S – safety technology already integrated**  
(For use up to SIL 3 (IEC 61508) or PL e (EN ISO 13849-1) in combin. with infeed contactor)

-- Failsafe kit needed

✓ Except DSS1e-x (max. SIL 1 or PL b can be achieved)

✓ Function available

-- Function not available

**ET 200S Standard motor starters****DS1e-x, RS1e-x****ET 200S High Feature motor starters****DS1e-x, RS1e-x****DSS1e-x****Device functions (firmware features)****Control function soft starter**

Soft start function	--	✓
Bypass function	--	
Starting time	--	✓ Locally adjustable, not through bus 0 ... 20 s
Ramp-down time	--	✓ Locally adjustable, not through bus 0 ... 20 s
Ramp-down mode	--	✓ Locally adjustable, not through bus
Starting voltage	--	✓ Locally adjustable, not through bus 30 ... 100 % of $U_e$
Stopping voltage	--	✓ Locally adjustable, not through bus
Trace	--	

✓ Function available

-- Function not available

**Technical specifications**

	ET 200S Standard motor starters		ET 200S High Feature motor starters	
	DS1e-x, RS1e-x		DS1e-x, RS1e-x	
<b>Mechanics and environment</b>				
<b>Motor starters for connection to ET 200S, max.<sup>1)</sup></b>		42		17
<b>Mounting dimensions (W x H x D)</b>				
• Direct-on-line starters	mm	45 x (265 + 45) x (120 + 27); (45: PE/N block; 27: auxiliary switch contactor from F-Kit)		65 x (290 + 45) x (150 + 23); (45: PE/N block; 23: control module)

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - Motor starters and Safety motor starters

### General data

		ET 200S Standard motor starters DS1-x, RS1-x		ET 200S High Feature motor starters DS1e-x, RS1e-x		DSS1e-x	
• Reversing starters	mm	90 x (265 + 45) x (120 + 27); (45: PE/N block; 27: auxiliary switch contactor from F-Kit)		130 x (290 + 45) x (150 + 23); (45: PE/N block; 23: control module)			
<b>Permissible ambient temperature</b>							
• During operation	°C	0 ... +60, from +40 with derating		0 ... +60 for horizontal mounting up to +40			
• During storage	°C	-40 ... +70		-40 ... +70			
• Permissible mounting position	°C	Vertical, horizontal with derating		Vertical, horizontal			
<b>Weight</b>							
• Direct-on-line/reversing starters incl. terminal module	kg	1.0/1.6		1.6/2.2		1	
• Direct-on-line/revers. starters incl. terminal block PE/N		1.1/1.8		1.7/2.3		1.1	
<b>Vibration resistance acc. to IEC 60068, parts 2-6</b>	g	2					
<b>Shock resistance acc. to IEC 60068, parts 2-27</b>	g/ms	Square 5/11					
<b>Conductor cross-section</b>							
• Solid	mm <sup>2</sup>	2 x (1 ... 2.5) <sup>2</sup> ; 2 x (2.5 ... 6) <sup>2</sup> , according to IEC 60947: max. 1 x 10					
• Finely stranded with end sleeve	mm <sup>2</sup>	2 x (1 ... 2.5) <sup>2</sup> ; 2 x (2.5 ... 6) <sup>2</sup>					
• AWG cables, solid or stranded	AWG	2 x (14 ... 10)					
<b>Degree of protection</b>							
IP20, finger-safe (also applies to terminal modules on a dismantled motor starter)							
<b>Mechanical endurance</b>							
• Motor starter protector	Oper- ating cycles	100 000		10 million		--	
• Contactors		30 million		--		--	
• Contactors with safety function (F-Kit)		10 million		--		--	
<b>Electrical specifications</b>							
<b>Current consumption</b>							
• From auxiliary circuit L+/M (U <sub>1</sub> )	mA	Approx. 20		Approx. 40		Approx. 30	
• From auxiliary circuit A1/A2 (U <sub>2</sub> )	mA	Approx. 100		Approx. 1 700 (80 ms long), approx. 350 (after 80 ms)		--	
<b>Rat. operat. current for terminal modules TM-D I<sub>e</sub></b>	A	40		50			
<b>Rated operational voltage U<sub>e</sub></b>	V	400					
<b>Approval DIN VDE 0106, part 101</b>	V	Yes, up to 500				Yes, up to 480	
<b>CSA and U<sub>i</sub> approval</b>	V	Yes, up to 600				Yes, up to 480	
<b>Rated operational current I<sub>e</sub> for motor starters</b>							
• AC-1/2/3 at 60 °C						3 / 8 / 16	
- At 400 V	A	12		16		--	
- At 500 V	A	9		11		--	
• AC-4 at 60 °C						--	
- At 400 V	A	4.1		9		--	
<b>Rated short-circuit breaking capacity</b>	kA	50 at 400 V					
<b>Power of three-phase motors at 500 V</b>	kW	5.5		7.5			
<b>Utilization categories</b>							
AC-1, AC-2, AC-3, AC-4							
<b>Protective separation between main and auxiliary circuits</b>	V	400, according to DIN VDE 0106, part 101					
<b>Positively-driven operation of contactor relay (NC)</b>		Yes				--	
<b>Trip class</b>		CLASS 10		Parameterizable CLASS 5 (10 A), 10, 15, 20		0.3 ... 3 A: CLASS 10/10A, parameterizable; 2.4 ... 8 A: CLASS 10A 2.4 ... 16 A: CLASS 10A	
<b>Type of coordination</b>		Up to 1.6 A: 2 Up to 12 A: 1		Up to 16 A: 2		Up to 16 A: 1	
<b>Electrical endurance</b>							
• Motor starter protector	h	100 000		See manual <sup>3)</sup>		--	
• Contactors		See manual <sup>3)</sup>		--			
<b>Permissible switching frequency with starting time t<sub>A</sub> = 0.1 s and relative ON period t<sub>ED</sub> = 50 %</b>	1/h	< 80		See manual <sup>3)</sup>			
<b>Induction protection</b>							
Already installed							

<sup>1)</sup> Additional limits: process image, max. design width 2 m.

<sup>2)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified. If identical cross-sections are used, this restriction does not apply.

<sup>3)</sup> <http://support.automation.siemens.com/WWW/view/en/6008567>

### More information

#### Notes on safety

System networking requires suitable protective measures (including network segmentation for IT security) in order to ensure safe plant operation.

More information on the subject of Industrial Security, see [www.siemens.com/industrialsecurity](http://www.siemens.com/industrialsecurity).

## Overview

**Functionality of the Standard motor starters**

- For basic functionality see "General data" → "Overview", page 9/216
- Direct-on-line and reversing starters up to 5.5 kW
- Power bus up to 40 A
- With motor starter protector and contactor assembly
- Integrated isolating function via motor starter protector
- Can be combined with local safety technology for use in safety-related system components with F-Kit and PM-D F modules (see "Accessories" → "Overview", page 9/243)

**Device functions (firmware features)**

See "General data" → "Overview", page 9/218

## Technical specifications

See "General data" → "Technical specifications", page 9/219

## Selection and ordering data

Motor rating three-phase motor 4-pin at 400 V AC, standard output P kW	Setting range of the overcurrent release A	Article No.
---	---	-------------

Standard motor starters,  
with diagnostics, electromechanical, fuseless,  
expandable with brake control module



DS1-x

**Direct starter DS1-x**

< 0.06	0.14 ... 0.20	3RK1301-0BB00-0AA2
0.06	0.18 ... 0.25	3RK1301-0CB00-0AA2
0.09	0.22 ... 0.32	3RK1301-0DB00-0AA2
0.10	0.28 ... 0.40	3RK1301-0EB00-0AA2
0.12	0.35 ... 0.50	3RK1301-0FB00-0AA2
0.18	0.45 ... 0.63	3RK1301-0GB00-0AA2
0.21	0.55 ... 0.80	3RK1301-0HB00-0AA2
0.25	0.70 ... 1.00	3RK1301-0JB00-0AA2
0.37	0.90 ... 1.25	3RK1301-0KB00-0AA2
0.55	1.1 ... 1.6	3RK1301-1AB00-0AA2
0.75	1.4 ... 2.0	3RK1301-1BB00-0AA2
0.90	1.8 ... 2.5	3RK1301-1CB00-0AA2
1.1	2.2 ... 3.2	3RK1301-1DB00-0AA2
1.5	2.8 ... 4.0	3RK1301-1EB00-0AA2
1.9	3.5 ... 5.0	3RK1301-1FB00-0AA2
2.2	4.5 ... 6.3	3RK1301-1GB00-0AA2
3.0	5.5 ... 8.0	3RK1301-1HB00-0AA2
4.0	7 ... 10	3RK1301-1JB00-0AA2
5.5	9 ... 12	3RK1301-1KB00-0AA2



RS1-x

**Reversing starter RS1-x**

< 0.06	0.14 ... 0.20	3RK1301-0BB00-1AA2
0.06	0.18 ... 0.25	3RK1301-0CB00-1AA2
0.09	0.22 ... 0.32	3RK1301-0DB00-1AA2
0.10	0.28 ... 0.40	3RK1301-0EB00-1AA2
0.12	0.35 ... 0.50	3RK1301-0FB00-1AA2
0.18	0.45 ... 0.63	3RK1301-0GB00-1AA2
0.21	0.55 ... 0.80	3RK1301-0HB00-1AA2
0.25	0.70 ... 1.00	3RK1301-0JB00-1AA2
0.37	0.90 ... 1.25	3RK1301-0KB00-1AA2
0.55	1.1 ... 1.6	3RK1301-1AB00-1AA2
0.75	1.4 ... 2.0	3RK1301-1BB00-1AA2
0.90	1.8 ... 2.5	3RK1301-1CB00-1AA2
1.1	2.2 ... 3.2	3RK1301-1DB00-1AA2
1.5	2.8 ... 4.0	3RK1301-1EB00-1AA2
1.9	3.5 ... 5.0	3RK1301-1FB00-1AA2
2.2	4.5 ... 6.3	3RK1301-1GB00-1AA2
3.0	5.5 ... 8.0	3RK1301-1HB00-1AA2
4.0	7 ... 10	3RK1301-1JB00-1AA2
5.5	9 ... 12	3RK1301-1KB00-1AA2

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - Motor starters and Safety motor starters

### Standard terminal modules

#### Overview

##### Terminal modules **TM-DS, TM-RS**

More information see also "General data" → "Overview" → from the section "Power supply through terminal modules", page 9/216.

- "-S32" version with supply terminals: 2 x 3 x 10 mm<sup>2</sup> screw terminals for power bus and motor feeder
- "-S31" version without supply terminals: 1 x 3 x 10 mm<sup>2</sup> screw terminals for motor feeder
- Optionally expandable with PE/N modules (see "Accessories", page 9/246)
- Applies only to Standard motor starters: For applications with high motor currents (> 6.3 A) or high ambient temperatures (> 40 °C), it is recommended to use the DM-V15 distance module between two DS1-x motor starters (see "Accessories", page 9/244).

#### Technical specifications

##### TM-DS45 and TM-DS65/TM-FDS65 terminal modules

		TM-DS45	TM-DS65/TM-FDS65
<b>Dimensions</b>			
• Mounting dimensions (W x H x D)	mm	45 x 264 x 100	65 x 290 x 100
• Height with PE/N terminal block	mm	306	332
• Depth with motor starter	mm	127	150
• Depth with motor starter and F-Kit (safety technology)	mm	152	--
• Depth with motor starter and 2DI control module	mm	--	173
<b>Rated voltages, currents and frequencies for the power bus</b>			
• Rated insulation voltage $U_i$	V	690	
• Rated operational voltage $U_e$	V AC	500	
• Rated impulse withstand voltage $U_{imp}$	kV	6	
• Rated operational current $I_e$	A	40	50
• Rated frequency	Hz	50/60	
<b>Conductor cross-sections</b>			
• Solid	mm <sup>2</sup>	2 x (1 ... 2.5) <sup>1)</sup> or 2 x (2.5 ... 6) <sup>1)</sup>	
• Finely stranded with end sleeve	mm <sup>2</sup>	1 x 10 or 2 x (1 ... 2.5) <sup>1)</sup> or 2 x (2.5 ... 6) <sup>1)</sup> according to IEC 60947	
• AWG cables, solid or stranded	AWG	2 x (14 ... 10)	
• With additional three-phase infeed terminal if required			
- Solid or stranded	mm <sup>2</sup>	1 x 2.5 ... 25	
- Finely stranded with end sleeve	mm <sup>2</sup>	1 x 2.5 ... 25	
- AWG cables, solid or stranded	AWG	1 x 12 ... 4	
<b>Wiring</b>			
• Required tool		Standard screwdriver size 2 and Pozidriv 2	
• Tightening torque	Nm	2.0 ... 2.5	

<sup>1)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified. If identical cross-sections are used, this restriction does not apply.




##### TM-RS90 and TM-RS130/TM-FRS130 terminal modules

		TM-RS90	TM-RS130/TM-FRS130
<b>Dimensions</b>			
• Mounting dimensions (W x H x D)	mm	90 x 264 x 100	130 x 290 x 100
• Height with PE/N	mm	306	332
• Depth with motor starter	mm	127	150
• Depth with motor starter and F-Kit (safety technology)	mm	152	--
• Depth with motor starter and 2DI control module	mm	--	173
<b>Rated voltages, currents and frequencies for the power bus</b>			
• Rated insulation voltage $U_i$	V	690	
• Rated operational voltage $U_e$	V AC	500	
• Rated impulse withstand voltage $U_{imp}$	kV	6	
• Rated operational current $I_e$	A	40	50
• Rated frequency	Hz	50/60	

	TM-RS90	TM-RS130/TM-FRS130
<b>Conductor cross-sections</b>		
• Solid	mm <sup>2</sup>	2 x (1 ... 2.5) <sup>1)</sup> or 2 x (2.5 ... 6) <sup>1)</sup>
• Finely stranded with end sleeve	mm <sup>2</sup>	1 x 10 or 2 x (1 ... 2.5) <sup>1)</sup> or 2 x (2.5 ... 6) <sup>1)</sup> according to IEC 60947
• AWG cables, solid or stranded	AWG	2 x (14 ... 10)
• With additional three-phase infeed terminal if required		
- Solid or stranded	mm <sup>2</sup>	1 x 2.5 ... 25
- Finely stranded with end sleeve	mm <sup>2</sup>	1 x 2.5 ... 25
- AWG cables, solid or stranded	AWG	1 x 12 ... 4
<b>Wiring</b>		
• Required tool		Standard screwdriver size 2 and Pozidriv 2
• Tightening torque	Nm	2.0 ... 2.5

<sup>1)</sup> If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified. If identical cross-sections are used, this restriction does not apply.

## Selection and ordering data

Version	Article No.
<b>Terminal modules for Standard motor starters</b>	
 3RK1903-0AB00	<b>TM-DS45-S32</b> <b>for DS1-x direct-on-line starters</b> with incoming power bus connection including three caps for terminating the power bus  <b>3RK1903-0AB00</b>
 3RK1903-0AB10	<b>TM-DS45-S31</b> <b>for DS1-x direct-on-line starters</b> without incoming power bus connection  <b>3RK1903-0AB10</b>
 3RK1903-0AC00	<b>TM-RS90-S32</b> <b>for RS1-x reversing starters</b> with incoming power bus connection including three caps for terminating the power bus  <b>3RK1903-0AC00</b>
	<b>TM-RS90-S31</b> <b>for RS1-x reversing starters</b> without incoming power bus connection  <b>3RK1903-0AC10</b>

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - Motor starters and Safety motor starters

### High Feature motor starters

#### Overview

##### Functionality of the High Feature motor starters

- For basic functionality see "General data" → "Overview", page 9/216.
- Direct-on-line, reversing or soft starters up to 7.5 kW
- With wide range in 3 setting ranges, with 0.3 to 3 A, 2.4 up to 8 A, 2.4 to 16 A available
- With combination of starter circuit breaker, electronic overload protection (parameterizable), and contactor or soft starter
- Power bus up to 50 A
- Upper and lower current limits for plant and process monitoring
- Motor stall protection, zero current detection and asymmetry detection integrated
- The actual motor current is measured and transmitted for diagnostics in the cycle process image
- Control of the motor starter from the control system and extensive diagnostics status via the cyclic process image
- Optional digital inputs available in the cyclic process image and flexibly assignable with functions for adaptation to all applications
- Integrated isolating function using starter circuit breakers
- Detection of the switching state of the starter circuit breaker via auxiliary switches and of the contactor via current evaluation
- Local safety engineering possible (without F-kit in the case of the HF starter, because the function of the failsafe kit is already integrated)
- Front-mounting 2DI LC COM control module for another 2 parameterizable digital inputs
- Optional "Motor Starter ES" software for easy commissioning and diagnostics (see Chapter 14 "Parameterization, Configuration and Visualization with SIRIUS" in Catalog IC 10)
- PROFinergy capable
- Supplying the motor current in PROFinergy format and shutting down in dead times
- Support of all DPV1 acyclic services on PROFIBUS and PROFINET
  - Changing of parameters during operation, e.g. the rated operational current
  - Reading and writing acyclic data for exact diagnostics of the unit or process and for analysis of the plant status

##### Selective protection concept for ET 200S High Feature motor starters

As the result of the selective protection concept (separate tripping of short circuit and overload) with electronic overload evaluation, additional advantages are realized on the High Feature motor starters – advantages which soon make themselves positively felt particularly in manufacturing processes with high plant stoppage costs:

- Only two versions up to 7.5 kW – hence little order variance and stock keeping
- All settings can be parameterized by bus – hence full TIA capability
- Separate signaling of overload and short circuit – enables selective diagnostics
- Overload can be acknowledged by remote reset – ideal for highly automated plants
- Current asymmetry monitoring – complete monitoring of the motor
- Stall protection – complete monitoring of the motor
- Emergency start function in case of overload – operation is possible in an emergency

- Current value transmission via bus – monitoring of the application
- Current limit monitoring
- Trip class can be parameterized – overload tripping can be adapted to the application
- Type of coordination "2" – still functional after short circuit with magnitude of 50 kA
- Very high contact endurance



ET 200S High Feature motor starters: DS1e-x direct-on-line starter



ET 200S High Feature motor starters: DSS1e-x direct-on-line soft starter



ET 200S High Feature motor starters: RS1e-x reversing starters



## High Feature motor starters

PROFenergy for ET 200S High Feature motor starters<sup>1)</sup>

Increasing energy prices, far-reaching ecological problems worldwide and the threat of climate change make it necessary for you to be more conscious about your use of energy.

Active and effective energy management is possible with PROFenergy.

PROFenergy is a manufacturer-independent profile on PROFINET, which can be used by all manufacturers, has been standardized by PNO<sup>1)</sup> and supports shutting down electrical devices during dead times and reading out measured values.

The ET 200S HF motor starter supplies the motor current in PROFenergy format and switches off during dead times.

## Support of all acyclic services on PROFIBUS and PROFINET

Thanks to the acyclic services, the ET 200S HF motor starters now offer plenty of diagnostics data via data records. There are new extensive options for reading out data from the motor starter for monitoring devices, systems or processes. The motor starter is equipped internally with three logbooks for device faults, motor starter trips and events, which are issued with a time stamp. These logbooks can be read out of the motor starter on demand at any time and provide the plant operator with plenty of information about the state of his plant and process which he can use to carry out improvements.

With the min/max pointer and statistical data functions it is possible to read out, for example, the maximum internal current values or the number of motor starter connection operations. This allows deviations in the process to be monitored, but also optimum initial commissioning to take place.

Statistical data or measured values make plant monitoring easy for the user.

The device diagnostics data record contains details of all the states of the motor starter, the device configuration and the communication status as a basis for central device and plant monitoring.

The Installation and Maintenance functions (I&M) store, firstly, information (I&M) about the modules used in the motor starter and, secondly, data (I&M) that can be defined during configuration, e.g. location designations. I&M functions are used for troubleshooting faults and localizing changes in hardware at a plant or checking the system configuration.

Supported data records:

- DS 0 S7-V1 system diagnostics (S7 diagnostics alarm)
- DS 72, 73, 75 logbooks, device faults, trips, events
- DS 92 device diagnostics
- DS 93 command
- DS 94 measured values
- DS 95 statistics
- DS 96 min/max pointer
- DS 100 device identification
- DS 131 device parameters
- DS 134 maintenance
- DS 165 comment
- DS 226 PROFenergy technology function
- DS 231 I&M 0 (= device identification)
- DS 232 I&M 1 (= equipment identifier)
- DS 233 I&M 2 (= installation)
- DS 234 I&M 3 (= description)

**Device functions (firmware features)**


See "General data" → "Overview", page 9/218

<sup>1)</sup> In the PNO (PROFIBUS Nutzerorganisation e. V. – PROFIBUS User Organization), manufacturers and users have come together to agree on the standardized PROFIBUS and PROFINET communication technologies.

**Technical specifications**

See "General data" → "Technical specifications", page 9/219

**Selection and ordering data****High Feature motor starters in fully innovated design ("-.AB4 starters")<sup>1)</sup>**

	Setting range of the overcurrent release A	Article No.
<b>High Feature motor starters, with diagnostics, electronic overload protection, fuseless, expandable with brake control module</b>		
 DS1e-x	<b>DS1e-x direct-on-line starter</b>	
	0.3 ... 3	<b>3RK1301-0AB10-0AB4</b>
	2.4 ... 8	<b>3RK1301-0BB10-0AB4</b>
	2.4 ... 16	<b>3RK1301-0CB10-0AB4</b>
	<b>RS1e-x reversing starters</b>	
	0.3 ... 3	<b>3RK1301-0AB10-1AB4</b>
	2.4 ... 8	<b>3RK1301-0BB10-1AB4</b>
	2.4 ... 16	<b>3RK1301-0CB10-1AB4</b>
	<b>DSS1e-x direct-on-line soft starter</b>	
	0.3 ... 3	<b>3RK1301-0AB20-0AB4</b>
	2.4 ... 8	<b>3RK1301-0BB20-0AB4</b>
	2.4 ... 16	<b>3RK1301-0CB20-0AB4</b>

<sup>1)</sup> When a device is replaced, the innovated motor starter will behave like a not yet innovated motor starter ("-.AA4 starter"), i.e. it will run in DPV0 mode.



## I/O systems

ET 200 systems for the control cabinet  
ET 200S - Motor starters and Safety motor starters

### High Feature terminal modules

#### Overview

##### Terminal modules *TM-DS, TM-RS*


More information see also "General data" → "Overview" → from the section "Power supply through terminal modules", page 9/216.

- "-S32" version with incoming connection: 2 x 3 x 10 mm<sup>2</sup> screw terminals for power bus and motor feeder
- "-S31" version without incoming connection: 1 x 3 x 10 mm<sup>2</sup> screw terminals for motor feeder
- Optionally expandable with PE/N modules (see "Accessories", page 9/246)

#### Technical specifications

See "Standard terminal modules" → "Technical specifications", page 9/222.

#### Selection and ordering data

Version	Article No.
<b>Terminal modules for High Feature motor starters</b>	
 <b>TM-DS65-S32</b> <b>for DS1e-x and DSS1e-x direct-on-line starters</b> with incoming power bus connection including three caps for terminating the power bus	<b>3RK1903-0AK00</b>
<b>TM-DS65-S31</b> <b>for DS1e-x and DSS1e-x direct-on-line starters</b> without incoming power bus connection	<b>3RK1903-0AK10</b>
<b>TM-RS130-S32</b> <b>for RS1e-x reversing starters</b> with incoming power bus connection including three caps for terminating the power bus	<b>3RK1903-0AL00</b>
<b>TM-RS130-S31</b> <b>for RS1e-x reversing starters</b> without incoming power bus connection	<b>3RK1903-0AL10</b>

3RK1903-0AK00

**Overview**

- Disconnection of a complete group of motor starters is possible without any additional outlay (PL b according to ISO 13849-1 or SIL 1 according to IEC 62061)
- PM-D power modules are plugged onto the TM-P15 terminal modules. (A PM-D power module must be followed by at least one motor starter or one frequency converter.)

PM-D power modules are used for monitoring the two 24 V DC auxiliary voltages for the group of motor starters following on the right or for supplying power to the group of frequency converters following on the right. The voltage is fed in through TM-D terminal modules to the self-assembling potential bars.

A voltage failure is signaled through PROFIBUS diagnostics to the higher-level master. Additional LEDs inform locally about the status of the auxiliary voltages.

The separation of auxiliary voltages for signal checkback and power unit actuation enables the entire group to be shut down while maintaining the diagnostics capability.

**Technical specifications**

		PM-D power module 3RK1903-0BA00
<b>Rated control supply voltage <math>U_s</math></b> up to 60 °C	V	20.4 ... 28
<b>Rated operational current <math>I_e</math></b>		
• Recommended short-circuit protection	A	10
• Melting fuse	A	10
• Miniature circuit breaker	A	10, tripping characteristic B
<b>Power consumption from backplane bus</b>	mA	≤ 10
<b>Supply of</b>		
• Motor starters		Yes
• Frequency converters		Yes
• Motor starters for safety technology		No
• Electronic modules		No
• Ex(i) modules		No
<b>Alarms</b>		None
<b>Diagnostic functions</b>		Yes
• System fault/device fault		Red "SF" LED
• Monitoring of the electronics power supply $U_1$		Green "PWR" LED
• Monitoring of the supply voltage for contactors $U_2$		Green "CON" LED
• Diagnostics information can be read out		Yes
<b>Conductor cross-sections</b>		
• Flexible with end sleeve	mm <sup>2</sup>	1.5
• Rigid	mm <sup>2</sup>	2.5
<b>Mounting dimensions (W x H x D)</b>	mm	15 x 195.5 x 117.5

**Selection and ordering data**

Version	Article No.
<b>Power module</b>	
 <p><b>PM-D power module</b> for 24 V DC with diagnostics</p> <p>3RK1903-0BA00</p>	<b>3RK1903-0BA00</b>

## I/O systems

ET 200 systems for the control cabinet

ET 200S - Motor starters and Safety motor starters

### Power module terminal modules


#### Overview

##### Terminal module for power module

For supplying load and sensor voltage to the self-assembling potential bars of the Standard motor starters, High Feature motor starters and frequency converters. Power modules for voltage monitoring are plugged onto TM-P modules.

TM-P modules can be used any number of times within the ET 200S. A power module must always be plugged upstream from the first motor starter/frequency converter.

#### Selection and ordering data

Version	Article No.		
<b>Terminal module for power module</b>			
 <p>3RK1903-0AA00</p>	<p><b>TM-P15 S27-01 terminal module</b> for PM-D power module</p>	<p><b>3RK1903-0AA00</b></p>	<p>1</p>

## Overview



ET 200S Failsafe motor starters: F-DS1e-x direct-on-line starter

The Failsafe motor starter has been developed on the basis of the High Feature motor starter (-AA4 starter). It differs in that in addition to a motor starter protector and contactor assembly, a safe electronic evaluation circuit is installed for fault detection purposes which makes the motor starter failsafe.

If the contactor to be switched fails in an EMERGENCY STOP case, the evaluation electronics detects a fault and opens the motor starter protector in the motor starter through a shunt release in a safety-related manner. The second redundant shut-down component is therefore no longer a main contactor, as is generally the case, but the motor starter protector installed in the motor.

#### All functions of the High Feature starter are already integrated

The new Failsafe motor starters are characterized by easy, space-saving assembly as well as minimal wiring outlay. Like the High Feature starters, the Failsafe motor starters have a switching capacity of up to 7.5 kW (16 A) which is achieved with just two motor starter versions. Another important feature is the high availability due to the high short-circuit strength (type of coordination "2").

## Use

The Failsafe motor starter is predestined for use in combination with PROFIsafe (see connection diagram "ET 200S Safety Motor Starter Solution PROFIsafe with Failsafe motor starters", page 9/237). Another field of application is in combination with ASIsafe or safety relays (see Example 2, page 9/235).

#### High degree of flexibility with safety technology

##### Solution PROFIsafe with PM-D F PROFIsafe

In EMERGENCY STOP applications, the fail-safe motor starters are selectively switched off through the upstream PM-D F PROFIsafe safety module. For each safety module, six switch-off groups can be formed. In the first delivery stage, the fail-safe freely-programmable logic of the SIMATIC controller is used to interface with the relevant fail-safe sensor technology. The interface between PROFIsafe and installations that use conventional safety technologies is implemented through the F-CM Failsafe contact multiplier with four floating contacts.

##### Solution local with PM-D FX1

Failsafe motor starters with safety relay (version 1) or ASIsafe (version 2, see example 2, page 9/235): Signals with relevance for safety can be input to ET 200S through a PM-D F X1 infeed terminal module through the enabling circuits of the AS-i safety monitor or the safety relay to control the Failsafe motor starters which then selectively switch off the downstream motors.

## Benefits

Advantages over conventional safety technology

- Significant savings in components (less hardware)
- Less mounting and installation work
- Motor starters are fail-safe and offer high availability

## Technical specifications

#### F-DS1e-x direct-on-line starters/F-RS1e-x reversing starters

		F-DS1e-x direct-on-line starters	F-RS1e-x reversing starters
<b>Dimensions</b>			
Dimensions (W x H x D)	mm	65 x 290 x 150 (incl. terminal module)	130 x 290 x 150 (incl. terminal module)
Height with PE/N module	mm	332	
Depth with 2DI control module (not safe)	mm	173	
<b>Module-specific specifications</b>			
Type of coordination		Type 2 up to $I_{\sigma} \leq 16$ A at 400 V	
Internal power supply		U1 (from PM-D F / PM-D X1)	
Maximum achievable safety class		SIL 3 Tripping class 6 (AK6) PL e	
Safety characteristics			
Low demand	PFD <sub>AVG</sub> (10a)		
• Test interval 3 months		3.5 x 10 <sup>-5</sup>	
• Test interval 6 months		8.0 x 10 <sup>-5</sup>	
High demand/continuous mode	PFH		
• Test interval 3 months	1/h	8.1 x 10 <sup>-10</sup>	
• Test interval 6 months	1/h	1.8 x 10 <sup>-9</sup>	
Proof-test interval	Years	10	


## I/O systems

ET 200 systems for the control cabinet  
ET 200S - Motor starters and Safety motor starters

### ET 200S Failsafe motor starters

		F-DS1e-x direct-on-line starters	F-RS1e-x reversing starters
<b>Voltages, currents, potentials</b>			
<b>Switching capacity</b>		Up to 7.5 kW at 400 V AC in three setting ranges	
	A	• 0.3 ... 3	
	A	• 2.4 ... 8	
	A	• 2.4 ... 16	
<b>Status, alarms, diagnostics</b>			
<b>Status display</b>		SF, DEVICE and C-STAT, SG1 ... SG6	
<b>Diagnostic functions</b>		Red LED (SF)	
• Group fault display		Possible	
• Diagnostics information can be read out			
<b>Control circuit</b>			
<b>Rated operational voltage for electronics <math>U_1</math></b>	V DC	24 (20.4 ... 28.8)	24 (21.6 ... 26.4)
<b>Reverse polarity protection for electronics <math>U_1</math></b>		Yes	
<b>Rated operational voltage for contactor <math>U_2</math></b>	V DC	24 (20.4 ... 28.8)	
<b>Reverse polarity protection for contactor <math>U_2</math></b>		Yes	
<b>Current consumption</b>			
• From electronics supply $U_1$	mA	Approx. 40	Approx. 100
• From contactor supply $U_2$			
- Pickup	A	1.7 (for 80 ms)	--
- Hold	mA	Max. 350	--
• From SG1 to 6			
- Pickup	mA	250 (for 200 ms)	
- Hold	mA	Max. 55	
• Test function of the shunt release/starter circuit breaker (50 ms) from $U_1$	A	Approx. 1.5	
• From the backplane bus	mA	Approx. 20	
<b>Main circuit</b>			
<b>Rated operational voltage <math>U_e</math></b>			
• Acc. to DIN VDE 0106, part 1014, IEC 60947-1, EN 60947-1	V AC	500	
• Protective separation between main and auxiliary circuits	V	400	
• UL, CSA	V AC	600	
<b>Rated insulation voltage <math>U_i</math></b>	V AC	500	
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6	
<b>Rated frequency</b>	Hz	50/60	

### Selection and ordering data

		Setting range of the overcurrent release	Article No.
		A	
<b>ET 200S Failsafe motor starters</b>			
	<b>F-DS1e-x direct-on-line starters</b>		
	Failsafe direct-on-line starters up to 7.5 kW at 400 V AC		
	Mechanically switching		
	Electronic overload protection		
	• 0.3 ... 3		
	• 2.4 ... 8		
• 2.4 ... 16			
<b>F-RS1e-x reversing starters</b>			
Failsafe reversing starters up to 7.5 kW at 400 V AC			
Mechanically switching			
Electronic overload protection, fuseless			
• 0.3 ... 3			
• 2.4 ... 8			
• 2.4 ... 16			
			<b>3RK1301-0AB13-0AA4</b>
			<b>3RK1301-0BB13-0AA4</b>
			<b>3RK1301-0CB13-0AA4</b>
			<b>3RK1301-0AB13-1AA4</b>
			<b>3RK1301-0BB13-1AA4</b>
			<b>3RK1301-0CB13-1AA4</b>

F-DS1e-x  
direct-on-line starters

## Selection and ordering data

Version	Article No.
---------	-------------

## Terminal modules for Failsafe motor starters



3RK1903-3AC00

**TM-FDS65-S32-01/S31-01 terminal modules**for F-DS1e-x direct-on-line starters  
with coding

- With incoming power bus connection (TM-FDS65-S32-01)
- Without incoming power bus connection (TM-FDS65-S31-01)

**3RK1903-3AC00****3RK1903-3AC10****TM-FRS130-S32-01/S31-01 terminal modules**for F-RS1e-x reversing starter  
with coding

- With incoming power bus connection (TM-FRS130-S32-01)
- Without incoming power bus connection (TM-FRS130-S31-01)

**3RK1903-3AD00****3RK1903-3AD10**

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - Motor starters and Safety motor starters

### Safety modules local and PROFIsafe

#### Overview

##### ET 200S Safety Motor Starter Solutions local/PROFIsafe

The ET 200S Safety Motor Starter Solutions are preferred in all production and process automation fields in which the enhancement of plant availability and flexibility play a key role.

- ET 200S Safety Motor Starters Solutions local are preferred from the safety technology point of view for locally restricted safety applications. These motor starters are not dependent on a safe control system.
- ET 200S Safety Motor Starters Solutions PROFIsafe, on the other hand, are often found in safety applications of the more complex type that are interlinked. In this case a safe control system is used with the PROFINET or PROFIBUS bus systems with the PROFIsafe profile.

The ET 200S Safety Motor Starter Solutions comprise:

- Safety modules ([page 9/233](#))
- Standard motor starters ([page 9/221](#))
- High Feature motor starters ([page 9/224](#))
- Failsafe motor starters ([page 9/229](#))

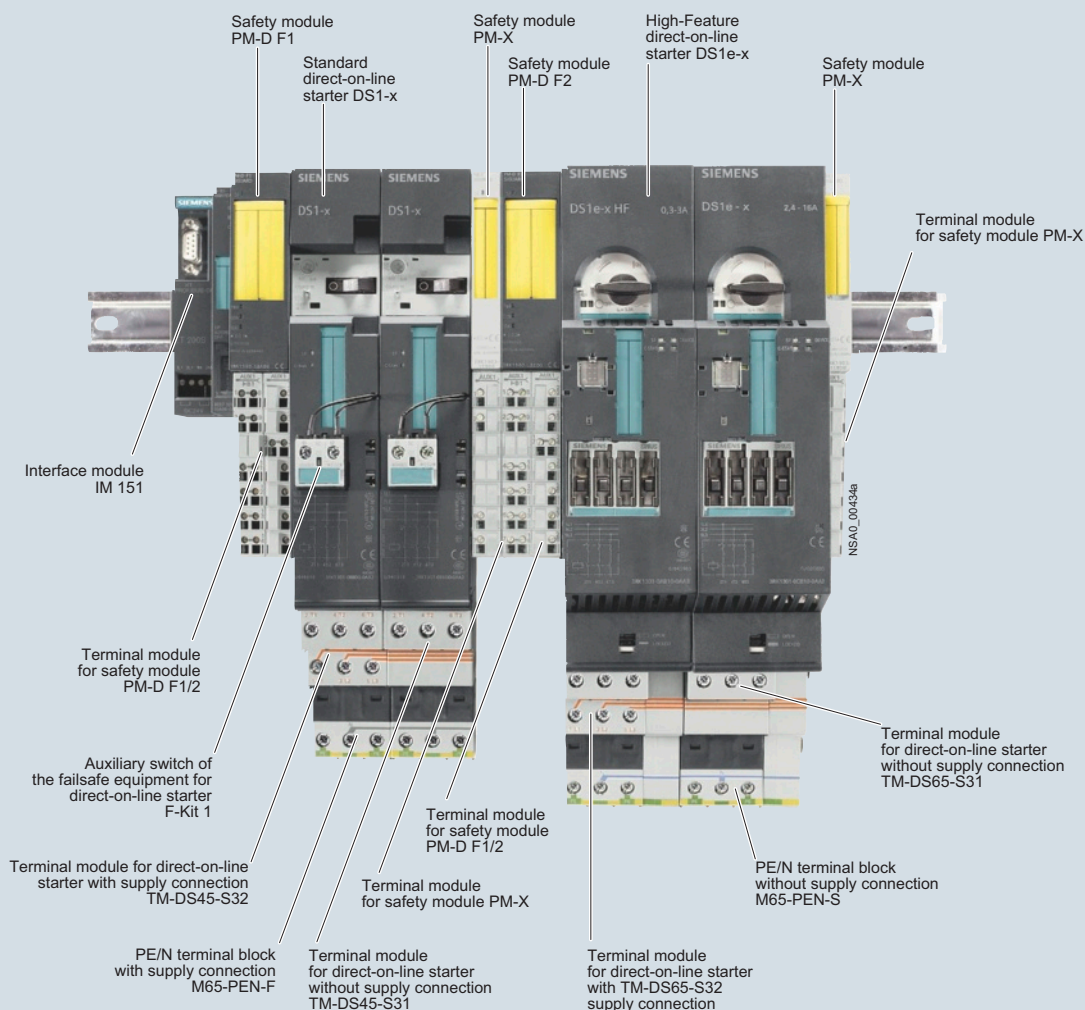
With the ET 200S Safety Motor Starter Solution local there is no complicated and hence cost-intensive configuring and wiring

##### ET 200S Safety Motor Starter Solution local

compared to conventional safety systems. The ET 200S Safety Motor Starter Solutions local are designed for PL e according to ISO 13849-1 or SIL 3 IEC 62061.

They enable the use of safety-related direct-on-line starters or reversing starters in the SIMATIC ET 200S distributed peripherals system on PROFINET or PROFIBUS. The bit-modular architecture of the system permits optimum imaging of machine or plant applications.

Within an ET 200S station, the Safety Motor Starter Solutions local can also be combined with Standard motor starters or High Feature motor starters without safety functions up to max. 4 kW up to PL d according to ISO 13849-1 or SIL 2 according to IEC 62061.



Interaction of ET 200S Safety Motor Starter Solutions local components

Components for ET 200S Safety Motor Starter Solution local

The ET 200S Safety Motor Starter Solutions local comprise:

Version 1 (see example 1, page 9/235):

- Safety modules PM-D F1 ... 5
- PM-X module
- Standard motor starter or High Feature motor starter

Version 2 (see example 2, page 9/235):

- PM-D FX1 safety module
- Failsafe motor starters

Functionality of the ET 200S Safety Motor Starter Solution local

- For using Standard, High Feature or Failsafe motor starters in systems with safety category SIL 1 (according to IEC 62061) or PL c to PL e (according to ISO 13849-1)
- Can also be used in combination with external safety relays
- Can also be used to activate external safety systems
- No complex wiring for conventional safety technology
- Safety module available for function-monitored and automatic starting
- Safety module available for Stop category 0 and 1
- Safety module for monitoring the auxiliary voltages for motor starters
- Safety modules can be plugged onto the TM-PF30 terminal modules

With Safety Motor Starter Solutions local the highest safety category can be achieved according to ISO 13849-1 and IEC 62061. They can thus be used for evaluation of EMERGENCY STOP circuits or for monitoring protective doors and also for time-delayed disconnections. With the contact multiplier the safety-relevant signals can also be made available to external systems.

All standard safety applications can be covered by combining of different TM-PF30 terminal modules. Needless to say, ET 200S motor starters can also be used in conjunction with external safety relays or with ASIsafe.

With the Safety Motor Starter Solutions local, up to 80 % of wiring is saved compared to conventional safety systems with local safety applications.

With the Safety Motor Starter Solutions local it is easy to configure several safety circuits. The safety sensors are connected directly and locally to the safety modules. These safety modules perform the work of the otherwise obligatory safety relays and safely shut down the downstream motor starters in accordance with the function selected. The crosslinks required for this are already integrated in the system and need no additional wiring. All signals from the safety modules are automatically relayed as diagnostic signals, e.g. in the event of cross-circuit in the EMERGENCY STOP circuit.

The safety module evaluates the signal state of the connected safety sensors and, using the integrated safety relays, shuts down the group(s) of downstream motor starters. The shutdown function is monitored by the module, as are the auxiliary voltages.

Safety-relevant system signals, e.g. due to an actuated EMERGENCY STOP switch or a missing auxiliary voltage, are automatically generated and notified to the interface module. The latter assigns an unambiguous ID to the fault. Using the PROFIBUS DP diagnostics block, faults of this type can be identified and localized without a great deal of programming work.

**PM-D F1/F2/F3/F4/F5 safety modules**

- PM-D F1/F2/F3/F4/F5 safety modules monitor auxiliary voltages and contain the complete functionality of a safety relay:
  - PM-D F1: For evaluation of EMERGENCY STOP circuits with the function "Monitored start"
  - PM-D F2: For monitoring of protective doors with the function "Automatic start"
  - PM-D F3: Expansion to PM-D F1/F2 for time-delayed disconnection
  - PM-D F4: For expanding safety circuits with other ET 200S motor starters, e.g. in a different tier
  - PM-D F5: Transmits the status from PM-D F1 ... 4 via four floating enabling circuits to external safety devices (contact multipliers)
- The PM-D F1 and PM-D F2 modules can be combined with the PM-D F3 or PM-D F4 modules.
- A PM-D F5 can be positioned at any point between a PM-D F1 ... 4 and a PM-X<sup>1)</sup>.
- Safety modules monitor the U1 and U2 auxiliary voltages. A voltage failure is relayed as a diagnostic signal over the bus.
  - No additional PM-D safety module is required when the safety modules are used.
  - Each safety circuit, beginning with a PM-D F1 ... 4, must be terminated with one PM-X each<sup>1)</sup>.

<sup>1)</sup> See "Accessories for Safety modules local", page 9/247.



PM-D F1 safety module

**PM-D FX1 safety module**

The PM-D FX1 safety module is used for feeding in 1 to 6 switch-off groups. The infeed voltage can be switched using 1 to 6 external safety shutdown devices (either ASIsafe monitors or 3TK28 safety relays). This safety module is used in applications with external safety shutdown devices where there is a need for the fully selective safety shutdown of Failsafe motor starters/frequency converters (see example 2, page 9/235).

**Terminal modules for (TM-PF30) safety module**

For feeding load and sensor voltage to the potential bars of the motor starters, and for connection of the 2-channel sensor circuit (e.g. EMERGENCY STOP pushbutton) and a RESET button. Different terminal modules are available for the configuring of separate safety circuits or for the cascading of safety circuits, and for applications with time-delayed disconnection (see page 9/241).



## I/O systems

ET 200 systems for the control cabinet  
ET 200S - Motor starters and Safety motor starters

### Safety modules local and PROFIsafe

#### Terminal module (TM-X)

For connection of an external infeed contactor (2nd shutdown possibility), with terminals for the contactor coil and feedback contact, this module is always required to terminate a group of safety-related motor starters.

#### Failsafe Kit

The Failsafe Kit (F-Kit) must be added to each Standard motor starter in a safety segment in order to monitor the switching function.

F-Kit 1 supplements the DS1-x direct-on-line starter, and F-Kit 2 supplements the RS1-x reversing starter.

The F-Kits are comprised of:

- Contact supports for the terminal modules
- One or two auxiliary switch blocks for the contactor/contactors of the motor starter
- Connecting cables

High Feature motor starters and their terminal modules come as standard with the functionality of the F-Kits integrated.

#### Components needed for applications with safety requirement

Components needed	Maximum achievable safety integrity according to ISO 13849-1 or IEC 62061				
	ISO 13849-1	PL b/c	PL c	PL d <sup>1)</sup>	PL d / PL e <sup>1)</sup>
	IEC 62061	SIL 1	SIL 1	SIL 2	SIL 3
PM-D		✓	--	--	--
PM-D F1/-F2/-F4		--	✓	✓	✓
PM-D F3		--	✓	✓	--
Failsafe kit 1/failsafe kit 2		--	✓ <sup>2)</sup>	✓ <sup>2)</sup>	✓ <sup>2)</sup>
PM-X		--	✓	✓	✓
PM-D FX1		--	✓	✓	✓

✓ Required

-- Not required

<sup>1)</sup> An external infeed contactor is required in the main circuit (2-channel capability).

<sup>2)</sup> F-Kit is only required for the Standard motor starter; it is already integrated in the High Feature motor starter.

#### Possible combinations of safety and terminal modules

Terminal modules	PM-D F1	PM-D F2	PM-D F3	PM-D F4	PM-D F5	PM-X	PM-DFX1	FCM
TM-PF30 S47-B0	✓	✓	--	--	--	--	--	--
TM-PF30 S47-B1	✓	✓	--	--	--	--	--	--
TM-PF30 S47-C0	--	--	✓	✓	--	--	--	--
TM-PF30 S47-C1	--	--	✓	✓	--	--	--	--
TM-PF30 S47-D0	--	--	--	--	✓	--	--	--
TM-X15 S27-01	--	--	--	--	--	✓	--	--
TM-PFX30 S47-G0	--	--	--	--	--	--	✓	--
TM-PFX30 S47-G1	--	--	--	--	--	--	✓	--
TM-FCM30 S47	--	--	--	--	--	--	--	✓

✓ Possible

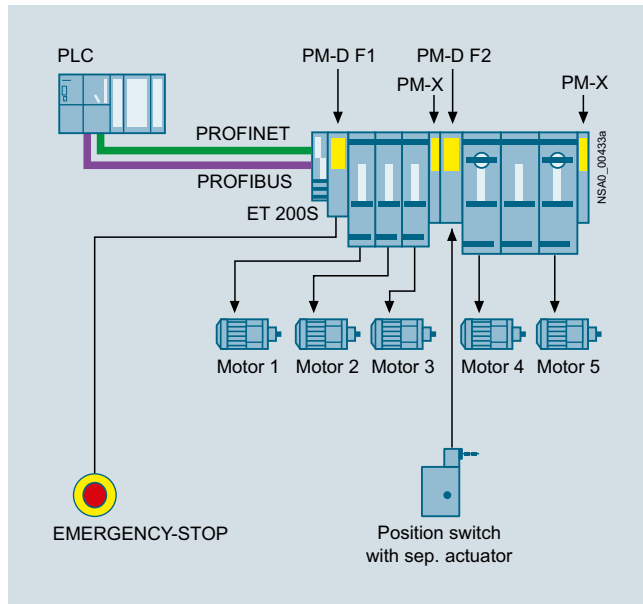
-- Not possible

**Examples**

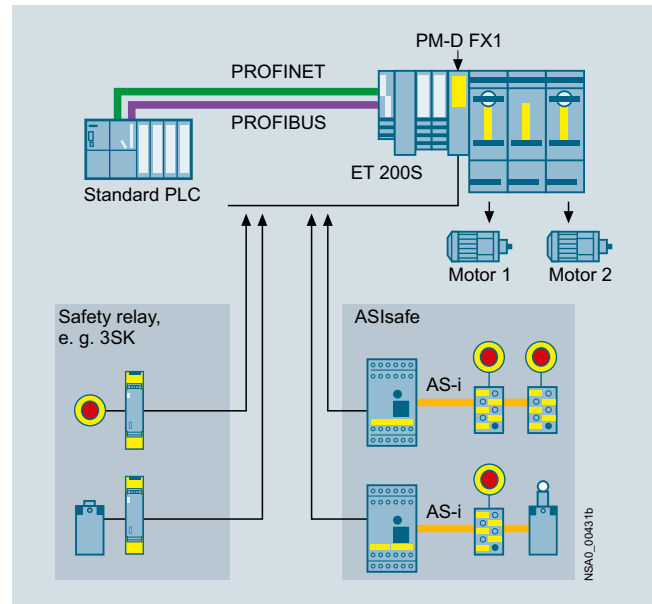
The diverse possible uses of the Safety Motor Starter Solutions local are presented in the manual SIMATIC ET 200S Motor Starters in the context of typical sample applications.

Safety functional examples for easy, quick and low-cost implementations of applications with Safety Motor Starter Solutions local are available on the Internet:

More information can be found on the Internet at:  
[www.siemens.com/ET200S-motorstarter](http://www.siemens.com/ET200S-motorstarter)

**Example 1:**

ET 200S Safety Motor Starter Solutions local with 2 safety circuits (= switch-off groups), Standard motor starters and High Feature motor starters.

**Example 2:**

ET 200S Safety Motor Starter Solutions local with 2 external safety combinations (= safety relays or ASIsafe monitors) and with Failsafe motor starters (PM-DFX1 application). 2 of the 6 available safe switch-off groups are used.

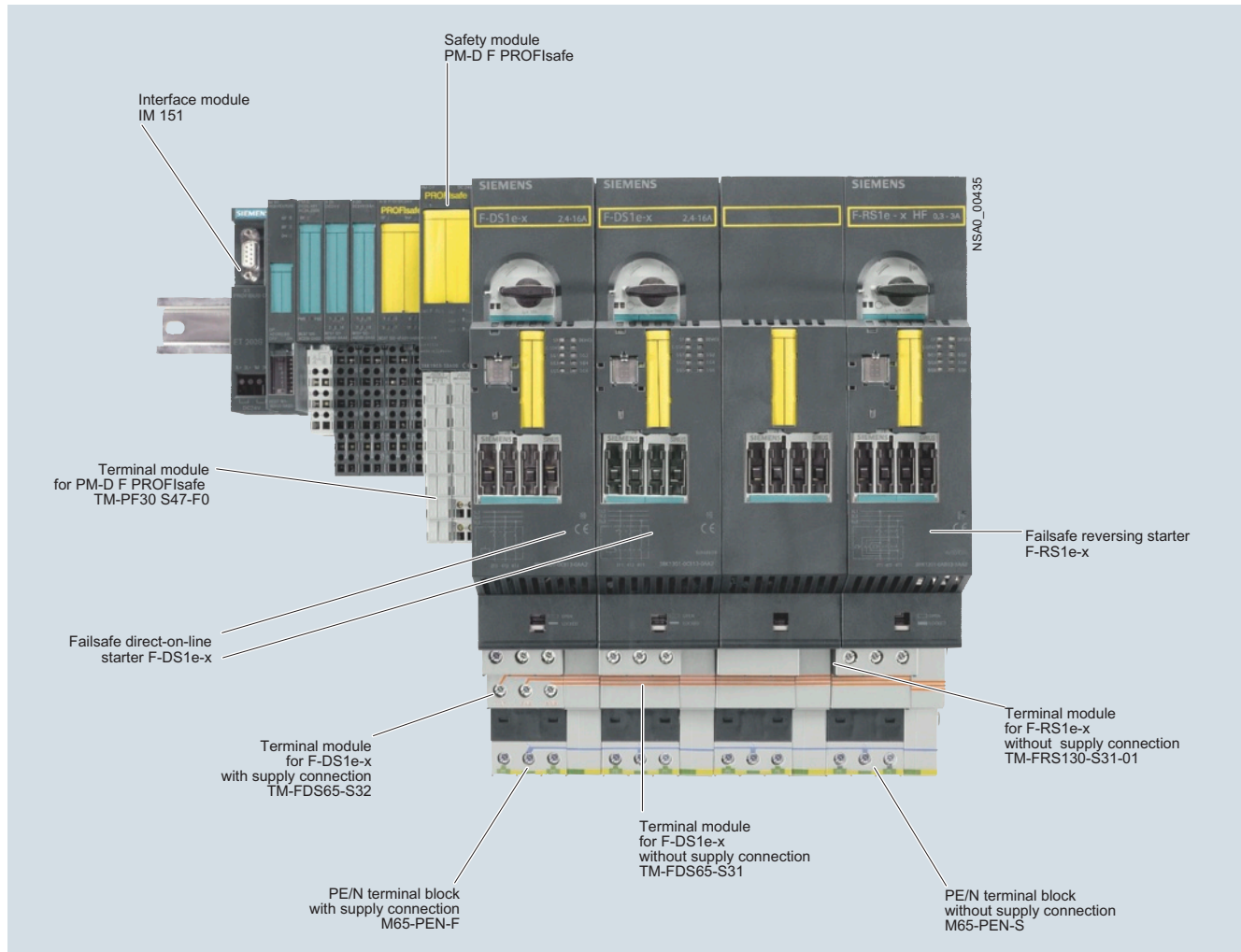
Signals with relevance for safety can be input to ET 200S through a PM-DFX1 infeed terminal module through the enabling circuits of the ASIsafe monitor or the safety relay to control the Failsafe motor starters which then selectively switch off the downstream motors.

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - Motor starters and Safety motor starters

### Safety modules local and PROFIsafe

#### ET 200S Safety Motor Starter Solution PROFIsafe



Interaction of ET 200S Safety Motor Starter Solution PROFIsafe components

#### Components for Safety Motor Starter ET 200S Solution PROFIsafe

The ET 200S Safety Motor Starter Solutions PROFIsafe consist of (see example, page 9/237):

- PMD F PROFIsafe safety modules
- Failsafe motor starters
- Safe control system with the PROFINET or PROFIBUS bus systems and the PROFIsafe profile

#### Functionality of the ET 200S Safety Motor Starter Solution PROFIsafe

- For the use of Failsafe motor starters in plants with PL c to PL e according to ISO 13849-1 and SIL 2 and 3 according to IEC 62061. The use of Standard or High Feature motor starters is also possible with certain assemblies.
- High flexibility (any assignment of sensors to motor starters using the PLC)
- Full selectivity of disconnection of the Failsafe motor starters
- No complex wiring for conventional safety systems, e.g. no infeed contactors even in the highest safety category
- Can also be used to activate external safety systems through F-CM contact multiplier
- Safety module available for any safety function
- Safety module available for Stop category 0 and 1
- Safety module for monitoring the auxiliary voltages for motor starters

- Safety modules can be plugged into the TM-PF30 terminal modules

Sensor and actuator assignment are freely configurable within the framework of the distributed safety concept:

The logic of the safety functions is implemented by software. Safety-related PROFIsafe communication and the use of a safety-related control system are required. Integration of the safety technology in the standard automation is realized through a single bus system (see [Advantages of PROFIsafe](#)), using PROFIBUS as well as PROFINET.

#### High degree of flexibility with safety technology Failsafe motor starters for PROFIsafe

In EMERGENCY STOP applications, the Failsafe motor starters are selectively switched off through the upstream PM-D F PROFIsafe safety module. For each safety module, six switch-off groups can be formed. In the first delivery stage, the Failsafe freely-programmable logic of the SIMATIC controller is used to interface with the relevant Failsafe sensor technology.

#### F-CM contact multipliers

The interface between PROFIsafe and installations that use conventional safety technology is implemented through the F-CM Failsafe contact multiplier with four floating contacts.

**PM-D F PROFIsafe safety module**

The PM-D F PROFIsafe safety module receives the shutdown signal from the interface module of the ET 200S and safely switches off 1 to 6 switch-off groups. This safety module is used in PROFIsafe applications where there is a need for the selective safety shutdown of Failsafe motor starters/frequency converters.

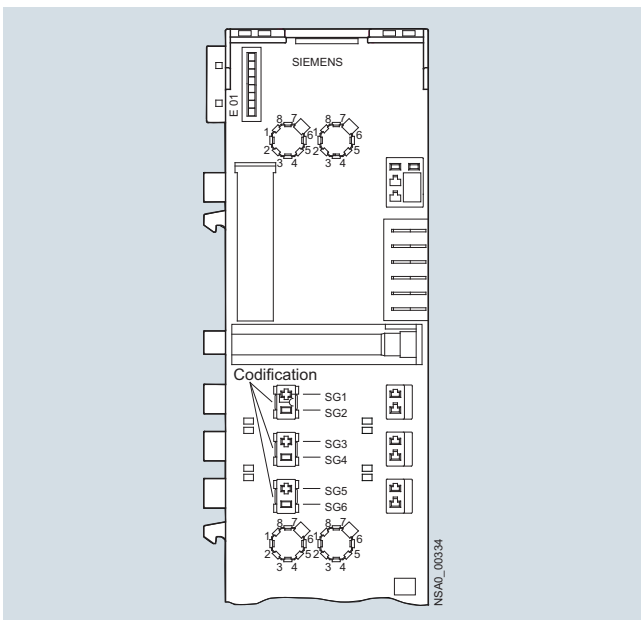


PM-D F PROFIsafe with TM-PF30 S47-F0 terminal module

**Terminal modules**

The terminal assignment of the terminal modules for safe motor starters corresponds to the terminal assignment of the 45 mm and 65 mm terminal modules. The terminal modules for safe motor starters have a coding module in addition. This enables the safe motor starter to be assigned to one of the six switch-off groups.

The terminal module contains three coding elements which fully cover the three coding openings in the terminal module. The labeled coding element contains (in the chamber marked with the dash) the busbar tap; the non-labeled coding elements are used only to cover the coding openings. Switch-off group 1 (AG1 or SG1) is coded in the as-delivered state. The coding can be changed to switch-off group 2 by releasing the coding element and turning it through 180°. Changing the coding to switch-off group 3 is possible by exchanging the labeled and blank coding elements. In this case, the dash on the labeled coding element must correlate with the dash of the required switch-off group (symbolized busbar).



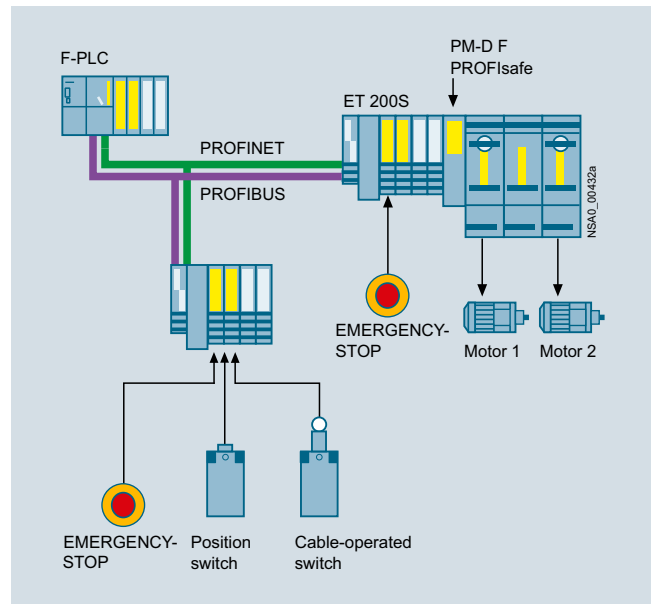
The Failsafe motor starters are assigned to one of the six possible switch-off groups.

**Example:**

The diverse possible uses of the Safety Motor Starter Solutions PROFIsafe are presented in the SIMATIC ET 200S Motor Starters manual in the context of typical sample applications.

Safety functional examples for easy, quick and low-cost implementations of applications with Safety Motor Starter Solution PROFIsafe are available on the Internet:

More information can be found on the Internet at:  
[www.siemens.com/ET200S](http://www.siemens.com/ET200S)



ET 200S Safety Motor Starter Solution PROFIsafe with Failsafe motor starters and fully selective disconnection (PM-DF PROFIsafe application)

Within an ET 200S station the Failsafe motor starters are assigned to one of 6 safety segments. For plants with distributed configuration the shutdown signals of these safety segments are preferably issued by a higher-level, safety-related control system through PROFIsafe. This permits the greatest flexibility for assigning the motor starters to different safety circuits.

Alternatively, an ET 200S F-CPU can also be used for control purposes.

If a safety-related SIMATIC CPU is used, the ET 200S is available as a safety-related I/O. Nevertheless, in such a station it is possible to configure conventional motor starters and input/output modules mixed with modules with safety functions.

Thanks to the PROFIsafe profile, the safety functions are available in the complete network, which means that the Safety Motor Starter Solutions PROFIsafe enable the selective disconnection of Failsafe motor starters or the disconnection of a group of Standard and High Feature motor starters, regardless of where and on which peripheral station the safe control devices were connected. As such, this solution provides an unprecedented level of flexibility and reduction of wiring for applications in widespread plants or with sporadic demand for changes in the assignment of safety segments.

The Safety Motor Starter Solutions PROFIsafe are ideally suited for safety concepts with Cat. 2 to 4 according to ISO 13849-1 and up to SIL 3 according to IEC 62061.

Each safety module switches up to 6 switch-off groups for Failsafe motor starters/frequency converters.

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - Motor starters and Safety motor starters

### Safety modules local and PROFIsafe

#### Technical specifications

Safety modules PM-D F1, F2, F3, F4 and F5		
<b>Mechanical endurance</b>	Operating cycles	$10 \times 10^6$
<b>Electrical endurance</b>	Operating cycles	200 000 at $I_e$
<b>Utilization category</b>		DC-13
<b>Control times</b>		
• Minimum command duration	ms	200
• Recovery time	s	< 1
• OFF-delay	ms	30
<b>Control circuit <math>U_1</math></b>		
• Rated control supply voltage $U_s$	V DC	24
• Operating range DC up to 60 °C		0.85 ... 1.2 x $U_s$
• Power consumption	W	2.4
• Recommended short-circuit protection		gG 2 A
• Output OUT+/OUT- for control of expansion modules		24 V DC/< 50 mA (PTC fuse)
<b>Switched auxiliary circuit <math>U_2</math></b>		
• Rated control supply voltage $U_s$	V DC	24
• Operating range DC up to 60 °C		0.85 ... 1.2 x $U_s$
• Rated operational current $I_e$ (13 ... 24 V DC)	A	4
• Uninterrupted thermal current $I_{th}$	A	5
<b>Recommended short-circuit protection for enabling and signaling circuits</b>		Fuse links: LV HRC type 3NA, DIAZED type 5SB, NEOZED type 5SE Operating class gG 6 A
<b>Supply of</b>		
• Motor starters		Yes
• Electronic modules		No
• Ex(i) modules		No
• BG certification		Yes
• UL, CSA certification		Yes
<b>Cable length for EMERGENCY STOP and ON buttons</b>	m	max. 1 000
<b>Mounting dimensions (W x H x D)</b>	mm	30 x 196.5 x 117.5 (incl. terminal module)
<b>Enabling circuits with PM-D F5</b>		4 (floating)

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PM-D FX1 safety module (infeed terminal module)		
<b>Dimensions</b>		
Mounting dimensions (W x H x D)	mm	30 x 196.5 x 117.5 (incl. terminal module)
<b>Module-specific specifications</b>		
Ambient temperature	°C	0 ... +60
Degree of protection		IP20
Maximum achievable safety classes		
• IEC 62061		SIL 3
• DIN V 19250		Tripping class 5 and 6
• ISO 13849-1		PL e
<b>Safety characteristics</b>		
Proof-test interval		10 years
<b>Voltages, currents, potentials</b>		
Rated control supply voltage $U_s$	V DC	21.6 ... 26.4 to 60 °C
Rated operational current $I_e$	A	6
Recommended upstream short-circuit protection	A	Internal fuse protection 7 A (quick-response) Melting fuse gG 6.3
<b>Supply of</b>		
• Failsafe motor starters		Yes
• Failsafe frequency converters		Yes
• Electronic modules		No
• Ex[i] modules		No
<b>Current consumption</b>		
• From the backplane bus	mA	≤ 10
• From $U_1$	mA	≤ 35
• From SGx	mA	≤ 15
<b>Status, alarms, diagnostics</b>		
Alarms		None
Diagnostic functions		
• Group fault/device fault		Red "SF" LED
• Monitoring of the electronics power supply U 1 (PWR)		Green LED PWR
• Monitoring of six switch-off groups		Green LED SG1 ... SG6
• Diagnostics information can be read out		Yes
<b>Standards, approvals</b>		
• TÜV		Yes
• UL, CSA certification		Yes


F-CM contact multipliers		
<b>Dimensions</b>		
Dimensions (W x H x D)	mm	30 x 196.5 x 117.5 (incl. terminal module)
<b>Module-specific specifications</b>		
Number of relay outputs		4 (4 x 1-channel or 2 x 2-channel safe coupling / contact multiplication)
Internal power supply for busbar		U1 (from PM-D F / PM-D FX1)
Maximum achievable safety class		SIL 3
• According to IEC 62061		AK 6
• According to DIN VDE 0801		Cat. 4
• According to ISO 13849-1		
<b>Voltages, currents, potentials</b>		
Switching capacity of relay outputs		Utilization category DC-13 ( $I_g/U_g$ ): 1.5 A/24 V
Electrical separation		Yes
• Between outputs and backplane bus		Yes
• Between outputs and power supply		Yes
• Between outputs		Yes
• Between outputs/power supply and shield		Yes
<b>Status, alarms, diagnostics</b>		
Status display		PWR and STAT
Alarms: Diagnostic interrupt		None
Diagnostic functions		Yes
• Group fault display		Red LED (SF)
• Diagnostics information can be read out		Possible
• Monitoring of the electronics power supply $U_1$ (PWR)		Green LED PWR
• Monitoring of the switching status of the enabling circuit		Red/green LED STAT
<b>PM-D F PROFI-safe safety modules</b>		
<b>Dimensions</b>		
Dimensions (W x H x D)	mm	30 x 196.5 x 117.5 (incl. terminal module)
<b>Module-specific specifications</b>		
Number of outputs, switching to P potential		6 switch-off groups (safety group 1 ... 6)
Internal power supply for busbar		U1
Assigned address range		
• in the PII	Byte	5
• in the PIQ	Byte	5
Maximum achievable safety class		SIL 3
• According to IEC 62061		AK 6
• According to DIN VDE 0801		Cat. 4
• According to ISO 13849-1		
<b>Voltages, currents, potentials</b>		
Supply voltage	V	24 DC
Electrical separation		Yes
• Between outputs and backplane bus		No
• Between outputs and power supply		No
• Between outputs		No
• Between outputs/power supply and shield		Yes
<b>Status, alarms, diagnostics</b>		
Status display		Green LED per SG Green LED for electronics supply Green LED for load voltage
Alarms: Diagnostic interrupt		"ON"
Diagnostic functions		Red LED (SF)
• Group fault display		Possible
• Diagnostics information can be read out		
<b>Settings</b>		
Module address		Diverse: 1. Using a safety-related parameter in the parameterization message frame via the backplane bus 2. Using the 10-pole DIL switch (binary-coded) on the left side of the module  The received address is then compared with the DIL switch setting.

**I/O systems**

ET 200 systems for the control cabinet

ET 200S - Motor starters and Safety motor starters

**Safety modules local and PROFIsafe****Selection and ordering data**

Version	Article No.	
<b>Safety modules local</b>		
 <p>3RK1903-3DA00</p>	<p><b>PM-D F1</b> With diagnostics Safety module for EMERGENCY STOP application Monitored start</p>	<p><b>3RK1903-1BA00</b></p>
<p><b>PM-D F2</b> With diagnostics Safety module for protective door monitoring Automatic start</p>	<p><b>3RK1903-1BB00</b></p>	
<p><b>PM-D F3</b> With diagnostics Safety module for expanding PM-D F1/2 for another voltage group Time-delayed 0 to 15 s</p>	<p><b>3RK1903-1BD00</b></p>	
<p><b>PM-D F4</b> With diagnostics Safety module for expanding PM-D F1/2 for another voltage group</p>	<p><b>3RK1903-1BC00</b></p>	
<p><b>PM-D F5</b> With diagnostics Safety module for expanding PM-D F1...4 with four floating enabling circuits Contact multipliers</p>	<p><b>3RK1903-1BE00</b></p>	
<p><b>PM-D FX1</b> With diagnostics Infeed terminal module for supply of 1 to 6 switch-off groups</p>	<p><b>3RK1903-3DA00</b></p>	
<p><b>FC-M contact multipliers</b> With 4 safe floating contacts</p>	<p><b>3RK1903-3CA00</b></p>	
<b>Safety modules PROFIsafe</b>		
<p><b>PM-D F PROFIsafe safety modules</b> For PROFIBUS and PROFINET For Failsafe motor starters For Failsafe contact multipliers With six switch-off groups (SG1 to SG6)</p>	<p><b>3RK1903-3BA02</b></p>	
<p><b>F-CM contact multipliers</b> With 4 safe floating contacts</p>	<p><b>3RK1903-3CA00</b></p>	



**Overview****Terminal modules for PM-D F1/F2/F3/F4/F5 safety modules**

For supplying load and sensor voltage to the self-assembling potential bars of the Standard motor starters, High Feature motor starters and frequency converters. Safety modules for voltage monitoring are plugged onto TM-P modules. TM-P modules can be used any number of times within the ET 200S. A safety module must always be plugged upstream from the first motor starter.

Different safety circuits can be functionally separated or else cascaded using different terminal modules. Each group in such a case must be terminated with a PM-X safety module (connection module).

TM-PF30 S47-B1

This terminal module is always positioned at the beginning of a safety segment and accommodates the PM-DF1 safety module for EMERGENCY STOP applications or the PM-DF2 safety module for protective door monitoring. The 24 V control supply voltages for the electronics (U1) and those for supplying the contactors (U2) of the motor starters must be connected along with the 2-channel connection of the safety sensors (e.g. EMERGENCY STOP pushbuttons) to this terminal module. Connections for the ON button (enabling) and safe output of the safety module are available in addition.

TM-PF30 S47-B0

This terminal module is used to cascade lower level safety segments and accommodates the PM-DF1 safety module for EMERGENCY STOP applications or the PM-DF2 safety module for protective door monitoring. No other auxiliary voltage has to be connected to this terminal module. The supply comes from the preceding PM-DF1 or PM-DF2 module over the potential bars of the terminal modules. Once the potential of the preceding safety module is disconnected, this sub-potential also has no voltage.

TM-PF30 S47-C1

This terminal module is always positioned at the beginning of a safety segment expansion in a new station, e.g. at an interlace point. It accommodates the PM-D F3 safety module for time-delayed shutdown or the PM-D F4 safety module for direct shutdown in separately located ET 200S stations. The 24 V control supply voltages for the electronics (U1) and those for supplying the contactors (U2) are fed in anew.

The shutdown command from an upstream ET 200S station is received through a safe input. Separate terminals are available for connecting the feedback circuit to the upstream ET 200S station. It is not possible to connect safety sensors to this terminal module.

TM-PF30 S47-C0

This terminal module is used to cascade lower-level safety segments and accommodates the PM-D F3 safety module for time-delayed shutdown, or the PM-D F4 safety module. Only the U2 control supply voltage for the contactors must be connected to this terminal module. The U1 supply comes from the preceding safety module (sub-potential group) over the potential bars of the terminal modules. It is not possible to connect safety sensors to this terminal module.

TM-PF30 S47-D0

This terminal module is used to accommodate the PM-D F5 safety module. On this terminal module, safe signals can be relayed to external systems through four groups, each with two safety relay contacts configured with redundancy. The terminal module must always be positioned between one of the above mentioned terminal modules and a terminal module for the TM-X connection module. It is not possible to connect safety sensors to this terminal module.

**Terminal module for PM-X safety module (TM-X)**TM-X15 S27-01

For connection of an external infeed contactor (second shutdown option) for SIL 2 and SIL 3 or PL d and PL e. The PM-X safety module (connection module) is plugged on the right next to the last motor starter of a safety segment. On the TM-X terminal module there are the terminals for connecting the positively driven NC contact of the contactors as well as the terminals for connecting the contactor coil. If no contactor with redundant switching is required, e.g. for PL c (ISO 13849-1), the feedback circuit has to be closed at these terminals with a jumper. In applications with external safety relays it is also used instead of the safety module as interface to the external safety relay.



## I/O systems


ET 200 systems for the control cabinet  
ET 200S - Motor starters and Safety motor starters

### Safety modules local and PROFIsafe terminal modules

#### Technical specifications

TM-PFX30 S47/TM-PF30 S47 terminal modules		
<b>Dimensions</b>		
• Mounting dimensions (W x H x D)	mm	30 x 196.5 x 102
• Depth with power module	mm	117.5
<b>Insulation voltages and rated currents</b>		
• Insulation voltage	V	500
• Rated operational voltage	V DC	24
• Rated operational current	A	10
<b>Conductor cross-sections</b>		
• Solid	mm <sup>2</sup>	1 x (0.14 ... 2.5), according to IEC 60947 1 x 2.5
• Finely stranded with end sleeve	mm <sup>2</sup>	1 x (0.14 ... 1.5), according to IEC 60947
• AWG cables, solid or stranded	AWG	1 x (18 ... 22)
<b>Wiring</b>		
• Required tool		Standard screwdriver size 1
• Tightening torque	Nm	0.4 ... 0.7

#### Selection and ordering data

Version	Article No.
<b>Terminal modules for Safety modules local</b>	
 <p>3RK1903-1AA00</p>	<b>TM-PF30 S47-B1 terminal module</b> For PM-D F1/2 safety modules With infeed U1/U2 and sensor connection <b>3RK1903-1AA00</b>
	<b>TM-PF30 S47-B0 terminal module</b> For PM-D F1/2 safety modules With sensor connection <b>3RK1903-1AA10</b>
	<b>TM-PF30 S47-C1 terminal module</b> For PM-D F3/4 safety modules With infeed U1/U2 and control input IN+/IN- <b>3RK1903-1AC00</b>
	<b>TM-PF30 S47-C0 terminal module</b> For PM-D F3/4 safety modules With infeed U2 <b>3RK1903-1AC10</b>
	<b>TM-PF30 S47-D0 terminal module</b> For PM-D F5 safety modules <b>3RK1903-1AD10</b>
	<b>TM-X15 S27-01 terminal module</b> For PM-X safety module <b>3RK1903-1AB00</b>
	<b>TM-P15-S27-01 terminal module</b> For PM-D power module <b>3RK1903-0AA00</b>
	<b>TM-PFX30 S47-G0/G1 terminal module</b> For PM-D FX1 safety modules (infeed terminal modules) • Infeed left (TM-PFX30 S47-G0) <b>3RK1903-3AE10</b> • Infeed center (TM-PFX30 S47-G1) <b>3RK1903-3AE00</b>
	<b>TM-FCM30 S47-F01 terminal module</b> For F-CM contact multipliers <b>3RK1903-3AB10</b>
	<b>Terminal modules for Safety modules PROFIsafe</b>
<b>TM-PF30 S47-F0 terminal module</b> For PM-D F PROFIsafe safety modules <b>3RK1903-3AA00</b>	
<b>TM-FCM30 S47-F01 terminal module</b> For F-CM contact multipliers <b>3RK1903-3AB10</b>	

**Overview****Accessories for Standard motor starters**Control kit

The control kit for the Standard motor starter makes it possible to test the motor during start up or service by actuating the motor starter protector. Using the control kit with the motor starter protector tripped, the contactor is mechanically locked in ON position.

Control unit

With the control unit the contactor coils of the Standard motor starter can be directly controlled using 24 V DC. The motor starter can thus be started as normal using a local control station without a PLC or bus.

Note:

The control unit cannot be used in combination with the safety system or a brake control module.

DM-V15 distance module

- Passive module without bus connection and terminals
- Does not need a separate terminal module
- Follows a TM-DS45 or TM-RS90 or TM-xB if required
- Does not need to be taken into account when configuring the GSD file

The distance module is available for applications with high motor currents or high ambient temperatures involving Standard motor starters. It can be used to the right and left of a DS1-x direct-on-line starter or to the right of an xB1...4 brake module in order to improve heat dissipation to the side. The distance module is a completely passive module and does not need to be taken into account with regard to the control system during configuration. Details of the distance module can be found in the "SIMATIC ET 200S" manual. If you have any queries concerning the use of the distance module, contact Technical Support for Siemens Industrial Controls (Fax: +49(0)911/895-5907).

**Accessories for High Feature motor starters**2DI LC COM control module

The 2DI LC COM control module is plugged onto the interface on the front of the motor starter. The module provides two inputs which can receive signals from the process and be assigned directly to the starter.

The functionality can be selected from a list of various control functions as part of the PROFIBUS parameterization. Local control point, emergency start and quick stop, for example, are available as functions. The signal levels can also be parameterized (NO/NC). For more extensive control functions the two inputs of an xB3 or xB4 brake control module plugged in to the right, can also be integrated. The signal states of all inputs are transmitted parallel to internal use to the higher-level control system.

When a motor starter is replaced, the parameterization is automatically transmitted by download to the new starter. The inputs on the motor starter ensure autonomous operation, e.g. in the event of PLC failure, on the one hand and short response times through direct processing in the starter on the other hand. Another advantage results from the direct assignment of functions to modular machine concepts.

The 2DI LC COM control module has in addition a PC interface for connecting the Switch ES Motor Starter parameterization and diagnostics software (Version 2.0 and higher). The module works solely on High Feature motor starters with Motor Starter ES interfaces. The Logo! PC cable is used as the connecting cable between the 2DI LC COM control module and the High Feature motor starter.

**Accessories for Standard and High Feature motor starters**PE/N bridge modules

PE/N bridge modules are used to bridge gaps of the PE/N bus which are caused, for example, by using brake control modules, PM-D(F) power modules or PM-X connection modules. If a bridge module is used, the supply does not have to be fed in anew. They are available in 15 mm and in 30 mm widths.

L123 bridge modules

The L123 bridge modules are used to bridge gaps of the power bus (see above). They are available in 15 mm and in 30 mm widths.

Brake control modules

For motors with mechanical brakes  
(see "General Data" → "Overview", page 9/216)

Terminal modules for brake control modules

The TM-xB terminal modules are used to accommodate the xB1, xB2, xB3 and xB4 brake control modules. The TM-xB terminal module must always follow directly after a terminal module for Standard motor starters, High Feature motor starters or frequency converters as control of the solid-state braking switch is provided through an output of the motor starter/frequency converter. The xB215 terminal modules for the brake control modules not only have terminals for connecting the motor brake cable, but also the terminals of the two local acting inputs. These local inputs are not evaluated by a frequency converter, which is why the xB215 terminal module can only be switched downstream of a motor starter.

**Accessories for Standard, High Feature and Failsafe motor starters**PE/N terminal blocks

The PE/N terminal block is required for direct connection of the protective conductor in the motor cable without intermediate terminals. It is plugged together with the terminal module for motor starters or frequency converters before the latter is mounted on the standard mounting rail. With two PE terminals and one N terminal the "-F" version is connected to the "-S32" terminal modules for motor starters or frequency converters. The "-S" version is combined with the "-S31" terminal module. The "F" terminal blocks are delivered with two caps for closing the PE/N bus contacts on the final terminal block of a segment. The modules for the Standard motor starters have a width of 45 mm and the modules for the High Feature motor starters and frequency converters have a width of 65 mm.

There is no electrical connection between the terminals of the PE/N terminal block and the integrated shielding of the frequency converter. The PE/N terminal block must therefore not be used for the shielding of the motor cable.

**Accessories for Safety modules local**

The Failsafe Kit (F-Kit) is required for Standard motor starters in a safety segment (see page 9/234).

## I/O systems

ET 200 systems for the control cabinet  
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### Accessories

#### Technical specifications

##### Brake control modules xB1, xB2, xB3, xB4, xB5, xB6

		xB1	xB3	xB2	xB4	xB5	xB6
<b>Dimensions (W x H x D)</b>	mm	15 x 196.5 x 125.5 including terminal module on 7.5 mm standard mounting rail					
<b>Rated operational voltage</b>	V	24 DC			500 DC (at least 100)		400 AC
<b>Power supply</b>		Externally through terminal module		From brake rectifier through terminal module		Externally through terminal module	
<b>Rated operational current</b>	A	4		0.7		0.5	
<b>Reverse polarity protection</b>		No, in the event of polarity reversal the brake is released and the overload/short-circuit protection is ineffective					Not applicable
<b>Overload/short-circuit protection</b>		Electronic					1 A melting fuse
<b>Conductor cross-section of terminal module for brake control module</b>	mm <sup>2</sup>	1 x 2.5 without end sleeve 1 x 1.5 with end sleeve					
<b>Number of outputs</b>		0	1 (used internally)	0	1 (used internally)	0	1 (used internally)
<b>Number of inputs</b>		0	2	0	2	0	2
<b>Address area required per module</b>							
• With summary		0	2 bits	0	2 bits	0	2 bits
• Without summary		0	1 byte	0	1 byte	0	1 byte
<b>Diagnostic functions</b>							
• Group fault "SF"		Red LED					
• Switching status for brake "STAT"		Yellow LED					
• Inputs 1 and 5		--	Green LED	--	Green LED	--	Green LED
<b>Parameters (default value underlined)</b>							
• Brake overload diagnostics		--	Disable/Enable	--	Disable/Enable	--	
• Input delay	ms	--	0 / 0.1 / 0.5 / <u>3</u> / 15	--	0 / 0.1 / 0.5 / <u>3</u> / 15	--	0 / 0.1 / 0.5 / <u>3</u> / 15

#### Selection and ordering data

Version	Article No.
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##### Accessories for Standard motor starters



3RK1903-OCA00

**Control kits**  
for manually operating the contactor contacts during start up and servicing  
(one set contains five control kits)

3RK1903-OCA00



3RK1903-OCG00

**Control units**  
for direct contactor control  
(manual control)  
24 V DC

3RK1903-OCG00



3RK1903-OCD00

**DM-V15 distance modules**  
for DS1-x direct-on-line starters  
with high temperatures or high current loading  
15 mm wide

3RK1903-OCD00




Version	Article No.	
<b>Accessories for Standard motor starters(continued)</b>		
 <p>3RK1903-2AA00</p>	<p><b>PE/N M45-PEN-F terminal blocks</b> 45 mm wide including two caps in combination with TM-DS45-S32/ TM-RS90-S32</p>	<p><b>3RK1903-2AA00</b></p>
 <p>3RK1903-2AA10</p>	<p><b>PE/N M45-PEN-S terminal blocks</b> 45 mm wide in combination with TM-DS45-S31/TM-RS90-S31</p>	<p><b>3RK1903-2AA10</b></p>
<b>Accessories for High Feature motor starters</b>		
 <p>3RK1903-0CH20</p>	<p><b>2DI LC COM control module</b> Digital input module with 2 inputs (cable length up to 100 m) for local motor starter functions for mounting onto the front of motor starters, operational voltage 24 V DC (supplied from <math>U_1</math>), short-circuit proof, floating contact with serial interface for connecting Motor Starter ES, connected using LOGO! PC cable</p>	<p><b>3RK1903-0CH20</b></p>
 <p>3RK1922-3BA00</p>	<p><b>Hand-held device</b> For ET 200S High Feature motor starters (or for ET 200pro and M200D motor starters) for local operation. The motor starter-specific serial interface cables must be ordered separately. The LOGO! PC cable is used for the MS ET 200S HF.</p>	<p><b>3RK1922-3BA00</b></p>
 <p>6ED1057-1AA01-0BA0</p>	<p><b>LOGO! USB PC cable</b> For connecting the ET 200S High Feature motor starters to the RS232 interface of a PG/PC/laptop (with the Motor Starter ES software) or the hand-held device 3RK1922-3BA00.</p>	<p><b>6ED1057-1AA01-0BA0</b></p>
 <p>3RK1903-2AC10</p>	<p><b>M65-PEN-F terminal block</b> 65 mm wide, including two caps, in combination with TM-DS65-S32/TM-RS130-S32</p>	<p><b>3RK1903-2AC00</b></p>
<p>3RK1903-2AC10</p>	<p><b>M65-PEN-S terminal block</b> 65 mm wide, in combination with TM-DS65-S31/TM-RS130-S31</p>	<p><b>3RK1903-2AC10</b></p>

**I/O systems**

ET 200 systems for the control cabinet  
 ET 200S - Motor starters and Safety motor starters

**Accessories**

Version	Article No.	
<b>Accessories for Standard/High Feature motor starters</b>		
 3RK1903-0AH00	<b>M15-PE/N bridge module</b> 15 mm wide for bridging a 15 mm module	<b>3RK1903-0AH00</b>
 3RK1903-0AJ00	<b>M30-PE/N bridge module</b> 30 mm wide for bridging a 30 mm module	<b>3RK1903-0AJ00</b>
 3RK1903-0AE00	<b>M15-L123 bridge module</b> 15 mm wide for bridging a 15 mm module	<b>3RK1903-0AE00</b>
 3RK1903-0AF00	<b>M30-L123 bridge module</b> 30 mm wide for bridging a 30 mm module	<b>3RK1903-0AF00</b>
 3RK1903-0AF20	<b>Sealing caps</b> for L123 and PE/N bridge modules (bag containing 20 units)	<b>3RK1903-0AF20</b>
 3RK1903-0CB00	<b>Brake control modules</b> for motors with mechanical brakes <ul style="list-style-type: none"> <li>• <b>xB1 for motor starters</b> 24 V DC/4 A</li> <li>• <b>xB2 for motor starters</b> 500 V DC/0.7 A</li> <li>• <b>xB3 for motor starters</b> 24 V DC/4 A/2 DI 24 V DC local control with diagnostics, with two inputs</li> <li>• <b>xB4 for motor starters</b> 500 V DC/0.7 A/2 DI 24 V DC local control with diagnostics, with two inputs</li> <li>• <b>xB5 for motor starters</b> 400 V AC without digital input</li> <li>• <b>xB6 for motor starters</b> 400 V AC with two digital inputs</li> </ul>	<b>3RK1903-0CB00</b>  <b>3RK1903-0CC00</b>  <b>3RK1903-0CE00</b>  <b>3RK1903-0CF00</b>  <b>3RK1903-0CJ00</b>  <b>3RK1903-0CK00</b>
	<b>Terminal modules for brake control modules</b> <ul style="list-style-type: none"> <li>• <b>TM-xB15 S24-01</b> for xB1, xB2 or xB5</li> <li>• <b>TM-xB215 S24-01</b> for xB3, xB4 or xB6</li> </ul>	<b>3RK1903-0AG00</b>  <b>3RK1903-0AG01</b>

Version	Article No.
<b>Accessories for Failsafe motor starters</b>	
<b>M65-PEN-F terminal block</b> with incoming connection, with caps	<b>3RK1903-2AC00</b>
<b>M65-PEN-S terminal block</b> without incoming connection	<b>3RK1903-2AC10</b>
<b>Accessories for Safety modules local</b>	
	<b>PM-X safety module (connection module)</b> with diagnostics, for plugging onto TM-X15 S27-01 Module for connecting a safety group and for connecting an external infeed contactor or for connecting to an external safety circuit
	<b>F-Kit 1</b> Failsafe equipment for DS1-x Standard motor starters <sup>1)</sup>
	<b>F-Kit 2</b> Failsafe equipment for RS1-x Standard motor starters <sup>1)</sup>
3RK1903-1CA00	<b>3RK1903-1CB00</b>
3RK1903-1CA01	<b>3RK1903-1CA00</b>
3RK1903-1CA01	<b>3RK1903-1CA01</b>
<b>Manual "SIMATIC ET 200S Motor Starters, Fail-Safe Motor Starters, Safety-Integrated Systems"</b>	
The manual can be downloaded free of charge in PDF format from the Internet, see <a href="http://support.automation.siemens.com/WWW/view/en/6008567">http://support.automation.siemens.com/WWW/view/en/6008567</a>	

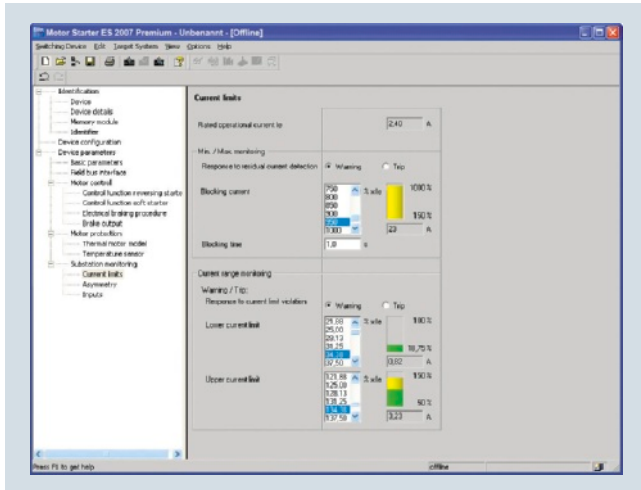
<sup>1)</sup> The function of the Failsafe Kit is already integrated into High Feature motor starters.

## I/O systems

ET 200 systems for the control cabinet  
ET 200S - Software

### Motor Starter ES

#### Overview



Motor Starter ES for parameterization, monitoring, diagnostics and testing of motor starters

Motor Starter ES is used for start up, parameterization, diagnostics, documentation and the preventative maintenance of the motor starters in the SIMATIC ET 200S, ET 200pro, ECOFAST and M200D product families.

Interfacing is performed

- Through the local interface on the device
- With PROFIBUS DP V1-capable motor starters from any point in PROFIBUS or in PROFINET (applies to ET 200S DP V1/ET 200pro/ECOFAST/M200D)
- With PROFINET capable motor starters from any point in PROFINET or in PROFIBUS (applies to ET 200S DP V1/ ET 200pro/M200D)

Using Motor Starter ES, the communication-capable motor starters are easily parameterized during start up, monitored during normal operation and successfully diagnosed for service purposes. Preventative maintenance is supported by a function for reading out diverse statistical data (e.g. operating hours, operating cycles, cut-off currents, etc.). The user is supported during these procedures with comprehensive Help functions and plain text displays.

Motor Starter ES can either be used as a stand-alone program or it can be integrated into STEP 7 via an object manager.

#### Efficient engineering with three program versions

The Motor Starter ES software program is available in three versions which differ in their user-friendliness, scope of functions and price.

Motor Starter ES	Basic	Standard	Premium
ET 200S High Feature PROFIBUS IM	✓	✓	✓
ET 200S High Feature PROFINET IM	✓	✓	✓
ECOFAST AS-Interface High Feature	✓	✓	--
ECOFAST PROFIBUS	✓	✓	✓
ET 200pro PROFIBUS IM	✓	✓	✓
ET 200pro PROFINET IM	✓	✓	✓
M200D AS-Interface Standard	✓	✓	(✓)
M200D PROFIBUS	✓	✓	✓
M200D PROFINET	✓	✓	✓

✓ Function available, (✓) Available with restricted functionality

-- Function not available

Motor Starter ES	Basic	Standard	Premium
Access through the local interface on the device	✓	✓	✓
Parameter assignment	✓	✓	✓
Operating	✓	✓	✓
Diagnostics	--	✓	✓
Creation of typicals	--	✓	✓
Comparison functions	--	✓	✓
Standard-compliant printout according to EN ISO 7200	--	✓	✓
Service data (min/max pointer, statistics data)	--	✓	✓
Access through PROFIBUS	--	--	✓
Access through PROFINET	--	--	✓
S7 routing	--	--	✓
Teleservice through MPI	--	--	✓
STEP 7 Object Manager	--	--	✓
Trace function	--	✓	✓

✓ Function available

-- Function not available

#### Additional functions

- Standard-compatible printouts  
The software tool greatly simplifies machine documentation. It enables parameterization printouts according to EN ISO 7200. The elements to be printed are easy to select and group as required.
- Easy creation of typicals  
Typicals can be created for devices and applications with only minimum differences in their parameters. These typicals contain all the parameters which are needed for the parameterization. In addition it is possible to specify which of these parameters are fixed and which can be adapted, e.g. by the startup engineer.
- Teleservice via MPI  
The Motor Starter ES Premium version supports the use of MPI Teleservice (comprising the Teleservice software and various Teleservice adapters) for remote diagnostics of the devices. This facilitates diagnostics and maintenance, and it shortens response times for service purposes.

#### Types of delivery and license

Motor Starter ES is available with the following licenses:

- Floating license – the license for any one user at any one time
  - Authorizes any one user
  - Independent of the number of installations (unlike the single license which may only be installed once)
  - Only the actual use of the program has to be licensed
  - Trial license (free use of all program functions for 14 days for test and evaluation purposes, included on every product CD, available in the download file of the SIRIUS ES program in the Service&Support portal)

The following delivery versions are also available for Motor Starter ES 2007:

- **Upgrade**  
Switching from an old to a new version with expanded functions, e.g. upgrade from Motor Starter ES 2006 to Motor Starter ES 2007.
- **Powerpack**  
Special pack for switching within the same software version to a more powerful version with more functionality, e.g. Powerpack for Motor Starter ES 2007 for switching from Standard to Premium.
- **Software Update Service**  
To keep you up to date at all times we offer a special service which supplies you automatically with all service packs and upgrades.
- **License download**  
User-friendly license key download from our Mall (for selected countries) as an easy and quick way for you to receive additional licenses for your software.  
For more information see [www.siemens.com/tia-online-software-delivery](http://www.siemens.com/tia-online-software-delivery).

### System requirements

<b>Parameterization, start up and diagnostics software</b> <b>Motor Starter ES 2007</b> For ECOFAST motor starters, SIMATIC ET 200S High Feature starters, SIMATIC ET 200pro starters, and M200D (AS-I standard, PROFIBUS, PROFINET)	
<b>Operating system</b>	Windows XP Professional (Service Pack 2 or 3) Windows 7 32/64-bit Professional/Ultimate/Enterprise (Service Pack 1)
<b>Processor</b>	≥ Pentium 800 MHz/≥ 1 GHz (Windows 7)
<b>RAM</b>	≥ 512 MB (Windows XP Professional)/≥ 1 GB (Windows 7 32-bit)/ ≥ 2 GB (Windows 7 64-bit)
<b>Monitor resolution</b>	≥ 1024 x 768
<b>Free space on hard disk<sup>1)</sup></b>	≥ 400 Mbyte
<b>CD-ROM/DVD drive</b>	Yes (only when installing from CD)
<b>Interface</b>	Depends on PC cable: serial (COM) or USB
<b>PC cable/parameterization cable/connection cable</b>	Yes
<b>PROFIBUS card/PROFIBUS processor</b>	Optional, for parameterization and diagnostics through PROFIBUS
<b>Ethernet interface/PROFINET card</b>	Optional, for parameterization and diagnostics through PROFINET

<sup>1)</sup> Additional free space recommended, e.g. for swap-out file.

### Benefits

- Fast, error-free configuration and startup of motor starters even without extensive previous knowledge
- Transparent setting of the device functions and their parameters – online and offline
- Effective diagnostics functions on the soft starter and display of the most important measured values
- Trace function (oscilloscope function) for recording measured values and events (included in the Motor Starter ES Standard and Premium software version for M200D PROFIBUS and PROFINET).



**I/O systems**



ET 200 systems for the control cabinet

ET 200S - Software

**Motor Starter ES****Selection and ordering data****Parameterization, start up and diagnostics software****Motor Starter ES 2007**

For ECOFAST motor starters, SIMATIC ET 200S High Feature starters, SIMATIC ET 200pro starters, and M200D (AS-I standard, PROFIBUS, PROFINET)


- Delivered without PC cable

Version	Article No.
<b>Motor Starter ES 2007 Basic</b>	
 <p><b>Floating license for one user</b> Engineering software in limited-function version for diagnostics purposes Software and documentation on CD, 3 languages (German/English/French), communication through system interface</p> <ul style="list-style-type: none"> <li>• License key on USB stick, Class A, including CD</li> <li>• License key download, Class A, without CD</li> </ul>	<p><b>3ZS1310-4CC10-0YA5</b> <b>3ZS1310-4CE10-0YB5</b></p>
3ZS1310-4CC10-0YA5	
<b>Motor Starter ES 2007 Standard</b>	
 <p><b>Floating license for one user</b> Engineering software, software and documentation on CD, 3 languages (German/English/French), communication through system interface</p> <ul style="list-style-type: none"> <li>• License key on USB stick, Class A, including CD</li> <li>• License key download, Class A, without CD</li> </ul>	<p><b>3ZS1310-5CC10-0YA5</b> <b>3ZS1310-5CE10-0YB5</b></p>
3ZS1310-5CC10-0YA5	
<p><b>Upgrade for Motor Starter ES 2006</b></p> <p>Floating license for one user, engineering software, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface</p>	<b>3ZS1310-5CC10-0YE5</b>
<p><b>Powerpack for Motor Starter ES 2007 Basic</b></p> <p>Floating license for one user, engineering software, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface</p>	<b>3ZS1310-5CC10-0YD5</b>
<p><b>Software Update Service</b></p> <p>For 1 year with automatic extension, assuming the current software version is in use, engineering software, software and documentation on CD, communication through the system interface</p>	<b>3ZS1310-5CC10-0YL5</b>

**Notes:**

Please order PC cable separately, [see page 9/251](#).

For description of the software versions, [see page 9/248](#).


Version	Article No.	
<b>Motor Starter ES 2007 Premium</b>		
 <p>3ZS1310-6CC10-0YA5</p>	<b>Floating license for one user</b> Engineering software, software and documentation on CD, 3 languages (German/English/French), communication through system interface or PROFIBUS/PROFINET, STEP7 Object Manager <ul style="list-style-type: none"> <li>• License key on USB stick, Class A, including CD</li> <li>• License key download, Class A, without CD</li> </ul>	<b>3ZS1310-6CC10-0YA5</b> <b>3ZS1310-6CE10-0YB5</b>
	<b>Upgrade for Motor Starter ES 2006</b> Floating license for one user, engineering software, software and documentation on CD, license key on USB stick, Class A, 3 languages (German/English/French), communication through the system interface or PROFIBUS/PROFINET, STEP7 Object Manager	<b>3ZS1310-6CC10-0YE5</b>
	<b>Powerpack for Motor Starter ES 2007 Standard</b> Floating license for one user, engineering software, license key on USB stick, Class A, 3 languages (German/English/French), communication through system interface or PROFIBUS/PROFINET, STEP7 Object Manager	<b>3ZS1310-6CC10-0YD5</b>
	<b>Software Update Service</b> For 1 year with automatic extension, assuming the current software version is in use, engineering software, software and documentation on CD, communication through the system interface or PROFIBUS/PROFINET, STEP7 Object Manager	<b>3ZS1310-6CC10-0YL5</b>

**Notes:**

Please order PC cable separately, [see Accessories](#).

For description of the software versions, [see page 9/248](#).

**Accessories**

Version	Article No.	
<b>Optional accessories</b>		
 <p>3RK1903-0CH20</p>	<b>2DI LC COM control module</b> For ET 200S High Feature starter, Failsafe starter A	<b>3RK1903-0CH20</b>
	<b>LOGO! USB PC cable</b> For ET 200S High Feature starter	<b>6ED1057-1AA01-0BA0</b>
	<b>RS 232 interface cable</b> Serial data connection between ET 200pro MS/FC, M200D and laptop/PC/PG or MS	<b>3RK1922-2BP00</b>
	<b>USB interface cable</b> Serial data connection between ET 200pro MS/FC, M200D and laptop/PC/PG or MS	<b>6SL3555-0PA00-2AA0</b>
	<b>USB/serial adapter</b> For connecting an RS 232 PC cable to the USB interface of a PC, recommended for use in conjunction with ET 200S/ECOFAS/ET 200pro motor starters	<b>3UF7946-0AA00-0</b>

## I/O systems

ET 200 systems for the control cabinet

ET 200S - Add-on products for the ET 200S

### EtherNet/IP interface module

#### Overview

An interface module (EtherNet/IP adapter) is provided for operating the ET 200S on EtherNet/IP. It can be used together with system and IO components of the ET 200S distributed I/O system.

#### Technical specifications

Article number	<b>ZNX:EIP-200S</b> ETHERNET/IP HEAD ASSEMBLY FOR ET200S
<b>Product type designation</b>	
<b>General information</b>	
Vendor identification (VendorID)	0008h
Device identifier (DeviceID)	0239h
<b>Supply voltage</b>	
<b>Mains buffering</b>	
• Mains/voltage failure stored energy time	20 ms
<b>Input current</b>	
from supply voltage 1L+, max.	250 mA
<b>Power losses</b>	
Power loss, typ.	2.5 W; Typical
<b>Address area</b>	
<b>Addressing volume</b>	
• Inputs	256 byte
• Outputs	256 byte
<b>Interfaces</b>	
<b>PROFINET IO</b>	
• Automatic detection of transmission speed	Yes
• Transmission rate, max.	100 Mbit/s
• Services	See manual
• RJ 45	Yes

Article number	<b>ZNX:EIP-200S</b> ETHERNET/IP HEAD ASSEMBLY FOR ET200S
<b>Diagnostics indication LED</b>	
• Monitoring 24 V voltage supply ON (green)	Yes
• Connection to network LINK (green)	Yes
<b>Galvanic isolation</b>	
between backplane bus and electronics	No
between supply voltage and electronics	No
between Ethernet and electronics	Yes
<b>Permissible potential difference</b>	
between different circuits	75V DC/60V AC
<b>Isolation</b>	
Isolation checked with	500 V
<b>Standards, approvals, certificates</b>	
CE mark	Yes
UL approval	Yes
<b>Dimensions</b>	
Width	60 mm
Height	119.5 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	120 g

#### Ordering data

#### Article No.

<b>SIMATIC ET 200S interface module for EtherNet/IP</b>	<b>ZNX:EIP-200S</b>
<b>Including:</b>	
• SD card 2 MB (6ES7954-8LB01-0AA0)	
• Bus termination module for ET 200S (6ES7193-4JA00-0AA0)	
• Connector for 24 V DC supply voltage	
• Companion disk with the manuals and the configuration tool	

**Overview**

An interface module (DeviceNet adapter) is provided for operating the ET 200S on DeviceNet. It can be used together with system and IO components of the ET 200S distributed I/O system.

**Application**

Nearly the entire range of ET 200S modules can be used, which makes it possible to use them across all industrial sectors, for example, the automotive industry, bottling plants, or conveyor systems. They can also be used in hybrid industries such as the cement, pharmaceutical or food and beverages industry.

The interface module enables connection of the ET 200S to DeviceNet and handles the communication between the modules and the higher-level control system (scanner) autonomously.

**Technical specifications**

<b>Article number</b>	<b>ZNX:10000005188 (Basic Version)</b>
<b>Product type designation</b>	<b>DeviceNet Interface Module for ET 200S</b>
Power dissipation, typ.	3.8 W
Address space	
• Outputs	128 bytes
• Inputs	128 bytes
RS 485 interfaces	Yes
Reports	
• PROFINET IO	No
• PROFIBUS DP protocol	No
• Ethernet TCP/IP	No
Isochronous mode (application synchronized up to terminal)	No
Alarms	No
Diagnostics functions	Yes
Connection to the network LINK (green)	Yes
Electrical isolation	
• Between the rear panel bus and electronic components	Yes
• Between electronics block and PROFIBUS DP	Yes
• Between the supply voltage and electronic components	No
Isolation test voltage	500 V
Emission of radio interference acc. to EN 55 011	
• Limit class A, for use in industrial areas	Yes
• Limit class B, for use in residential areas	No
Dimensions	
• Width	45 mm
• Height	109.5 mm
• Depth	75 mm
Weight	300 g

**Ordering data****Article No.****SIMATIC ET 200S interface module for DeviceNet****ZNX:10000005188****Including:**

- Bus termination module for ET 200S (6ES7193-4JA00-0AA0)
- Power module PM-E 24 ... 4 V DC/24 ... 230 V AC (6ES7138-4CB11-0AB0)
- Terminal module TM-P (6ES7193-4CD30-0AA0)
- Connector for the connection to DeviceNet.

## I/O systems

ET 200 systems for the control cabinet

ET 200S - Add-on products from third-party manufacturers

### Add-on products from third-party manufacturers

#### Overview

The following catalog pages contain non-binding information on supplementary products that are manufactured and marketed, not by Siemens, but by third-parties outside the Siemens group ("external companies"). These external companies organize the manufacture, sale and delivery of their products independently. Their own terms and conditions of business and delivery apply.

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**Overview**

The 1-STEP-DRIVE-5A-48V module from Phytron GmbH is a high-precision stepper motor control with integrated power output stage for use in the SIMATIC ET 200S distributed I/O system.

The module can be used together with system and I/O components of the ET 200S distributed I/O system. Operation is possible with the following head assemblies:

- IM PROFIBUS
- IM PROFINET
- ET 200S CPU

Corresponding GSD files and an HSP are available for this.

**Note:**

The 1-STEP-DRIVE-5A-48V module is a Phytron GmbH product and can only be obtained from them.

**Application**

High-precision control of stepper motors:

The technology of the 1-STEP-DRIVE-5A-48V enables highly precise current settings which facilitate fine positioning up to 1/512 step with an absolute error of only  $\sim 0.0015^\circ$ . This corresponds to approx. 102,400 positions per revolution or  $0.0035^\circ/\text{step}$  with a 200-step motor.

The module permits connection of a 2-phase stepping motor in the 200 W power range up to 5 A peak with a power supply of 24 to 48 V DC.

Sample function blocks are available for operation with SIMATIC and can be downloaded by the user from the Internet site specified below and then modified.

The 1-STEP-DRIVE-5A-48V provides the following positioning functions:

- Absolute positioning
- Relative positioning
- Reference point approach
- Endless axes: Speed mode/frequency output
- Selection of feedback value

In the manufacturer's manual, you can find a list of possible terminal modules with which the 1-STEP-DRIVE-5A-48V can be operated.

**Technical specifications**

- Suitable for bipolar control of 2-phase stepping motors of 4-, (6-) or 8-wire design (in 4-wire system)
- 5 A peak phase current with adjustable current steps
- Power supply 24 V to 48 V DC
- Up to 1/512 microstep (physical resolution: approx. 102,400 positions per revolution ( $0.0035^\circ / \text{step}$ )). A counter module with encoder should be evaluated for microstep positioning
- Maximum step frequency: 510,000 steps/s
- 2 digital inputs for limit and reference switches
- Diagnostics LEDs (overcurrent, overtemperature, traversing task or motor running, ...)
- Short-circuit-proof, overload-proof
- Online power output stage parameterization and diagnostics
- Boost: boosted torque during acceleration or braking
- Selectable current controller frequency: 18, 20, 22 or 25 kHz

## I/O systems

ET 200 systems for the control cabinet

ET 200S - Add-on products from third-party manufacturers

### SIMATIC ET 200S 1-STEP-DRIVE-5A-48V

#### More information

You can find further information on the module and associated contact information on the Internet at:

<http://www.phytron.de/1-step-drive>

There you will also find the manual, the data sheet, the HSP, a link to the GSD files as well as sample function blocks for SIMATIC.

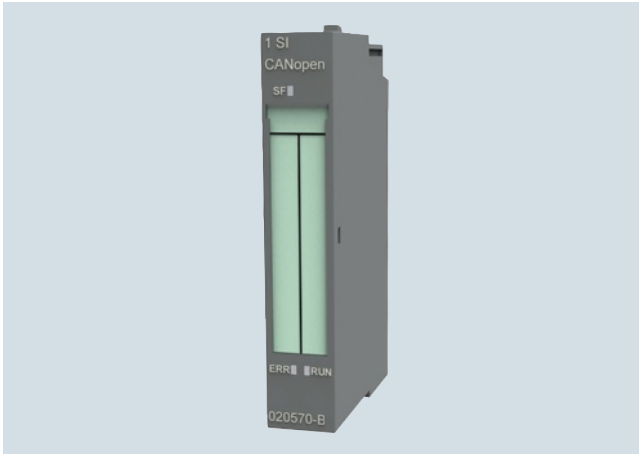
You can find Service and Support at:

<http://www.phytron.de/support>

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**Overview**

A CANopen module (1 SI CANopen) from HMS is available for use in ET 200S. It can be used together with system and I/O components of the ET 200S distributed I/O system. Operation is possible with the following head assemblies:

- IM PROFIBUS
- IM PROFINET
- ET 200S CPU

Corresponding GSD files and an HSP are available for this.

In the manual, you can find a list of possible terminal modules with which the 1 SI CANopen module can be operated.

Please note that the module cannot be operated together with the ET 200S COMPACT or the BASIC header of the ET 200S. Please refer to the manual for the currently approved Article No.'s. of the ET 200S head assemblies.

**Note:**

The 1 SI CANopen module is an HMS product and can only be obtained from them.

**Application**

CANopen is a widely used industrial bus system suitable for a variety of different applications. The module allows simple and cost-effective connection of CANopen applications to SIMATIC.

- Control of hydraulic valves/axes in vehicles
- Control of motors in packaging machines or conveyors
- Capturing of angular encoder positions in wind turbines
- Capturing of control devices on machines, e.g. joysticks
- Capturing the measured data of path encoders, inclinometers or angular encoders, e.g. for tower cranes or gantry cranes

The 1 SI CANopen module has the following properties:

- Operation either as CAN master or CAN slave
- The module complies with the CiA301rev CANopen specification. 4.2 or CiA302 (master).
- It supports the transparent CAN 2.0A standard (11-bit identifier). In this mode, CAN message frames can be sent and received by the CPU program, thus enabling implementation of customized CAN protocols.
- When used as master, up to 126 slaves, e.g. valves or actuators, can be operated on the module.

**More information**

The CANopen bus can be configured via any commercially available CANopen configuration tool. The HMS company provides corresponding "Anybus Configuration Manager CANopen" software together with the product. The configuration is saved directly in the module by means of a point-to-point connection via a USB to CAN adapter. Routing via PROFIBUS/PROFINET is not possible.

Function blocks are available for operation with SIMATIC and can be downloaded by the user from the Internet site specified below.

The module is also available in a SIPLUS version for use in extreme conditions as encountered e.g. on vehicles used outdoors. This version is also only available from HMS.

For further information, please contact HMS directly:

<http://www.hms-networks.com/can-for-et200s>

There you will also find the manual, the HSP, a link to the GSD files as well as the function blocks for SIMATIC.



## I/O systems

ET 200 systems for the control cabinet

ET 200S - Add-on products from third-party manufacturers

### SIMATIC ET 200S 1 SI CANopen

#### More information (continued)

##### **Ordering and Support**

Please note that ordering and support for the module are exclusively carried out via HMS. Please contact HMS directly should you have any questions concerning this module. The relevant contact details can be found on the Internet at:

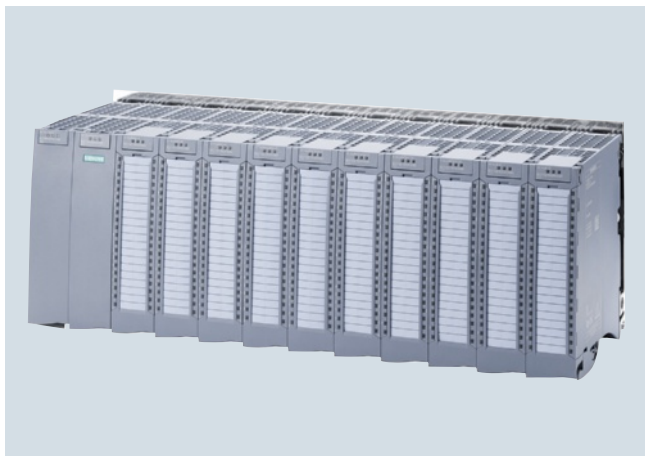
<http://www.hms-networks.com/can-for-et200s>

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## Overview



The SIMATIC ET 200MP is a modular and scalable I/O system with IP20 degree of protection for universal use, and offers the same system advantages as the S7-1500. The SIMATIC ET 200MP permits extremely short bus cycles and very fast response times, even with large quantity structures.

SIMATIC ET 200MP consists of the following components:

- Interface module for connecting S7-1500 I/O modules to PROFINET; up to 30 modules can be connected to one interface module.
- Interface module for connecting S7-1500 I/O modules to PROFIBUS; up to 12 modules can be connected to one interface module.

The SIMATIC ET 200MP distributed I/O system is particularly easy to install, wire, and commission.

### Highlights:

- Modular I/O system with IP20 protection for PROFINET or alternatively for PROFIBUS
- Compact dimensions
- High degree of user-friendliness due to the following design features:
  - Uniform 40-pin front connector simplifies ordering, logistics, and warehousing
  - Uniform pin assignment per module type simplifies wiring and helps avoid errors
  - Integrated potential bridges simplify wiring and allow flexible subsequent modification
  - The cable storage space grows along with the requirements and allows a uniform appearance even with insulated conductors with a large cross-section and/or thick insulation
  - The prewiring position for the front connector allows convenient wiring both when commissioning and making changes during operation

- The DIN rail integrated in the S7-1500 mounting rail allows snapping-on of many standard components such as additional terminals, miniature circuit breakers or small relays
- The 1:1 allocation of channel status and diagnostics LED, terminal and inscription allows fast location and elimination of errors. Assistance is provided by the wiring diagram printed on the inside of the front panels.
- The integrated shielding concept for analog and technology modules allows reliable and rugged operation, in particular with high-speed applications. Installation does not require any tools.
- Particularly space-saving and simple design with slim 25 mm modules; the maximum possible station configuration with power supply (PS), interface module (IM) and 30 I/O modules can be accommodated on an 830-mm wide S7-1500 mounting rail.
- Comprehensive product portfolio comprising digital and analog input or output modules, technology modules, and communication modules for point-to-point communication; further modules, e.g. F modules, will be available soon
- Extensive system functions
  - Integrated system diagnostics when operated with an S7-1500 and the TIA portal
  - Increased communication availability by using Media Redundancy Protocol (MRP) on the PROFINET; in addition, the IM 155-5 PN HF High Feature interface module can be operated on an S7-400H. Configuration is carried out with STEP 7 V5.5 SP3 and a GSDML file. The IM 155-5 PN HF also supports the functions MRPD (Media Redundancy with Planned Duplication) and operation on an S7-400H CPU (system redundancy).
  - Consistent use of identification and maintenance data IM0 to IM3 for fast electronic and unambiguous identification of individual modules (Article No., serial number, etc.).
  - Uniform firmware update for the interface module and all I/O modules for subsequent expansion of functions (investment security)
  - Bus cycle time  $\geq 250 \mu\text{s}$  and coupling to the isochronous task permit implementation of applications with high performance requirements with PROFINET
  - Up to 30 I/O modules (PROFINET) or 12 I/O modules (PROFIBUS) within a station save on interface modules and installation time
  - CompactFlash card not required with PROFINET; automatic address assignment via LLDP or manually via TIA portal or PST tool
  - Shared Device on up to two (IM 155-5 PN ST) or four (IM 155-5 PN HF) IO Controllers
  - Modular Shared Input / Modular Shared Output as system function for all S7-1500 I/O modules

## I/O systems

ET 200 systems for the control cabinet  
ET 200MP – Interface modules

### IM 155-5 PN

#### Overview



- Interface modules for linking the ET 200MP to PROFINET
- These handle data exchange with the PROFINET IO controller in the PLC
- Integrated 2-port switch for line topology
- Max. 30 I/O modules
- Shortest bus cycle 250  $\mu$ s
- Linking to the isochronous task of the CPU
- Prioritized fast startup (FSU) with 500 ms (max. 12 I/O modules)
- Media Redundancy Protocol (MRP)
- Shared device on up to two I/O controllers (when configuring using GSD file; depends on the respective configuration tool)
- Omission of SIMATIC memory card (SMC); IM replacement without PG using LLDP

Starting from FW version V2.0.0, the IM155-5 PN ST interface module supports the following new functions:

- Submodule-granular shared device with up to two I/O controllers
- Configuration control (option handling)
- Module-internal shared input and output (MSI/MSO), i.e. the inputs or outputs of a module can be made available simultaneously to up to two I/O controllers

The IM155-5 PN HF interface module has the following additional functions:

- Shared device on up to 4 IO controllers
- Module-internal shared input and output (MSI/MSO) on up to four IO controllers
- Operation on a highly available SIMATIC S7-400H
- Support for the MRPD function (media redundancy with planned duplication)

### Technical specifications

Article number	<b>6ES7155-5AA00-0AB0</b> IM 155-5 PN ST	<b>6ES7155-5AA00-0AC0</b> IM 155-5 PN HF
<b>Product type designation</b>		
<b>General information</b>		
<b>Product function</b>		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
<b>Engineering with</b>		
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFINET as of GSD version/GSD revision	V2.3 / -	V2.3 / -
<b>Supply voltage</b>		
Type of supply voltage	DC	DC
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
short-circuit protection	Yes	Yes
<b>Mains buffering</b>		
• Mains/voltage failure stored energy time	5 ms	5 ms
<b>Hardware configuration</b>		
Integrated power supply		Yes
<b>Rack</b>		
• Modules per rack, max.	30; I/O modules	30; I/O modules
<b>Interfaces</b>		
Number of PROFINET interfaces	1	1
<b>1st interface</b>		
<b>Interface types</b>		
- Number of ports	2	2
- Integrated switch	Yes	Yes
- RJ 45 (Ethernet)	Yes	Yes
<b>Protocols</b>		
- PROFINET IO Device	Yes	Yes
- Media redundancy	Yes	Yes
<b>Interface types</b>		
<b>RJ 45 (Ethernet)</b>		
• 10 Mbps		No
• 100 Mbps	Yes	Yes
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
<b>Protocols</b>		
<b>PROFINET IO</b>		
• PROFINET IO	Yes	Yes
<b>PROFINET IO Device</b>		
<b>Services</b>		
- Isochronous mode	Yes	Yes
- IRT	Yes	Yes
- MRP	Yes	Yes
- MRPD		Yes
- PROFINET system redundancy		Yes
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO controllers with shared device, max.	2	4
<b>Open IE communication</b>		
• TCP/IP	Yes	Yes
• SNMP	Yes	Yes
• LLDP	Yes	Yes

## I/O systems

ET 200 systems for the control cabinet  
ET 200MP – Interface modules

### IM 155-5 PN

#### Technical specifications (continued)

Article number	6ES7155-5AA00-0AB0 IM 155-5 PN ST	6ES7155-5AA00-0AC0 IM 155-5 PN HF
<b>Isochronous mode</b>		
Isochronous operation (application synchronized up to terminal)	Yes	Yes
equidistance	Yes	Yes
shortest clock pulse	250 µs	250 µs
max. cycle	4 ms	4 ms
<b>Interrupts/diagnostics/ status information</b>		
Status indicator	Yes	Yes
<b>Alarms</b>		
• Alarms	Yes	Yes
<b>Diagnostic messages</b>		
• Diagnostic functions	Yes	Yes
<b>Diagnostics indication LED</b>		
• RUN LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED
• MAINT LED	Yes; yellow LED	Yes; yellow LED
• Connection display LINK TX/RX	Yes; yellow LED	Yes; yellow LED
<b>Isolation</b>		
Isolation checked with	707 V DC (type test)	707 V DC (type test)
<b>Dimensions</b>		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
<b>Weights</b>		
Weight, approx.	310 g	350 g

#### Ordering data

	Article No.	Article No.
<b>IM 155-5 PN interface module</b>		
IP 20 degree of protection, module width 35 mm, installation on S7-1500 mounting rail		
IM 155-5 PN ST, standard version	6ES7155-5AA00-0AB0	
IM 155-5 PN HF, High Feature version with additional functions	6ES7155-5AA00-0AC0	
<b>Accessories</b>		
<b>Front flap for IM 155-5 PN (spare part), 5 units</b>	6ES7528-0AA70-7AA0	
<b>SIMATIC S7-1500 mounting rail</b>		
Fixed lengths, with grounding elements		
• 160 mm	6ES7590-1AB60-0AA0	
• 245 mm	6ES7590-1AC40-0AA0	
• 482 mm	6ES7590-1AE80-0AA0	
• 530 mm	6ES7590-1AF30-0AA0	
• 830 mm	6ES7590-1AJ30-0AA0	
For cutting to length by customer, without drill holes; grounding elements must be ordered separately		
• 2000 mm	6ES7590-1BC00-0AA0	
<b>PE connection element for mounting rail 2000 mm</b>		6ES7590-5AA00-0AA0
20 units		
<b>Power supply</b>		
For supplying the backplane bus of the S7-1500		
24 V DC input voltage, power 25 W		6ES7505-0KA00-0AB0
24/48/60 V DC input voltage, power 60 W		6ES7505-0RA00-0AB0
120/230 V AC input voltage, power 60 W		6ES7507-0RA00-0AB0
<b>Power connector</b>		6ES7590-8AA00-0AA0
With coding element for power supply module; spare part, 10 units		
<b>Load power supply</b>		
24 V DC/3 A		6EP1332-4BA00
24 V DC/8 A		6EP1333-4BA00
<b>Power supply connector</b>		
Spare part; for connecting the 24 V DC supply voltage		
• with push-in terminals		6ES7193-4JB00-0AA0

Ordering data	Article No.	Ordering data	Article No.
<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables		<b>IE FC TP Trailing Cable 2 x 2 (Type C)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 for trailing cable use; PROFINET-compatible; with UL approval; Sold by the meter, max. length 1000 m; minimum order 20 m	<b>6XV1840-3AH10</b>
<b>IE FC RJ45 plug 180</b> 180° cable outlet 1 unit 10 units 50 units	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>	<b>IE FC TP Marine Cable 2 x 2 (Type B)</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug 180/90 marine certified; Sold by the meter, max. length 1000 m; minimum order 20 m	<b>6XV1840-4AH10</b>
<b>IE FC TP Standard Cable GP 2x2</b> 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; Sold by the meter, max. length 1000 m; minimum order 20 m	<b>6XV1840-2AH10</b>	<b>IE FC Stripping Tool</b> Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>

## I/O systems

ET 200 systems for the control cabinet  
ET 200MP – Interface modules

### IM 155-5 DP

#### Overview



- Interface module for linking the ET 200MP to PROFIBUS
- Handles data exchange with the PROFIBUS master in the PLC
- Max. 12 I/O modules
- Automatic detection of baud rate 9.6 kBd ... 12 MBd
- PROFIBUS addresses 1 ... 125; adjustable using DIP switches
- Identification and maintenance data IMO ... IM3

#### Technical specifications

Article number	<b>6ES7155-5BA00-0AB0</b> IM155-5 DP ST
<b>Product type designation</b>	
<b>General information</b>	
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	V13 / V13
• STEP 7 can be configured/integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	V1.0 / V5.1
<b>Supply voltage</b>	
Type of supply voltage	DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
<b>Mains buffering</b>	
• Mains/voltage failure stored energy time	5 ms
<b>Hardware configuration</b>	
<b>Rack</b>	
• Modules per rack, max.	12; I/O modules
<b>Interfaces</b>	
Number of PROFIBUS interfaces	1
<b>Protocols</b>	
- PROFIBUS DP slave	Yes
<b>RS 485</b>	
• Transmission rate, max.	12 Mbit/s
<b>PROFIBUS</b>	
<b>Services</b>	
- SYNC capability	Yes
- FREEZE capability	Yes
- DPV1	Yes

Article number	<b>6ES7155-5BA00-0AB0</b> IM155-5 DP ST
<b>Interrupts/diagnostics/status information</b>	
Status indicator	Yes
<b>Alarms</b>	
• Alarms	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	360 g

Ordering data	Article No.	Ordering data	Article No.
<b>IM 155-5 DP ST interface module</b> IP 20 degree of protection, module width 35 mm, installation on S7-1500 mounting rail	<b>6ES7155-5BA00-0AB0</b>	<b>FC robust cable</b> Bus cable with PUR sheath for use under conditions of extreme mechanical stress or aggressive chemicals, 2-core, shielded, sold by the meter, maximum delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1830-0JH10</b>
<b>Accessories</b>		<b>FC flexible cable</b> PROFIBUS bus cable, flexible, with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	<b>6XV1831-2K</b>
<b>Front flap for IM 155-5 PN (spare part), 5 units</b>	<b>6ES7528-0AA70-7AA0</b>	<b>FC trailing cable</b> PROFIBUS trailing cable, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	<b>6XV1830-3EH10</b>
<b>SIMATIC S7-1500 mounting rail</b> Fixed lengths, with grounding elements <ul style="list-style-type: none"> <li>• 160 mm</li> <li>• 245 mm</li> <li>• 482 mm</li> <li>• 530 mm</li> <li>• 830 mm</li> </ul> For cutting to length by customer, without drill holes; grounding elements must be ordered separately <ul style="list-style-type: none"> <li>• 2000 mm</li> </ul>	<b>6ES7590-1AB60-0AA0</b> <b>6ES7590-1AC40-0AA0</b> <b>6ES7590-1AE80-0AA0</b> <b>6ES7590-1AF30-0AA0</b> <b>6ES7590-1AJ30-0AA0</b>	<b>FC bus cable</b> PROFIBUS Food bus cable with PE sheath for use in the food and beverages industry, 2-core, shielded, sold by the meter, maximum delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1830-0GH10</b>
<b>PE connection element for mounting rail 2000 mm</b> 20 units	<b>6ES7590-5AA00-0AA0</b>	<b>FC underground cable</b> PROFIBUS underground cable, 2-core, shielded, sold by the meter, maximum delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1830-3FH10</b>
<b>Load power supply</b> 24 V DC/3 A 24 V DC/8 A	<b>6EP1332-4BA00</b> <b>6EP1333-4BA00</b>	<b>FC FRNC cable</b> PROFIBUS bus cable, flame-retardant and halogen-free, with copolymer sheath FRNC, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1830-0LH10</b>
<b>Power supply connector</b> Spare part; for connecting the 24 V DC supply voltage <ul style="list-style-type: none"> <li>• with push-in terminals</li> </ul>	<b>6ES7193-4JB00-0AA0</b>	<b>FC trailing cable</b> PROFIBUS trailing cable, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m	<b>6XV1831-2L</b>
<b>PROFIBUS connector</b> <ul style="list-style-type: none"> <li>• Connector for PROFIBUS, up to 12 Mbit/s, 90° cable outlet, insulation displacement system, without PG socket</li> <li>• Connector for PROFIBUS, up to 12 Mbit/s, 90° cable outlet, insulation displacement system, with PG socket</li> </ul>	<b>6ES7972-0BA70-0XA0</b> <b>6ES7972-0BB70-0XA0</b>	<b>IE FC Stripping Tool</b> Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	<b>6GK1901-1GA00</b>
<b>PROFIBUS Stripping Tool</b> Stripping tool for fast stripping of the PROFIBUS	<b>6GK1905-6AA00</b>		
<b>PROFIBUS FastConnect bus cable</b> <ul style="list-style-type: none"> <li>• Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m</li> <li>• 20 m</li> <li>• 50 m</li> <li>• 100 m</li> <li>• 200 m</li> <li>• 500 m</li> <li>• 1000 m</li> </ul>	<b>6XV1830-0EH10</b> <b>6XV1830-0EN20</b> <b>6XV1830-0EN50</b> <b>6XV1830-0ET10</b> <b>6XV1830-0ET20</b> <b>6XV1830-0ET50</b> <b>6XV1830-0EU10</b>		



**I/O systems**

ET 200 systems for the control cabinet  
ET 200MP – Interface modules

**SIPLUS IM 155-5 PN****Overview**

- Interface module for linking the ET 200MP to PROFINET
- Handles data exchange with the PROFINET IO controller in the PLC
- Integrated 2-port switch for line topology
- Max. 30 I/O modules
- Shortest bus cycle 250 µs
- Linking to the isochronous task of the CPU
- Prioritized fast startup (FSU) with 500 ms (max. 12 I/O modules)
- Media Redundancy Protocol (MRP)
- Shared device on up to two I/O controllers (when configuring using GSD file; depends on the respective configuration tool)
- Omission of SIMATIC memory card (SMC); IM replacement without PG using LLDP

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

**Technical specifications**

Article number	<b>6AG1155-5AA00-7AB0</b>
Based on	<b>6ES7155-5AA00-0AB0</b> SIPLUS ET 200MP IM 155-5 PN ST
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• horizontal installation, min.	-40 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data**

**SIPLUS IM 155-5 PN interface module**  
(extended temperature range and medial exposure)  
IP 20 degree of protection, module width 35 mm, installation on S7-1500 rail

**Article No.****6AG1155-5AA00-7AB0****Accessories**

See SIMATIC ET 200MP, interface module IM 155-5 PN, page 9/262

**Overview**

I/O modules constitute the interface of the SIMATIC ET 200MP to the process:

- Digital and analog modules provide exactly the inputs/outputs required for each task.
- Technology modules for SIMATIC S7-1500 and ET 200MP
  - With integrated functions for high-speed counting and position detection
  - With integrated inputs and outputs for tasks at the process level and short response times
- Communication modules for SIMATIC S7-1500 and ET 200MP
  - For data exchange using point-to-point coupling
  - For connecting to PROFIBUS
  - For connecting to Industrial Ethernet
- Connection system for user-friendly, low-overhead wiring of the S7-1500 and ET 200MP modules

For more information see SIMATIC S7-1500 Catalog, chapter 4.

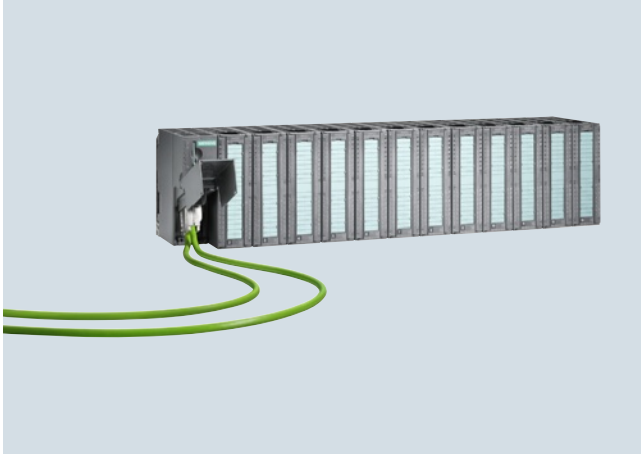
## I/O systems

ET 200 systems for the control cabinet

ET 200M

### Introduction

#### Overview



- Modular I/O system with IP20 degree of protection, particularly suitable for user-specific and complex automation tasks
- Consists of a PROFIBUS DP or PROFINET interface module IM 153, up to 8 or 12 I/O modules of the S7-300 automation system (structure with bus connection or with active bus modules), and a power supply if applicable
- Can be expanded with S7-300 automation system signal, communication and function modules
- Applicable Ex analog input or output modules with HART optimize the ET 200M for use in process engineering
- Can be used in redundant systems (S7-400H, S7-400F/FH)
- Modules can be replaced during operation (hot swapping) with the bus modules active
- Transmission rates up to 12 Mbit/s
- Ex approval to Cat. 3 for Zone 2 acc. to ATEX 100 a
- Failsafe digital inputs/outputs as well as analog inputs for safety-oriented signal processing in accordance with PROFIsafe
- Support of modules with expanded user data, e.g. HART modules with HART minor variables

#### Technical specifications

##### General technical data ET 200M

Cables and connections	Screw and spring-loaded connections in permanent wiring
Degree of protection	IP20
Ambient temperature on vertical wall (preferred mounting position)	
• with horizontal assembly	0 to +60 °C
• with other assembly	0 to +40 °C
Relative humidity	5 to 95% (RH stress level 2 according to IEC 1131-2)
Atmospheric pressure	795 to 1080 hPa
Mechanical stress	
• Vibrations	IEC 68, parts 2 – 6: 10 - 57 Hz (const. amplitude 0.075 mm) 57 - 150 Hz (constant acceleration 1 g)
• Shock	IEC 68, parts 2 – 27 half-sine, 15 g, 11 ms

## Overview



The ET 200M system with various interface modules is available for the distributed use of S7-300 I/O modules. Depending on the application purpose, the best suited IM in terms of costs and functions can be selected:

**IM 153-1 Standard**

The IM 153-1 is a reasonably priced variant that is excellently suited for most applications in the manufacturing environment. It permits the use of up to 8 S7-300 I/O modules.

**IM 153-2 High Feature**

For higher requirements in manufacturing technology, such as the use of F-technology or the highest performance in conjunction with clock synchronization, the IM 153-2 High Feature is available. This IM is also designed for use with the PCS 7 in the field of manufacturing applications. This IM can be redundantly used and supports typical functions as they are required in the control field. These include, for example, clock synchronization or time stamping with an accuracy of up to 1ms.

## Technical specifications

Article number	6ES7153-1AA03-0XB0 ET200M, INTERFACE MODULE IM153-1	6ES7153-2BA02-0XB0 ET200M, INTERFACE IM153-2 HF	6ES7153-2BA82-0XB0 ET200M, INTERFACE IM153-2 HF OUTDOOR
<b>Product type designation</b>			
<b>General information</b>			
Vendor identification (VendorID)	801Dh	801Eh	801Eh
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V
permissible range (ripple included), lower limit (DC)	20.4 V	20.4 V	20.4 V
permissible range (ripple included), upper limit (DC)	28.8 V	28.8 V	28.8 V
External protection for supply cables (recommendation)	not necessary	2,5 A	2,5 A
<b>Mains buffering</b>			
• Mains/voltage failure stored energy time	5 ms	5 ms	5 ms
<b>Input current</b>			
Current consumption, max.	350 mA; at 24 V DC	600 mA	650 mA
Inrush current, typ.	2.5 A	3 A	3 A
I <sub>p</sub> t	0.1 A <sup>2</sup> ·s	0.1 A <sup>2</sup> ·s	0.1 A <sup>2</sup> ·s
<b>Output voltage</b>			
Rated value (DC)	5 V	5 V	5 V
<b>Output current</b>			
for backplane bus (5 V DC), max.	1 A	1.5 A	1.5 A
<b>Power losses</b>			
Power loss, typ.	3 W	5.5 W	5.5 W

**I/O systems**

ET 200 systems for the control cabinet

ET 200M – Interface modules

**IM 153-1/153-2****Technical specifications** (continued)

Article number	<b>6ES7153-1AA03-0XB0</b> ET200M, INTERFACE MODULE IM153-1	<b>6ES7153-2BA02-0XB0</b> ET200M, INTERFACE IM153-2 HF	<b>6ES7153-2BA82-0XB0</b> ET200M, INTERFACE IM153-2 HF OUTDOOR
<b>Address area</b>			
<b>Addressing volume</b>			
• Inputs	128 byte	244 byte	244 byte
• Outputs	128 byte	244 byte	244 byte
<b>Hardware configuration</b>			
Number of modules per DP slave interface, max.	8	12	12
<b>Time stamping</b>			
Accuracy		1 ms; 1ms at up to 8 modules; 10ms at up to 12 modules	1 ms; 1ms at up to 8 modules; 10ms at up to 12 modules
Number of message buffers		15	15
Messages per message buffer		20	20
Number of stampable digital inputs, max.		128; Max. 128 signals/station; max. 32 signals/slot	128; Max. 128 signals/station; max. 32 signals/slot
Time format		RFC 1119	RFC 1119
Time resolution		0.466 ns	0.466 ns
Time interval for transmitting the message buffer if a message is present		1 000 ms	1 000 ms
Time stamp on signal change		rising / falling edge as signal entering or exiting	rising / falling edge as signal entering or exiting
<b>Interfaces</b>			
Interface physics, RS 485	Yes	Yes	Yes
Interface physics, FOC	No	No	No
<b>PROFIBUS DP</b>			
• Node addresses	1 to 125 permitted	1 to 125 permitted	1 to 125 permitted
• Automatic detection of transmission speed	Yes	Yes	Yes
• Output current, max.	90 mA	70 mA	70 mA
• Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
• Transmission procedure	RS 485	RS 485	RS 485
• SYNC capability	Yes	Yes	Yes
• FREEZE capability	Yes	Yes	Yes
• Direct data exchange (slave-to-slave communication)	Yes; Sender	Yes; Sender	Yes; Sender
• Connector type	9-pin sub D socket	9-pin sub D	9-pin sub D
<b>1st interface</b>			
<b>DP slave</b>			
• GSD file	(for DPV1) SIEM801D.GSD; SI01801D.GSG	SI04801.GSG	SI0480E.GSG
• Automatic baud rate search	Yes	Yes	Yes

**Technical specifications** (continued)

Article number	<b>6ES7153-1AA03-0XB0</b> ET200M, INTERFACE MODULE IM153-1	<b>6ES7153-2BA02-0XB0</b> ET200M, INTERFACE IM153-2 HF	<b>6ES7153-2BA82-0XB0</b> ET200M, INTERFACE IM153-2 HF OUTDOOR
<b>Protocols</b>			
Bus protocol/transmission protocol	PROFIBUS DP to EN 50170	PROFIBUS DP to EN 50170	PROFIBUS DP to EN 50170
<b>Isolation</b>			
Isolation checked with	Isolation voltage 500 V	Isolation voltage 500 V	Isolation voltage 500 V
<b>Degree and class of protection</b>			
Degree of protection to EN 60529			
• IP20	Yes	Yes	Yes
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
• Min.	0 °C	0 °C	-25 °C
• max.	60 °C	60 °C	60 °C
<b>Air pressure acc. to IEC 60068-2-13</b>			
• Operating altitude above sea level, max.	3 000 m	3 000 m	3 000 m
<b>Configuration</b>			
<b>Configuration software</b>			
• STEP 7	STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file	Yes; STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file	Yes; STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file
<b>Dimensions</b>			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	117 mm	117 mm	117 mm
<b>Weights</b>			
Weight, approx.	360 g	360 g	360 g

Article number	<b>6ES7195-7HD10-0XA0</b> ET200M, BUS UNIT F. 2 IM 153-2 RED.
<b>Product type designation</b>	
<b>Accessories</b>	
belongs to product	ET 200M
<b>Dimensions</b>	
Width	97 mm
Height	92 mm
Depth	30 mm
<b>Weights</b>	
Weight, approx.	133 g

Article number	<b>6ES7195-7HA00-0XA0</b> ET200M, BUS UNIT F. PS AND IM 153	<b>6ES7195-7HB00-0XA0</b> ET200M, BUS UNIT F. 2 40MM I/O MODULES	<b>6ES7195-7HC00-0XA0</b> ET200M, BUS UNIT F. 1 80MM I/O MODULE
<b>Product type designation</b>			
<b>Accessories</b>			
belongs to product	ET 200M	ET 200M	ET 200M
<b>Dimensions</b>			
Width	97 mm	97 mm	97 mm
Height	92 mm	92 mm	92 mm
Depth	30 mm	30 mm	30 mm
<b>Weights</b>			
Weight, approx.	111 g	140 g	127 g

**I/O systems**

ET 200 systems for the control cabinet

ET 200M – Interface modules

**IM 153-1/153-2****Ordering data****Article No.****IM 153-1 interface module**

Slave interface for connecting an ET 200M to PROFIBUS DP

- Standard temperature range

**6ES7153-1AA03-0XB0****IM 153-2 interface module**

Slave interface for connecting an ET 200M to PROFIBUS DP; also for use in redundant systems

- High Feature
- High Feature with extended temperature range

**6ES7153-2BA02-0XB0**  
**6ES7153-2BA82-0XB0****Active IM 153 /IM 153 bus module**

For two IM 153-2 High Feature modules for designing redundant systems

**6ES7195-7HD10-0XA0****Bus module for ET 200M**

- For accommodating a power supply and an IM 153 module for the hot-swapping function during RUN, incl. bus module cover
- For accommodating two 40-mm wide I/O modules for the hot-swapping function
- For accommodating one 80-mm wide I/O module for the hot-swapping function

**6ES7195-7HA00-0XA0****6ES7195-7HB00-0XA0****6ES7195-7HC00-0XA0****ET 200M redundancy bundle**

Comprising two IM 153-2 High Feature modules and one IM 153/IM 153 bus module

**6ES7153-2AR03-0XA0****Article No.****Accessories****PROFIBUS bus connector**

90° outgoing cable, terminating resistor with disconnecting function, up to 12 Mbit/s, FastConnect

Without PG interface

- 1 unit
- 100 units

**6ES7972-0BA52-0XA0**  
**6ES7972-0BA52-0XB0**

With PG interface

- 1 unit
- 100 units

**6ES7972-0BB52-0XA0**  
**6ES7972-0BB52-0XB0****SIMATIC DP DIN rail for ET 200M**

Accommodates up to 5 bus modules; for hot-swapping function

- Length: 483 mm (19")
- Length: 530 mm
- Length: 620 mm
- Length: 2000 mm

**6ES7195-1GA00-0XA0**  
**6ES7195-1GF30-0XA0**  
**6ES7195-1GG30-0XA0**  
**6ES7195-1GC00-0XA0****SIMATIC S7-300 DIN rail**

- Length: 160 mm
- Length: 480 mm (19")
- Length: 530 mm
- Length: 830 mm
- Length: 2000 mm

**6ES7390-1AB60-0AA0**  
**6ES7390-1AE80-0AA0**  
**6ES7390-1AF30-0AA0**  
**6ES7390-1AJ30-0AA0**  
**6ES7390-1BC00-0AA0****S7 Manual Collection****6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)

**S7 Manual Collection, update service for 1 year****6ES7998-8XC01-8YE2**

Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates

## Overview



- For connecting ET 200M to PROFINET IO (via copper line, RJ45) as an IO device
- 2 versions:
  - IM 153-4 PN STANDARD
  - IM 153-4 PN HIGH FEATURE: supports, in contrast to the STANDARD version, the operation of PROFI-safe F and HART modules. The operation of an S7-400H (system redundancy) is likewise possible.
- Integrated 2-port switch
- 12 modules per station
- Usable I/O capacity: 192 bytes each
- Active bus backplane to hot-swap modules available as an option
- Baud rate 10 Mbit/s / 100 Mbit/s (autonegotiation / full duplex)
- I&M functions according to PNO Guideline Order No. 3.502, Version V1.1

Note:

Micro Memory Card with at least 64 KB required if not all the stations in the network support LLDP (Link Layer Discovery Protocol; proximity detection).

## Technical specifications

Article number	<b>6ES7153-4AA01-0XB0</b> IM153-4 PN IO FOR 12 MODULES S7-300	<b>6ES7153-4BA00-0XB0</b> IM153-4 PN IO HF FOR 12 MODULES S7-300
<b>Product type designation</b>		
<b>General information</b>		
Vendor identification (VendorID)	002AH	002AH
Device identifier (DeviceID)	0302H	0302H
<b>Supply voltage</b>		
Rated value (DC)		
• 24 V DC	Yes	Yes
permissible range, lower limit (DC)	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V
permissible range (ripple included), lower limit (DC)	20.4 V	18.5 V
permissible range (ripple included), upper limit (DC)	28.8 V	30.2 V
External protection for supply cables (recommendation)	In a construction with grounded reference potential, a fuse is necessary for redundant interface modules (Recommendation: 2.5 A)	In a construction with grounded reference potential, a fuse is necessary for redundant interface modules (Recommendation: 2.5 A)



**I/O systems**

ET 200 systems for the control cabinet

ET 200M – Interface modules

**IM 153-4 PN****Technical specifications** (continued)

Article number	<b>6ES7153-4AA01-0XB0</b> IM153-4 PN IO FOR 12 MODULES S7-300	<b>6ES7153-4BA00-0XB0</b> IM153-4 PN IO HF FOR 12 MODULES S7-300
<b>Mains buffering</b>		
• Mains/voltage failure stored energy time	5 ms	5 ms
<b>Input current</b>		
Current consumption, max.	600 mA	600 mA
Inrush current, typ.	4 A	4 A
I <sub>p</sub> t	0.09 A <sup>2</sup> ·s	0.09 A <sup>2</sup> ·s
<b>Output voltage</b>		
Rated value (DC)	5 V	5 V
<b>Output current</b>		
for backplane bus (5 V DC), max.	1.5 A	1.5 A
<b>Power losses</b>		
Power loss, typ.	6 W; Typical	6 W; Typical
<b>Address area</b>		
<b>Addressing volume</b>		
• Inputs	192 byte	672 byte; Extended HART user data
• Outputs	192 byte	192 byte
<b>Hardware configuration</b>		
Number of modules per DP slave interface, max.	12	12
<b>PROFINET IO Controller</b>		
<b>Services</b>		
- PROFINET system redundancy		Yes
<b>Protocols</b>		
Bus protocol/transmission protocol	PROFINET IO	PROFINET IO
<b>Interrupts/diagnostics/status information</b>		
<b>Diagnostics indication LED</b>		
• Connection to network LINK (green)	Yes	Yes
• Transmit/receive RX/TX (yellow)	Yes	Yes
<b>Isolation</b>		
Isolation checked with	500 V DC	Between PROFINET and 24V supply: 1500V AC, between functional grounding and 24V supply: 500V DC
<b>Degree and class of protection</b>		
Degree of protection to EN 60529		
• IP20	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	0 °C	0 °C
• max.	60 °C	60 °C
<b>Air pressure acc. to IEC 60068-2-13</b>		
• Operating altitude above sea level, max.	2 000 m	2 000 m
<b>Dimensions</b>		
Width	40 mm	40 mm
Height	125 mm	125 mm
Depth	118 mm	118 mm
<b>Weights</b>		
Weight, approx.	215 g	215 g

Ordering data	Article No.	Article No.
<b>IM 153-4 PN interface module</b> I/O device for connecting an ET 200M to PROFINET Standard High Feature	<b>6ES7153-4AA01-0XB0</b> <b>6ES7153-4BA00-0XB0</b>	<b>6ES7998-8XC01-8YE0</b>
<b>Accessories</b>		
<b>Bus modules for ET 200M</b> <ul style="list-style-type: none"> <li>For accommodating a power supply and an IM 153 module for the hot-swapping function during RUN, incl. bus module cover</li> <li>For accommodating two 40-mm wide I/O modules for the hot-swapping function</li> <li>For accommodating one 80-mm wide I/O module for the hot-swapping function</li> </ul>	<b>6ES7195-7HA00-0XA0</b> <b>6ES7195-7HB00-0XA0</b> <b>6ES7195-7HC00-0XA0</b>	<b>6ES7998-8XC01-8YE2</b>
<b>SIMATIC Micro Memory Card</b> 64 KB <sup>1)</sup>	<b>6ES7953-8LF30-0AA0</b>	
<b>SIMATIC DP DIN rail for ET 200M</b> Accommodates bus modules; for hot-swapping function <ul style="list-style-type: none"> <li>Length: 483 mm (19")</li> <li>Length: 530 mm</li> <li>Length: 620 mm</li> <li>Length: 2 000 mm</li> </ul>	<b>6ES7195-1GA00-0XA0</b> <b>6ES7195-1GF30-0XA0</b> <b>6ES7195-1GG30-0XA0</b> <b>6ES7195-1GC00-0XA0</b>	
<b>SIMATIC S7-300 DIN rail</b> Length: 160 mm Length: 480 mm (19") Length: 530 mm Length: 830 mm Length: 2000 mm	<b>6ES7390-1AB60-0AA0</b> <b>6ES7390-1AE80-0AA0</b> <b>6ES7390-1AF30-0AA0</b> <b>6ES7390-1AJ30-0AA0</b> <b>6ES7390-1BC00-0AA0</b>	
<b>Power supply connector</b> For connection of the 24 V DC power supply; spare part, 1 pack containing 10 units Spring-loaded connection Screw terminal connection	<b>6ES7193-4JB00-0AA0</b> <b>6ES7193-4JB50-0AA0</b>	
		<b>S7 Manual Collection</b> Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)
		<b>S7 Manual Collection update service for 1 year</b> Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates
		<b>Industrial Ethernet FC RJ45 Plug 180</b> RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet 1 unit 10 units 50 units
		<b>Industrial Ethernet FastConnect installation cables</b> <ul style="list-style-type: none"> <li>FastConnect standard cable</li> <li>FastConnect trailing cable</li> <li>FastConnect marine cable</li> </ul>
		<b>Industrial Ethernet FastConnect Stripping Tool</b>
		<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b> <b>6XV1840-2AH10</b> <b>6XV1840-3AH10</b> <b>6XV1840-4AH10</b> <b>6GK1901-1GA00</b>

<sup>1)</sup> To operate the IM153-4, an MMC is required with at least 64 KB memory. Cards with higher memory capacity may also be used.

## I/O systems

ET 200 systems for the control cabinet

ET 200M – Interface modules

### SIPLUS IM 153-1/153-2

#### Overview



#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

#### Technical specifications

Article number	6AG1153-1AA03-2XB0	6AG1153-2BA02-2XY0	6AG1153-2BA02-7XB0
Based on	6ES7153-1AA03-0XB0 SIPLUS IM153-1	6ES7153-2BA02-0XY0 SIPLUS ET200M IM153-2 EN50155	6ES7153-2BA02-0XB0 SIPLUS_IM153-2
<b>Ambient conditions</b>			
<b>Ambient temperature in operation</b>			
<ul style="list-style-type: none"> <li>Min.</li> <li>max.</li> </ul>	-40 °C; = Tmin 70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	-25 °C; = Tmin 60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	-40 °C; = Tmin 70 °C; = Tmax; 60 °C @ UL/cUL use
<b>Extended ambient conditions</b>			
<ul style="list-style-type: none"> <li>Relative to ambient temperature-atmospheric pressure-installation altitude</li> </ul>	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<ul style="list-style-type: none"> <li>At cold restart, min.</li> </ul>	-25 °C		-25 °C
<b>Relative humidity</b>			
<ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>			
<ul style="list-style-type: none"> <li>against biologically active substances / conformity with EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
<ul style="list-style-type: none"> <li>against chemically active substances / conformity with EN 60721-3-3</li> </ul>	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
<ul style="list-style-type: none"> <li>against mechanically active substances / conformity with EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Technical specifications** (continued)

Article number	<b>6AG1195-7HA00-2XA0</b>	<b>6AG1195-7HB00-7XA0</b>	<b>6AG1195-7HC00-2XA0</b>	<b>6AG1195-7HD10-2XA0</b>
Based on	<b>6ES7195-7HA00-0XA0</b> SIPLUS_ET200M_DP_ BUSMODUL	<b>6ES7195-7HB00-0XA0</b> SIPLUS DP BUSMODUL ET200M 2X40	<b>6ES7195-7HC00-0XA0</b> SIPLUS_ET200M_ BUSMODUL	<b>6ES7195-7HD10-0XA0</b> SIPLUS_ET200M_DP_ BUSMODUL
<b>Ambient conditions</b>				
<b>Ambient temperature in operation</b>				
<ul style="list-style-type: none"> <li>• Min.</li> <li>• max.</li> </ul>				-25 °C; = Tmin 70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>				
<ul style="list-style-type: none"> <li>• Relative to ambient temperature-atmospheric pressure-installation altitude</li> </ul>				Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>				
<ul style="list-style-type: none"> <li>- With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>				100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>				
<ul style="list-style-type: none"> <li>- against biologically active substances / conformity with EN 60721-3-3</li> <li>- against chemically active substances / conformity with EN 60721-3-3</li> <li>- against mechanically active substances / conformity with EN 60721-3-3</li> </ul>				Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!  Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!  Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**I/O systems**

ET 200 systems for the control cabinet

ET 200M – Interface modules

**SIPLUS IM 153-1/153-2**

Ordering data	Article No.	Article No.
<b>SIPLUS ET 200M IM 153-1</b> Slave interface for connecting an ET 200M to PROFIBUS DP for a maximum of 8 S7-300 modules <ul style="list-style-type: none"> <li>Extended temperature range and exposure to media</li> <li>Conforms to EN 50155</li> </ul>	<b>6AG1153-1AA03-2XB0</b>  <b>6AG1153-1AA03-2XB0</b>	<b>Bus module for SIPLUS ET 200M</b> Bus module for accommodating a power supply and an IM 153 module for the hot-swapping function during RUN, incl. bus module cover <ul style="list-style-type: none"> <li>Extended temperature range and exposure to media</li> </ul>
<b>SIPLUS ET 200M IM 153-2 High Feature</b> Slave interface for connecting an ET 200M to PROFIBUS DP for a maximum of 12 S7-300 modules; also for use in redundant systems <ul style="list-style-type: none"> <li>Extended temperature range and exposure to media</li> <li>Conforms to EN 50155</li> </ul>	<b>6AG1153-2BA02-7XB0</b>  <b>6AG1153-2BA02-2XY0</b>	Bus module for accommodating two 40-mm wide I/O modules for the hot-swapping function <ul style="list-style-type: none"> <li>Extended temperature range and exposure to media</li> </ul> Bus module for accommodating one 80 mm wide I/O module for the hot swapping function <ul style="list-style-type: none"> <li>Extended temperature range and exposure to media</li> </ul>
		Bus module for accommodating two IM-153 modules for the hot-swapping function; for setting up redundant systems <ul style="list-style-type: none"> <li>Extended temperature range and exposure to media</li> </ul>
		<b>RS 485 bus connector with 90° cable outlet</b> Max. transfer rate 12 Mbit/s Extended temperature range and exposure to media <ul style="list-style-type: none"> <li>without PG interface</li> <li>with PG interface</li> </ul>
		<b>Further accessories</b> See SIMATIC ET 200M IM 153-1/153-2, page 9/272

## Overview



- For connection of ET 200M as IO Device to PROFINET IO (copper, RJ-45)
- 2 versions:
  - IM 153-4 PN STANDARD
  - IM 153-4 PN HIGH FEATURE: Compared to the STANDARD version, also allows operation of PROFI-safe F and HART modules
- Integrated 2-port switch
- 12 modules per station
- Usable I/O quantity structure: 192 bytes each
- Active backplane bus for hot swapping of modules optionally available
- Baud rate 10 Mbit/s / 100 Mbit/s (Autonegotiation/Full Duplex)
- I&M functions according to PNO Guideline Order No. 3.502, Version V1.1

## Notes:

Micro Memory Card with min. 64 KB required if not all participants in the network support LLDP (Link Layer Discovery Protocol; proximity detection).

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

## Technical specifications

Article number	<b>6AG1153-4AA01-7XB0</b>
Based on	<b>6ES7153-4AA01-0XB0</b> SIPLUS ET200M IM 153-4 PN IO
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

## Ordering data

## Article No.

<b>SIPLUS ET 200M IM 153-4 PN</b>	
Slave interface for connecting an ET 200M to PROFINET for a maximum of 12 S7-300 modules	
• Extended temperature range and exposure to media	<b>6AG1153-4AA01-7XB0</b>
<b>Accessories</b>	
<b>IE FC RJ45 Plug 180</b>	<b>6AG1901-1BB10-7AA0</b>
180° cable outlet; 1 unit	
<b>Additional accessories</b>	See SIMATIC ET 200M interface module IM 153-4 PN, page 9/275

## I/O systems

ET 200 systems for the control cabinet

ET 200M – I/O modules

### Digital modules, analog modules

#### Overview Digital modules



- Digital inputs/outputs
- For flexible adaptation of the controller to the respective task
- For connecting digital sensors and actuators

For further information, see SIMATIC S7-300, chapter 5.

#### Overview Analog modules



- Analog inputs and outputs
- For solving more complex tasks with analog process signals
- For connecting analog actuators and sensors without additional measuring amplifiers

For further information, see SIMATIC S7-300, chapter 5.

### Overview



- Can only be plugged into ET 200M with IM 153-2 and IM 153-2 FO
- 8 AI HART
- Redundancy switching
- Firmware update
- HART minor variables

### Technical specifications

Article number	<b>6ES7331-7TF01-0AB0</b> SM331, 8AI, 0/4-20mA HART
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
<b>Input current</b>	
from load voltage L+ (without load), max.	20 mA
from backplane bus 5 V DC, max.	120 mA
<b>Output voltage</b>	
<b>Power supply to the transmitters</b>	
• present	Yes
• Rated value (DC)	24 V
• short-circuit proof	Yes
<b>Power losses</b>	
Power loss, typ.	1.5 W
<b>Analog inputs</b>	
Number of analog inputs	8
permissible input current for current input (destruction limit), max.	40 mA
<b>Input ranges</b>	
• Current	Yes
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
• Input resistance (0 to 20 mA)	240 Ω
• Input resistance (-20 mA to +20 mA)	240 Ω
• Input resistance (4 mA to 20 mA)	240 Ω
<b>Cable length</b>	
• shielded, max.	800 m

Article number	<b>6ES7331-7TF01-0AB0</b> SM331, 8AI, 0/4-20mA HART
<b>Analog value generation for the inputs</b>	
Measurement principle	Sigma Delta
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Integration time (ms)	20 ms@50 Hz / 16.6 ms@60 Hz / 100 ms@100 Hz
• Basic conversion time, including integration time (ms)	65ms@50Hz / 55ms@60Hz / 305ms@100Hz
• Interference voltage suppression for interference frequency f1 in Hz	60 / 50 / 10 Hz
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes
<b>Errors/accuracies</b>	
Linearity error (relative to input range), (+/-)	0.01 %
Temperature error (relative to input range), (+/-)	0.001 %/K
Crosstalk between the inputs, min.	70 dB
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.1 %
<b>Operational limit in overall temperature range</b>	
• Current, relative to input area, (+/-)	0.15 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to input area, (+/-)	0.1 %
<b>Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency</b>	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB
• Common mode interference, min.	100 dB



**I/O systems**

ET 200 systems for the control cabinet

ET 200M – I/O modules

**Analog input module with HART****Technical specifications (continued)**

Article number	<b>6ES7331-7TF01-0AB0</b> SM331, 8AI, 0/4-20mA HART
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	No
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Limit value alarm	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
<b>Galvanic isolation</b>	
<b>Galvanic isolation analog inputs</b>	
• between the channels	No
• between the channels, in groups of 8	8
• between the channels and the backplane bus	Yes
<b>Isolation</b>	
Isolation checked with	500
<b>Connection method</b>	
required front connector	20-pin
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	117 mm
<b>Weights</b>	
Weight, approx.	205 g

**Ordering data****Article No.****SM 331 HART analog input module**

8 inputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2 interface module

**6ES7331-7TF01-0AB0****Accessories****Front connectors**

- 20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0**  
**6ES7392-1AJ00-1AB0**

- 20-pin, with spring contacts

- 1 unit
- 100 units

**6ES7392-1BJ00-0AA0**  
**6ES7392-1BJ00-1AB0****LK 393 cable guide**

Mandatory for operation in hazardous areas

**6ES7393-4AA00-0AA0****SIMATIC DP DIN rail for ET 200M**

For mounting of up to 5 bus modules for hot-swapping function

- Length: 483 mm (19")
- Length: 530 mm

**6ES7195-1GA00-0XA0**  
**6ES7195-1GF30-0XA0****SIMATIC S7-300 DIN rail**

- Length: 160 mm
- Length: 480 mm (19")
- Length: 530 mm
- Length: 830 mm
- Length: 2000 mm

**6ES7390-1AB60-0AA0**  
**6ES7390-1AE80-0AA0**  
**6ES7390-1AF30-0AA0**  
**6ES7390-1AJ30-0AA0**  
**6ES7390-1BC00-0AA0****Label cover**

(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM

**6ES7392-2XY00-0AA0****Labeling strips**

(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM

**6ES7392-2XX00-0AA0****Labeling sheets for machine printing**

For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units

petrol

**6ES7392-2AX00-0AA0**

light beige

**6ES7392-2BX00-0AA0**

yellow

**6ES7392-2CX00-0AA0**

red

**6ES7392-2DX00-0AA0**

### Overview



- For plugging into ET 200M exclusively with IM 153-2 and IM 153-2 FO
- 8 AO HART
- Redundancy switching
- Firmware update
- HART minor variables

### Technical specifications

Article number	<b>6ES7332-8TF01-0AB0</b> SM332, 8AO, 0/4 - 20MA HART
<b>Product type designation</b>	
<b>Supply voltage</b>	
<b>Load voltage L+</b>	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
<b>Input current</b>	
from load voltage L+ (without load), max.	350 mA
from backplane bus 5 V DC, max.	110 mA
<b>Power losses</b>	
Power loss, typ.	6 W
<b>Analog outputs</b>	
Number of analog outputs	8
Current output, no-load voltage, max.	24 V
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	No
• 4 mA to 20 mA	Yes
<b>Connection of actuators</b>	
• for current output two-wire connection	Yes
<b>Load impedance (in rated range of output)</b>	
• with current outputs, max.	750 Ω
• with current outputs, inductive load, max.	10 mH
<b>Destruction limits against externally applied voltages and currents</b>	
• Voltages at the outputs towards MANA	+60/-0.5 V
<b>Cable length</b>	
• shielded, max.	800 m
<b>Analog value generation for the outputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit
<b>Settling time</b>	
• for resistive load	0.1 ms
• for inductive load	0.5 ms

Article number	<b>6ES7332-8TF01-0AB0</b> SM332, 8AO, 0/4 - 20MA HART
<b>Errors/accuracies</b>	
Output ripple (based on output area, bandwidth 0 to 50 kHz), (+/-)	0.02 %
Linearity error (relative to output range), (+/-)	0.01 %
Temperature error (relative to output range), (+/-)	0.002 %/K
Crosstalk between the outputs, min.	70 dB
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.05 %
<b>Operational limit in overall temperature range</b>	
• Current, relative to output area, (+/-)	0.2 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to output area, (+/-)	0.1 %
<b>Interrupts/diagnostics/status information</b>	
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Diagnostics	Yes
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
<b>Galvanic isolation</b>	
<b>Galvanic isolation analog outputs</b>	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	Yes

**I/O systems**

ET 200 systems for the control cabinet

ET 200M – I/O modules

**Analog output module with HART****Technical specifications (continued)**

Article number	<b>6ES7332-8TF01-0AB0</b> SM332, 8AO, 0/4 - 20MA HART
<b>Isolation</b>	
Isolation checked with	500 V DC
<b>Connection method</b>	
required front connector	20-pin
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	117 mm
<b>Weights</b>	
Weight, approx.	220 g

**Ordering data****Article No.****SM 332 HART analog output module**

HART analog output,  
8 outputs, 0/4 – 20 mA,  
HART for ET 200M with IM 153-2

**6ES7332-8TF01-0AB0****Accessories****Front connector** (1 unit)

20-pin, with screw contacts

**6ES7392-1AJ00-0AA0****LK 393 cable guide**Mandatory for operation  
in hazardous areas**6ES7393-4AA00-0AA0****SIMATIC DP DIN rail for ET 200M**For mounting of up to 5 bus  
modules for hot-swapping function

- Length: 483 mm
- Length: 530 mm

**6ES7195-1GA00-0XA0**  
**6ES7195-1GF30-0XA0****SIMATIC S7-300 DIN rail**

- Length: 160 mm
- Length: 480 mm
- Length: 530 mm
- Length: 830 mm
- Length: 2000 mm

**6ES7390-1AB60-0AA0**  
**6ES7390-1AE80-0AA0**  
**6ES7390-1AF30-0AA0**  
**6ES7390-1AJ30-0AA0**  
**6ES7390-1BC00-0AA0****Label cover**(10 units, spare part) for signal  
modules (not 32-channel modules),  
function modules and CPU 312 IFM**6ES7392-2XY00-0AA0****Labeling strips**(10 units, spare part) for signal  
modules (not 32-channel modules),  
function modules and CPU 312 IFM**6ES7392-2XX00-0AA0****S7 Manual Collection**Electronic manuals on DVD,  
multi-language:  
S7-200, TD 200, S7-300, M7-300,  
C7, S7-400, M7-400, STEP 7,  
Engineering Tools,  
Runtime Software, SIMATIC DP  
(distributed I/O), SIMATIC HMI  
(Human Machine Interface),  
SIMATIC NET  
(Industrial Communication)**6ES7998-8XC01-8YE0****S7 Manual Collection update service for 1 year**Scope of delivery: Current DVD  
"S7 Manual Collection" and the  
three subsequent updates**6ES7998-8XC01-8YE2****Labeling sheets for machine printing**For modules with 20-pin front  
connector, DIN A4, for printing  
with laser printer; 10 units

petrol

**6ES7392-2AX00-0AA0**

light beige

**6ES7392-2BX00-0AA0**

yellow

**6ES7392-2CX00-0AA0**

red

**6ES7392-2DX00-0AA0**

### Overview



- For connecting HART devices in hazardous areas
- Can only be plugged into ET 200M
- 2 AI HART, Ex
- 2 inputs in 2 channel groups (single-channel isolation)
- Measurement type/range can be selected for each channel
- Diagnostics and diagnostic alarm parameterizable

### Technical specifications

Article number	6ES7331-7TB00-0AB0 SIMATIC DP, HART ANALOG INPUT M	6ES7331-7TB10-0AB0 SIMATIC DP, HART ANALOG INPUT M
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes
<b>Input current</b>		
from backplane bus 5 V DC, max.	100 mA	100 mA
from supply voltage L+, max.	180 mA	180 mA
<b>Output voltage</b>		
<b>Power supply to the transmitters</b>		
• present	Yes	Yes
• Rated value (DC)	15 V; at 22 mA	15 V; at 22 mA
• short-circuit proof	Yes; approx. 30 mA	Yes; approx. 30 mA
• No-load voltage (DC)	29.6 V	29.6 V
<b>Power losses</b>		
Power loss, typ.	4.5 W	4.5 W
<b>Analog inputs</b>		
Number of analog inputs	2	2
permissible input current for current input (destruction limit), max.	40 mA	40 mA
<b>Input ranges</b>		
• Current	Yes	Yes
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes	Yes
• Input resistance (0 to 20 mA)	50 Ω	50 Ω
• 4 mA to 20 mA	Yes	Yes
• Input resistance (4 mA to 20 mA)	50 Ω	50 Ω
<b>Cable length</b>		
• shielded, max.	400 m	400 m

## I/O systems

ET 200 systems for the control cabinet

ET 200M – I/O modules

### Ex-analog input module with HART

#### Technical specifications (continued)

Article number	<b>6ES7331-7TB00-0AB0</b> SIMATIC DP, HART ANALOG INPUT M	<b>6ES7331-7TB10-0AB0</b> SIMATIC DP, HART ANALOG INPUT M
<b>Analog value generation for the inputs</b>		
Measurement principle	Sigma Delta	Sigma Delta
<b>Integration and conversion time/resolution per channel</b>		
<ul style="list-style-type: none"> <li>Resolution with overrange (bit including sign), max.</li> <li>Integration time, parameterizable</li> <li>Integration time (ms)</li> <li>Basic conversion time, including integration time (ms)</li> <li>Interference voltage suppression for interference frequency <math>f_1</math> in Hz</li> </ul>	16 bit; 10 to 15 bits + sign Yes 2,5 / 16,67 / 20 / 100 ms 2,5 / 16,67 / 20 / 100 (1 channel enabled); 7,5 / 50 / 60 / 300 (2 channels enabled) 10 / 50 / 60 / 400 Hz	16 bit; 10 to 15 bits + sign Yes 2,5 / 16,67 / 20 / 100 ms 2,5 / 16,67 / 20 / 100 (1 channel enabled); 7,5 / 50 / 60 / 300 (2 channels enabled) 10 / 50 / 60 / 400 Hz
<b>Encoder</b>		
<b>Connection of signal encoders</b>		
<ul style="list-style-type: none"> <li>for current measurement as 2-wire transducer</li> <li>for current measurement as 4-wire transducer</li> </ul>	Yes Yes	Yes Yes
<b>Errors/accuracies</b>		
Linearity error (relative to input range), (+/-)	0.01 %	0.01 %
Temperature error (relative to input range), (+/-)	0.01 %/K	0.01 %/K
Crosstalk between the inputs, min.	130 dB	130 dB
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.05 %	0.05 %
<b>Operational limit in overall temperature range</b>		
<ul style="list-style-type: none"> <li>Current, relative to input area, (+/-)</li> </ul>	0.45 %; From 0/4 to 20 mA	0.45 %; From 0/4 to 20 mA
<b>Basic error limit (operational limit at 25 °C)</b>		
<ul style="list-style-type: none"> <li>Current, relative to input area, (+/-)</li> </ul>	0.1 %; From 0/4 to 20 mA	0.1 %; From 0/4 to 20 mA
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>		
<ul style="list-style-type: none"> <li>Series mode interference (peak value of interference &lt; rated value of input range), min.</li> <li>Common mode interference, min.</li> </ul>	60 dB 130 dB	60 dB 130 dB
<b>Interrupts/diagnostics/status information</b>		
<b>Alarms</b>		
<ul style="list-style-type: none"> <li>Diagnostic alarm</li> <li>Limit value alarm</li> </ul>	Yes; Parameterizable Yes; Parameterizable, channels 0 and 1	Yes; Parameterizable Yes; Parameterizable, channels 0 and 1
<b>Diagnostic messages</b>		
<ul style="list-style-type: none"> <li>Diagnostic functions</li> <li>Diagnostic information readable</li> <li>Overrange</li> <li>Wire break in signal transmitter cable</li> <li>Short circuit of the signal encoder cable</li> <li>HART communication active</li> </ul>	Yes; can be set in parameters, red LED, alarm message Yes Yes; Red LED, signal Yes; Red LED, signal Yes; Red LED, signal Yes; green LED (H)	Yes; Parameterizable Yes; possible Yes; Red LED, signal Yes; Red LED, signal Yes; Red LED, signal Yes; green LED (H)
<b>Diagnostics indication LED</b>		
<ul style="list-style-type: none"> <li>Group error SF (red)</li> <li>Channel error indicator F (red)</li> </ul>	Yes Yes	Yes Yes

#### Technical specifications (continued)

Article number	<b>6ES7331-7TB00-0AB0</b> SIMATIC DP, HART ANALOG INPUT M	<b>6ES7331-7TB10-0AB0</b> SIMATIC DP, HART ANALOG INPUT M
<b>Ex(i) characteristics</b>		
Module for Ex(i) protection	Yes	Yes
<b>Max. values of input circuits (per channel)</b>		
• Co (permissible external capacity), max.	62 nF	62 nF
• Io (short-circuit current), max.	96.1 mA	96.1 mA
• Lo (permissible external inductivity), max.	3 mH	3 mH
• Po (power of load), max.	511 mW	511 mW
• Uo (output no-load voltage), max.	26 V	26 V
• Um (fault voltage), max.	250 V; DC	250 V; DC
• Ta (permissible ambient temperature), max.	0.6 °C	60 °C
<b>Galvanic isolation</b>		
between the channels and backplane bus	Yes	
<b>Galvanic isolation analog inputs</b>		
• Galvanic isolation analog inputs	Yes	
• between the channels		Yes
• between the channels and the backplane bus		Yes
<b>Galvanic isolation analog outputs</b>		
• between the channels	Yes	
• between the channels and the load voltage L+	Yes	
<b>Permissible potential difference</b>		
between the inputs (UCM)	60V DC/30V AC	60 V DC/30 V AC permitted potential difference (Viso) of signals from hazardous areas
<b>Isolation tested with</b>		
• Channels against backplane bus and load voltage L+	1500 V AC	2500 V DC
• Channels among one another	1500 V AC	2500 V DC
• Load voltage L+ against backplane bus	500 V DC	500 V DC
<b>Standards, approvals, certificates</b>		
CE mark		Yes
UL approval		Yes
FM approval	Available soon	Yes
RCM (formerly C-TICK)		Yes
KC approval		Yes
EAC (formerly Gost-R)		Yes
<b>Use in hazardous areas</b>		
• Type of protection acc. to EN 50020 (GENELEC)	[EEx ib] IIC	
• Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4; Class I, Zone 2, Group IIC T4	Class I, Division 2, Group A, B, C, D T4; Class I, Zone 2, Group IIC T4
• Test number KEMA	KEMA 97 ATEX 3039X	DEKRA 14 ATEX 0052X
• Type of protection acc. to KEMA	II 3 (2) G Eex nA [ib] IIC T4	II 3 G (2) GD Ex nA [ib Gb] [ib IIIC Db] IIC T4 Gc
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.		0 °C
• max.	60 °C	60 °C
<b>Connection method</b>		
required front connector		1x 20-pin
<b>Dimensions</b>		
Width	40 mm	40 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
<b>Weights</b>		
Weight, approx.	260 g	260 g

**I/O systems**

ET 200 systems for the control cabinet

ET 200M – I/O modules

**Ex-analog input module with HART**

Ordering data	Article No.	Ordering data	Article No.
<b>SM 331 HART analog input module</b> 2 inputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2 interface module For HART protocol up to V5.0 For HART protocol V5.0 and higher	<b>6ES7331-7TB00-0AB0</b> <b>6ES7331-7TB10-0AB0</b>	<b>Label cover</b> (10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	<b>6ES7392-2XY00-0AA0</b>
<b>Accessories</b>		<b>Labeling strips</b> (10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	<b>6ES7392-2XX00-0AA0</b>
<b>Front connector<sup>1)</sup></b> 20-pin, with screw contacts <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 100 units</li> </ul>	<b>6ES7392-1AJ00-0AA0</b> <b>6ES7392-1AJ00-1AB0</b>	<b>Labeling sheets for machine printing</b> For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
<b>LK 393 cable guide</b> Mandatory for operation in hazardous areas	<b>6ES7393-4AA00-0AA0</b>	petrol light beige yellow red	<b>6ES7392-2AX00-0AA0</b> <b>6ES7392-2BX00-0AA0</b> <b>6ES7392-2CX00-0AA0</b> <b>6ES7392-2DX00-0AA0</b>
<b>SIMATIC DP DIN rail for ET 200M</b> For mounting of up to 5 bus modules for <ul style="list-style-type: none"> <li>• Length: 483 mm</li> <li>• Length: 530 mm</li> </ul>	<b>6ES7195-1GA00-0XA0</b> <b>6ES7195-1GF30-0XA0</b>		
<b>SIMATIC S7-300 DIN rail</b> <ul style="list-style-type: none"> <li>• Length: 160 mm</li> <li>• Length: 480 mm (19")</li> <li>• Length: 530 mm</li> <li>• Length: 830 mm</li> <li>• Length: 2000 mm</li> </ul>	<b>6ES7390-1AB60-0AA0</b> <b>6ES7390-1AE80-0AA0</b> <b>6ES7390-1AF30-0AA0</b> <b>6ES7390-1AJ30-0AA0</b> <b>6ES7390-1BC00-0AA0</b>		

<sup>1)</sup> A connector with spring-loaded terminals cannot be used if the cable guide is used.

### Overview



- For using HART devices in hazardous areas
- Can only be plugged into ET 200M
- 2 AO HART, Ex
- 2 current outputs in 2 channel groups (single-channel isolation)
- Output type and range can be selected for each channel
- Diagnostics and diagnostic alarm parameterizable
- Read-back capability of the analog outputs

### Technical specifications

Article number	6ES7332-5TB00-0AB0	6ES7332-5TB10-0AB0
	SM332, 2AA, 0/4 - 20MA HART	SM332, 2AA, 0/4 - 20MA HART
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes
<b>Input current</b>		
from load voltage L+ (without load), max.		150 mA
from backplane bus 5 V DC, max.	100 mA	100 mA
from supply voltage L+, max.	150 mA	
<b>Power losses</b>		
Power loss, typ.	3.5 W	3.5 W
<b>Analog outputs</b>		
Number of analog outputs	2	2
Voltage output, short-circuit protection	Yes	
Current output, no-load voltage, max.	19 V	19 V
Cycle time (all channels) max.	5 ms	5 ms
<b>Output ranges, current</b>		
• 0 to 20 mA	Yes	Yes
• -20 mA to +20 mA		No
• 4 mA to 20 mA	Yes	Yes
<b>Connection of actuators</b>		
• for current output two-wire connection	Yes	Yes
<b>Load impedance (in rated range of output)</b>		
• with current outputs, max.	650 Ω	650 Ω
• with current outputs, inductive load, max.	7.5 mH	7.5 mH
<b>Destruction limits against externally applied voltages and currents</b>		
• Voltages at the outputs towards MANA	max. 17 V / -0.5 V	max. 17 V / -0.5 V
• Current, max.	60 mA / -1 A	60 mA / -1 A
<b>Cable length</b>		
• shielded, max.	400 m	400 m



**I/O systems**

ET 200 systems for the control cabinet

ET 200M – I/O modules

**Ex-analog output module with HART****Technical specifications (continued)**

Article number	<b>6ES7332-5TB00-0AB0</b> SM332, 2AA, 0/4 - 20MA HART	<b>6ES7332-5TB10-0AB0</b> SM332, 2AA, 0/4 - 20MA HART
<b>Analog value generation for the outputs</b>		
<b>Integration and conversion time/ resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	12 bit; Output value; 8 bit (+ sign) read back value	12 bit; + sign
• Conversion time (per channel)	40 ms	40 ms
<b>Settling time</b>		
• for resistive load	2.5 ms	2.5 ms
• for capacitive load	4 ms	4 ms
• for inductive load	2.5 ms	2.5 ms
<b>Errors/accuracies</b>		
Output ripple (based on output area, bandwidth 0 to 50 kHz), (+/-)	0.02 %	0.02 %
Linearity error (relative to output range), (+/-)	0.03 %	0.03 %
Temperature error (relative to output range), (+/-)	0.01 %/K	0.01 %/K
Crosstalk between the outputs, min.	130 dB	130 dB
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.005 %	0.005 %
<b>Operational limit in overall temperature range</b>		
• Current, relative to output area, (+/-)	0.55 %	0.55 %
<b>Basic error limit (operational limit at 25 °C)</b>		
• Current, relative to output area, (+/-)	0.15 %	0.15 %
<b>Interrupts/diagnostics/ status information</b>		
Substitute values connectable	Yes; Parameterizable	Yes; Parameterizable
<b>Alarms</b>		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnostic messages</b>		
• Diagnostic functions	Yes; Parameterizable	Yes; Parameterizable
• Diagnostic information readable	Yes	Yes; possible
• Diagnostics	Yes	Yes
• Overrange	Yes	Yes
• Wire break	Yes; as of output value > 0.5 mA	Yes; as of output value > 0.5 mA
• Wire break in actuator cable	Yes	
• HART communication active	Yes; green LED (H)	Yes; green LED (H)
<b>Diagnostics indication LED</b>		
• Group error SF (red)	Yes; Additional group message per channel	Yes; Red LED
• Channel error indicator F (red)	Yes; per channel	Yes; per channel

#### Technical specifications (continued)

Article number	<b>6ES7332-5TB00-0AB0</b> SM332, 2AA, 0/4 - 20MA HART	<b>6ES7332-5TB10-0AB0</b> SM332, 2AA, 0/4 - 20MA HART
<b>Ex(i) characteristics</b>		
Module for Ex(i) protection	Yes	Yes
<b>Max. values of output circuits (per channel)</b>		
• Co (permissible external capacity), max.	230 nF	230 nF
• Io (short-circuit current), max.	66 mA	66 mA
• Lo (permissible external inductivity), max.	7.5 mH	7.5 mH
• Po (power of load), max.	506 mW	506 mW
• Uo (output no-load voltage), max.	19 V	19 V
• Um (fault voltage), max.	60 V; DC	60 V; DC
• Ta (permissible ambient temperature), max.	60 °C	60 °C
<b>Galvanic isolation</b>		
between the channels and backplane bus	Yes	
<b>Galvanic isolation analog outputs</b>		
• Galvanic isolation analog outputs	Yes	
• between the channels	Yes	Yes
• between the channels and the backplane bus		Yes
• between the channels and the load voltage L+	Yes	Yes
<b>Permissible potential difference</b>		
between the outputs (UCM)	60V DC/30V AC	60 V DC/30 V AC permitted potential difference (Viso) of signals from hazardous areas
between M internally and the outputs	60V DC/30V AC	
<b>Isolation tested with</b>		
• Channels against backplane bus and load voltage L+	1500 V AC	2500 V DC
• Channels among one another	1500 V AC	2500 V DC
• Load voltage L+ against backplane bus	500 V DC	500 V DC
<b>Standards, approvals, certificates</b>		
FM approval	Available soon	Yes
<b>Use in hazardous areas</b>		
• Type of protection acc. to EN 50020 (CENELEC)	[EEx ib] IIC	
• Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4; Class I, Zone 2, Group IIC T4	Class I, Division 2, Group A, B, C, D T4; Class I, Zone 2, Group IIC T4
• Test number KEMA	97 ATEX 2359 X	DEKRA 14 ATEX 0053X
• Type of protection acc. to KEMA	II 3 (2) G Eex nA [ib] IIC T4	II 3 G (2) GD Ex nA [ib Gb] [ib IIC Db] IIC T4 Gc
<b>Connection method</b>		
required front connector		20-pin
<b>Dimensions</b>		
Width	40 mm	40 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
<b>Weights</b>		
Weight, approx.	280 g	290 g

**I/O systems**

ET 200 systems for the control cabinet

ET 200M – I/O modules

**Ex-analog output module with HART****Ordering data****Article No.****SM 332 HART analog output module**

HART analog output, 8 outputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2

For HART protocol up to V5.0

**6ES7332-5TB00-0AB0**

For HART protocol V5.0 and higher

**6ES7332-5TB10-0AB0****Accessories****Front connectors**

20-pin, with screw contacts

- 1 unit
- 100 units

**6ES7392-1AJ00-0AA0****6ES7392-1AJ00-1AB0****LK 393 cable guide**

Mandatory for operation in hazardous areas

**6ES7393-4AA00-0AA0****SIMATIC DP DIN rail for ET 200M**

For mounting of up to 5 bus modules for hot-swapping function

- Length: 483 mm (19")
- Length: 530 mm

**6ES7195-1GA00-0XA0****6ES7195-1GF30-0XA0****SIMATIC S7-300 DIN rail**

- Length: 160 mm
- Length: 480 mm (19")
- Length: 530 mm
- Length: 830 mm
- Length: 2000 mm

**6ES7390-1AB60-0AA0****6ES7390-1AE80-0AA0****6ES7390-1AF30-0AA0****6ES7390-1AJ30-0AA0****6ES7390-1BC00-0AA0****Label cover**

(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM

**6ES7392-2XY00-0AA0****Article No.****Labeling strips**

(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM

Software for machine labeling of modules directly from the STEP 7 project

**6ES7392-2XX00-0AA0****Labeling sheets for machine printing**

For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units

petrol

**6ES7392-2AX00-0AA0**

light beige

**6ES7392-2BX00-0AA0**

yellow

**6ES7392-2CX00-0AA0**

red

**6ES7392-2DX00-0AA0****S7 Manual Collection**

Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)

**6ES7998-8XC01-8YE0****S7 Manual Collection update service for 1 year**

Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates

**6ES7998-8XC01-8YE2**

### Overview



- Can only be plugged into ET 200M with IM 153-2 and IM 153-2 FO
- 8 AI HART
- Redundant connection
- Firmware update
- HART secondary variables

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

### Technical specifications

Article number	<b>6AG1331-7TF01-7AB0</b>
Based on	<b>6ES7331-7TF01-0AB0</b> SIPLUS SM331 AI 8 X 0/4...20MA HART
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL use
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

### Ordering data

**SIPLUS SM 331 analog input module with HART**  
8 inputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2 interface module

Extended temperature range and exposure to media

#### Accessories

### Article No.

**6AG1331-7TF01-7AB0**

See SIMATIC ET 200M analog module with HART, page 9/282

## I/O systems

ET 200 systems for the control cabinet

ET 200M – I/O modules

### SIPLUS analog output module with HART

#### Overview



- Pluggable exclusively in ET 200M with IM 153-2 and IM 153-2 FO
- 8 AO HART
- Redundant connection
- Firmware update
- HART secondary variables

#### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

#### Technical specifications

Article number	<b>6AG1332-8TF01-2AB0</b>
Based on	<b>6ES7332-8TF01-0AB0</b> SIPLUS SM332 8AO HART
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

#### Ordering data

##### SIPLUS SM 332 analog output module with HART

8 outputs, 0/4...20 mA HART, for ET 200M with IM 153-2 interface module

Extended temperature range and exposure to media

##### Accessories

#### Article No.

**6AG1332-8TF01-2AB0**

See SIMATIC SM 332 analog output module with HART, page 9/284

## Overview



- For connecting HART devices in hazardous areas
- Can only be plugged into ET 200M
- 2 AI HART, Ex
- 2 inputs in 2 channel groups (single-channel isolation)
- Measurement type/range can be selected for each channel
- Programmable diagnostics and diagnostic interrupt

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

## Technical specifications

Article number	<b>6AG1331-7TB00-7AB0</b>
Based on	<b>6ES7331-7TB00-0AB0</b> SIPLUS S7-300 SM331 2AE HART
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

## Ordering data

## Article No.

**SIPLUS SM 331 Ex analog input module with HART**

2 inputs, 0/4 ... 20 mA, HART for ET 200M with IM 153-2 interface module

Extended temperature range and exposure to media

**Accessories**

**6AG1331-7TB00-7AB0**

See SIMATIC ET 200M Ex analog input module with HART, page 9/288

**I/O systems**

ET 200 systems for the control cabinet

ET 200M – I/O modules

**Function modules****Overview**

Function modules relieve the CPU of work-intensive tasks such as counting, positioning and controlling

Module spectrum

- Counter modules
- Positioning modules for rapid traverse and creep speed drives
- Positioning modules for stepper motors
- Positioning modules for servo motors
- Positioning and continuous path modules
- SSI position detection modules
- Electronic cam controllers
- High-speed Boolean processor
- Control modules

<b>Function modules</b>	
Counting	FM 350-1 counter module
	FM 350-2 counter module
Positioning	• of rapid traverse and creep speed drives
	• of stepper motors
	• of servo motors
Position and path control	FM 351 positioning module
SSI position detection	FM 353 positioning module
	FM 354 positioning module
Electronic cam control	FM 357-2 path and position control module <sup>1)</sup>
High speed logic operation	SM 338 POS input modules
Controlling	FM 352 electronic cam controller
	FM 355-5 high speed Boolean processor
Weighing and proportioning electronics	FM 355 controller module
	FM 355-2 temperature controller module
	SIWAREX

<sup>1)</sup> Not for ET 200M

**Overview** (continued)**Applicability with ET 200M distributed I/O device**

Almost all function modules can be used in the ET 200M distributed I/O device. In doing so, the following details must be observed:

Module	Article No.	For plugging in behind IM 153-1 (6ES7153-1AA03-0XB0)		For plugging in behind IM 153-2 (6ES7153-2BA02-0XB0)		For plugging in behind IM 153-2 FO (6ES7153-2BB00-0XB0)		For plugging in behind IM 153-4 PN (6ES7153-4AA00-0XB0)
		STEP 7 <sup>1)</sup>	GSD <sup>2)</sup>	STEP 7 <sup>1)</sup>	GSD <sup>2)</sup>	STEP 7 <sup>1)</sup>	GSD <sup>2)</sup>	STEP 7 <sup>1)</sup>
		<b>configurable with</b>						
FM 350-1 counter module	6ES7350-1AH03-0AE0	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 350-2 counter module	6ES7350-2AH01-0AE0	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 351 positioning module	6ES7351-1AH01-0AE0	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 352 cam controller	6ES7352-1AH02-0AE0	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 352-5 high speed Boolean processor	6ES7352-5AH00-0AE0	<input checked="" type="checkbox"/> <sup>3)</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <sup>3)</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <sup>3)</sup>	<input type="checkbox"/>	<input type="checkbox"/>
FM 352-5 high speed Boolean processor	6ES7352-5AH10-0AE0	<input checked="" type="checkbox"/> <sup>3)</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <sup>3)</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <sup>3)</sup>	<input type="checkbox"/>	<input type="checkbox"/>
FM 353 positioning module	6ES7353-1AH01-0AE0	--	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	--
FM 354 positioning module	6ES7354-1AH01-0AE0	--	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	--
FM 355 C controller module	6ES7355-0VH10-0AE0	--	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 355 S controller module	6ES7355-1VH10-0AE0	--	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 355-2 C temperature controller module	6ES7355-2CH00-0AE0	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
FM 355-2 S temperature controller module	6ES7355-2SH00-0AE0	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>	--	<input type="checkbox"/>
SM 338 POS input module	6ES7338-4BC01-0AB0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

: configurable

--: not configurable

<sup>1)</sup> Configuration using the meta-knowledge integrated into STEP 7 (in hardware catalog under PROFIBUS DP > ET200M > IM 153-1 / IM 153-2 or PROFINET IO > I/O > ET 200M > IM153-4 PN).

<sup>2)</sup> Configuration using GSD file (after installation of the GSD file configurable from the Hardware Catalog under PROFIBUS DP > Additional field devices > I/O > ET200M). During configuration on the CP 342-5 as DP master, S5 (IM 308C) as DP master or external masters, the GSD file must be configured.

<sup>3)</sup> Visible and configurable only with the corresponding configuration package in STEP 7.

**Note:**

Position measurement systems and prefabricated connecting cables for counter and positioning function are offered under SIMODRIVE Sensor and Motion Connect 500.

<http://www.siemens.com/simatic-technology>

For further information, see SIMATIC S7-300, chapter 5.



## I/O systems

ET 200 systems for the control cabinet  
ET 200M – I/O modules

### Special modules, Communication

#### Overview Special modules



The special modules provide the user with functions for diagnostics, as well as commissioning.

For further information, see SIMATIC S7-300, chapter 5.

#### Overview Communication



- Communication boards for data exchange using point-to-point coupling
- Communication board for the connection of identification systems

For further information, see SIMATIC S7-300, chapter 5.

## Overview



The ASM 475 is a powerful module for connecting the MOBY D, U, SIMATIC RF200, RF300, RF600 and SIMATIC MV400 identification systems to the S7-300 and ET 200M.

## Technical specifications

Article No.	6GT2002-0GA10
<b>Product-type designation</b>	<b>ASM 475 communication module</b>
<b>Suitability for installation</b>	SIMATIC S7-300, ET200M in conjunction with RF200/300/600, MOBY D/E//U, MV
Transmission rate at point-to-point connection serial maximum	115.2 kbit/s
<b>Interfaces</b>	
Design of interface for point-to-point connection	RS422
Number of readers connectable	2
Design of electrical connection	
• of the backplane bus	S7-300 backplane bus
• of the PROFIBUS interface	(according to the head module)
• the Industrial Ethernet Interface	(according to the head module)
• for supply voltage	Screw-type or spring-loaded terminals
Version of the interface to the reader for communication	Screw-type or spring-loaded terminals
<b>Mechanical data</b>	
Material	Noryl
Color	Anthracite
<b>Supply voltage, current consumption, power loss</b>	
Supply voltage for DC	
• rated value	24 V
• minimum	20 V
• maximum	30 V
Current consumed at 24 V DC	
• without connected devices typical	0.1 A
• including connected devices maximum	1 A
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operating	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Protection class IP	IP 20
Resistance against shock	According to IEC 61131-2
Resistance against shock	150 m/s <sup>2</sup>
Resistance against vibration	10 m/s <sup>2</sup>

Article No.	6GT2002-0GA10
<b>Product-type designation</b>	<b>ASM 475 communication module</b>
<b>Design, dimensions and weight</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.2 kg
Mounting type	S7-300 rack
Cable length for RS 422 interface maximum	1000 m
<b>Product properties, functions, components general</b>	
Type of display	4 LEDs per reader connection, 2 LEDs for device status
Product function transponder file handler can be addressed	Yes
Protocol is supported S7 communication	Yes
<b>Product functions management, configuration</b>	
Type of parameterization	Object manager, GSD
Type of programming	FB 45, FB 55, FC 56 (FC 45/55 with limited functionality)
Type of computer-mediated communication	acyclic communication
<b>Standards, specifications, approvals</b>	
Verification of suitability	CE, FCC, UL/CSA
<b>Accessories</b>	
Accessories	Front connector with screw-type or spring-loaded terminals

**I/O systems**

ET 200 systems for the control cabinet  
 ET 200M – I/O modules – Communication

**ASM 475****Ordering data****ASM 475 communication module**

For SIMATIC S7-300 and ET 200M,  
 parameterizable

**Article No.****6GT2002-0GA10****Article No.****Accessories****Front connector  
(1 x per ASM 475)**

- with screw terminals
- with spring-loaded terminals

**6ES7392-1AJ00-0AA0****6ES7392-1BJ00-0AA0****MOBY U connecting cable**

Pre-assembled,  
 between the ASM 475 and reader,  
 angled connector, PUR material,  
 in the following lengths:

2 m

**6GT2091-4EH20**

5 m

**6GT2091-4EH50**

10 m

**6GT2091-4EN10**

20 m

**6GT2091-4EN20**

50 m

**6GT2091-4EN50****MOBY D connecting cable**

Pre-assembled, between ASM 475  
 and reader D1xS,  
 9-pin sub D plug, PUR material,  
 CMG approval, suitable for cable  
 carriers, in the following lengths:

5 m

**6GT2491-4EH50**

20 m

**6GT2491-4EN20**

50 m

**6GT2491-4EN50****SIMATIC RF200 / RF300 / RF600 /  
MV400 connecting cable**

Pre-assembled,  
 between the ASM 475 and RF200 /  
 RF300 / RF600 / MV400, IP65,  
 straight connector, PUR material,  
 suitable for cable carriers, CMG  
 approval, in the following lengths<sup>1)</sup>:

2 m

**6GT2891-4EH20**

5 m

**6GT2891-4EH50****Extension cable**

SIMATIC RF200 / RF300 / RF600 /  
 MV400, PUR material,  
 CMG approval, suitable for cable  
 carriers, straight connector

2 m

**6GT2891-4FH20**

5 m

**6GT2891-4FH50**

10 m

**6GT2891-4FN10**

20 m

**6GT2891-4FN20**

50 m

**6GT2891-4FN50****DVD "RFID Systems Software &  
Documentation"****6GT2080-2AA20**

<sup>1)</sup> The connecting cables can be extended using RF300 connecting cables of type 6GT2891-4Fxxx. These connecting cables are available in the lengths 2 m, 5 m, 10 m, 20 m and 50 m.

**Overview**



- Load current supplies for S7-300/ET 200M
- For converting the line voltage to the required operating voltage (24V DC)
- Output current 2 A, 5 A or 10 A

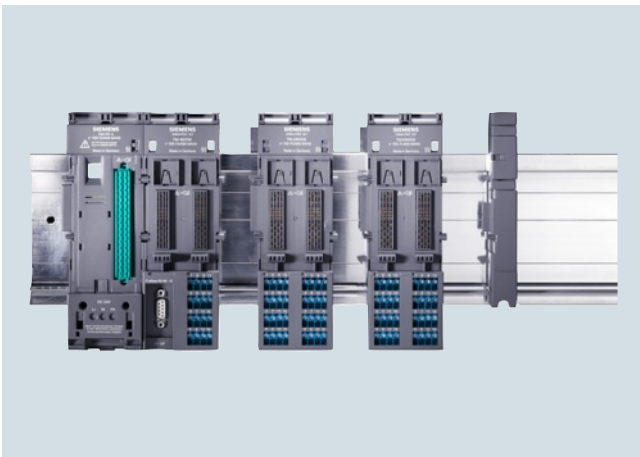
[For further information, see SIMATIC S7-300, chapter 5.](#)

## I/O systems

ET 200 systems for the control cabinet  
ET 200iSP

### Introduction

### Overview



- Failsafe distributed I/O system to IP30 degree of protection for use in hazardous gaseous and dusty areas, i.e. in Zones 1 and 2 as well as 21 and 22
- Sensors and actuators can also be situated directly in Zone 0 or 20
- Individual configuration and flexible expansion with the modular design for optimization to the respective automation task
- Independent wiring enables prewiring without the electronics connected
- Optimized for integration into process control systems (e.g. SIMATIC PCS 7)
- Parameters can be assigned using SIMATIC PDM
- Optimal integration of HART field devices (HART transparency)
- Failsafe digital inputs and outputs as well as analog inputs for the safety-related signal processing according to PROFIsafe
- Connection to PROFIBUS DP via isolating transformers
- Module replacement (hot swapping) and configuration expansion (Configuration in Run) possible during operation
- Extensive diagnostics possibilities
- Condensation-proof modules in temperature range -20 °C to +70 °C
- EMC in accordance with NE 21 (on NAMUR recommendation)
- Full redundancy of PROFIBUS and power supply

### Technical specifications

General	
Degree of protection	IP30
Ambient temperature	-20°C ... +70°C
Medial load	In accordance with ISA-S71.04 severity level G1 ;G2 ;G3 (with the exception of NH3 here only Level G2)
EMC	Electromagnetic compatibility in accordance with NE21
Vibration-proof	0.5 g continuously, 1 g periodically
Approvals, standards	
• ATEX	II 2 G (1) GD I M2 Ex de [ia/ib] IIC T4
• IECEx	Zone 1 Ex de [ia/ib] IIC T4
• INMETRO	Zone 1 BR-Ex de [ia/ib] IIC T4
• cFMus	Class I,II,II NI Division 2, Groups A, B, C, D, E, F, G T4 AIS Division 1, Groups A, B, C, D, E, F, G

General		
• cULus	Class I	Zone 1, AEx de [ia/ib] IIC T4
	Class I,II,II	Division 2, Groups A, B, C, D, E, F, G T4 providing int. safe circuits for Division 1, Groups A, B, C, D, E, F, G
• PROFIBUS • IEC • CE  • Shipbuilding approval	Class I	Zone 1, AEx de [ia/ib] IIC T4
		EN 50170, Volume 2 IEC 61131, Part 2 In accordance with 94/9/EG (ATEX 100a), 89/336/EEC and 73/23/EEC Classification companies • ABS (American Bureau of Shipping) • BV (Bureau Veritas) • DNV (Det Norske Veritas) • GL (Germanischer Lloyd) • LRS (Lloyds Register of Shipping) • Class NK (Nippon Kaiji Kyokai)

## I/O systems

ET 200 systems for the control cabinet  
ET 200iSP

### IM 152-1 interface module

#### Overview



- The IM 152 interface module is plugged onto the corresponding terminal module TM-IM/EM (to be ordered separately). For redundant operation, two IM 152s are used. They are plugged onto the TM-IM/IM.
- The interface module IM 152 has the following properties:
  - Connects the ET 200iSP to PROFIBUS DP
  - Prepares data for the fitted electronic modules
  - The PROFIBUS address of ET 200iSP can be adjusted using a switch
  - Slot for MMC
  - Firmware updating over PROFIBUS DP or MMC
- Shutting down the 24 V DC supply voltage at the terminal module TM-PS also shuts down the interface module IM 152
- The maximum address size is 244 byte inputs and 244 byte outputs.

#### Technical specifications

Article number	<b>6ES7152-1AA00-0AB0</b> ET200iSP, IM152-1 INTERFACE MODULE
<b>Product type designation</b>	
<b>General information</b>	
Vendor identification (VendorID)	8110H
<b>Input current</b>	
from supply voltage 1L+, max.	30 mA
<b>Power losses</b>	
Power loss, typ.	0.5 W
<b>Time stamping</b>	
Description	for each digital input, digital input module, total ET 200iS
Accuracy	20 ms
Number of stampable digital inputs, max.	64; for accuracy class 20 ms
Time format	RFC 1119 Internet (ISP)
Time resolution	1 ms
Time interval for transmitting the message buffer if a message is present	1 000 ms
Time stamp on signal change	rising / falling edge as signal entering or exiting
<b>Interfaces</b>	
Interface physics, RS 485	Yes; intrinsically safe
<b>PROFIBUS DP</b>	
• Transmission rate, max.	1.5 Mbit/s; 9,6 / 19,2 / 45,45 / 93,75 / 187,5 / 500 kbit/s
• SYNC capability	Yes
• FREEZE capability	Yes
• Direct data exchange (slave-to-slave communication)	Yes; Slave to slave as publisher
<b>Protocols</b>	
PROFIBUS DP	Yes
<b>Protocols (Ethernet)</b>	
• TCP/IP	No
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	No

Article number	<b>6ES7152-1AA00-0AB0</b> ET200iSP, IM152-1 INTERFACE MODULE
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Alarms	Yes
• Acyclic function, interrupts	Yes
• Acyclic function, parameters	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
<b>Diagnostics indication LED</b>	
• Bus fault BF (red)	Yes
• Group error SF (red)	Yes
• Monitoring 24 V voltage supply ON (green)	Yes
<b>Galvanic isolation</b>	
between supply voltage and electronics	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
<b>Use in hazardous areas</b>	
• Type of protection acc. to EN 50020 (CENELEC)	I/2 G Ex ib IIC T4 and I M2 Ex ib I
• Type of protection acc. to KEMA	04 ATEX 1243
<b>Dimensions</b>	
Width	30 mm
Height	129 mm
Depth	136.5 mm
<b>Weights</b>	
Weight, approx.	245 g

### Technical specifications (continued)

Article number	6ES7193-7AA00-0AA0 ET200iSP, TERM.-MOD. TM-IM/EM60S, SCREW	6ES7193-7AA10-0AA0 ET200iSP, TERM.-MOD. TM-IM/EM60C, SPRING	6ES7193-7AB00-0AA0 ET200iSP, TERM.-MOD. TM-IM/IM F. TWO IM
<b>Product type designation</b>			
<b>Standards, approvals, certificates</b>			
CE mark	Yes	Yes	Yes
<b>Use in hazardous areas</b>			
• Type of protection acc. to EN 50020 (CENELEC)	see ET200iSP system	see ET200iSP system	see ET200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242	04 ATEX 2242
<b>Dimensions</b>			
Width	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm
<b>Weights</b>			
Weight, approx.	235 g	235 g	195 g

### Ordering data

Ordering data	Article No.	Article No.
<b>IM152</b> • ET 200iSP-IM152-1	6ES7152-1AA00-0AB0	
<b>Terminal module for IM152 incl. termination module</b> • TM-IM/EM60S • TM-IM/EM60C • TM-IM/IM	6ES7193-7AA00-0AA0 6ES7193-7AA10-0AA0 6ES7193-7AB00-0AA0	
<b>Accessories</b>		
<b>Connectors</b> PROFIBUS connector with active terminating resistor For RS 485-IS circuit; 1.5 Mbit/s	6ES7972-0DA60-0XA0	
<b>RS 485-IS coupler</b> Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS	6ES7972-0AC80-0XA0	
<b>Labeling sheets</b> DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules, and 20 strips each for IM 152 • petrol • yellow	6ES7193-7BH00-0AA0 6ES7193-7BB00-0AA0	
<b>Labels, inscribed</b> Ordering unit 1 set with 200 pieces each for slot numbering • 200 items, 10 x slots 1 to 2 • 200 items, 5 x slots 1 to 40 • 100 items for slot numbering, inscription in plain text	8WA8861-0AB 8WA8861-0AC 8WA8848-0XA	
<b>Labels, blank</b> Ordering unit 1 set with 200 pieces each for slot numbering	8WA8848-2AY	
<b>S7-300 DIN rails</b> Standard rail 585 mm Standard rail 885 mm	6ES7390-1AF85-0AA0 6ES7390-1AJ85-0AA0	
<b>Stainless steel enclosure IP66 for hazardous zone 1 in protection class EEx e</b> Empty enclosure without installation of modules, for use in gaseous area, IP65 (IP54 when using a breather gland) • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable glands (41 units) and 2 rows of blanking plugs • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (66 units) • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (111 units) Empty enclosure without installation of modules, for use in dust area, IP65 • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs • Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (66 units) • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs • Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (111 units)		6DL2804-0AD30  6DL2804-0AD50  6DL2804-0AE30  6DL2804-0AE50  6DL2804-0DD30  6DL2804-0DD50  6DL2804-0DE30  6DL2804-0DE50



**I/O systems**

ET 200 systems for the control cabinet

ET 200iSP

**IM 152-1 interface module**

Ordering data	Article No.		Article No.
<p>Enclosure with installation of ET 200iSP modules for use in gaseous area, IP65 (IP54 when using a breather gland); ET 200iSP components must be ordered separately</p> <ul style="list-style-type: none"> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable glands (41 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (66 units)</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (111 units)</li> </ul>	<p><b>6DL2804-1AD30</b></p> <p><b>6DL2804-1AD50</b></p> <p><b>6DL2804-1AE30</b></p> <p><b>6DL2804-1AE50</b></p>	<p>Enclosure with installation of modules, for use in dust area, IP65; the ET 200iSP components must be ordered separately</p> <ul style="list-style-type: none"> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (66 units)</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (111 units)</li> </ul>	<p><b>6DL2804-1DD30</b></p> <p><b>6DL2804-1DD50</b></p> <p><b>6DL2804-1DE30</b></p> <p><b>6DL2804-1DE50</b></p>

### Overview



The power supply (PS) is plugged into the associated terminal module TM-PS-A or TM-PS-B (with redundancy; to be ordered separately).

The power supply unit fulfills the following functions:

- It provides a reliable isolated power supply for the ET 200iSP with the necessary operating voltages for
  - logic (through the backplane bus)
  - PROFIBUS DP interface of IM 152-1
  - powerbus (for supplying the electronic modules)
- Takes over the safety limit of the output voltage
- Has an explosion-proof metal enclosure (explosion protection EEx d)
- Can be redundantly configured

### Technical specifications

Article number	6ES7138-7EA01-0AA0	6ES7138-7EC00-0AA0
	ET200iSP, POWER SUPPLY MODULE	ET200iSP, POWER SUPPLY MOD. AC120/230V
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	
• Reverse polarity protection	Yes	
<b>Load voltage L1</b>		
• Rated value (AC)		230 V; 120/230V AC
• permissible range, lower limit (AC)		85 V
• permissible range, upper limit (AC)		264 V
• permissible frequency range, lower limit		47 Hz
• permissible frequency range, upper limit		63 Hz
<b>Input current</b>		
from supply voltage L+, max.	4 A	
from supply voltage L1, max.		1.04 A; at rated voltage 230 VAC:0.45A at rated voltage 120 VAC:0.75A
<b>Power losses</b>		
Power loss, typ.	20 W	5 W; 5 W + 1.2 x total power loss of the electronics modules
Power loss, max.	20 W	21.3 W
<b>Interrupts/diagnostics/status information</b>		
Status indicator	Yes	Yes
<b>Alarms</b>		
• Alarms	No	No
<b>Diagnostic messages</b>		
• Diagnostic information readable	Yes; via IM 152	Yes; via IM 152
<b>Diagnostics indication LED</b>		
• Group error SF (red)	No	No
<b>Ex(i) characteristics</b>		
<b>Max. values of input circuits (per channel)</b>		
• Um (fault voltage), max.	250 V; DC	264 V; AC/DC
<b>Galvanic isolation</b>		
primary/secondary	Yes	Yes
between supply voltage and electronics	Yes	No

## I/O systems

ET 200 systems for the control cabinet  
ET 200iSP

### Power supply units

#### Technical specifications (continued)

Article number	<b>6ES7138-7EA01-0AA0</b> ET200iSP, POWER SUPPLY MODULE	<b>6ES7138-7EC00-0AA0</b> ET200iSP, POWER SUPPLY MOD. AC120/230V		
<b>Standards, approvals, certificates</b>				
CE mark	Yes	Yes		
<b>Use in hazardous areas</b>				
• Type of protection acc. to EN 50020 (CENELEC)	Ex de [ib]IIC T4	Ex de [ib]IIC T4		
• Type of protection acc. to KEMA	04 ATEX 2263	09 ATEX 0156		
<b>Dimensions</b>				
Width	60 mm	60 mm		
Height	190 mm	190 mm		
Depth	136.5 mm	136.5 mm		
<b>Weights</b>				
Weight, approx.	2 700 g	2 700 g		
Article number	<b>6ES7193-7DA10-0AA0</b> ET200iSP, TERMINAL-MOD. TM-PS-A F. PS	<b>6ES7193-7DB10-0AA0</b> ET200iSP, TERMINAL-MOD. TM-PS-A F. PS	<b>6ES7193-7DA20-0AA0</b> ET200iSP, TERM.-MOD. TM-PS-A UC	<b>6ES7193-7DB20-0AA0</b> ET200iSP, TERM.-MOD. TM-PS-B UC
<b>Product type designation</b>				
<b>Standards, approvals, certificates</b>				
CE mark			Yes	Yes
<b>Use in hazardous areas</b>				
• Type of protection acc. to EN 50020 (CENELEC)	see ET200iSP system	see ET200iSP system	see ET200iSP system	see ET200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242	04 ATEX 2242	04 ATEX 2242
<b>Dimensions</b>				
Width	60 mm	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm	52 mm
<b>Weights</b>				
Weight, approx.			230 g	230 g

#### Ordering data

#### Article No.

<b>Power supply module PS 24 V DC</b>	<b>6ES7138-7EA01-0AA0</b>
<b>Terminal module TM-PS-A Standard</b>	<b>6ES7193-7DA10-0AA0</b>
<b>Terminal module TM-PS-B for redundant operation</b>	<b>6ES7193-7DB10-0AA0</b>
<b>Power supply module PS 120/230 V AC</b>	<b>6ES7138-7EC00-0AA0</b>
<b>Terminal module TM-PS-A UC Standard</b>	<b>6ES7193-7DA20-0AA0</b>
<b>Terminal module TM-PS-B UC for redundant operation</b>	<b>6ES7193-7DB20-0AA0</b>

### Overview



- The electronic modules are plugged into the associated terminal modules that must be ordered separately (with screw-type or spring-loaded terminals).
- When plugged in, the modules are automatically and uniquely mechanically coded
- Modules can be replaced under potentially explosive conditions during runtime.

### Technical specifications

Article number	<b>6ES7131-7RF00-0AB0</b> ET200iSP, EL-MOD., 8DI, NAMUR
<b>Product type designation</b>	
<b>Supply voltage</b>	
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Digital inputs</b>	
Number of digital inputs	8
Number of NAMUR inputs	8
<b>Input voltage</b>	
• Type of input voltage	DC
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at "0" to "1", min.	2.8 ms
- at "0" to "1", max.	3.5 ms
- at "1" to "0", min.	2.8 ms
- at "1" to "0", max.	3.5 ms
<b>Cable length</b>	
• shielded, max.	500 m
<b>Encoder</b>	
Number of connectable encoders, max.	8
<b>Connectable encoders</b>	
• NAMUR encoder	Yes
<b>NAMUR encoder</b>	
• Input current for signal "0", max.	1.2 mA
• Input current for signal "1", min.	2.1 mA
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	No
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Short circuit	Yes; R load < 150 ohms with NAMUR sensor/sensor and NAMUR changeover contact/sensor to DIN 19234
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes

Article number	<b>6ES7131-7RF00-0AB0</b> ET200iSP, EL-MOD., 8DI, NAMUR
<b>Integrated Functions</b>	
Frequency meter	Yes
Frequency measurement	Yes; (Gate time) 50 ms; 200 ms; 1 s
Number of frequency meters	2
<b>Counter</b>	
Number of counter inputs	2; normal and periodic count function
Input frequency, max.	5 kHz; with a cable length of 20 m: 5 kHz; with a cable length of 100 m: 1 kHz; with a cable length of 200 m: 500 Hz
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
• between the channels	No
• between the channels and the backplane bus	Yes
<b>Permissible potential difference</b>	
between different circuits	60V DC/30V AC
<b>Standards, approvals, certificates</b>	
CE mark	Yes
<b>Use in hazardous areas</b>	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
• Type of protection acc. to KEMA	04 ATEX 1248
<b>Dimensions</b>	
Width	30 mm
Height	129 mm
Depth	136.5 mm
<b>Weights</b>	
Weight, approx.	255 g

**I/O systems**

ET 200 systems for the control cabinet

ET 200iSP

**Digital electronic modules****Technical specifications (continued)**

Article number	<b>6ES7132-7RD01-0AB0</b> ET200iSP, EL-MOD., 4DO, DC 23,1V, 20MA	<b>6ES7132-7RD11-0AB0</b> ET200iSP, EL-MOD., 4DO, DC 17,4V, 27MA	<b>6ES7132-7RD22-0AB0</b> ET200iSP, EL-MOD., 4DO, DC 17.4V, 40MA
<b>Product type designation</b>			
<b>Input current</b>			
from load voltage L+ (without load), max.	340 mA; with actuator supply	300 mA	400 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA	
<b>Power losses</b>			
Power loss, typ.	2.5 W	2.1 W	2.8 W
<b>Address area</b>			
<b>Address space per module</b>			
• without packing	2 byte	2 byte	2 byte
<b>Digital inputs</b>			
<b>Cable length</b>			
• shielded, max.			20 m
• Unshielded, max.			20 m
<b>Digital outputs</b>			
Number of digital outputs	4; additionally 1 intrinsically-safe input for H shutdown	4; additionally 1 intrinsically-safe input for H shutdown	4; additionally 1 intrinsically-safe input for H shutdown
short-circuit protection	Yes	Yes	Yes
No-load voltage U <sub>ao</sub> (DC)	23.1 V	17.4 V	17.4 V
Internal resistor R <sub>i</sub>	275 Ω	150 Ω	167 Ω
<b>Trend key points E</b>			
• Voltage U <sub>e</sub> (DC)	17.1 V	13.2 V	10.7 V
• Current I <sub>e</sub>	20 mA	27 mA	40 mA; 80 mA when outputs connected in parallel
<b>Output current</b>			
• for signal "1" rated value	0.02 A	0.027 A	0.04 A
<b>Output delay with resistive load</b>			
• "0" to "1", max.	2 ms	2 ms	2 ms
• "1" to "0", max.	1.5 ms	1.5 ms	1.5 ms
<b>Parallel switching of 2 outputs</b>			
• for increased power	No; for Ex reasons not possible; nor for predecessor	Yes	Yes
<b>Switching frequency</b>			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz	2 Hz
<b>Cable length</b>			
• shielded, max.	500 m	500 m	500 m
• Unshielded, max.	500 m	500 m	500 m
<b>Interrupts/diagnostics/status information</b>			
Status indicator	Yes	Yes	Yes
<b>Alarms</b>			
• Alarms		No	
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnostic messages</b>			
• Diagnostic functions	Yes	Yes	
• Diagnostic information readable	Yes	Yes	Yes
• Wire break	Yes; R > 10 kohms, I < 100 μA	Yes	Yes; R > 10 kohms, I < 100 μA
• Short circuit	Yes; R < 800 ohms (one output), R < 40 ohms (outputs connected in parallel)	Yes	Yes; R < 80 Ohm (one output), R < 40 Ohm (outputs connected in parallel)
<b>Diagnostics indication LED</b>			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes; Per channel

#### Technical specifications (continued)

Article number	<b>6ES7132-7RD01-0AB0</b> ET200iSP, EL-MOD., 4DO, DC 23,1V, 20MA	<b>6ES7132-7RD11-0AB0</b> ET200iSP, EL-MOD., 4DO, DC 17,4V, 27MA	<b>6ES7132-7RD22-0AB0</b> ET200iSP, EL-MOD., 4DO, DC 17.4V, 40MA
<b>Parameter</b>			
Remark		14 byte	
Diagnosis: wire break	Yes	Yes	Yes
Diagnosis: short circuit	Yes	Yes	Yes
Behavior on CPU/Master STOP, channel-wise	Substitute a value/keep last value	Substitute a value/keep last value	Substitute a value/keep last value
<b>Ex(i) characteristics</b>			
<b>Max. values of output circuits (per channel)</b>			
• Co (permissible external capacity), max.			241 nF; For IIC, 1507 nF for IIB
• Io (short-circuit current), max.			118 mA
• Lo (permissible external inductivity), max.			1.7 mH; For IIC, 10.4 mH for IIB
• Po (power of load), max.			572 mW
• Uo (output no-load voltage), max.			19.4 V
• Ta (permissible ambient temperature), max.	70 °C	70 °C	
<b>Galvanic isolation</b>			
<b>Galvanic isolation digital outputs</b>			
• between the channels	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes
• between the channels and the load voltage L+	Yes	Yes	Yes
<b>Permissible potential difference</b> between different circuits			60V DC/30V AC
<b>Standards, approvals, certificates</b>			
CE mark			Yes
<b>Highest safety class achievable in safety mode</b>			
• SIL according to IEC 61508	No		No
<b>Use in hazardous areas</b>			
• Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
• Type of protection acc. to KEMA	04 ATEX 1249	04 ATEX 1249	04 ATEX 1249
<b>Dimensions</b>			
Width	30 mm	30 mm	30 mm
Height	129 mm	129 mm	129 mm
Depth	136.5 mm	136.5 mm	136.5 mm
<b>Weights</b>			
Weight, approx.	255 g	255 g	255 g

**I/O systems**

ET 200 systems for the control cabinet

ET 200iSP

**Digital electronic modules****Technical specifications (continued)**

Article number	<b>6ES7132-7GD00-0AB0</b> ET200iSP, EL-MOD., 4DO, DC 23,1V, 20MA	<b>6ES7132-7GD10-0AB0</b> ET200iSP, EL-MOD., 4DO, DC 17,4V, 27MA	<b>6ES7132-7GD21-0AB0</b> ET200iSP, EL-MOD., 4DO, DC 17,4V, 40MA	<b>6ES7132-7GD30-0AB0</b> ET200iSP, EL-MOD., 4DO, DC 25.5V, 22MA
<b>Product type designation</b>				
<b>Input current</b>				
from load voltage L+ (without load), max.	340 mA; with actuator supply	300 mA; with actuator supply	400 mA	400 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA		
<b>Power losses</b>				
Power loss, typ.	2.5 W	2.1 W	2.8 W	2.8 W
<b>Address area</b>				
<b>Address space per module</b>				
• without packing	2 byte	2 byte	2 byte	2 byte
<b>Digital inputs</b>				
<b>Cable length</b>				
• shielded, max.			20 m	20 m
• Unshielded, max.			20 m	20 m
<b>Digital outputs</b>				
Number of digital outputs	4; additionally 1 intrinsically-safe input for L shutdown	4; additionally 1 intrinsically-safe input for L shutdown	4; additionally 1 intrinsically-safe input for L shutdown	4; additionally 1 intrinsically-safe input for L shutdown
short-circuit protection	Yes	Yes	Yes	Yes
No-load voltage U <sub>ao</sub> (DC)	23.1 V	17.4 V	17.4 V	25.5 V
Internal resistor R <sub>i</sub>		150 Ω	167 Ω	260 Ω
<b>Trend key points E</b>				
• Voltage U <sub>e</sub> (DC)	17.1 V	13.2 V	10.7 V	19.8 V
• Current I <sub>e</sub>	20 mA	27 mA; 54 mA when outputs connected in parallel	40 mA	22 mA
<b>Output current</b>				
• for signal "1" rated value	0.02 A	0.027 A	0.04 A	0.022 A
<b>Output delay with resistive load</b>				
• "0" to "1", max.	2 ms	2 ms	2 ms	2 ms
• "1" to "0", max.	1.5 ms	1.5 ms	1.5 ms	1.5 ms
<b>Parallel switching of 2 outputs</b>				
• for increased power	No; for Ex reasons not possible; nor for predecessor	Yes	Yes	No
<b>Switching frequency</b>				
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz	2 Hz	2 Hz
<b>Cable length</b>				
• shielded, max.	500 m	500 m	500 m	500 m
• Unshielded, max.	500 m	500 m	500 m	500 m
<b>Interrupts/diagnostics/status information</b>				
Status indicator	Yes	Yes	Yes	Yes
<b>Alarms</b>				
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnostic messages</b>				
• Diagnostic functions	Yes	Yes	Yes	Yes
• Diagnostic information readable	Yes	Yes	Yes	Yes
• Wire break	Yes; R > 10 kohms, I < 100 μA	Yes; R > 10 kohms, I < 100 μA	Yes; R > 10 kohms, I < 100 μA	Yes; R > 10 kohms, I < 100 μA
• Short circuit	Yes; R < 80 Ohm (one output), R < 40 Ohm (outputs connected in parallel)	Yes; R < 80 ohms (one output), R < 40 ohms (outputs connected in parallel)	Yes; R < 80 Ohm (one output), R < 40 Ohm (outputs connected in parallel)	Yes; R < 80 ohms
<b>Diagnostics indication LED</b>				
• Group error SF (red)	Yes	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes; Per channel	Yes; Per channel

### Technical specifications (continued)

Article number	<b>6ES7132-7GD00-0AB0</b> ET200iSP, EL-MOD., 4DO, DC 23,1V, 20MA	<b>6ES7132-7GD10-0AB0</b> ET200iSP, EL-MOD., 4DO, DC 17,4V, 27MA	<b>6ES7132-7GD21-0AB0</b> ET200iSP, EL-MOD., 4DO, DC 17,4V, 40MA	<b>6ES7132-7GD30-0AB0</b> ET200iSP, EL-MOD., 4DO, DC 25.5V, 22MA
<b>Parameter</b>				
Remark	14 byte	14 byte		
Diagnosis: wire break	Yes	Yes	Yes	Yes
Diagnosis: short circuit	Yes	Yes	Yes	Yes
Behavior on CPU/Master STOP, channel-wise	Substitute a value/keep last value	Substitute a value/keep last value	Substitute a value/keep last value	Substitute a value/keep last value
<b>Ex(i) characteristics</b>				
<b>Max. values of output circuits (per channel)</b>				
• Co (permissible external capacity), max.			241 nF; For IIC, 1507 nF for IIB	81 nF; For IIC, 651 nF for IIB
• Io (short-circuit current), max.			118 mA	110 mA
• Lo (permissible external inductivity), max.			1.7 mH; For IIC, 10.4 mH for IIB	1.7 mH; For IIC, 11.5 mH for IIB
• Po (power of load), max.			572 mW	764 mW
• Uo (output no-load voltage), max.			19.4 V	27.9 V
• Ta (permissible ambient temperature), max.	70 °C	70 °C		
<b>Galvanic isolation</b>				
<b>Galvanic isolation digital outputs</b>				
• between the channels	No	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes	Yes
• between the channels and the load voltage L+	Yes	Yes	Yes	Yes
<b>Permissible potential difference</b> between different circuits			60V DC/30V AC	60V DC/30V AC
<b>Standards, approvals, certificates</b>				
CE mark	Yes	Yes	Yes	Yes
<b>Highest safety class achievable in safety mode</b>				
• SIL according to IEC 61508	No	No	No	No
<b>Use in hazardous areas</b>				
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II 2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II 2 G (1) GD and I M2 Ex ib[ia][iaD] IIC T4; Ex ib [ia] I	II 2 G (1) GD and I M2 Ex ib[ia][iaD] IIC T4; Ex ib [ia] I
• Type of protection acc. to KEMA	04 ATEX 1249	04 ATEX 1249	04 ATEX 1249	04 ATEX 1249
<b>Dimensions</b>				
Width	30 mm	30 mm	30 mm	30 mm
Height	129 mm	129 mm	129 mm	129 mm
Depth	136.5 mm	136.5 mm	136.5 mm	136.5 mm
<b>Weights</b>				
Weight, approx.	255 g	255 g	255 g	255 g



## I/O systems

ET 200 systems for the control cabinet

ET 200iSP

### Digital electronic modules

#### Technical specifications (continued)

Article number	<b>6ES7132-7HB00-0AB0</b> ET200iSP, RELAY-MOD., 2DO, UC60V, 2A
<b>Product type designation</b>	
<b>Input current</b>	
from load voltage L+ (without load), max.	120 mA
<b>Power losses</b>	
Power loss, typ.	1 W
<b>Digital outputs</b>	
Number of digital outputs	2
short-circuit protection	Yes
<b>Output current</b>	
• for signal "1" rated value	2 A
<b>Output delay with resistive load</b>	
• "0" to "1", max.	8 ms
• "1" to "0", max.	3 ms
<b>Parallel switching of 2 outputs</b>	
• for increased power	No
• for redundant control of a load	No
<b>Switching frequency</b>	
• with resistive load, max.	0.5 Hz; See data in manual
• with inductive load, max.	0.2 Hz; See data in manual
<b>Relay outputs</b>	
<b>Switching capacity of contacts</b>	
- at ohmic load, up to 60 °C, max.	2 A; See data in manual
- Thermal continuous current, max.	2 A; See data in manual
<b>Cable length</b>	
• shielded, max.	500 m
• Unshielded, max.	500 m
<b>Interrupts/diagnostics/ status information</b>	
Status indicator	Yes
Substitute values connectable	Yes
<b>Alarms</b>	
• Alarms	No
• Diagnostic alarm	Yes
• Hardware interrupt	No

Article number	<b>6ES7132-7HB00-0AB0</b> ET200iSP, RELAY-MOD., 2DO, UC60V, 2A
<b>Diagnostic messages</b>	
• Diagnostic information readable	Yes
• Wire break	No; Cannot be determined in contact power circuit
• Short circuit	No; Cannot be determined in contact power circuit
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes; Per channel
<b>Ex(i) characteristics</b>	
<b>Max. values of output circuits (per channel)</b>	
• U <sub>o</sub> (output no-load voltage), max.	60 V
• U <sub>m</sub> (fault voltage), max.	250 V
• T <sub>a</sub> (permissible ambient temperature), max.	70 °C
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital outputs</b>	
• between the channels	Yes
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	Yes; Channels and power bus
<b>Standards, approvals, certificates</b>	
CE mark	Yes
<b>Highest safety class achievable in safety mode</b>	
• SIL according to IEC 61508	No
<b>Use in hazardous areas</b>	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G and I M2 Ex eibmb IIC T4; Ex eibmb I
• Type of protection acc. to KEMA	07 ATEX 0180
<b>Dimensions</b>	
Width	30 mm
Height	129 mm
Depth	136.5 mm
<b>Weights</b>	
Weight, approx.	280 g

#### Technical specifications (continued)

Article number	<b>6ES7193-7CA00-0AA0</b> ET200iSP, TERM.-MOD. TM-EM/ EM60S F. EM	<b>6ES7193-7CA10-0AA0</b> ET200iSP, TERM.-MOD. TM-EM/ EM60C F. EM	<b>6ES7193-7CB00-0AA0</b> ET200iSP, TERM.-MOD. TM-RM/RM
<b>Product type designation</b>			
<b>Standards, approvals, certificates</b>			
CE mark	Yes	Yes	Yes
<b>Use in hazardous areas</b>			
• Type of protection acc. to EN 50020 (CENELEC)	see ET200iSP system	see ET200iSP system	see ET200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242	07 ATEX 0205
<b>Dimensions</b>			
Width	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm
<b>Weights</b>			
Weight, approx.	275 g	275 g	340 g

#### Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>Digital input modules</b>		<b>Accessories</b>	
8 x DI NAMUR		<b>Connector</b>	
<b>Digital input module 8 DI NAMUR</b>	<b>6ES7131-7RF00-0AB0</b>	PROFIBUS connector with active terminating resistor	<b>6ES7972-0DA60-0XA0</b>
<b>Digital output modules for EEX i</b>		For RS 485-IS circuit; 1.5 Mbit/s	
4 x DO; 1 additional intrinsically safe input for "H" shut-off		<b>RS 485-IS coupler</b>	<b>6ES7972-0AC80-0XA0</b>
<b>Digital output module 4 DO 23.1 V DC/20 mA</b>	<b>6ES7132-7RD01-0AB0</b>	Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS	
<b>Digital output module 4 DO 17.4 V DC/27 mA</b>	<b>6ES7132-7RD11-0AB0</b>	<b>Labeling sheets</b>	
<b>Digital output module 4 DO 17.4 V DC/40 mA</b>	<b>6ES7132-7RD22-0AB0</b>	DIN A4, perforated, each consisting of 10 sheets of 30 strips each, used for electronic modules and 20 strips, used for IM 151	
4 x DO; 1 additional intrinsically safe input for "L" shut-off		• petrol	<b>6ES7193-7BH00-0AA0</b>
<b>Digital output module 4 DO 23.1 V DC/20 mA</b>	<b>6ES7132-7GD00-0AB0</b>	• yellow	<b>6ES7193-7BB00-0AA0</b>
<b>Digital output module 4 DO 17.4 V DC/27 mA</b>	<b>6ES7132-7GD10-0AB0</b>	<b>Labels, inscribed</b>	
<b>Digital output module 4 DO 17.4 V DC/40 mA</b>	<b>6ES7132-7GD21-0AB0</b>	Ordering unit 1 set with 200 pieces each for slot numbering	
<b>Digital output module 4 DO 25.4 V DC/22 mA</b>	<b>6ES7132-7GD30-0AB0</b>	• 10 x slots 1 to 2	<b>8WA8861-0AB</b>
<b>Digital output modules for EEX e</b>		• 5 x slots 1 to 40	<b>8WA8861-0AC</b>
<b>Digital output module 2 DO relay, 60 V UC, 2 A</b>	<b>6ES7132-7HB00-0AB0</b>	<b>Labels, blank</b>	<b>8WA8848-2AY</b>
<b>Terminal modules</b>		Ordering unit 1 set with 200 pieces each for slot numbering	
<b>TM-EM/EM60S</b>	<b>6ES7193-7CA00-0AA0</b>	<b>S7-300 DIN rails</b>	
For accommodating all electronic modules except 2 DO relay; screw-type terminals		Standard rail 585 mm	<b>6ES7390-1AF85-0AA0</b>
<b>TM-EM/EM60C</b>	<b>6ES7193-7CA10-0AA0</b>	Standard rail 885 mm	<b>6ES7390-1AJ85-0AA0</b>
For accommodating all electronic modules except 2 DO relay; spring-loaded terminals			
<b>TM-RM/RM 60S</b>	<b>6ES7193-7CB00-0AA0</b>		
For accommodating digital output module 2 DO relay and reserve modules; screw-type terminal			

## I/O systems

ET 200 systems for the control cabinet

ET 200iSP

### Digital electronic modules

#### Ordering data

#### Article No.

#### Article No.

##### Stainless steel enclosure IP66 for hazardous zone 1 in protection class EEx e

Empty enclosure without installation of modules, for use in gaseous area, IP65 (IP54 when using a breather gland)

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (111 units)

Empty enclosure without installation of modules, for use in dust area, IP65

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (111 units)

**6DL2804-0AD30**

**6DL2804-0AD50**

**6DL2804-0AE30**

**6DL2804-0AE50**

**6DL2804-0DD30**

**6DL2804-0DD50**

**6DL2804-0DE30**

**6DL2804-0DE50**

Enclosure with installation of ET 200iSP modules for use in gaseous area, IP65 (IP54 when using a breather gland); ET 200iSP components must be ordered separately

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (111 units)

Enclosure with installation of modules, for use in dust area, IP65; the ET 200iSP components must be ordered separately

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (111 units)

**6DL2804-1AD30**

**6DL2804-1AD50**

**6DL2804-1AE30**

**6DL2804-1AE50**

**6DL2804-1DD30**

**6DL2804-1DD50**

**6DL2804-1DE30**

**6DL2804-1DE50**

### Overview



- The electronic modules are plugged into the associated terminal modules that must be ordered separately (with screw-type or spring-loaded terminals)
- When plugged in, the modules are automatically and uniquely mechanically coded
- Modules can be replaced under potentially explosive conditions during runtime

### Technical specifications

Article number	6ES7134-7SD00-0AB0	6ES7134-7SD51-0AB0	6ES7134-7TD00-0AB0	6ES7134-7TD50-0AB0
	ET200iSP, EL-MOD., 4 AI TC	ET200iSP, EL-MOD., 4 AI RTD, PT100/NI100	ET200iSP, EL-MOD., 4 AI, HART, 2-WIRE	ET200iSP, EL-MOD., 4 AI, HART, 4-WIRE
<b>Product type designation</b>				
<b>Input current</b>				
from supply voltage L+, max.	30 mA	22 mA	320 mA	30 mA
<b>Output voltage</b>				
<b>Power supply to the transmitters</b>				
• short-circuit proof			Yes	
• Supply current, max.			23 mA; per channel	
<b>Power losses</b>				
Power loss, typ.	0.4 W	0.4 W	2.7 W	0.4 W
<b>Analog inputs</b>				
Number of analog inputs	4	4	4	4
permissible input current for current input (destruction limit), max.			90 mA	50 mA
Cycle time (all channels) max.	320 ms	320 ms	120 ms; 30 ms basic conversion time x 4 channels with 60 Hz, 50 Hz interference frequency suppression	120 ms; 30 ms basic conversion time x 4 channels with 60 Hz, 50 Hz interference frequency suppression
Technical unit for temperature measurement adjustable	Yes	Yes	Yes	Yes
<b>Input ranges</b>				
• Voltage	Yes	No	No	No
• Current	No	No	Yes	Yes
• Thermocouple	Yes	No	No	No
• Resistance thermometer	No	Yes	No	No
• Resistance	No	Yes	No	No
<b>Input ranges (rated values), voltages</b>				
• -80 mV to +80 mV	Yes			
• Input resistance (-80 mV to +80 mV)	1 000 kΩ			
<b>Input ranges (rated values), currents</b>				
• 4 mA to 20 mA			Yes	Yes; Min. 295 Ohm
<b>Input ranges (rated values), thermoelements</b>				
• Type B	Yes			
• Input resistance (Type B)	1 000 kΩ			
• Type C	Yes			
• Input resistance (Type C)	1 000 kΩ			
• Type E	Yes			
• Input resistance (Type E)	1 000 kΩ			

## I/O systems

ET 200 systems for the control cabinet

ET 200iSP

### Analog electronic modules

#### Technical specifications (continued)

Article number	6ES7134-7SD00-0AB0 ET200iSP, EL-MOD., 4 AI TC	6ES7134-7SD51-0AB0 ET200iSP, EL-MOD., 4 AI RTD, PT100/NI100	6ES7134-7TD00-0AB0 ET200iSP, EL-MOD., 4 AI, HART, 2-WIRE	6ES7134-7TD50-0AB0 ET200iSP, EL-MOD., 4 AI, HART, 4-WIRE
<ul style="list-style-type: none"> <li>Type J</li> <li>Input resistance (type J)</li> <li>Type K</li> <li>Input resistance (Type K)</li> <li>Type L</li> <li>Input resistance (Type L)</li> <li>Type N</li> <li>Input resistance (Type N)</li> <li>Type R</li> <li>Input resistance (Type R)</li> <li>Type S</li> <li>Input resistance (Type S)</li> <li>Type T</li> <li>Input resistance (Type T)</li> <li>Type U</li> <li>Input resistance (Type U)</li> </ul>	Yes 1 000 kΩ Yes 1 000 kΩ Yes 1 000 kΩ Yes 1 000 kΩ Yes 1 000 kΩ Yes 1 000 kΩ Yes 1 000 kΩ Yes 1 000 kΩ			
<b>Input ranges (rated values), resistance thermometer</b> <ul style="list-style-type: none"> <li>Ni 100</li> <li>Input resistance (Ni 100)</li> <li>Pt 100</li> <li>Input resistance (Pt 100)</li> </ul>		Yes 2 000 kΩ Yes 2 000 kΩ		
<b>Input ranges (rated values), resistors</b> <ul style="list-style-type: none"> <li>0 to 600 ohms</li> <li>Input resistance (0 to 600 ohms)</li> </ul>		Yes; Also 1000 ohms 1 000 kΩ		
<b>Thermocouple (TC)</b> <b>Temperature compensation</b> <ul style="list-style-type: none"> <li>internal temperature compensation</li> <li>external temperature compensation with compensations socket</li> </ul>	Yes; via supplied TC sensor module Yes; via temperature value, acquired by an analog module of the same ET 200iSP station			
<b>Characteristic linearization</b> <ul style="list-style-type: none"> <li>Parameterizable</li> <li>for thermocouples</li> <li>for resistance thermometer</li> </ul>	Yes 1	Yes Yes		
<b>Cable length</b> <ul style="list-style-type: none"> <li>shielded, max.</li> </ul>	50 m	500 m	500 m	500 m
<b>Analog value generation for the inputs</b>				
Measurement principle	integrating (Sigma-Delta)	integrating (Sigma-Delta)	integrating (Sigma-Delta)	integrating (Sigma-Delta)
<b>Integration and conversion time/ resolution per channel</b> <ul style="list-style-type: none"> <li>Resolution with overrange (bit including sign), max.</li> <li>Integration time, parameterizable</li> <li>Basic conversion time, including integration time (ms)               <ul style="list-style-type: none"> <li>additional conversion time for wire break monitoring</li> </ul> </li> <li>Interference voltage suppression for interference frequency f1 in Hz</li> </ul>	16 bit Yes 80 ms at 50 Hz; 66 ms at 60 Hz 5 ms 50 / 60 Hz	16 bit Yes 80 ms at 50 Hz; 66 ms at 60 Hz 5 ms 50 / 60 Hz	13 bit No 50 / 60 Hz	12 bit; + sign Yes 30 ms 50 / 60 Hz
<b>Smoothing of measured values</b> <ul style="list-style-type: none"> <li>Parameterizable</li> <li>Step: None</li> <li>Step: low</li> <li>Step: Medium</li> <li>Step: High</li> </ul>	Yes; in 4 stages Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; in 4 stages Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; in 4 stages Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time	Yes; in 4 stages Yes; 1 x cycle time Yes; 4 x cycle time Yes; 32 x cycle time Yes; 64 x cycle time

#### Technical specifications (continued)

Article number	6ES7134-7SD00-0AB0 ET200iSP, EL-MOD., 4 AI TC	6ES7134-7SD51-0AB0 ET200iSP, EL-MOD., 4 AI RTD, PT100/NI100	6ES7134-7TD00-0AB0 ET200iSP, EL-MOD., 4 AI, HART, 2-WIRE	6ES7134-7TD50-0AB0 ET200iSP, EL-MOD., 4 AI, HART, 4-WIRE					
<b>Encoder</b>									
<b>Connection of signal encoders</b>									
<ul style="list-style-type: none"> <li>for current measurement as 2-wire transducer               <ul style="list-style-type: none"> <li>Burden of 2-wire transmitter, max.</li> </ul> </li> <li>for current measurement as 4-wire transducer</li> <li>for resistance measurement with two-wire connection</li> <li>for resistance measurement with three-wire connection</li> <li>for resistance measurement with four-wire connection</li> </ul>			Yes		750 ?		Yes		
<b>Errors/accuracies</b>									
Linearity error (relative to input range), (+/-)	0.015 %	0.015 %	0.015 %	0.015 %					
Temperature error (relative to input range), (+/-)	0.02 %/K	0.02 %/K	0.005 %/K	0.005 %/K					
Crosstalk between the inputs, min.	-50 dB	-50 dB	-50 dB	-50 dB					
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.01 %	0.01 %	0.01 %	0.01 %					
<b>Operational limit in overall temperature range</b>									
<ul style="list-style-type: none"> <li>Voltage, relative to input area, (+/-)</li> <li>Current, relative to input area, (+/-)</li> <li>Resistance thermometer, relative to input area, (+/-)</li> </ul>	0.15 %				0.15 %		0.15 %		0.15 %
<b>Basic error limit (operational limit at 25 °C)</b>									
<ul style="list-style-type: none"> <li>Voltage, relative to input area, (+/-)</li> <li>Current, relative to input area, (+/-)</li> <li>Resistance thermometer, relative to input area, (+/-)</li> </ul>	0.1 %				0.1 %		0.1 %		0.1 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>									
<ul style="list-style-type: none"> <li>Series mode interference (peak value of interference &lt; rated value of input range), min.</li> <li>Common mode interference, min.</li> </ul>	70 dB	70 dB	70 dB	70 dB	90 dB	90 dB			
<b>Interrupts/diagnostics/status information</b>									
<b>Alarms</b>									
<ul style="list-style-type: none"> <li>Diagnostic alarm</li> <li>Limit value alarm</li> </ul>	Yes; Parameterizable	Yes	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnostic messages</b>									
<ul style="list-style-type: none"> <li>Diagnostic information readable</li> <li>Wire break</li> <li>Short circuit</li> <li>Group error</li> </ul>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Diagnostics indication LED</b>									
<ul style="list-style-type: none"> <li>Group error SF (red)</li> </ul>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

**I/O systems**

ET 200 systems for the control cabinet

ET 200iSP

**Analog electronic modules****Technical specifications (continued)**

Article number	<b>6ES7134-7SD00-0AB0</b> ET200iSP, EL-MOD., 4 AI TC	<b>6ES7134-7SD51-0AB0</b> ET200iSP, EL-MOD., 4 AI RTD, PT100/NI100	<b>6ES7134-7TD00-0AB0</b> ET200iSP, EL-MOD., 4 AI, HART, 2-WIRE	<b>6ES7134-7TD50-0AB0</b> ET200iSP, EL-MOD., 4 AI, HART, 4-WIRE
<b>Galvanic isolation</b>				
<b>Galvanic isolation analog inputs</b>				
• between the channels	Yes; Functional, yes	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes	Yes
• between the channels and the load voltage L+		Yes; Channels and power bus		
<b>Standards, approvals, certificates</b>				
CE mark	Yes	Yes	Yes	Yes
<b>Highest safety class achievable in safety mode</b>				
• Performance level according to EN ISO 13849-1:2008	none	none	none	none
• SIL according to IEC 61508	No	No	No	No
<b>Use in hazardous areas</b>				
• Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
• Type of protection acc. to KEMA	04 ATEX 1246	04 ATEX 1247	04 ATEX 1244	04 ATEX 1245
<b>Dimensions</b>				
Width	30 mm	30 mm	30 mm	30 mm
Height	129 mm	129 mm	129 mm	129 mm
Depth	136.5 mm	136.5 mm	136.5 mm	136.5 mm
<b>Weights</b>				
Weight, approx.	230 g	230 g	230 g	230 g

#### Technical specifications (continued)

Article number	<b>6ES7135-7TD00-0AB0</b> ET200iSP, EL-MOD., 4 AO, 4-20mA, HART
<b>Product type designation</b>	
<b>Input current</b>	
from load voltage 1L+, max.	330 mA
<b>Power losses</b>	
Power loss, max.	2.7 W
<b>Analog outputs</b>	
Number of analog outputs	4
Cycle time (all channels) max.	3.6 ms
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Connection of actuators</b>	
• for current output two-wire connection	Yes
<b>Load impedance (in rated range of output)</b>	
• with current outputs, max.	750 Ω
<b>Cable length</b>	
• shielded, max.	500 m
<b>Analog value generation for the outputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	14 bit
<b>Settling time</b>	
• for resistive load	4 ms
• for capacitive load	40 ms
• for inductive load	40 ms
<b>Errors/accuracies</b>	
Linearity error (relative to output range), (+/-)	0.015 %
Temperature error (relative to output range), (+/-)	0.005 %/K
Crosstalk between the outputs, min.	-50 dB
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.01 %
<b>Operational limit in overall temperature range</b>	
• Current, relative to output area, (+/-)	0.15 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Current, relative to output area, (+/-)	0.1 %

Article number	<b>6ES7135-7TD00-0AB0</b> ET200iSP, EL-MOD., 4 AO, 4-20mA, HART
<b>Interrupts/diagnostics/status information</b>	
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnostic messages</b>	
• Diagnostic information readable	Yes
• Wire break	Yes
• Short circuit	Yes
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
<b>Galvanic isolation</b>	
<b>Galvanic isolation analog outputs</b>	
• between the channels	No
• between the channels and the backplane bus	Yes
<b>Standards, approvals, certificates</b>	
<b>Use in hazardous areas</b>	
• Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
• Type of protection acc. to KEMA	04 ATEX 1250
<b>Dimensions</b>	
Width	30 mm
Height	129 mm
Depth	136.5 mm
<b>Weights</b>	
Weight, approx.	265 g



**I/O systems**

ET 200 systems for the control cabinet  
ET 200iSP

**Analog electronic modules****Technical specifications** (continued)

Article number	<b>6ES7193-7CA00-0AA0</b> ET200iSP, TERM.-MOD. TM-EM/ EM60S F. EM	<b>6ES7193-7CA10-0AA0</b> ET200iSP, TERM.-MOD. TM-EM/ EM60C F. EM	<b>6ES7193-7CB00-0AA0</b> ET200iSP, TERM.-MOD. TM-RM/RM
<b>Product type designation</b>			
<b>Standards, approvals, certificates</b>			
CE mark	Yes	Yes	Yes
<b>Use in hazardous areas</b>			
• Type of protection acc. to EN 50020 (CENELEC)	see ET200iSP system	see ET200iSP system	see ET200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242	07 ATEX 0205
<b>Dimensions</b>			
Width	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm
<b>Weights</b>			
Weight, approx.	275 g	275 g	340 g

**Ordering data****Article No.****Article No.****Analog input modules****4 AI | 2WIRE HART** **6ES7134-7TD00-0AB0****4 AI | 4WIRE HART** **6ES7134-7TD50-0AB0****4 AI RTD** **6ES7134-7SD51-0AB0****4 AI TC** **6ES7134-7SD00-0AB0****Analog output modules****4 AO | HART** **6ES7135-7TD00-0AB0****Terminal modules****TM-EM/EM60S** **6ES7193-7CA00-0AA0**Terminal module E60S  
(screw-type terminal)**TM-EM/EM60C** **6ES7193-7CA10-0AA0**Terminal module E60C  
(spring-loaded terminal)**Accessories****Connector**PROFIBUS connector with active  
terminating resistor**6ES7972-0DA60-0XA0**

For RS 485-IS circuit; 1.5 Mbit/s

**RS 485-IS coupler****6ES7972-0AC80-0XA0**Isolating transformer  
for coupling of PROFIBUS DP  
and PROFIBUS RS 485-IS**Labeling sheets**DIN A4, perforated, each consisting  
of 10 sheets of 30 strips each,  
used for electronic modules  
and 20 strips, used for IM 151

- petrol
- yellow

**6ES7193-7BH00-0AA0**  
**6ES7193-7BB00-0AA0****Labels, inscribed**Ordering unit 1 set with 200 pieces  
each for slot numbering

- 10 x slots 1 to 2
- 5 x slots 1 to 40

**8WA8861-0AB**  
**8WA8861-0AC****Labels, blank****8WA8848-2AY**Ordering unit 1 set with 200 pieces  
each for slot numbering**S7-300 DIN rails**

Standard rail 585 mm

**6ES7390-1AF85-0AA0**

Standard rail 885 mm

**6ES7390-1AJ85-0AA0**

Ordering data	Article No.	Article No.
<p><b>Stainless steel enclosure IP66 for hazardous zone 1 in protection class EEx e</b></p> <p>Empty enclosure without installation of modules, for use in gaseous area, IP65 (IP54 when using a breather gland)</p> <ul style="list-style-type: none"> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (66 units)</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (111 units)</li> </ul> <p>Empty enclosure without installation of modules, for use in dust area, IP65</p> <ul style="list-style-type: none"> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (66 units)</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (111 units)</li> </ul>	<p><b>6DL2804-0AD30</b></p> <p><b>6DL2804-0AD50</b></p> <p><b>6DL2804-0AE30</b></p> <p><b>6DL2804-0AE50</b></p> <p><b>6DL2804-0DD30</b></p> <p><b>6DL2804-0DD50</b></p> <p><b>6DL2804-0DE30</b></p> <p><b>6DL2804-0DE50</b></p>	<p>Enclosure with installation of ET 200iSP modules for use in gaseous area, IP65 (IP54 when using a breather gland); ET 200iSP components must be ordered separately</p> <ul style="list-style-type: none"> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (66 units)</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (111 units)</li> </ul> <p>Enclosure with installation of modules, for use in dust area, IP65; the ET 200iSP components must be ordered separately</p> <ul style="list-style-type: none"> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (66 units)</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (111 units)</li> </ul>
		<p><b>6DL2804-1AD30</b></p> <p><b>6DL2804-1AD50</b></p> <p><b>6DL2804-1AE30</b></p> <p><b>6DL2804-1AE50</b></p> <p><b>6DL2804-1DD30</b></p> <p><b>6DL2804-1DD50</b></p> <p><b>6DL2804-1DE30</b></p> <p><b>6DL2804-1DE50</b></p>

## I/O systems

ET 200 systems for the control cabinet  
ET 200iSP – Fail-safe electronic modules

### F digital input module

#### Overview



- Digital inputs for fail-safe SIMATIC S7 systems
- Can be used in the distributed ET 200iSP I/O device with IM 152-1

The digital electronic module 8 F-DI Ex NAMUR has the following features:

- Suitable for the connection of encoders from the hazardous area
- 8 inputs 1-channel (SIL3/Category 3/PLe) or 4 inputs 2-channel (SIL3/Category 4/PLe)
- Isolated from the power bus/backplane bus
- Suitable for the following sensors:
  - According to IEC 60947-5-6 or NAMUR (with diagnostic evaluation)
  - Wired mechanical contacts (with diagnostic evaluation)
  - Unwired mechanical contacts (with deactivated diagnostics)
- Programmable diagnostic interrupt
- Diagnostic buffer integrated in module
- Firmware update
- Identification data I&M
- Channel-selective passivation
- Supports time stamping
- Can only be used in safety mode

#### Technical specifications

Article number	<b>6ES7138-7FN00-0AB0</b> ET200iSP, 8F-DI NAMUR EX, FAILSAFE
<b>Product type designation</b>	
<b>FH technology</b>	
Module for failsafe applications	Yes
<b>Input current</b>	
from supply voltage L+, max.	150 mA; int. Powerbus
<b>Encoder supply</b>	
Number of outputs	8
Type of output voltage	8 V DC
<b>Power losses</b>	
Power loss, typ.	1.4 W
<b>Address area</b>	
<b>Occupied address area</b>	
• Inputs	6 byte
• Outputs	4 byte
<b>Digital inputs</b>	
Number of digital inputs	8
Number of NAMUR inputs	8
<b>Input voltage</b>	
• Type of input voltage	DC
<b>Input current</b>	
• for signal "1", typ.	9.5 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at "0" to "1", min.	0.7 ms
- at "0" to "1", max.	16 ms; Parameterizable
- at "1" to "0", min.	0.7 ms
- at "1" to "0", max.	16 ms; Parameterizable
<b>Cable length</b>	
• shielded, max.	500 m
• Unshielded, max.	200 m

Article number	<b>6ES7138-7FN00-0AB0</b> ET200iSP, 8F-DI NAMUR EX, FAILSAFE
<b>Encoder</b>	
Number of connectable encoders, max.	8
<b>Connectable encoders</b>	
• NAMUR encoder	Yes
<b>NAMUR encoder</b>	
• Input current for signal "0", max.	1.2 mA
• Input current for signal "1", min.	2.1 mA
<b>Interrupts/diagnostics/ status information</b>	
Status indicator	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	No
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Wire break	Yes; NAMUR encoders or single contact with 10 kOhm parallel resistor
• Short circuit	Yes; R load < 150 ohms with NAMUR sensor/sensor and NAMUR changeover contact/sensor to DIN 19234
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes

## Technical specifications (continued)

Article number	<b>6ES7138-7FN00-0AB0</b> ET200iSP, 8F-DI NAMUR EX, FAILSAFE
<b>Parameter</b>	
Diagnosis: wire break	channel by channel
Diagnosis: short circuit	channel by channel
<b>Galvanic isolation</b>	
between the channels and backplane bus	Yes
<b>Galvanic isolation digital inputs</b>	
• between the channels	No
• between the channels and the backplane bus	Yes
<b>Permissible potential difference</b>	
between different circuits	60V DC/30V AC
<b>Isolation</b>	
Isolation checked with	350 V AC/1 min between the shield and backplane bus connection 350 V AC/1 min between the shield and I/O 2830 V AC/1 min between backplane bus connection and I/O

Article number	<b>6ES7138-7FN00-0AB0</b> ET200iSP, 8F-DI NAMUR EX, FAILSAFE
<b>Standards, approvals, certificates</b>	
CE mark	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to EN ISO 13849-1:2008	PLe
• SIL according to IEC 61508	SIL 3
<b>Use in hazardous areas</b>	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ia Ga][ia IIC Da]
• Type of protection acc. to KEMA	IIC T4 GB and I M2 Ex ib[ia Ma] I Mb 10 ATEX 0056
<b>Dimensions</b>	
Width	30 mm
Height	129 mm
Depth	136.5 mm
<b>Weights</b>	
Weight, approx.	288 g

## Ordering data

## Article No.

## Article No.

<b>F digital input modules</b>	
8 F-DI Ex NAMUR	<b>6ES7138-7FN00-0AB0</b>
<b>Terminal modules</b>	
<b>TM-EM/EM60S</b>	<b>6ES7193-7CA00-0AA0</b>
Terminal module E60S (screw-type terminal)	
<b>TM-EM/EM60C</b>	<b>6ES7193-7CA10-0AA0</b>
Terminal module E60C (spring-loaded terminal)	
<b>Accessories</b>	
<b>Cable connector</b>	
PROFIBUS cable connector with active terminating resistor For RS 485-IS electric circuit; 1.5 Mbit/s	<b>6ES7972-0DA60-0XA0</b>
<b>RS 485-IS coupler</b>	<b>6ES7972-0AC80-0XA0</b>
Isolating transformer for connection of PROFIBUS DP and PROFIBUS RS 485-IS	
<b>Labeling sheets</b>	
DIN A4, perforated, each consisting of 10 sheets of 30 strips each, can be used for electronic modules, and 20 strips each, can be used for IM 151	
• petrol	<b>6ES7193-7BH00-0AA0</b>
• yellow	<b>6ES7193-7BB00-0AA0</b>
<b>Labels, inscribed</b>	
Ordering unit: 1 set with 200 items each for slot numbering	
• 10 x slots 1 to 2	<b>8WA8861-0AB</b>
• 5 x slots 1 to 40	<b>8WA8861-0AC</b>
<b>Labels, not inscribed</b>	<b>8WA8848-2AY</b>
Ordering unit: 1 set with 200 items each for slot numbering	

<b>Distributed Safety V5.4 programming tool</b>	
Task: Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S Requirement: STEP 7 V5.3 SP3 and higher	
Floating License	<b>6ES7833-1FC02-0YA5</b>
<b>S7 F Systems RT License</b>	<b>6ES7833-1CC00-6YX0</b>
For processing safety-related user programs, for one AS 412F/FH, AS 414F/FH or AS 417F/FH	
<b>S7 F Systems V6.1</b>	<b>6ES7833-1CC02-0YA5</b>
Programming and configuring environment for creating and operating safety-related STEP 7 programs for an S7 400H-based target system, Floating License for 1 user, executable under Windows XP Prof SP2/SP3, Windows Server 2003 SP2 2 languages (German, English) Delivery form: Certificate of License as well as software and electronic documentation on CD	

**I/O systems**

ET 200 systems for the control cabinet  
 ET 200iSP – Fail-safe electronic modules

**F digital input module**

Ordering data	Article No.	Article No.	Article No.
<p><b>SIMATIC Safety Matrix Tool V6.2</b>            Creation, configuration, compilation, loading and online monitoring of the Safety Matrix in a SIMATIC PCS 7 environment            Including SIMATIC Safety Matrix Viewer for SIMATIC PCS 7, for operation and monitoring of the Safety Matrix in a SIMATIC PCS 7 environment with several operator control levels            1 language (English), executes with Windows XP Professional  <i>Type of delivery:</i> Certificate of License and authorization diskette for Safety Matrix Tool and Safety Matrix Viewer; software and electronic documentation on CD            Floating License for 1 installation            Floating License upgrade from V5.x/V6.x to V6.2</p>	<p><b>6ES7833-1SM02-0YA5</b>  <b>6ES7833-1SM02-0YE5</b></p>	<p><b>SIMATIC Safety Matrix Editor V6.2</b>            Creation and checking of the Safety Matrix logic on an external computer without a SIMATIC PCS 7 or STEP 7 environment            1 language (English), executes with Windows 2000 Professional or Windows XP Professional, single license for 1 installation  <i>Type of delivery:</i> Certificate of License and authorization diskette; software and electronic documentation on CD</p>	<p><b>6ES7833-1SM42-0YA5</b></p>
		<p><b>SIMATIC Safety Matrix Viewer V6.2 for SIMATIC PCS 7</b>            Operation and monitoring of the Safety Matrix in the SIMATIC PCS 7 environment with several operator control levels            2 languages (English/German), runs under Windows 2000 Professional, Windows XP Professional, Windows 2003 Server  <i>Type of delivery:</i> Certificate of License and authorization diskette; software and electronic documentation on CD            Floating License for 1 installation            Floating License upgrade from V6.x to V6.2</p>	<p><b>6ES7833-1SM62-0YA5</b>  <b>6ES7833-1SM62-0YE5</b></p>

## Overview



- Digital outputs for fail-safe SIMATIC S7 systems
- Can be used in the distributed ET 200iSP I/O device with IM 152-1

The digital electronic module 4 F-DO Ex 17.4 V/40 mA has the following properties:

- Suitable for the connection of actuators from the hazardous area
- 4 outputs, PP-switching (SIL3/Category 4/PLe)
- Isolated from the power bus/backplane bus
- Max. output current 40 mA
- Rated load voltage 17.4 V DC
- Short-circuit, overload and wire-break monitoring
- Suitable for Ex i solenoid valves, DC current relays and actuators
- To increase the power rating, two digital outputs can be connected in parallel for one actuator
- Programmable diagnostics
- Programmable diagnostic interrupt
- Diagnostic buffer integrated in module
- Firmware update
- Identification data I&M
- Channel-selective passivation
- Can only be used in safety mode

## Technical specifications

Article number	<b>6ES7138-7FD00-0AB0</b> ET200iSP, 4F-DO 40MA EX, FAILSAFE
<b>Product type designation</b>	
<b>Input current</b>	
from load voltage L+ (without load), max.	510 mA; int. Powerbus
<b>Power losses</b>	
Power loss, typ.	5.3 W; max.
<b>Digital outputs</b>	
Number of digital outputs	4
short-circuit protection	Yes
• Response threshold, typ.	Depending on the "short-circuit level" parameter
Controlling a digital input	No
No-load voltage U <sub>ao</sub> (DC)	17.4 V
Internal resistor R <sub>i</sub>	167 Ω
<b>Load resistance range</b>	
• lower limit	270 Ω
• upper limit	18 kΩ
<b>Trend key points E</b>	
• Voltage U <sub>e</sub> (DC)	10 V
• Current I <sub>e</sub>	40 mA
<b>Output voltage</b>	
• for signal "1", min.	max. 17.4 V
<b>Output current</b>	
• for signal "0" residual current, max.	10 μA

Article number	<b>6ES7138-7FD00-0AB0</b> ET200iSP, 4F-DO 40MA EX, FAILSAFE
<b>Parallel switching of 2 outputs</b>	
• for increased power	Yes
• for redundant control of a load	No
<b>Switching frequency</b>	
• with resistive load, max.	30 Hz
• with inductive load, max.	2 Hz
<b>Cable length</b>	
• shielded, max.	500 m
• Unshielded, max.	500 m
<b>Interrupts/diagnostics/ status information</b>	
Status indicator	Yes
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
<b>Diagnostic messages</b>	
• Diagnostic information readable	Yes
• Wire break	Yes
• Short circuit	Yes
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes

## I/O systems

ET 200 systems for the control cabinet  
ET 200iSP – Fail-safe electronic modules

### F digital output module

#### Technical specifications (continued)

Article number	<b>6ES7138-7FD00-0AB0</b> ET200iSP, 4F-DO 40MA EX, FAILSAFE
<b>Parameter</b>	
Diagnosis: wire break	Yes
Diagnosis: short circuit	Yes
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital outputs</b>	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	Yes
<b>Permissible potential difference</b>	
between different circuits	60V DC/30V AC
<b>Isolation</b>	
Isolation checked with	370V for 1 min

Article number	<b>6ES7138-7FD00-0AB0</b> ET200iSP, 4F-DO 40MA EX, FAILSAFE
<b>Standards, approvals, certificates</b>	
CE mark	Yes
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to EN ISO 13849-1:2008	PLe
• SIL according to IEC 61508	SIL 3
<b>Use in hazardous areas</b>	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ia Ga][ia IIC Da]
• Type of protection acc. to KEMA	IIC T4 GB and I M2 Ex ib[ia Ma] I Mb 10 ATEX 0057
<b>Dimensions</b>	
Width	30 mm
Height	129 mm
Depth	136.5 mm
<b>Weights</b>	
Weight, approx.	285 g

#### Ordering data

#### Article No.

<b>Digital output module</b>	
4 F-DO Ex 17.4 V/40 mA	<b>6ES7138-7FD00-0AB0</b>
<b>Terminal modules</b>	
<b>TM-EM/EM60S</b>	<b>6ES7193-7CA00-0AA0</b>
Terminal module E60S (screw-type terminal)	
<b>TM-EM/EM60C</b>	<b>6ES7193-7CA10-0AA0</b>
Terminal module E60C (spring-loaded terminal)	
<b>Accessories</b>	
<b>Cable connector</b>	
PROFIBUS cable connector with active terminating resistor	<b>6ES7972-0DA60-0XA0</b>
For RS 485-IS electric circuit; 1.5 Mbit/s	
<b>RS 485-IS coupler</b>	<b>6ES7972-0AC80-0XA0</b>
Isolating transformer for connection of PROFIBUS DP and PROFIBUS RS 485-IS	
<b>Labeling sheets</b>	
DIN A4, perforated, each consisting of 10 sheets of 30 strips each, can be used for electronic modules, and 20 strips each, can be used for IM 151	
• petrol	<b>6ES7193-7BH00-0AA0</b>
• yellow	<b>6ES7193-7BB00-0AA0</b>
<b>Labels, inscribed</b>	
Ordering unit: 1 set with 200 items each for slot numbering	
• 10 x slots 1 to 2	<b>8WA8861-0AB</b>
• 5 x slots 1 to 40	<b>8WA8861-0AC</b>

#### Article No.

<b>Labels, not inscribed</b>	<b>8WA8848-2AY</b>
Ordering unit: 1 set with 200 items each for slot numbering	
<b>Distributed Safety V5.4 programming tool</b>	
Task: Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S	
Requirement: STEP 7 V5.3 SP3 and higher	
Floating License	<b>6ES7833-1FC02-0YA5</b>
<b>S7 F Systems RT License</b>	<b>6ES7833-1CC00-6YX0</b>
For processing safety-related user programs, for one AS 412F/FH, AS 414F/FH or AS 417F/FH	
<b>S7 F Systems V6.1</b>	<b>6ES7833-1CC02-0YA5</b>
Programming and configuring environment for creating and operating safety-related STEP 7 programs for an S7 400H-based target system, Floating License for 1 user, executable under Windows XP Prof SP2/SP3, Windows Server 2003 SP2	
2 languages (German, English)	
Delivery form: Certificate of License as well as software and electronic documentation on CD	

Ordering data	Article No.	Article No.	Article No.
<p><b>SIMATIC Safety Matrix Tool V6.2</b> Creation, configuration, compilation, loading and online monitoring of the Safety Matrix in a SIMATIC PCS 7 environment Including SIMATIC Safety Matrix Viewer for SIMATIC PCS 7, for operation and monitoring of the Safety Matrix in a SIMATIC PCS 7 environment with several operator control levels 1 language (English), executes with Windows XP Professional <i>Delivery form:</i> Certificate of License and authorization diskette for Safety Matrix Tool and Safety Matrix Viewer; software and electronic documentation on CD Floating License for 1 installation Floating License upgrade from V5.x/V6.x to V6.2</p>	<p><b>6ES7833-1SM02-0YA5</b> <b>6ES7833-1SM02-0YE5</b></p>	<p><b>SIMATIC Safety Matrix Editor V6.2</b> Creation and checking of the Safety Matrix logic on an external computer without a SIMATIC PCS 7 or STEP 7 environment 1 language (English), executes with Windows 2000 Professional or Windows XP Professional, single license for 1 installation <i>Delivery form:</i> Certificate of License and authorization diskette; software and electronic documentation on CD</p>	<p><b>6ES7833-1SM42-0YA5</b></p>
		<p><b>SIMATIC Safety Matrix Viewer V6.2 for SIMATIC PCS 7</b> Operation and monitoring of the Safety Matrix in the SIMATIC PCS 7 environment with several operator control levels 2 languages (English/German), runs under Windows 2000 Professional, Windows XP Professional, Windows 2003 Server <i>Delivery form:</i> Certificate of License and authorization diskette; software and electronic documentation on CD Floating License for 1 installation Floating License upgrade from V6.x to V6.2</p>	<p><b>6ES7833-1SM62-0YA5</b> <b>6ES7833-1SM62-0YE5</b></p>



## I/O systems

ET 200 systems for the control cabinet  
ET 200iSP – Fail-safe electronic modules

### F analog input module

#### Overview



- Analog inputs for fail-safe SIMATIC S7 systems
- Can be used in the distributed ET 200iSP I/O device with IM 152-1

The analog electronic module 4 F-AI Ex HART has the following properties:

- Suitable for the connection of encoders from the hazardous area
- 4 analog inputs 1-channel (SIL3/Cat.3/PLe) or 4 inputs 2-channel (SIL3/Cat.4/PLe, with two 4 F-AI Ex HART modules)
- Electrical isolation between channels and the backplane bus
- Input ranges:
  - 0 to 20 mA
  - 4 to 20 mA
- Suitable for the following sensors:
  - 2-wire transducers
  - HART field devices
- Programmable diagnostics
- Programmable diagnostic interrupt
- Diagnostic buffer integrated in module
- HART communication (HART protocol versions 5, 6, 7)
- Firmware update
- Identification data I&M
- Can only be used in safety mode

#### Technical specifications

Article number	<b>6ES7138-7FA00-0AB0</b> ET200iSP, 4F-AI HART EX, FAILSAFE
<b>Product type designation</b>	
<b>Input current</b>	
from supply voltage L+, max.	490 mA; int. Powerbus
<b>Output voltage</b>	
<b>Power supply to the transmitters</b>	
• short-circuit proof	Yes
• Supply current, max.	25 mA; Plus 4 mA per channel
<b>Power losses</b>	
Power loss, typ.	5.4 W; max.
<b>Address area</b>	
<b>Address space per module</b>	
• Address space per module, max.	16 byte; 12 bytes in the I area / 4 bytes in the O area
<b>Analog inputs</b>	
Number of analog inputs	4
Cycle time (all channels) max.	See data in manual
<b>Input ranges</b>	
• Voltage	No
• Current	Yes
• Thermocouple	No
• Resistance thermometer	No
• Resistance	No
<b>Input ranges (rated values), currents</b>	
• 4 mA to 20 mA	Yes; and 0 to 20 mA
<b>Cable length</b>	
• shielded, max.	500 m

Article number	<b>6ES7138-7FA00-0AB0</b> ET200iSP, 4F-AI HART EX, FAILSAFE
<b>Analog value generation for the inputs</b>	
Measurement principle	integrating (Sigma-Delta)
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz
<b>Smoothing of measured values</b>	
• Parameterizable	Yes; in 4 stages
• Step: None	Yes; 1 x cycle time
• Step: low	Yes; 4 x cycle time
• Step: Medium	Yes; 32 x cycle time
• Step: High	Yes; 64 x cycle time
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for current measurement as 2-wire transducer	Yes
- Burden of 2-wire transmitter, max.	750 Ω

## Technical specifications (continued)

Article number	<b>6ES7138-7FA00-0AB0</b> ET200iSP, 4F-AI HART EX, FAILSAFE	Article number	<b>6ES7138-7FA00-0AB0</b> ET200iSP, 4F-AI HART EX, FAILSAFE
<b>Errors/accuracies</b>		<b>Galvanic isolation</b>	
Linearity error (relative to input range), (+/-)	0.015 %	<b>Galvanic isolation analog inputs</b>	
Temperature error (relative to input range), (+/-)	0.005 %/K	• between the channels	No
Crosstalk between the inputs, min.	-50 dB	• between the channels and the backplane bus	Yes
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.015 %	• between the channels and the load voltage L+	Yes; Power bus
<b>Operational limit in overall temperature range</b>		<b>Permissible potential difference</b>	
• Current, relative to input area, (+/-)	0.35 %	between the inputs (UCM)	60V DC/30V AC
<b>Basic error limit (operational limit at 25 °C)</b>		<b>Standards, approvals, certificates</b>	
• Current, relative to input area, (+/-)	0.1 %	CE mark	Yes
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, <math>f1 =</math> interference frequency</b>		<b>Highest safety class achievable in safety mode</b>	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	• Performance level according to EN ISO 13849-1:2008	PLe
• Common mode interference, min.	50 dB	• SIL according to IEC 61508	SIL 3
<b>Interrupts/diagnostics/status information</b>		<b>Use in hazardous areas</b>	
<b>Alarms</b>		• Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ia Ga][ia IIIC Da] IIC T4 GB and I M2 Ex ib[ia Ma] I Mb
• Diagnostic alarm	Yes; Parameterizable	• Type of protection acc. to KEMA	10 ATEX 0058
<b>Diagnostic messages</b>		<b>Dimensions</b>	
• Diagnostic information readable	Yes	Width	30 mm
• Wire break	Yes	Height	129 mm
• Short circuit	Yes	Depth	136.5 mm
<b>Diagnostics indication LED</b>		<b>Weights</b>	
• Group error SF (red)	Yes	Weight, approx.	299 g

**I/O systems**

ET 200 systems for the control cabinet  
ET 200iSP – Fail-safe electronic modules

**F analog input module****Ordering data****Article No.****F analog input module**

4 F-AI Ex HART

**6ES7138-7FA00-0AB0****Terminal modules****TM-EM/EM60S**Terminal module E60S  
(screw-type terminal)**6ES7193-7CA00-0AAA****TM-EM/EM60C**Terminal module E60C  
(spring-loaded terminal)**6ES7193-7CA10-0AAA****Accessories****Cable connector**PROFIBUS cable connector  
with active terminating resistorFor RS 485-IS electric circuit;  
1.5 Mbit/s**6ES7972-0DA60-0XA0****RS 485-IS coupler**Isolating transformer for  
connection of PROFIBUS DP  
and PROFIBUS RS 485-IS**6ES7972-0AC80-0XA0****Labeling sheets**DIN A4, perforated, each consisting  
of 10 sheets of 30 strips each,  
can be used for electronic modules,  
and 20 strips each, can be used for  
IM 151

- petrol
- yellow

**6ES7193-7BH00-0AAA**  
**6ES7193-7BB00-0AAA****Labels, inscribed**Ordering unit: 1 set with 200 items  
each for slot numbering

- 10 x slots 1 to 2
- 5 x slots 1 to 40

**8WA8861-0AB**  
**8WA8861-0AC****Labels, not inscribed**Ordering unit: 1 set with 200 items  
each for slot numbering**8WA8848-2AY****Distributed Safety V5.4  
programming tool**Task: Software for configuring of  
fail-safe user programs for  
SIMATIC S7-300F, S7-400F,  
ET 200SRequirement: STEP 7 V5.3 SP3 and  
higher

Floating License

**6ES7833-1FC02-0YA5****S7 F Systems RT License**For processing safety-related user  
programs, for one AS 412F/FH,  
AS 414F/FH or AS 417F/FH**6ES7833-1CC00-6YX0****Article No.****S7 F Systems V6.1**Programming and configuring envi-  
ronment for creating and operating  
safety-related STEP 7 programs for  
an S7 400H-based target system,  
Floating License for 1 user, execut-  
able under Windows XP Prof SP2/  
SP3, Windows Server 2003 SP2

2 languages (German, English)

**Delivery form:**Certificate of License as well as  
software and electronic documenta-  
tion on CD**6ES7833-1CC02-0YA5****SIMATIC Safety Matrix Tool V6.2**Creation, configuration, compila-  
tion, loading and online monitoring  
of the Safety Matrix in a  
SIMATIC PCS 7 environmentIncluding SIMATIC Safety Matrix  
Viewer for SIMATIC PCS 7, for oper-  
ation and monitoring of the Safety  
Matrix in a SIMATIC PCS 7 environ-  
ment with several operator control  
levels1 language (English), executes  
with Windows XP Professional**Delivery form:** Certificate of License  
and authorization diskette for Safety  
Matrix Tool and Safety Matrix  
Viewer; software and electronic  
documentation on CD

Floating License for 1 installation

**6ES7833-1SM02-0YA5**Floating License upgrade from  
V5.x/V6.x to V6.2**6ES7833-1SM02-0YE5****SIMATIC Safety Matrix Editor V6.2**Creation and checking of the Safety  
Matrix logic on an external com-  
puter without a SIMATIC PCS 7 or  
STEP 7 environment1 language (English), executes  
with Windows 2000 Professional or  
Windows XP Professional,single license for 1 installation  
**Delivery form:** Certificate of License  
and authorization diskette; software  
and electronic documentation on  
CD**6ES7833-1SM42-0YA5****SIMATIC Safety Matrix Viewer  
V6.2 for SIMATIC PCS 7**Operation and monitoring of the  
Safety Matrix in the SIMATIC PCS 7  
environment with several operator  
control levels2 languages (English/German),  
runs under Windows 2000 Profes-  
sional, Windows XP Professional,  
Windows 2003 Server**Delivery form:** Certificate of License  
and authorization diskette; software  
and electronic documentation on  
CDFloating License for 1 installation  
Floating License upgrade from V6.x  
to V6.2**6ES7833-1SM62-0YA5**  
**6ES7833-1SM62-0YE5**

### Overview



- The watchdog module is plugged onto the associated terminal module with screw or spring-loaded connection (to be ordered separately).
- Modules can be replaced under potentially explosive conditions during runtime.

### Technical specifications

Article number	<b>6ES7138-7BB00-0AB0</b> ET 200iSP, WATCHDOG MOD.
<b>Product type designation</b>	
<b>Supply voltage</b>	
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Digital inputs</b>	
Number of digital inputs	0
<b>Dimensions</b>	
Width	30 mm
Height	129 mm
Depth	136.5 mm

### Ordering data

	Article No.
<b>Watchdog module</b>	<b>6ES7138-7BB00-0AB0</b>
<b>Terminal modules</b>	
<b>TM-EM/EM60S</b>	<b>6ES7193-7CA00-0AA0</b>
Terminal module E60S (screw-type terminal)	
<b>TM-EM/EM60C</b>	<b>6ES7193-7CA10-0AA0</b>
Terminal module E60C (spring-loaded terminal)	
<b>Accessories</b>	
<b>Connectors</b>	
<b>PROFIBUS connector with active terminating resistor</b>	<b>6ES7972-0DA60-0XA0</b>
For RS485-IS circuit; 1.5 Mbit/s	
<b>RS 485-IS coupler</b>	<b>6ES7972-0AC80-0XA0</b>
Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS	

### Article No.

#### Labeling sheets

DIN A4, perforated, each consisting of 10 sheets of 30 strips each, used for electronic modules and 20 strips, used for IM 151

- petrol
- yellow

**6ES7193-7BH00-0AA0**  
**6ES7193-7BB00-0AA0**

## I/O systems

ET 200 systems for the control cabinet

ET 200iSP

### ET 200iSP watchdog module

#### Ordering data

##### Labels, inscribed

Ordering unit 1 set with 200 pieces each for slot numbering

- 10 x slots 1 to 2
- 5 x slots 1 to 40

**8WA8861-0AB**  
**8WA8861-0AC**

##### Labels, blank

Ordering unit 1 set with 200 pieces each for slot numbering

**8WA8848-2AY**

##### S7-300 DIN rails

Standard Rail 585 mm

**6ES7390-1AF85-0AA0**

Standard Rail 885 mm

**6ES7390-1AJ85-0AA0**

##### Stainless steel enclosure IP66 for hazardous zone 1 in protection class EEx e

Empty enclosure without installation of modules, for use in gaseous area, IP65 (IP54 when using a breather gland)

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (111 units)

**6DL2804-0AD30**

**6DL2804-0AD50**

**6DL2804-0AE30**

**6DL2804-0AE50**

Empty enclosure without installation of modules, for use in dust area, IP65

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (111 units)

**6DL2804-0DD30**

**6DL2804-0DD50**

**6DL2804-0DE30**

**6DL2804-0DE50**

#### Article No.

Enclosure with installation of ET 200iSP modules for use in gaseous area, IP65 (IP54 when using a breather gland); ET 200iSP components must be ordered separately

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (111 units)

**6DL2804-1AD30**

**6DL2804-1AD50**

**6DL2804-1AE30**

**6DL2804-1AE50**

Enclosure with installation of modules, for use in dust area, IP65; the ET 200iSP components must be ordered separately

- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
- Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (66 units)
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
- Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (111 units)

**6DL2804-1DD30**

**6DL2804-1DD50**

**6DL2804-1DE30**

**6DL2804-1DE50**

### Overview



- The reserve module is plugged onto the relevant terminal module (to be ordered separately; screw-type or spring-loaded connection).
- Modules can be replaced under potentially explosive conditions during runtime.

### Technical specifications

Article number	<b>6ES7138-7AA00-0AA0</b> ET200iSP, RESERVE MODULE
<b>Product type designation</b>	
<b>Installation type/mounting</b>	
Wall mounting/direct mounting possible	Yes
<b>Digital inputs</b>	
Number of digital inputs	0
<b>Standards, approvals, certificates</b>	
CE mark	Yes
<b>Use in hazardous areas</b>	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G EEx ib IIC T4
• Test number KEMA	04 ATEX 1251
<b>Dimensions</b>	
Width	30 mm
Height	129 mm
Depth	136.5 mm
<b>Weights</b>	
Weight, approx.	180 g

Article number	<b>6ES7193-7CA00-0AA0</b> ET200iSP, TERM.-MOD. TM-EM/EM60S F. EM	<b>6ES7193-7CA10-0AA0</b> ET200iSP, TERM.-MOD. TM-EM/EM60C F. EM	<b>6ES7193-7CB00-0AA0</b> ET200iSP, TERM.-MOD. TM-RM/RM
<b>Product type designation</b>			
<b>Standards, approvals, certificates</b>			
CE mark	Yes	Yes	Yes
<b>Use in hazardous areas</b>			
• Type of protection acc. to EN 50020 (CENELEC)	see ET200iSP system	see ET200iSP system	see ET200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242	07 ATEX 0205
<b>Dimensions</b>			
Width	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm
<b>Weights</b>			
Weight, approx.	275 g	275 g	340 g

**I/O systems**

ET 200 systems for the control cabinet

ET 200iSP

**Reserve module**

Ordering data	Article No.	Article No.
<b>Reserve module</b>	<b>6ES7138-7AA00-0AA0</b>	
<b>Terminal modules</b>		
<b>TM-EM/EM 60S</b>	<b>6ES7193-7CA00-0AA0</b>	
Terminal module E60S (screw-type terminal)		
<b>TM-EM/EM 60C</b>	<b>6ES7193-7CA10-0AA0</b>	
Terminal module E60C (spring-loaded terminal)		
<b>TM-RM/RM 60S</b>	<b>6ES7193-7CB00-0AA0</b>	
For accommodating digital output module 2 DO relay and reserve modules; screw-type terminal		
<b>Accessories</b>		
<b>Connectors</b>		
PROFIBUS connector with active terminating resistor	<b>6ES7972-0DA60-0XA0</b>	
For RS 485-IS circuit; 1.5 Mbit/s		
<b>RS 485-IS coupler</b>	<b>6ES7972-0AC80-0XA0</b>	
Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS		
<b>Labeling sheets</b>		
DIN A4, perforated, each consisting of 10 sheets of 30 strips each, used for electronic modules and 20 strips, used for IM 151		
• petrol	<b>6ES7193-7BH00-0AA0</b>	
• yellow	<b>6ES7193-7BB00-0AA0</b>	
<b>Labels, inscribed</b>		
Ordering unit 1 set with 200 pieces each for slot numbering		
• 10 x slots 1 to 2	<b>8WA8861-0AB</b>	
• 5 x slots 1 to 40	<b>8WA8861-0AC</b>	
<b>Labels, blank</b>	<b>8WA8848-2AY</b>	
Ordering unit 1 set with 200 pieces each for slot numbering		
<b>S7-300 DIN rails</b>		
Standard rail 585 mm	<b>6ES7390-1AF85-0AA0</b>	
Standard rail 885 mm	<b>6ES7390-1AJ85-0AA0</b>	
		<b>Stainless steel enclosure IP66 for hazardous zone 1 in protection class EEx e</b>
		Empty enclosure without installation of modules, for use in gaseous area, IP65 (IP54 when using a breather gland)
		• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
		<b>6DL2804-0AD30</b>
		• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (66 units)
		<b>6DL2804-0AD50</b>
		• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
		<b>6DL2804-0AE30</b>
		• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (111 units)
		<b>6DL2804-0AE50</b>
		Empty enclosure without installation of modules, for use in dust area, IP65
		• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs
		<b>6DL2804-0DD30</b>
		• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (66 units)
		<b>6DL2804-0DD50</b>
		• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs
		<b>6DL2804-0DE30</b>
		• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (111 units)
		<b>6DL2804-0DE50</b>

Ordering data	Article No.	Article No.
<p>Enclosure with installation of ET 200iSP modules for use in gaseous area, IP65 (IP54 when using a breather gland); ET 200iSP components must be ordered separately</p> <ul style="list-style-type: none"> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (66 units)</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in gaseous area, with 5 rows of M16 cable entries (111 units)</li> </ul>	<p><b>6DL2804-1AD30</b></p> <p><b>6DL2804-1AD50</b></p> <p><b>6DL2804-1AE30</b></p> <p><b>6DL2804-1AE50</b></p>	<p>Enclosure with installation of modules, for use in dust area, IP65; the ET 200iSP components must be ordered separately</p> <ul style="list-style-type: none"> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (41 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 650 x 450 x 230, for installation of max. 15 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (66 units)</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 3 rows of M16 cable entries (68 units) and 2 rows of blanking plugs</li> <li>• Wall enclosure 950 x 450 x 230, for installation of max. 25 ET 200iSP modules, for use in dust area, with 5 rows of M16 cable entries (111 units)</li> </ul>
		<p><b>6DL2804-1DD30</b></p> <p><b>6DL2804-1DD50</b></p> <p><b>6DL2804-1DE30</b></p> <p><b>6DL2804-1DE50</b></p>



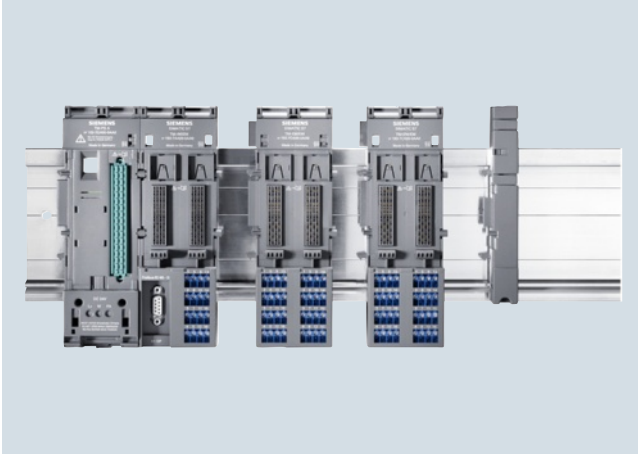
## I/O systems

ET 200 systems for the control cabinet

ET 200iSP

### Terminal modules

#### Overview



- Mechanical modules for accommodating the power supply unit, interface and electronic modules
- For setting up the fixed wiring via self-assembling voltage buses
- Different versions for accommodating electronic modules
- Automatic encoding of the electronic modules
- Self-assembling shielding of the backplane bus for high data security
- Alternatively with screw or spring-loaded terminals

#### Ordering data

##### TM-PS terminal modules

TM-PS A  
for accommodating a 24 V DC power supply

**6ES7193-7DA10-0AA0**

TM-PS A UC  
for accommodating a 110/230 V AC power supply

**6ES7193-7DA20-0AA0**

TM-PS B  
for accommodating an additional, redundant 24 V DC power supply

**6ES7193-7DB10-0AA0**

TM-PS B UC  
for accommodating an additional, redundant 110/230 V AC power supply

**6ES7193-7DB20-0AA0**

##### TM-IM/xx terminal modules

TM-IM/EM60S  
for accommodating the IM152-1 and an electronic module, including power termination module; screw terminals

**6ES7193-7AA00-0AA0**

TM-IM/EM60S  
for accommodating the IM152-1 and an electronic module, including power termination module; screw terminals, black

**6ES7193-7AA20-0AA0**

TM-IM/EM60C  
for accommodating the IM152-1 and an electronic module, including power termination module; spring-loaded terminals

**6ES7193-7AA10-0AA0**

TM-IM/IM  
for accommodating two IM152-1 modules in redundant mode, including power termination module

**6ES7193-7AB00-0AA0**

#### Article No.

##### TM-EM/EM terminal modules

TM-EM/EM60S  
for accommodating two electronic modules, screw terminals

**6ES7193-7CA00-0AA0**

TM-EM/EM60S  
for accommodating two electronic modules, screw terminals, black

**6ES7193-7CA20-0AA0**

TM-EM/EM60C  
for accommodating two electronic modules, spring-loaded terminals

**6ES7193-7CA10-0AA0**

##### TM-RM/RM terminal module

TM-RM/RM  
for accommodating two relay modules, screw terminals

**6ES7193-7CB00-0AA0**

## Overview



- Coupler for converting PROFIBUS DP into PROFIBUS RS485-IS intrinsically safe (protection type intrinsically safe i)
- Required for connecting intrinsically safe PROFIBUS DP stations (e.g. ET 200iS, ET 200iSP) and on all third-party devices that have an Ex i DP connection
- Additional use as a repeater in the hazardous area
- Acts as a safety barrier
- Passive bus node, configuration not required
- Certified according to ATEX 100a

## Technical specifications

Technical specifications RS 485-IS Coupler	
<b>Dimensions and weight</b>	
Dimensions W x H x D (mm)	80 x 125 x 130
Weight	Approx. 500 g
<b>Technical specifications – General</b>	
Degree of protection	IP20
Ambient temperature	- 20 °C ... + 60 °C
<b>Standards and approvals</b>	
<ul style="list-style-type: none"> <li>• PROFIBUS</li> <li>• EU directive</li> <li>• CENELEC</li> <li>• UL and CSA</li> </ul>	IEC 61784-1: 2002 Ed1 CP 3/1 94/9/EG (ATEX 100a) II 3 (2) G EEx nA[ib] IIC T4 Class I, Division2, Group A, B, C, D T4 Class I Zone 2, Group IIC T4 AIS Class I, Division 1, Group A, B, C, D [Aexib] IIC, Class I, Zone1, 2, Group IIC
<ul style="list-style-type: none"> <li>• FM</li> </ul>	Class I, Division2, Group A, B, C, D T4 Class I Zone 2, Group IIC T4 AIS Class I, Division 1, Group A, B, C, D [Aexib] IIC, Class I, Zone1, 2, Group IIC
<ul style="list-style-type: none"> <li>• IEC</li> <li>• CE</li> </ul>	IEC61131-2, Part 2 Conforming with 89/336/EWG Conforming with 73/23/EWG
<ul style="list-style-type: none"> <li>• Ship-building certification</li> </ul>	Classification companies <ul style="list-style-type: none"> <li>• ABS (American Bureau of Shipping)</li> <li>• BV (Bureau Veritas)</li> <li>• DNV (Det Norske Veritas)</li> <li>• GL (Germanischer Lloyd)</li> <li>• LRD (Lloyds Register of Shipping)</li> <li>• Class NK (Nippon Kaiji Kyokai)</li> </ul>
<b>Module-specific specifications</b>	
Data transmission rate on PROFIBUS DP, PROFIBUS RS 485-IS	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbit/s 1.5 Mbit/s
Bus protocol	PROFIBUS DP

Technical specifications RS 485-IS Coupler													
<b>Voltages, currents, potentials</b>													
Nominal supply voltage for RS 485-IS coupler	24 V DC (20.4 ... 28.8 V)												
<ul style="list-style-type: none"> <li>• Polarity reversal protection</li> <li>• Voltage drop bypass</li> </ul>	Yes Min. 5 ms												
Potential isolation for 24 V power supply													
<ul style="list-style-type: none"> <li>• to PROFIBUS DP</li> <li>- tested with</li> <li>• to PROFIBUS RS 485-IS</li> <li>- tested with</li> </ul>	Yes 500 V DC Yes 500 V AC												
Current consumption RS 485-IS coupler (24 V DC), max.	150 mA												
Power loss of the module, typically	3 Watts												
<b>Status, alarms, diagnostics</b>													
Status display	No												
Alarms	None												
Diagnostic functions													
<ul style="list-style-type: none"> <li>• Bus monitoring PROFIBUS DP (primary)</li> <li>• Bus monitoring PROFIBUS RS 485-IS (secondary)</li> <li>• Monitoring 24 V power supply</li> </ul>	Yellow LED "DP1" Yellow LED "DP2" Green LED "ON"												
<b>Technical safety notice</b>													
$V_{DC}$	$\pm 4.2$ V												
$I_{SC}$	$\pm 93$ mA												
$P_0$	0.1 Watts												
$V_{max}$	$\pm 4.2$ V												
$L_I$	0												
$C_i$	0												
$U_m$	250 V AC												
$T_a$	-25 ... +60 °C												
<b>RS 485-IS segment</b>													
Permitted cable length on a single line	<table border="1"> <thead> <tr> <th></th> <th>RS 485-IS</th> <th>DP Ex i</th> </tr> </thead> <tbody> <tr> <td>• 9.6 ... 187.5 kbit/s</td> <td>1,000 m</td> <td>200 m</td> </tr> <tr> <td>• 500 kbit/s</td> <td>400 m</td> <td>200 m</td> </tr> <tr> <td>• 1.5 Mbit/s</td> <td>200 m</td> <td>200 m</td> </tr> </tbody> </table>		RS 485-IS	DP Ex i	• 9.6 ... 187.5 kbit/s	1,000 m	200 m	• 500 kbit/s	400 m	200 m	• 1.5 Mbit/s	200 m	200 m
	RS 485-IS	DP Ex i											
• 9.6 ... 187.5 kbit/s	1,000 m	200 m											
• 500 kbit/s	400 m	200 m											
• 1.5 Mbit/s	200 m	200 m											
Number of PROFIBUS DP nodes that can be connected, max.	31	16											
PROFIBUS RS 485-IS bus termination	integrated, can be added switch												

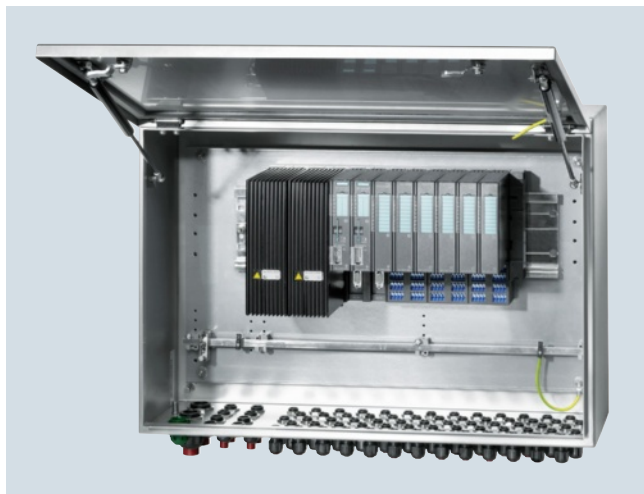
**I/O systems**

ET 200 systems for the control cabinet  
ET 200iSP

**RS 485-IS coupler**

Ordering data	Article No.		Article No.
<p><b>RS 485-IS coupler</b></p> <p>Isolating transformer for coupling of PROFIBUS DP and PROFIBUS RS 485-IS</p>	<p><b>6ES7972-0AC80-0XA0</b></p>	<p><b>Accessories</b></p> <p><b>PROFIBUS connector with active terminating resistor</b> For RS 485-IS circuit; 1.5 Mbit/s</p> <p><b>PROFIBUS cable connector</b> For the intrinsically safe PROFIBUS, 1.5 Mbit/s</p> <p><b>DIN rail</b> 160 mm 482 mm 530 mm 830 mm 2000 mm</p> <p><b>PROFIBUS FastConnect bus cable</b> Standard type with special design for quick assembly, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m</p>	<p><b>6ES7972-0DA60-0XA0</b></p> <p><b>6ES7972-0BA30-0XA0</b></p> <p><b>6ES7390-1AB60-0AA0</b></p> <p><b>6ES7390-1AE80-0AA0</b></p> <p><b>6ES7390-1AF30-0AA0</b></p> <p><b>6ES7390-1AJ30-0AA0</b></p> <p><b>6ES7390-1BC00-0AA0</b></p> <p><b>6XV1830-0EH10</b></p>

## Design



ET 200iSP modules can also be installed in stainless steel wall enclosures designed to meet more exacting protection requirements. The enclosures are available in various sizes. They comply with degree of protection IP65 and can be used in Ex zones 1 and 21.

Delivery is possible as an empty enclosure (6DL2804-0....) or including components (6DL2804-1.... or 6DL2804-2....), depending on the order. The ET 200iSP components and AirLINE Ex components (see Catalog "Add-ons for SIMATIC PCS 7") envisaged for installation must be ordered separately and delivered to the following address with reference to the enclosure order:

Siemens AG  
I IA CE SE MF\_PLAN \_CEN  
Ms. Vala  
(please enter a project name at this position)  
Siemensallee 84  
D-76187 Karlsruhe, Germany

## Ordering data

## Article No.

## Article No.

**Stainless steel enclosure IP65, protection class Ex e, suitable for Ex zones 1 and 21**

**Empty enclosure without installation of modules, for use in gas area (zones 1 and 2), IP65**

**Enclosure with hinged cover 650 x 450 x 230**

For the installation of max. 15 ET 200iSP modules, for use in gas area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets:

- 2 x M32 for infeed, 4 x M20 for bus cables, 39 x M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic
- 2 x M32 for infeed, 4 x M20 for bus cables, 39 x M16 (3 rows) for signal lines, and 2 rows of blanking plugs, all cable inlets of metal, for extended temperature range -40 ... +70 °C

6DL2804-0AD30

6DL2804-0AD31

- 2 x M32 for infeed, 4 x M20 for bus cables, 39 x M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic

6DL2804-0AD32

- 2 x M32 for infeed, 4 x M20 for bus cables, 36 x M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic

6DL2804-0AD42

- 2 x M32 for infeed, 4 x M20 for bus cables, 65 x M16 (5 rows) for signal lines, all cable inlets of black plastic

6DL2804-0AD50

- 2 x M32 for infeed, 4 x M20 for bus cables, 65 x M16 (5 rows) for signal lines, all cable inlets of metal, for extended temperature range -40 ... +70 °C

6DL2804-0AD51

- 2 x M32 for infeed, 4 x M20 for bus cables, 65 x M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic

6DL2804-0AD52

- 2 x M32 for infeed, 4 x M20 for bus cables, 60 x M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic

6DL2804-0AD62

**I/O systems**

ET 200 systems for the control cabinet

ET 200iSP

**Stainless steel wall enclosures****Ordering data****Article No.****Article No.****Enclosure with hinged cover  
950 × 450 × 230**

For the installation of max.  
25 ET 200iSP modules, for use in  
gas area, for temperature range  
-20 ... +70 °C, with equipotential  
bonding rail and cable inlets:

- 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines, and 2 rows of blanking plugs, all cable inlets of metal, for extended temperature range -40 ... +70 °C
- 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 57 × M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, all cable inlets of metal, for extended temperature range -40 ... +70 °C
- 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 90 × M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic

**6DL2804-0AE30****6DL2804-0AE31****6DL2804-0AE32****6DL2804-0AE42****6DL2804-0AE50****6DL2804-0AE51****6DL2804-0AE52****6DL2804-0AE62****Empty enclosure without installation of modules, for use in dust area (zones 21 and 22), IP65****Enclosure with hinged cover  
650 × 450 × 230**

For the installation of max.  
15 ET 200iSP modules, for use in  
dust area, for temperature range  
-20 ... +70 °C, with equipotential  
bonding rail and cable inlets:

- 2 × M32 for infeed, 4 × M20 for bus cables, 39 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 39 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 36 × M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 60 × M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic

**6DL2804-0DD30****6DL2804-0DD32****6DL2804-0DD42****6DL2804-0DD50****6DL2804-0DD52****6DL2804-0DD62**

Ordering data	Article No.	Article No.	
<b>Enclosure with hinged cover</b> <b>950 × 450 × 230</b> For the installation of max. 25 ET 200iSP modules, for use in dust area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 57 × M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, all cable inlets of black plastic</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 95 × M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic</li> </ul>	<b>6DL2804-0DE30</b>  <b>6DL2804-0DE32</b>  <b>6DL2804-0DE42</b>  <b>6DL2804-0DE50</b>  <b>6DL2804-0DE52</b>  <b>6DL2804-0DE62</b>	<b>Enclosure with hinged cover</b> <b>950 × 450 × 230</b> For the installation of max. 25 ET 200iSP modules, for use in mining (Cat. M2), for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> <li>• 6 × M25 for infeed, 9 × M32 (1 row) for signal lines, all cable inlets of metal</li> <li>• 6 × M25 for infeed, 18 × M32 (2 rows) for signal lines, all cable inlets of metal</li> </ul>	<b>6DL2804-0ME16</b>  <b>6DL2804-0ME26</b>
<b>Empty enclosure without installation of modules, for use in mining (Cat. M2), IP65</b>		<b>Enclosure with installation of ET 200iSP modules, for use in gas area (zones 1 and 2), IP65<sup>1)</sup></b>	
<b>Enclosure with hinged cover</b> <b>650 × 450 × 230</b> For the installation of max. 15 ET 200iSP modules, for use in mining (Cat. M2), for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> <li>• 6 × M25 for infeed, 6 × M32 (1 row) for signal lines, all cable inlets of metal</li> <li>• 6 × M25 for infeed, 12 × M32 (2 rows) for signal lines, all cable inlets of metal</li> </ul>	<b>6DL2804-0MD16</b>  <b>6DL2804-0MD26</b>	<b>Enclosure with hinged cover</b> <b>650 × 450 × 230</b> For installation of max. 15 ET 200iSP modules, for use in gas area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 39 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 39 × M16 (3 rows) for signal lines, and 2 rows of blanking plugs, all cable inlets of metal, minimum ambient operating temperature -30 °C (heater must be ordered separately)</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 39 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 36 × M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, all cable inlets of black plastic</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, all cable inlets of metal, minimum ambient operating temperature -30 °C (heater must be ordered separately)</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 60 × M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic</li> </ul>	<b>6DL2804-1AD30</b>  <b>6DL2804-1AD31</b>  <b>6DL2804-1AD32</b>  <b>6DL2804-1AD32</b>  <b>6DL2804-1AD32</b>  <b>6DL2804-1AD42</b>  <b>6DL2804-1AD50</b>  <b>6DL2804-1AD51</b>  <b>6DL2804-1AD52</b>  <b>6DL2804-1AD62</b>

<sup>1)</sup> The ET 200iSP components must be ordered separately.

## I/O systems

ET 200 systems for the control cabinet

ET 200iSP

### Stainless steel wall enclosures

#### Ordering data

##### Enclosure with hinged cover

**950 × 450 × 230**

For the installation of max. 25 ET 200iSP modules, for use in gas area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets:

- 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines, and 2 rows of blanking plugs, all cable inlets of metal, minimum ambient operating temperature -30 °C (heater must be ordered separately)
- 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 57 × M20 (3 rows) for signal lines, and 2 rows of blanking plugs, all cable inlets of metal, minimum ambient operating temperature -30 °C (heater must be ordered separately)
- 2 × M32 for infeed, 4 × M20 for bus cables, 57 × M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, all cable inlets of metal, minimum ambient operating temperature -30 °C (heater must be ordered separately)
- 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 95 × M20 (5 rows) for signal lines, all cable inlets of metal, minimum ambient operating temperature -30 °C (heater must be ordered separately)
- 2 × M32 for infeed, 4 × M20 for bus cables, 90 × M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic

#### Article No.

6DL2804-1AE30

6DL2804-1AE31

6DL2804-1AE32

6DL2804-1AE41

6DL2804-1AE42

6DL2804-1AE50

6DL2804-1AE51

6DL2804-1AE52

6DL2804-1AE61

6DL2804-1AE62

#### Article No.

##### Enclosure with installation of ET 200iSP modules, for use in dust area (zones 21 and 22), IP65<sup>1)</sup>

##### Enclosure with hinged cover

**650 × 450 × 230**

For the installation of max. 15 ET 200iSP modules, for use in dust area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets:

- 2 × M32 for infeed, 4 × M20 for bus cables, 39 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 39 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 36 × M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, all cable inlets of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, all cable inlets of metal, minimum ambient operating temperature -30 °C (heater must be ordered separately)
- 2 × M32 for infeed, 4 × M20 for bus cables, 65 × M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic
- 2 × M32 for infeed, 4 × M20 for bus cables, 60 × M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic

6DL2804-1DD30

6DL2804-1DD32

6DL2804-1DD42

6DL2804-1DD50

6DL2804-1DD51

6DL2804-1DD52

6DL2804-1DD62

<sup>1)</sup> The ET 200iSP components must be ordered separately.



Ordering data	Article No.	Article No.
<p><b>Enclosure with hinged cover</b>  <b>950 × 450 × 230</b>            For the installation of max. 25 ET 200iSP modules, for use in dust area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets:</p> <ul style="list-style-type: none"> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 66 × M16 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 and M16 of blue plastic, M32 of black plastic</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 57 × M20 (3 rows) for signal lines and 2 rows of blanking plugs, cable inlets M20 of blue plastic, M32 of black plastic</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, all cable inlets of black plastic</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 110 × M16 (5 rows) for signal lines, cable inlets M20 and M16 of blue plastic, M32 of black plastic</li> <li>• 2 × M32 for infeed, 4 × M20 for bus cables, 95 × M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic</li> </ul>	<p><b>6DL2804-1DE30</b></p> <p><b>6DL2804-1DE32</b></p> <p><b>6DL2804-1DE42</b></p> <p><b>6DL2804-1DE50</b></p> <p><b>6DL2804-1DE52</b></p> <p><b>6DL2804-1DE62</b></p>	<p><b>Enclosure with installation of ET 200iSP modules, for use in mining (Cat. M2), IP65</b></p> <p><b>Enclosure with hinged cover</b>  <b>650 × 450 × 230</b>            For the installation of max. 15 ET 200iSP modules, for use in mining (Cat. M2), for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets:</p> <ul style="list-style-type: none"> <li>• 6 × M25 for infeed, 6 × M32 (1 row) for signal lines, all cable inlets of metal</li> <li>• 6 × M25 for infeed, 12 × M32 (2 rows) for signal lines, all cable inlets of metal</li> </ul> <p><b>Enclosure with hinged cover</b>  <b>950 × 450 × 230</b>            For the installation of max. 25 ET 200iSP modules, for use in mining (Cat. M2), for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets:</p> <ul style="list-style-type: none"> <li>• 6 × M25 for infeed, 9 × M32 (1 row) for signal lines, all cable inlets of metal</li> <li>• 6 × M25 for infeed, 18 × M32 (2 rows) for signal lines, all cable inlets of metal</li> </ul>
		<p><b>6DL2804-1MD16</b></p> <p><b>6DL2804-1MD26</b></p> <p><b>6DL2804-1ME16</b></p> <p><b>6DL2804-1ME26</b></p>



## I/O systems

ET 200 systems for the control cabinet

ET 200iSP

### Stainless steel wall enclosures

Ordering data	Article No.	Article No.	
<b>Enclosure with installation of ET 200iSP and AirLINE Ex modules, for use in gaseous area (zones 1 and 2), IP65<sup>1)</sup></b>		<b>Enclosure with installation of ET 200iSP and AirLINE Ex modules, for use in dusty area (zones 21 and 22), IP65<sup>1)</sup></b>	
<b>Enclosure with hinged cover 650 x 450 x 230</b> For the installation of max. 15 ET 200iSP modules, for use in gas area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> <li>• 2 x M32 for infeed, 4 x M20 for bus cables, 39 x M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic</li> <li>• 2 x M32 for infeed, 4 x M20 for bus cables, 65 x M16 (5 rows) for signal lines, all cable inlets of black plastic</li> <li>• 2 x M32 for infeed, 4 x M20 for bus cables, 60 x M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic</li> </ul>	<b>6DL2804-2AD30</b>  <b>6DL2804-2AD50</b>  <b>6DL2804-2AD62</b>	<b>Enclosure with hinged cover 650 x 450 x 230</b> For the installation of max. 15 ET 200iSP modules, for use in dust area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> <li>• 2 x M32 for infeed, 4 x M20 for bus cables, 36 x M20 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic</li> </ul>	<b>6DL2804-2DD40</b>
<b>Enclosure with hinged cover 950 x 450 x 230</b> For the installation of max. 25 ET 200iSP modules, for use in gas area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> <li>• 2 x M32 for infeed, 4 x M20 for bus cables, 66 x M16 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic</li> <li>• 2 x M32 for infeed, 4 x M20 for bus cables, 110 x M16 (5 rows) for signal lines, all cable inlets of black plastic</li> <li>• 2 x M32 for infeed, 4 x M20 for bus cables, 95 x M20 (5 rows) for signal lines, cable inlets M20 of blue plastic, M32 of black plastic</li> </ul>	<b>6DL2804-2AE30</b>  <b>6DL2804-2AE50</b>  <b>6DL2804-2AE62</b>	<b>Enclosure with hinged cover 950 x 450 x 230</b> For installation of max. 25 ET 200iSP modules, for use in dust area, for temperature range -20 ... +70 °C, with equipotential bonding rail and cable inlets: <ul style="list-style-type: none"> <li>• 2 x M32 for infeed, 4 x M20 for bus cables, 57 x M20 (3 rows) for signal lines and 2 rows of blanking plugs, all cable inlets of black plastic</li> <li>• 2 x M32 for infeed, 4 x M20 for bus cables, 110 x M16 (5 rows) for signal lines, all cable inlets of black plastic</li> </ul>	<b>6DL2804-2DE40</b>  <b>6DL2804-2DE50</b>
		<b>Special configurations</b> See the section "Options".	

<sup>1)</sup> The AirLINE Ex components (see catalog "Add-ons for SIMATIC PCS 7") and the ET 200iSP components must be ordered separately.

### Options

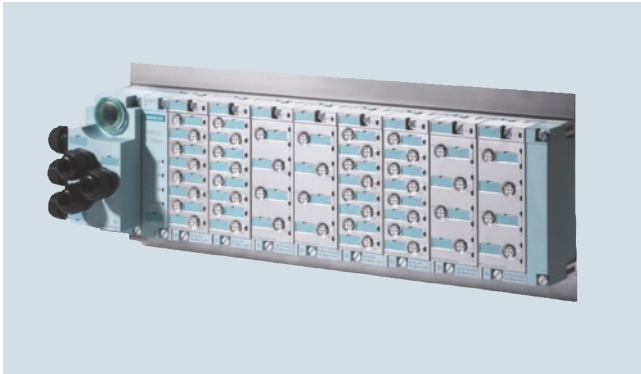
#### Special configurations

For all configurations which deviate from the described standard configurations the Article no. **6DL5711-8AB** must be listed as an additional order number alongside one of the specified basic article numbers.

The following additional information must be appended to the article number:

- Specification/description of the supplementary service and/or
- Reference to an offer

### Overview



- SIMATIC ET 200pro distributed I/O system with IP65/67 degree of protection for cabinet-free use at the machine.
- Small, multifunctional complete solution: Digital inputs/ outputs, fail-safe modules, motor starters up to 5.5 kW, etc.
- Communication over PROFIBUS or PROFINET
- Mixed arrangement of fail-safe and standard modules in the same station
- Freely selectable connection technique: Direct, ECOFAST or M12 7/8"
- Power module for easy implementation of load groups
- Module replacement during operation (hot swapping)
- Easy installation as well as permanent wiring
- Transmission rate for PROFIBUS DP up to 12 Mbit/s
- Extensive diagnostics: Module-specific or channel-specific
- Intelligent motor starters for starting and protection of motors and loads up to 5.5 kW
  - Versions: Direct and reversing starters - Standard and High Feature
- Fail-safe motor starters
- Fail-safe modules with safety-related signal processing according to PROFIsafe
- Frequency converters
- RFID communication modules
- Pneumatic interface modules

### Technical specifications

General technical specifications	
Electronic modules	<ul style="list-style-type: none"> <li>• Digital inputs/outputs</li> <li>• Analog inputs</li> <li>• Analog outputs</li> </ul>
Connections	M12 and M8 round connector with standard assignment for actuator/ sensor
Transmission rate, max.	12 Mbit/s (PROFIBUS DP), 100 Mbit/s (PROFINET IO)
Supply voltage	24 V DC
Current consumption of one ET 200pro (internal and encoder supply, non-switched voltage), up to 55 °C, max.	≤ 5 A
Load current for ET 200pro per incoming supply (IM, PM, switched voltage), up to 55 °C, max.	10 A
For overall configuration with looping through (multiple ET 200pros), up to 55 °C, max.	16 A (with connecting module, directly)
Degree of protection	IP65/66/IP67 for interface, digital and analog modules
Material	Thermoplastic (reinforced with glass fiber)

Environmental conditions	
Temperature	From -25 °C/0 °C to +55 °C
Relative humidity	From 5 to 100%
Air pressure	From 795 to 1080 hPa
Mechanical stress	
• Vibration	Vibration test according to IEC 60068, Part 2-6 (sinusoidal) <ul style="list-style-type: none"> <li>• Constant acceleration 5 g, occasionally 10 g for interface, digital and analog modules</li> <li>• 2 g motor starters</li> </ul>
• Shock	Shock test according to IEC 680068 Part 2-27, half-sine, 30 g, 18 ms duration for interface, digital and analog modules <ul style="list-style-type: none"> <li>• 15 g, 11 ms duration for motor starters</li> </ul>
Approvals	UL, CSA or cULus

## I/O systems

ET 200 systems without control cabinet

ET 200pro – Interface modules

### IM 154-1 and IM 154-2

#### Overview



Interface modules for handling communication between the ET 200pro and the higher-level master over PROFIBUS DP.

#### Technical specifications

Article number	6ES7154-1AA01-0AB0	6ES7154-2AA01-0AB0
	ET200PRO, IM 154-1 DP	ET200PRO, IM154-2 DP HF
<b>Product type designation</b>		
<b>General information</b>		
Vendor identification (VendorID)	8118H	8119H
<b>Supply voltage</b>		
Rated value (DC)		
• 24 V DC	Yes	Yes
permissible range, lower limit (DC)	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V
<b>Load voltage 1L+</b>		
• Rated value (DC)	24 V	24 V
• short-circuit protection	Yes; over exchangeable fuses	Yes; over exchangeable fuses
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
<b>Input current</b>		
from supply voltage 1L+, max.	200 mA	200 mA
<b>Power losses</b>		
Power loss, typ.	5 W	5 W
<b>Address area</b>		
<b>Addressing volume</b>		
• Inputs	244 byte	244 byte
• Outputs	244 byte	244 byte
<b>PROFIBUS DP</b>		
• Automatic detection of transmission speed	Yes	Yes

**Technical specifications (continued)**

Article number	<b>6ES7154-1AA01-0AB0</b> ET200PRO, IM 154-1 DP	<b>6ES7154-2AA01-0AB0</b> ET200PRO, IM154-2 DP HF
<b>1st interface</b>		
Interface type	PROFIBUS DP	PROFIBUS DP
Physics	RS 485	RS 485
<b>Functionality</b>		
• DP slave	Yes	Yes
<b>DP slave</b>		
• Transmission rate, min.	9.6 kbit/s	9.6 kbit/s
• Transmission rate, max.	12 Mbit/s	12 Mbit/s
<b>Services</b>		
- SYNC/FREEZE	Yes	Yes
- Direct data exchange (slave-to-slave communication)	Yes	Yes
<b>Interrupts/diagnostics/ status information</b>		
<b>Diagnostics indication LED</b>		
• Bus fault BF (red)	Yes	Yes
• Group error SF (red)	Yes	Yes
• Monitoring 24 V voltage supply ON (green)	Yes	Yes
• Load voltage monitoring DC 24 V (green)	Yes	Yes
<b>Parameter</b>		
DPV1 operation	possible	possible
Hardware interrupt	Parameterizable	Parameterizable
Swapping interrupt	Parameterizable	Parameterizable
Startup if setpoint not equal to actual configuration	Parameterizable	Parameterizable
<b>Galvanic isolation</b>		
between supply voltage and electronics	Yes	Yes
<b>Isolation</b>		
Isolation checked with	500 V DC	500 V DC
<b>Degree and class of protection</b>		
Degree of protection to EN 60529		
• IP67	Yes	Yes
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C	-25 °C
• max.	55 °C	55 °C
<b>Storage/transport temperature</b>		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
<b>Dimensions</b>		
Width	90 mm	90 mm
Height	130 mm	130 mm
Depth	59.3 mm	59.3 mm
<b>Weights</b>		
Weight, approx.	375 g	375 g

**I/O systems**

ET 200 systems without control cabinet

ET 200pro – Interface modules

**IM 154-1 and IM 154-2****Ordering data****Article No.****Article No.****IM154-1 interface module****6ES7154-1AA01-0AB0**

For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP.

**IM154-2 DP High Feature interface module****6ES7154-2AA01-0AB0**

For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP; supports PROFI-safe.

**Accessories****CM IM DP ECOFAST connection module****6ES7194-4AA00-0AA0**

For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 ECOFAST Cu connections.

**CM IM DP direct connection module****6ES7194-4AC00-0AA0**

For connecting PROFIBUS DP and the 24 V power supply directly to PROFIBUS interface modules, up to six M20 cable glands.

**CM IM DP M12, 7/8" connection module****6ES7194-4AD00-0AA0**

For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 x M12 and 2 x 7/8".

**Accessories for CM IM DP ECOFAST****PROFIBUS ECOFAST hybrid cable, preassembled**

With 2 ECOFAST connectors, trailing-type cable with 2 x CU 0.64 mm<sup>2</sup> and 4 x Cu 1.5 mm<sup>2</sup>, in various lengths:

1.5 m  
3.0 m  
5.0 m  
10 m  
15 m  
20 m  
25 m  
30 m  
35 m  
40 m  
45 m  
50 m

**6XV1830-7BH15**  
**6XV1830-7BH30**  
**6XV1830-7BH50**  
**6XV1830-7BN10**  
**6XV1830-7BN15**  
**6XV1830-7BN20**  
**6XV1830-7BN25**  
**6XV1830-7BN30**  
**6XV1830-7BN35**  
**6XV1830-7BN40**  
**6XV1830-7BN45**  
**6XV1830-7BN50**

**PROFIBUS ECOFAST hybrid cable GP, preassembled**

With 2 ECOFAST connectors, trailing-type cable with 2 x CU 0.64 mm<sup>2</sup> and 4 x Cu 1.5 mm<sup>2</sup>, in various lengths:

1.5 m  
3.0 m  
5.0 m  
10 m  
15 m  
20 m  
25 m  
30 m  
35 m  
40 m  
45 m  
50 m

**6XV1860-3PH15**  
**6XV1860-3PH30**  
**6XV1860-3PH50**  
**6XV1860-3PN10**  
**6XV1860-3PN15**  
**6XV1860-3PN20**  
**6XV1860-3PN25**  
**6XV1860-3PN30**  
**6XV1860-3PN35**  
**6XV1860-3PN40**  
**6XV1860-3PN45**  
**6XV1860-3PN50**

**PROFIBUS ECOFAST hybrid cable, non-assembled**

Trailing-type cable with 2 x CU 0.64 mm<sup>2</sup> and 4 x Cu 1.5 mm<sup>2</sup>, in various lengths:

50 m  
100 m

**6XV1830-7AN50**  
**6XV1830-7AT10**

**PROFIBUS ECOFAST hybrid cable GP, non-assembled**

Trailing-type cable with 2 x CU 0.64 mm<sup>2</sup> and 4 x Cu 1.5 mm<sup>2</sup>, in various lengths:

50 m  
100 m

**6XV1860-4PN50**  
**6XV1860-4PT10**

**PROFIBUS ECOFAST hybrid connector 180**

ECOFAST Cu, 2 x Cu, 4 x 1.5 mm<sup>2</sup>, HANBRID connector

- With male insert, 5-pack
- With female insert, 5-pack

**6GK1905-0CA00**  
**6GK1905-0CB00**

Ordering data	Article No.	Ordering data	Article No.
<b>PROFIBUS ECOFAST hybrid connector angular</b> ECOFAST Cu, 2 x Cu, 4 x 1.5 mm <sup>2</sup> , HANBRID connector <ul style="list-style-type: none"> <li>• With male insert, 5-pack</li> <li>• With female insert, 5-pack</li> </ul>	<b>6GK1905-0CC00</b> <b>6GK1905-0CD00</b>	<b>Accessories for CM IM DP M12, 7/8"</b> <b>PROFIBUS M12 connecting cable</b> Preassembled with two M12 connectors, 5-pin, in various lengths: <ul style="list-style-type: none"> <li>1.5 m</li> <li>2.0 m</li> <li>3.0 m</li> <li>5.0 m</li> <li>10 m</li> <li>15 m</li> </ul>	<b>6XV1830-3DH15</b> <b>6XV1830-3DH20</b> <b>6XV1830-3DH30</b> <b>6XV1830-3DH50</b> <b>6XV1830-3DN10</b> <b>6XV1830-3DN15</b>
<b>Accessories for CM IM DP direct</b> <b>PROFIBUS trailing cable</b> Max. acceleration 4 m/s <sup>2</sup> , at least 3 000 000 bending cycles, bending radius at least 60 mm, 2-core shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	<b>6XV1830-3EH10</b>	<b>7/8" connecting cable to power supply</b> 5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, preassembled with two 7/8" connectors, 5-pin, in various lengths: <ul style="list-style-type: none"> <li>1.5 m</li> <li>2.0 m</li> <li>3.0 m</li> <li>5.0 m</li> <li>10 m</li> <li>15 m</li> </ul>	<b>6XV1822-5BH15</b> <b>6XV1822-5BH20</b> <b>6XV1822-5BH30</b> <b>6XV1822-5BH50</b> <b>6XV1822-5BN10</b> <b>6XV1822-5BN15</b>
<b>PROFIBUS FC Food bus cable</b> With PE sheath for use in the food and beverages industry, 2-core, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	<b>6XV1830-0GH10</b>	<b>M12 cable connector</b> For ET 200eco, with axial cable outlet. <ul style="list-style-type: none"> <li>• With male insert, 5-pack</li> <li>• With female insert, 5-pack</li> </ul>	<b>6GK1905-0EA00</b> <b>6GK1905-0EB00</b>
<b>PROFIBUS FC Robust bus cable</b> With PUR sheath for use in environments subject to harsh chemicals and extreme mechanical stress, 2-core, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	<b>6XV1830-0JH10</b>	<b>PROFIBUS M12 bus termination connector</b> With male insert.	<b>6GK1905-0EC00</b>
<b>Power line</b> 5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	<b>6XV1830-8AH10</b>	<b>7/8" cable connector</b> For ET 200eco, with axial cable outlet. <ul style="list-style-type: none"> <li>• With male insert, 5-pack</li> <li>• With female insert, 5-pack</li> </ul>	<b>6GK1905-0FA00</b> <b>6GK1905-0FB00</b>
		<b>M12 sealing cap</b> For protection of unused M12 connections with ET 200pro.	<b>3RX9802-0AA00</b>
		<b>Sealing cap 7/8"</b> For protection of unused 7/8" connections with ET 200pro; 10 units per pack.	<b>6ES7194-3JA00-0AA0</b>

## I/O systems

ET 200 systems without control cabinet

ET 200pro – Interface modules

### IM 154-1 and IM 154-2

Ordering data	Article No.	Article No.
<b>General accessories</b>		
<b>ET 200pro rack</b>		
<ul style="list-style-type: none"> <li>Narrow, for interface, electronics and power modules               <ul style="list-style-type: none"> <li>- 500 mm</li> <li>- 1000 mm</li> <li>- 2000 mm, can be cut to length</li> </ul> </li> <li>Compact, for interface, electronics and power modules               <ul style="list-style-type: none"> <li>- 500 mm</li> <li>- 1000 mm</li> <li>- 2000 mm, can be cut to length</li> </ul> </li> <li>Wide, for interface, electronics, power modules and motor starters               <ul style="list-style-type: none"> <li>- 500 mm</li> <li>- 1000 mm</li> <li>- 2000 mm, can be cut to length</li> </ul> </li> <li>Wide, for I/O modules and motor starters               <ul style="list-style-type: none"> <li>- 500 mm</li> <li>- 1000 mm</li> <li>- 2000 mm</li> </ul> </li> </ul>	<b>6ES7194-4GA00-0AA0</b> <b>6ES7194-4GA60-0AA0</b> <b>6ES7194-4GA20-0AA0</b>  <b>6ES7194-4GC70-0AA0</b> <b>6ES7194-4GC60-0AA0</b> <b>6ES7194-4GC20-0AA0</b>  <b>6ES7194-4GB00-0AA0</b> <b>6ES7194-4GB60-0AA0</b> <b>6ES7194-4GB20-0AA0</b>  <b>6ES7194-4GD00-0AA0</b> <b>6ES7194-4GD10-0AA0</b> <b>6ES7194-4GD20-0AA0</b>	
<b>Spare fuse</b>	<b>6ES7194-4HB00-0AA0</b>	
12.5 A fast-blow, for interface and power modules, 10 units per pack.		
<b>PROFIBUS FastConnect bus cable</b>	<b>6XV1830-0EH10</b>	
Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m.		
		<b>PROFIBUS Hybrid Standard Cable GP</b>
		Standard PROFIBUS hybrid cable with 2 energy cables (1.5 mm <sup>2</sup> ) for supplying data and energy for ET 200pro.
		<b>SIMATIC Manual Collection</b>
		Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication).
		<b>SIMATIC Manual Collection – Update service for 1 year</b>
		Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates.
		<b>6XV1860-2R</b>
		<b>6ES7998-8XC01-8YE0</b>
		<b>6ES7998-8XC01-8YE2</b>

## Overview



Interface module for processing the communication between ET 200pro and a higher-level controller over PROFINET IO.

## Technical specifications

Article number	<b>6ES7154-4AB10-0AB0</b> ET200PRO, IM 154-4 PN HF
<b>Product type designation</b>	
<b>General information</b>	
Vendor identification (VendorID)	0x002A
Device identifier (DeviceID)	0x0305
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V; Unit [V]
permissible range, upper limit (DC)	28.8 V; Unit [V]
<b>Load voltage 1L+</b>	
• Rated value (DC)	24 V
• short-circuit protection	Yes; Fuse in lower part is exchangeable, the fuse on the IM-LP is not
• Reverse polarity protection	Yes; against destruction
<b>Input current</b>	
from supply voltage 1L+, max.	400 mA; Dependent on terminal module, typ. maximum value for FO connection method, full load on RWB and 20.4 V input voltage
<b>Power losses</b>	
Power loss, typ.	6 W; Dependent on terminal module, typ. maximum value for CU connection method, full load on RWB, for FO the value is approx. 0.7 W higher
<b>Memory</b>	
Micro Memory Card	No; Internal memory medium

Article number	<b>6ES7154-4AB10-0AB0</b> ET200PRO, IM 154-4 PN HF
<b>Address area</b>	
<b>Addressing volume</b>	
• Inputs	256 byte
• Outputs	256 byte
<b>Interfaces</b>	
<b>PROFINET IO</b>	
• Automatic detection of transmission speed	Yes
• Transmission rate, max.	100 Mbit/s
• Services	ARP, PING, SNMP
<b>Protocols</b>	
PROFINET IO	Yes
<b>Interrupts/diagnostics/status information</b>	
<b>Diagnostics indication LED</b>	
• Bus fault BF (red)	Yes; Additional LEDs (MAINT, P1/2 LINK, P1/2 RX/TX) available
• Group error SF (red)	Yes
• Monitoring 24 V voltage supply ON (green)	Yes
• Load voltage monitoring DC 24 V (green)	Yes



## I/O systems

ET 200 systems without control cabinet

ET 200pro – Interface modules

### IM 154-4 PN

#### Technical specifications (continued)

Article number	<b>6ES7154-4AB10-0AB0</b> ET200PRO, IM 154-4 PN HF	
<b>Parameter</b>		
Diagnostic alarm	1	
Hardware interrupt	1	
Swapping interrupt	1	
identifier-related diagnostic data	1	
Module status	1	
Channel-related diagnostics	1	
Startup if setpoint not equal to actual configuration	1	
Hot swapping of modules	1	
<b>Galvanic isolation</b>		
between backplane bus and electronics	No	
between supply voltage and electronics	Yes	
<b>Isolation</b>		
Isolation checked with	500 V DC	

Article number	<b>6ES7154-4AB10-0AB0</b> ET200PRO, IM 154-4 PN HF	
<b>Degree and class of protection</b>		
Degree of protection to EN 60529		
• IP65	Yes	
• IP66	Yes	
• IP67	Yes	
<b>Ambient conditions</b>		
<b>Ambient temperature in operation</b>		
• Min.	-25 °C	
• max.	55 °C	
<b>Storage/transport temperature</b>		
• Min.	-40 °C	
• max.	70 °C	
<b>Dimensions</b>		
Width	135 mm	
Height	130 mm	
Depth	59.3 mm	
<b>Weights</b>		
Weight, approx.	490 g	

#### Ordering data

#### Article No.

<b>IM 154-4 PN High Feature interface module</b>	<b>6ES7154-4AB10-0AB0</b>
For communication between ET 200pro and higher-level controllers over PROFINET IO; support of PROFI-safe.	
<b>Accessories</b>	
<b>CM IM PN connection module M12, 7/8"</b>	<b>6ES7194-4AJ00-0AA0</b>
For connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x M12 and 2 x 7/8".	
<b>CM IM PN connection module 2xRJ45</b>	<b>6ES7194-4AF00-0AA0</b>
For connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x RJ45 and 2 x push-pull power connector.	
<b>CM IM PN 2xSCRJ FO connection module</b>	<b>6ES7194-4AG00-0AA0</b>
For connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x SCRJ FO and 2 x push-pull power connector.	

#### Article No.

<b>M12 sealing cap</b>	<b>3RX9 802-0AA00</b>
For protection of unused M12 connections with ET 200pro.	
<b>IE M12 connecting cables</b>	
Preassembled with two M12 connectors, up to 85 m, in various lengths:	
0.3 m	<b>6XV1 870-8AE30</b>
0.5 m	<b>6XV1 870-8AE50</b>
1.0 m	<b>6XV1 870-8AH10</b>
1.5 m	<b>6XV1 870-8AH15</b>
2.0 m	<b>6XV1 870-8AH20</b>
3.0 m	<b>6XV1 870-8AH30</b>
5.0 m	<b>6XV1 870-8AH50</b>
10 m	<b>6XV1 870-8AN10</b>
15 m	<b>6XV1 870-8AN15</b>
Other special lengths with 90° or 180° cable outlet.	See <a href="http://support.automation.siemens.com/WWW/view/en/26999294">http://support.automation.siemens.com/WWW/view/en/26999294</a>
<b>7/8" sealing caps</b>	<b>6ES7194-3JA00-0AA0</b>
1 pack = 10 units	

Ordering data	Article No.	Article No.	
<b>7/8" connecting cable to power supply</b> 5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, preassembled with two 7/8" connectors, 5-pin, up to 50 m, in various lengths: 1.5 m 2.0 m 3.0 m 5.0 m 10 m 15 m Other special lengths with 90° or 180° cable outlet.	6XV1 822-5BH15 6XV1 822-5BH20 6XV1 822-5BH30 6XV1 822-5BH50 6XV1 822-5BN10 6XV1 822-5BN15 See <a href="http://support.automation.siemens.com/WWW/view/en/26999294">http://support.automation.siemens.com/WWW/view/en/26999294</a>	<b>IE RJ45 Plug PRO</b> RJ45 plug in IP65/67-rated design for on-site assembly, plastic housing, insulation/displacement connection system, for SCALANCE X-200IRT PRO and ET200pro; 1 pack = 1 unit.	<b>6GK1901-1BB10-6AA0</b>
<b>Power line</b> 5-core, 5 x 1.5 mm <sup>2</sup> , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	<b>6XV1 830-8AH10</b>	<b>IE SC RJ POF Plug PRO</b> SC RJ plug for POF fibers in IP65/67-rated design for on-site assembly, plastic housing, for SCALANCE X-200IRT PRO and ET200pro; 1 pack = 1 unit	<b>6GK1900-0MB00-6AA0</b>
<b>7/8" cable connector</b> For ET 200eco, with axial cable outlet. <ul style="list-style-type: none"> <li>• With male insert, 5-pack</li> <li>• With female insert, 5-pack</li> </ul>	<b>6GK1 905-0FA00</b> <b>6GK1 905-0FB00</b>	<b>IE SC RJ PCF Plug PRO</b> SC RJ plug connector for PCF fibers in IP65/67-rated design for on-site assembly, plastic housing, for SCALANCE X-200IRT PRO; 1 pack = 1 unit.	<b>6GK1900-0NB00-6AA0</b>
<b>Industrial Ethernet FastConnect installation cables</b> <ul style="list-style-type: none"> <li>• <b>IE FC TP Standard Cable GP 2 x 2;</b> Sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.</li> <li>• <b>IE FC TP Trailing Cable 2 x 2;</b> Sold by the meter, max. order quantity 1000 m; Minimum order quantity 20 m.</li> <li>• <b>IE FC TP Trailing Cable GP 2 x 2;</b> Sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.</li> <li>• <b>IE TP Torsion Cable GP 2 x 2;</b> Sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.</li> <li>• <b>IE FC TP Marine Cable 2 x 2;</b> Sold by the meter, max. order quantity 1000 m; Minimum order quantity 20 m.</li> </ul>	<b>6XV1 840-2AH10</b>  <b>6XV1 840-3AH10</b>  <b>6XV1 870-2D</b>  <b>6XV1 870-2F</b>  <b>6XV1 840-4AH10</b>	<b>Power Plug PRO</b> 5-pin power plug for 2 x 24 V power supply in IP65/67-rated design, for on-site assembly, plastic housing, for SCALANCE X-200IRT and ET200 pro; 1 pack = 1 unit.	<b>6GK1907-0AB10-6AA0</b>
		<b>IE panel feedthrough</b> Control cabinet feedthrough for converting M12 D-coded connection system (IP65) to RJ45 connection system (IP20). <ul style="list-style-type: none"> <li>• 1 pack = 5 units</li> </ul>	<b>6GK1 901-0DM20-2AA5</b>
		<b>Push-pull cable connector</b> For 1L+/ 2L+, unassembled	<b>6GK1 907-0AB10-6AA0</b>
		<b>Cover caps for Push-pull RJ45 female connectors</b> 5 items per pack	<b>6ES7194-4JD50-0AA0</b>

**I/O systems**

ET 200 systems without control cabinet

ET 200pro – Interface modules

**IM 154-4 PN**

<b>Ordering data</b>	<b>Article No.</b>	<b>Ordering data</b>	<b>Article No.</b>
<b>General accessories</b>		<b>Spare fuse</b>	<b>6ES7194-4HB00-0AA0</b>
<b>ET 200pro rack</b>		12.5 A fast-blow, for interface and power modules, 10 units per pack.	
• Narrow, for interface, electronics and power modules		<b>SIMATIC Manual Collection</b>	<b>6ES7998-8XC01-8YE0</b>
- 500 mm	<b>6ES7194-4GA00-0AA0</b>	Electronic manuals on DVD, multi-language:	
- 1000 mm	<b>6ES7194-4GA60-0AA0</b>	S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools,	
- 2000 mm, can be cut to length	<b>6ES7194-4GA20-0AA0</b>	Runtime Software, SIMATIC DP (distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication).	
• Compact, for interface, electronics and power modules		<b>SIMATIC Manual Collection – Update service for 1 year</b>	<b>6ES7998-8XC01-8YE2</b>
- 500 mm	<b>6ES7194-4GC70-0AA0</b>	Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates.	
- 1000 mm	<b>6ES7194-4GC60-0AA0</b>		
- 2000 mm, can be cut to length	<b>6ES7194-4GC20-0AA0</b>		
• Wide, for interface, electronics, power modules and motor starters			
- 500 mm	<b>6ES7194-4GB00-0AA0</b>		
- 1000 mm	<b>6ES7194-4GB60-0AA0</b>		
- 2000 mm, can be cut to length	<b>6ES7194-4GB20-0AA0</b>		
• Wide, for I/O modules and motor starters			
- 500 mm	<b>6ES7194-4GD00-0AA0</b>		
- 1000 mm	<b>6ES7194-4GD10-0AA0</b>		
- 2000 mm	<b>6ES7194-4GD20-0AA0</b>		

## Overview



Interface module IM 154-6 PN IWLAN for handling communication between ET 200pro and host PROFINET IO controller over Industrial Wireless LAN (IWLAN) wireless networks for 2.4 GHz or 5 GHz with data transfer rates up to 54 Mbit/s.

- Protection against illegal access, espionage, tapping and falsification through use of effective encryption mechanisms
- Fast replacement of devices through use of the SIMATIC Micro Memory Card swap medium
- With country permit for USA only

## Technical specifications

IM 154-6 PN IWLAN interface module	6ES7154-6AB50-0AB0
Supply voltage for electronic components 1L+	
• Rated value	24 V DC
• Valid range, lower limit	20.4 V DC
• Valid range, upper limit	28.8 V DC
• Short-circuit protection	Yes; replaceable fuse
• Reverse polarity protection	Yes; against destruction
• Max. infeed current	5 A
Load voltage 2L+	
• Rated value (DC)	24 V DC
• Lower limit of permissible range (DC)	20.4 V DC
• Upper limit of permissible range (DC)	28.8 V DC
• Short-circuit protection	Yes, for potential group
• Reverse polarity protection	Yes; against destruction
• Max. infeed current	8 A
Current consumption from supply voltage 1L+, typ.	335 mA
Power loss, typ.	8.5 W
Memory type	Micro Memory Card, is required
Address range/address volume	
• Outputs	256 byte
• Inputs	256 byte
Reports	
• PROFINET IO	Yes
• Industrial Wireless LAN	Yes

IM 154-6 PN IWLAN interface module	6ES7154-6AB50-0AB0
PROFINET IO services	ARP, PING, SNMP
Industrial Wireless LAN	
• Transmission rate, max.	54 Mbit/s
• Standards for wireless communication	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11e IEEE 802.11i
• Radio frequency for WLAN in 2.4 GHz frequency band	2,4 ... 2.4835 GHz
• Radio frequency for WLAN in 5 GHz frequency band	5,15 ... 5.825 GHz
• Transmission method	Direct Sequence Spread Spectrum (DSSS) Complementary Code Keying (CCK) Orthogonal Frequency Division Multiplexing (OFDM)
• Supported IWLAN services	Current approvals can be found in the Internet at <a href="http://support.automation.siemens.com/WW/view/en/19812553">http://support.automation.siemens.com/WW/view/en/19812553</a>
• Connection for external antenna	

**I/O systems**

ET 200 systems without control cabinet

ET 200pro – Interface modules

**IM 154-6 PN IWLAN****Technical specifications** (continued)

<b>IM 154-6 PN IWLAN interface module</b>	<b>6ES7154-6AB50-0AB0</b>
Parameters	
• Diagnostic interrupt	Yes
• Maintenance alarm	Yes
• Hardware interrupt	Yes
• Swapping interrupt	Yes
• Identifier-related diagnostic data	Yes
• Module status	Yes
• Channel-specific diagnostics	Yes
• Start-up if preset configuration is not equal to actual configuration	Yes
• Module replacement during operation	Yes
Diagnostics indication (LED)	Yes
• Group fault (red)	Yes
• Bus fault (red)	Yes
• Maintenance information (yellow)	Yes
• Monitoring 24 V power supply ON (green)	Yes
• Load voltage monitoring 24 V DC (green)	Yes
• Connection to an Access Point R1 LINK (green)	Yes
• Data exchange R1 RX/TX (yellow)	Yes
• Connection to a PG/PC (green)	Yes
• Data exchange with a PG/PC (yellow)	Yes
Insulation tested at	500 V DC

<b>IM 154-6 PN IWLAN interface module</b>	<b>6ES7154-6AB50-0AB0</b>
Isolation	
• Between the backplane bus and supply voltage 1L+ and 2L+	Yes
• Between Ethernet and supply voltage 1L+ and 2L+	Yes
• Between the supply voltage and electronic components	Yes
Operating temperature	
• Minimum	-25 °C
• Maximum	55 °C
Storage/transport temperature	
• Minimum	-40 °C
• Maximum	70 °C
Degree of protection	IP65, IP66, IP67
General information	
• Manufacturer's code (VendorID)	0x002A
• Device ID	0x0305
Dimensions	
• Width	135 mm
• Height	130 mm
• Depth	60 mm
Weight, approx.	1085 g

**Ordering data****Article No.****Article No.****IM 154-6 PN HF IWLAN interface module**

For communication between ET 200pro and higher-level controllers over Industrial Wireless LAN (IWLAN) radio networks; support of PROFI-safe.

With country permit for USA

**6ES7154-6AB50-0AB0****Antennas with omnidirectional characteristic**

Mounting directly on IM154-6 PN HF IWLAN

• ANT IM 154-6 IWLAN; 2 units

**6ES7194-4MA00-0AA0**

For wall or mast mounting

• ANT 792-6MN; rod antenna N-Connect female 2.4 GHz; 1 unit

**6GK5792-6MN00-0AA6**

• ANT793-6MN; rod antenna N-Connect female 5 GHz; 1 unit

**6GK5793-6MN00-0AA6**

For use with the RCoax antenna system

• ANT 792-4DN; RCoax N-Connect female 2.4 GHz; 1 unit

**6GK5792-4DN00-0AA6**

• ANT793-4MN; RCoax N-Connect female 5 GHz; 1 unit

**6GK5793-4MN00-0AA6****Antenna cables IWLAN RCoax; N-Connect / R-SMA**

1 m

**6XV1875-5CH10**

2 m

**6XV1875-5CH20**

5 m

**6XV1875-5CH50**

10 m

**6XV1875-5CN10**

IWLAN terminating resistor 50 ohms for second R-SMA antenna socket, 3 units.

**6GK5795-1TR10-0AA6****Accessories****7/8" connecting cable to power supply**5-core, 5 x 1.5 mm<sup>2</sup>, trailing type, preassembled with two 7/8" connectors, in various lengths:

1.5 m

**6XV1822-5BH15**

2.0 m

**6XV1822-5BH20**

3.0 m

**6XV1822-5BH30**

5.0 m

**6XV1822-5BH50**

10 m

**6XV1822-5BN10**

15 m

**6XV1822-5BN15**

Other special lengths with 90° or 180° cable outlet.

see <http://support.automation.siemens.com/WW/view/en/26999294>**Power line****6XV1830-8AH10**5-core, 5 x 1.5 mm<sup>2</sup>, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.**7/8" cable connector****6GK1905-0FB00**

For ET 200eco, with axial cable outlet; with female contact insert, pack of 5.

**Twisted Pair cables 4x2 with RJ45 connectors**

0.5 m

**6XV1870-3QE50**

1 m

**6XV1870-3QH10**

2 m

**6XV1870-3QH20**

6 m

**6XV1870-3QH60**

10 m

**6XV1870-3QN10**

Ordering data	Article No.	Article No.
<b>Crossed Twisted Pair cables 4x2 with RJ45 connectors</b> 0.5 m 1 m 2 m 6 m 10 m	6XV1870-3RE50 6XV1870-3RH10 6XV1870-3RH20 6XV1870-3RH60 6XV1870-3RN10	<b>General accessories</b> <b>ET 200pro module rack</b> <ul style="list-style-type: none"> <li>Narrow, for interface, electronics and power modules               <ul style="list-style-type: none"> <li>500 mm</li> <li>1000 mm</li> <li>2000 mm, can be cut to length</li> </ul> </li> <li>Compact, for interface, electronics and power modules               <ul style="list-style-type: none"> <li>500 mm</li> <li>1000 mm</li> <li>2000 mm, can be cut to length</li> </ul> </li> <li>Wide, for interface, electronics, power modules and motor starters               <ul style="list-style-type: none"> <li>500 mm</li> <li>1000 mm</li> <li>2000 mm, can be cut to length</li> </ul> </li> <li>Wide, for I/O modules and motor starters               <ul style="list-style-type: none"> <li>500 mm</li> <li>1000 mm</li> <li>2000 mm</li> </ul> </li> </ul>
<b>IE FC RJ45 Plug 180</b> 180° cable outlet; for line components and CPs/CPUs with Industrial Ethernet interface. <ul style="list-style-type: none"> <li>1 pack = 1 unit</li> <li>1 pack = 10 units</li> </ul>	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0	6ES7194-4GA00-0AA0 6ES7194-4GA60-0AA0 6ES7194-4GA20-0AA0 6ES7194-4GC70-0AA0 6ES7194-4GC60-0AA0 6ES7194-4GC20-0AA0 6ES7194-4GB00-0AA0 6ES7194-4GB60-0AA0 6ES7194-4GB20-0AA0 6ES7194-4GD00-0AA0 6ES7194-4GD10-0AA0 6ES7194-4GD20-0AA0
<b>IE FC RJ45 Plug 90</b> 90° cable outlet; e.g. for ET 200S. <ul style="list-style-type: none"> <li>1 pack = 1 unit</li> <li>1 pack = 10 units</li> </ul>	6GK1901-1BB20-2AA0 6GK1901-1BB20-2AB0	6ES7194-4HB00-0AA0
		<b>Spare fuse</b> 12.5 A quick-response, for interface and power modules, 10 units per pack.
		<b>Labels</b> 20 x 7 mm, pale turquoise, 340 units per pack.
		<b>SIMATIC Micro Memory Card</b> <ul style="list-style-type: none"> <li>64 KB</li> <li>128 KB</li> <li>512 KB</li> </ul>
		<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication).
		<b>SIMATIC Manual Collection – Update service for 1 year</b> Product package: Current DVD "S7 Manual Collection" and the three subsequent updates.

## I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

### Digital expansion modules

#### Overview



- Expansion modules with digital inputs/outputs for connection of actuators/sensors
- With scalable diagnostics
  - Standard modules with module-specific diagnostics
  - High-feature module with channel-specific diagnostics and parameterizable input delay or hardware interrupts
- Double or single assignment can be implemented for each M12 in the case of the 8DI and 8DO module by selecting CM IO 4 x M12 or CM IO 8 x M12
- IO connection modules are available in metal and plastic versions

#### Technical specifications

Article number	<b>6ES7141-4BF00-0AA0</b> ET200PRO, EM 8DI 24V DC	<b>6ES7141-4BF00-0AB0</b> ET200PRO, EM 8DI 24V DC HF	<b>6ES7141-4BH00-0AA0</b> ET200PRO, EM 16DI DC 24V
<b>Product type designation</b>			
<b>FH technology</b>			
Module for failsafe applications	No	No	No
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V
Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; against destruction; load increasing	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
<b>Input current</b>			
from backplane bus 3.3 V DC, max.	20 mA	40 mA	20 mA
from supply voltage 1L+, max.	20 mA	20 mA	30 mA
<b>Encoder supply</b>			
Number of outputs	8	8	8
<b>Output current</b>			
• up to 55 °C, max.	1 A	1 A	1 A
<b>Power losses</b>			
Power loss, typ.	2.5 W	2.5 W	3 W
<b>Address area</b>			
<b>Occupied address area</b>			
• Inputs	1 byte	1 byte	2 byte

**Technical specifications (continued)**

Article number	<b>6ES7141-4BF00-0AA0</b> ET200PRO, EM 8DI 24V DC	<b>6ES7141-4BF00-0AB0</b> ET200PRO, EM 8DI 24V DC HF	<b>6ES7141-4BH00-0AA0</b> ET200PRO, EM 16DI DC 24V
<b>Digital inputs</b>			
Number of digital inputs	8	8	16
Input characteristic curve in accordance with IEC 61131, type 1	Yes	No	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No	Yes	
<b>Number of simultaneously controllable inputs</b>			
<b>all mounting positions</b>			
- up to 55 °C, max.	8	8	16
<b>Input voltage</b>			
• Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-3 to +5V
• for signal "1"	13 to 30V	+11 to +30V	+11 to +30V
<b>Input current</b>			
• for signal "1", typ.	7 mA	7 mA	4 mA
<b>Input delay (for rated value of input voltage)</b>			
<b>for standard inputs</b>			
- Parameterizable	No	Yes	No
- at "0" to "1", min.	1.2 ms	0.5 ms; 0.5 ms/ 3ms/ 15 ms/ 20 ms	1.2 ms
- at "0" to "1", max.	4.8 ms	20 ms	4.8 ms
- at "1" to "0", min.	1.2 ms	0.5 ms; 0.5 ms/ 3ms/ 15 ms/ 20 ms	0.7 ms
- at "1" to "0", max.	4.8 ms	20 ms	3 ms
<b>Cable length</b>			
• shielded, max.	30 m	30 m	30 m
• Unshielded, max.	30 m	30 m	30 m
<b>Encoder</b>			
<b>Connectable encoders</b>			
• 2-wire sensor	Yes	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)	No	No	No
<b>Interrupts/diagnostics/status information</b>			
<b>Diagnostic messages</b>			
• Diagnostic functions	Yes	Yes; channel by channel, parameterizable	Yes
• Diagnostic information readable	Yes	Yes	Yes
• Wire break		Yes; Monitoring, I < 0.3 mA	
• Short circuit	Yes; Sensor supply to M; module by module	Yes	Yes; Sensor supply to M; module by module
• Group error			Yes
<b>Diagnostics indication LED</b>			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital input (green)	Yes; Per channel	Yes; Per channel	Yes; Per channel



**I/O systems**

ET 200 systems without control cabinet

ET 200pro – I/O modules

**Digital expansion modules****Technical specifications (continued)**

Article number	<b>6ES7141-4BF00-0AA0</b> ET200PRO, EM 8DI 24V DC	<b>6ES7141-4BF00-0AB0</b> ET200PRO, EM 8DI 24V DC HF	<b>6ES7141-4BH00-0AA0</b> ET200PRO, EM 16DI DC 24V
<b>Parameter</b>			
Diagnostic alarm		Yes	
Hardware interrupt		for 6 channels	
Diagnosis: wire break		channel by channel	
Diagnosis: short circuit	Sensor supply to M; module by module	channel by channel	
<b>Galvanic isolation</b>			
<b>Galvanic isolation digital inputs</b>			
• between the channels	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes
<b>Permissible potential difference</b>			
between different circuits	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>			
Isolation checked with	500 V DC	500 V DC	500 V DC
<b>Degree and class of protection</b>			
Degree of protection to EN 60529			
• IP65	Yes	Yes	Yes
• IP66	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
<b>Dimensions</b>			
Width	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm
Depth	35 mm	35 mm; without terminal module	35 mm
<b>Weights</b>			
Weight, approx.	140 g	140 g	140 g
Article number	<b>6ES7142-4BD00-0AA0</b> ET200PRO, EM 4DO 24V DC/2.0A	<b>6ES7142-4BD00-0AB0</b> ET200PRO, EM 4DO 24VDC/2.0A HF	<b>6ES7142-4BF00-0AA0</b> ET200PRO, EM 8DO DC24V/0.5A
<b>Product type designation</b>			
<b>FH technology</b>			
Module for failsafe applications	No	No	No
<b>Supply voltage</b>			
<b>Load voltage 2L+</b>			
• Rated value (DC)	24 V	24 V	24 V
• short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction; load increasing	Yes; against destruction; load increasing
<b>Input current</b>			
from load voltage 2L+ (without load), max.	20 mA	40 mA	30 mA
from backplane bus 3.3 V DC, max.	20 mA	40 mA	30 mA
<b>Power losses</b>			
Power loss, typ.	2 W	2.5 W	2 W
<b>Address area</b>			
<b>Address space per module</b>			
• with packing	4 bit	4 bit	8 bit
• without packing	1 byte	1 byte	1 byte

**Technical specifications (continued)**

Article number	<b>6ES7142-4BD00-0AA0</b> ET200PRO, EM 4DO 24V DC/2.0A	<b>6ES7142-4BD00-0AB0</b> ET200PRO, EM 4DO 24VDC/2.0A HF	<b>6ES7142-4BF00-0AA0</b> ET200PRO, EM 8DO DC24V/0.5A
<b>Digital outputs</b>			
Number of digital outputs	4	4	8
short-circuit protection	Yes	Yes	Yes
• Response threshold, typ.	3	3	0,7
Limitation of inductive shutdown voltage to	2L+ (-47 V)	2L+ (-47 V)	2L+ (-47 V)
Controlling a digital input	Yes	Yes	Yes; Isolation between 1L+ and 2L+ is no longer provided, as 1M and 2M are jumpered
<b>Switching capacity of the outputs</b>			
• on lamp load, max.	10 W	10 W	5 W
<b>Load resistance range</b>			
• lower limit	12 Ω	12 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ
<b>Output voltage</b>			
• for signal "1", min.	2L+ (-0,8 V)	2L+ (-0,8 V)	2L+ (-0,8 V)
<b>Output current</b>			
• for signal "1" rated value	2 A	2 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
<b>Parallel switching of 2 outputs</b>			
• for increased power	No	No	No
• for redundant control of a load	Yes	Yes	Yes
<b>Switching frequency</b>			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz	1 Hz
<b>Aggregate current of outputs (per group)</b>			
<b>all mounting positions</b> - up to 55 °C, max.	4 A	4 A	4 A
<b>Cable length</b>			
• shielded, max.	30 m	30 m	30 m
• Unshielded, max.	30 m	30 m	30 m
<b>Interrupts/diagnostics/status information</b>			
Substitute values connectable		Yes	
<b>Alarms</b>			
• Diagnostic alarm		Yes	
<b>Diagnostic messages</b>			
• Diagnostic functions	Yes	Yes	Yes
• Diagnostic information readable	Yes	Yes	Yes
• Wire break		Yes	
• Short circuit	Yes; Short-circuit of outputs to ground; module by module	Yes	Yes; Short-circuit of outputs to ground; module by module
<b>Diagnostics indication LED</b>			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes
• Channel error indicator F (red)		Yes	

**I/O systems**

ET 200 systems without control cabinet

ET 200pro – I/O modules

**Digital expansion modules****Technical specifications (continued)**

Article number	<b>6ES7142-4BD00-0AA0</b> ET200PRO, EM 4DO 24V DC/2.0A	<b>6ES7142-4BD00-0AB0</b> ET200PRO, EM 4DO 24VDC/2.0A HF	<b>6ES7142-4BF00-0AA0</b> ET200PRO, EM 8DO DC24V/0.5A
<b>Parameter</b>			
Diagnosis: wire break		channel by channel	
Diagnosis: short circuit		channel by channel	
Behavior on CPU/Master STOP		channel by channel	
<b>Galvanic isolation</b>			
between backplane bus and all other circuit components		Yes	
between the channels and backplane bus		Yes	
<b>Galvanic isolation digital outputs</b>			
• between the channels	No	No	No
• between the channels and the backplane bus	Yes	Yes	Yes
<b>Permissible potential difference</b>			
between different circuits		75V DC/60V AC	
<b>Isolation</b>			
Isolation checked with	500 V DC	500 V DC	500 V DC
<b>Dimensions</b>			
Width	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm
Depth	35 mm	35 mm; without terminal module	35 mm
<b>Weights</b>			
Weight, approx.	140 g	140 g	140 g

Article number	<b>6ES7143-4BF50-0AA0</b> ET200PRO, EM 4DI / 4DO DC 24V, 0.5A	<b>6ES7143-4BF00-0AA0</b> ET200PRO, EM 4 DIO / 4 DO DC 24V, 0.5A
<b>Product type designation</b>		
<b>Supply voltage</b>		
Rated value (DC)		
• 24 V DC	Yes	Yes
permissible range, lower limit (DC)	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V
Reverse polarity protection	Yes	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
<b>Load voltage 2L+</b>		
• Rated value (DC)	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V
• Reverse polarity protection	Yes	Yes; against destruction; load increasing
<b>Input current</b>		
from load voltage 1L+ (unswitched voltage)		20 mA
from load voltage 2L+, max.	20 mA	20 mA

**Technical specifications (continued)**

Article number	<b>6ES7143-4BF50-0AA0</b>	<b>6ES7143-4BF00-0AA0</b>
	ET200PRO, EM 4DI / 4DO DC 24V, 0.5A	ET200PRO, EM 4 DIO / 4 DO DC 24V, 0.5A
<b>Encoder supply</b>		
Number of outputs	4	4
<b>Output current</b>		
• nominal	1 A; per module, electronic	1 A; per module, electronic
<b>24 V encoder supply</b>		
• short-circuit protection	Yes; per module, electronic	Yes; per module, electronic
<b>Power losses</b>		
Power loss, typ.	2 W	3 W
<b>Digital inputs</b>		
Number of digital inputs	4	4; 4 DI0s can be parameterized
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
<b>Number of simultaneously controllable inputs all mounting positions</b>		
- up to 60 °C, max.		4; Up to 55 °C
<b>Input voltage</b>		
• Type of input voltage	DC	DC
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V
<b>Input current</b>		
• for signal "0", max. (permissible quiescent current)	1.5 mA	1.5 mA
• for signal "1", typ.	7 mA	7 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>		
- at "0" to "1", max.	3 ms	4.8 ms
- at "1" to "0", max.	3 ms	4.8 ms
<b>Cable length</b>		
• Unshielded, max.	30 m	30 m
<b>Digital outputs</b>		
Number of digital outputs	4	8; 4 DO fixed, 4 DIO parameterizable
• In groups of		4; 2 load groups for 4 outputs each
short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
• Response threshold, typ.	0,7 A	0,7 A
Limitation of inductive shutdown voltage to	Typ. (2L+) -47 V	Typ. (L1+, L2+) -47 V
Controlling a digital input	Yes	Yes
<b>Switching capacity of the outputs</b>		
• on lamp load, max.	5 W	5 W
<b>Output current</b>		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
<b>Parallel switching of 2 outputs</b>		
• for increased power	No	No
• for redundant control of a load	Yes	Yes
<b>Switching frequency</b>		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz
<b>Aggregate current of outputs (per group) all mounting positions</b>		
- up to 55 °C, max.	2 A	2 A
<b>Cable length</b>		
• Unshielded, max.	30 m	30 m

**I/O systems**

ET 200 systems without control cabinet

ET 200pro – I/O modules

**Digital expansion modules****Technical specifications** (continued)

Article number	<b>6ES7143-4BF50-0AA0</b> ET200PRO, EM 4DI / 4DO DC 24V, 0.5A	<b>6ES7143-4BF00-0AA0</b> ET200PRO, EM 4 DIO / 4 DO DC 24V, 0.5A
<b>Interrupts/diagnostics/ status information</b>		
Status indicator	Yes; Green LED	Yes; Green LED
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes
<b>Diagnostic messages</b>		
• Diagnostic functions	Yes	Yes
• Diagnostic information readable	Yes	Yes
• Short circuit	Yes; Short-circuit of outputs to ground; module by module	Yes; Short-circuit of outputs to ground; module by module
• Short circuit encoder supply	Yes; per module	Yes; per module
• Group error	Yes	Yes
<b>Galvanic isolation</b>		
between the load voltages	Yes	Yes
between load voltage and all other switching components	Yes	Yes
<b>Galvanic isolation digital inputs</b>		
• between the channels	No	No
<b>Permissible potential difference</b>		
between different circuits	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>		
<b>tested with</b>		
• 24 V DC circuits	500 V	500 V
<b>Dimensions</b>		
Width	45 mm	45 mm
Height	130 mm	130 mm
Depth	35 mm	35 mm
<b>Weights</b>		
Weight (without packaging)	140 g	140 g

Ordering data	Article No.	Ordering data	Article No.
<b>8 DI digital input module</b> 24 V DC, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7141-4BF00-0AA0	<b>Accessories</b>	
<b>8 DI High Feature digital input module</b> 24 V DC, with channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7141-4BF00-0AB0	<b>CM IO 4 x M12 connection module</b> 4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro	6ES7194-4CA00-0AA0
<b>16 DI digital input module</b> 24 V DC, with module-specific diagnostics, including bus module. Connection module 6ES7194-4CB50-0AA0 must be ordered separately	6ES7141-4BH00-0AA0	<b>CM IO 4 x M12 inverse connection module</b> 4 sockets M12 for connection of digital actuators to ET 200pro (4 DO and 4 DO HF); 2 x M12 single assignment, 2 x M12 double assignment	6ES7194-4CA50-0AA0
<b>4 DO digital output module</b> 24 V DC, 2 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7142-4BD00-0AA0	<b>CM IO 4 x M12 P connection module</b> 4 M12 sockets for connecting digital sensors/actuators to ET 200pro; plastic version	6ES7194-4CA10-0AA0
<b>4 DO High Feature digital output module</b> 24 V DC, 2 A, with channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7142-4BD00-0AB0	<b>CM IO 8 x M12 connection module</b> 8 M12 sockets for connecting digital sensors or actuators to ET 200pro	6ES7194-4CB00-0AA0
<b>8 DO digital output module</b> 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7142-4BF00-0AA0	<b>CM IO 8 x M12 P connection module</b> 8 M12 sockets for connecting digital sensors/actuators to ET 200pro; plastic version	6ES7194-4CB10-0AA0
<b>4 DI/4 DO digital input and output module</b> 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7143-4BF50-0AA0	<b>CM IO 8 x M12D connection module</b> 8 M12 sockets for connecting digital sensors or actuators to ET 200pro	6ES7194-4CB50-0AA0
<b>Digital input and output module 4 DIO / 4 DO</b> 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7143-4BF00-0AA0	<b>CM IO 8 x M8 connection module</b> 8 sockets M8 for connection of digital sensors or actuators to ET 200pro	6ES7194-4EB00-0AA0
		<b>CM IO 2 x M12 connection module</b> 2 M12 8-pin sockets; for use with: EM 8 DI, 24 V DC and 8 DO, 24 V DC/0.5 A	6ES7194-4FB00-0AA0
		<b>CM IO 1 x M23 connection module</b> 1 socket M23; for use with: EM 8 DI, 24 V DC and 8 DO, 24 V DC/0.5 A	6ES7194-4FA00-0AA0
		<b>Module identification labels</b> For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	6ES7194-4HA00-0AA0
		<b>M12 sealing cap</b> For protection of unused M12 connections with ET 200pro	3RX9802-0AA00
		<b>Labels</b> 20 x 7, pale turquoise, 340 items per pack	3RT1900-1SB20
		<b>Y circular connector M12</b> For double connection of sensors via a single cable, 5-pin; cannot be used for F DI 4/8	6ES7194-1KA01-0XA0
		<b>Y cable M12</b> For double connection of I/O by means of a single-cable on ET200, 5-pin	6ES7194-6KA00-0XA0
		<b>M8 sealing cap</b> For IP 67 modules	3RK1901-1PN00

## I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

### Analog expansion modules

#### Overview



- Expansion modules with analog inputs and outputs for connecting sensors/actuators
- With diagnostics functionality, limit values and substitute values

#### Technical specifications

Article number	6ES7144-4FF01-0AB0	6ES7144-4GF01-0AB0	6ES7144-4JF00-0AB0	6ES7144-4PF00-0AB0
	ET200PRO, EM 4AI-U HF	ET200PRO, EM 4AI-I HF	ET200PRO, EM 4 AI-RTD HF	ET200PRO, EM 4 AI-TC HF
<b>Product type designation</b>				
<b>Supply voltage</b>				
<b>Load voltage L+</b>				
• Rated value (DC)	24 V	24 V	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction	Yes; against destruction	Yes; against destruction
<b>Input current</b>				
from load voltage L+ (without load), max.				34 mA; Typical
from backplane bus 3.3 V DC, max.	12 mA; Typical	12 mA; Typical	10 mA; Typical	20 mA; Typical
<b>Encoder supply</b>				
short-circuit protection	Yes; per module, electronic to frame	Yes; per module, electronic to frame		
<b>Power losses</b>				
Power loss, typ.	1.1 W	1.1 W	0.7 W	0.7 W
<b>Address area</b>				
<b>Address space per module</b>				
• Address space per module, max.	8 byte	8 byte	8 byte	8 byte
<b>Analog inputs</b>				
Number of analog inputs	4	4	4	4
permissible input voltage for voltage input (destruction limit), max.	35 V			20 V
permissible input current for current input (destruction limit), max.		40 mA		
Constant measurement current for resistance-type transmitter, typ.			1.25 mA; 1.25 / 0.5 mA depending on measuring range	
Cycle time (all channels) max.	5 ms	10 ms	83 ms; 83 ms at 50 Hz; 69 ms at 60 Hz	Number of active channels per module x basic conversion time
Technical unit for temperature measurement adjustable			Yes	

**Technical specifications** (continued)

Article number	<b>6ES7144-4FF01-0AB0</b> ET200PRO, EM 4AI-U HF	<b>6ES7144-4GF01-0AB0</b> ET200PRO, EM 4AI-I HF	<b>6ES7144-4JF00-0AB0</b> ET200PRO, EM 4 AI-RTD HF	<b>6ES7144-4PF00-0AB0</b> ET200PRO, EM 4 AI-TC HF
<b>Input ranges</b>				
• Voltage	Yes	No	No	Yes
• Current	No	Yes	No	No
• Thermocouple	No	No	No	Yes
• Resistance thermometer	No	No	Yes	No
• Resistance	No	No	Yes	No
<b>Input ranges (rated values), voltages</b>				
• 0 to +10 V	Yes			
• 1 V to 5 V	Yes			
• -10 V to +10 V	Yes			
• -5 V to +5 V	Yes			
• -80 mV to +80 mV				Yes
• Input resistance (-80 mV to +80 mV)				10 MΩ
<b>Input ranges (rated values), currents</b>				
• 0 to 20 mA		Yes		
• Input resistance (0 to 20 mA)		50 Ω		
• -20 mA to +20 mA		Yes		
• Input resistance (-20 mA to +20 mA)		50 Ω		
• 4 mA to 20 mA		Yes		
• Input resistance (4 mA to 20 mA)		50 Ω		
<b>Input ranges (rated values), thermoelements</b>				
• Type B				Yes
• Input resistance (Type B)				10 MΩ
• Type E				Yes
• Input resistance (Type E)				10 MΩ
• Type J				Yes
• Input resistance (type J)				10 MΩ
• Type K				Yes
• Input resistance (Type K)				10 MΩ
• Type L				Yes
• Input resistance (Type L)				10 MΩ
• Type N				Yes
• Input resistance (Type N)				10 MΩ
• Type R				Yes
• Input resistance (Type R)				10 MΩ
• Type S				Yes
• Input resistance (Type S)				10 MΩ
• Type T				Yes
• Input resistance (Type T)				10 MΩ



**I/O systems**

ET 200 systems without control cabinet

ET 200pro – I/O modules

**Analog expansion modules****Technical specifications** (continued)

Article number	<b>6ES7144-4FF01-0AB0</b> ET200PRO, EM 4AI-U HF	<b>6ES7144-4GF01-0AB0</b> ET200PRO, EM 4AI-I HF	<b>6ES7144-4JF00-0AB0</b> ET200PRO, EM 4 AI-RTD HF	<b>6ES7144-4PF00-0AB0</b> ET200PRO, EM 4 AI-TC HF
<b>Input ranges (rated values), resistance thermometer</b>				
• Cu 10			No	
• Ni 100			Yes	
• Input resistance (Ni 100)			10 000 kΩ	
• Ni 1000			Yes	
• Input resistance (Ni 1000)			10 000 kΩ	
• Ni 120			Yes	
• Input resistance (Ni 120)			10 000 kΩ	
• Ni 200			Yes	
• Input resistance (Ni 200)			10 000 kΩ	
• Ni 500			Yes	
• Input resistance (Ni 500)			10 000 kΩ	
• Pt 100			Yes	
• Input resistance (Pt 100)			10 000 kΩ	
• Pt 1000			Yes	
• Input resistance (Pt 1000)			10 000 kΩ	
• Pt 200			Yes	
• Input resistance (Pt 200)			10 000 kΩ	
• Pt 500			Yes	
• Input resistance (Pt 500)			10 000 kΩ	
<b>Input ranges (rated values), resistors</b>				
• 0 to 150 ohms			Yes	
• Input resistance (0 to 150 ohms)			10 000 kΩ	
• 0 to 300 ohms			Yes	
• Input resistance (0 to 300 ohms)			10 000 kΩ	
• 0 to 600 ohms			Yes	
• Input resistance (0 to 600 ohms)			10 000 kΩ	
• 0 to 3000 ohms			Yes	
• Input resistance (0 to 3000 ohms)			10 000 kΩ	
<b>Thermocouple (TC)</b>				
<b>Temperature compensation</b>				
- internal temperature compensation				Yes
- external temperature compensation with compensations socket				Yes
<b>Characteristic linearization</b>				
• Parameterizable			Yes	
- for resistance thermometer			Ptxxx, Nixxx	
<b>Cable length</b>				
• shielded, max.	30 m	30 m	30 m	30 m

**Technical specifications (continued)**

Article number	<b>6ES7144-4FF01-0AB0</b> ET200PRO, EM 4AI-U HF	<b>6ES7144-4GF01-0AB0</b> ET200PRO, EM 4AI-I HF	<b>6ES7144-4JF00-0AB0</b> ET200PRO, EM 4 AI-RTD HF	<b>6ES7144-4PF00-0AB0</b> ET200PRO, EM 4 AI-TC HF
<b>Analog value generation for the inputs</b>				
Measurement principle	integrating	integrating	integrating	integrating
<b>Integration and conversion time/resolution per channel</b>				
<ul style="list-style-type: none"> <li>Resolution with overrange (bit including sign), max.</li> <li>Integration time (ms)</li> <li>Interference voltage suppression for interference frequency f1 in Hz</li> <li>Conversion time (per channel)</li> </ul>	15 bit; 15 bits + sign at ±10 V, at ±5 V; 15 bits at 0 V to 10 V, at 1 V to 5 V 0.3 / 16.7 / 20 / 60 16.67 / 50 / 60 / 3 600 1.1 ms	15 bit; 15 bits + sign at ±10 V, at ±5 V; 15 bits at 0 V to 10 V, at 1 V to 5 V 0.3 / 16.7 / 20 / 60 16.67 / 50 / 60 / 3 600 1.1 ms	15 bit; at 150, 300, 600 and 3000 ohms; otherwise 15 bits + sign 20 / 16.667 50 / 60 Hz 20.625 ms; 20.625 ms at 50 Hz; 17.25 ms at 60 Hz	15 bit; + sign 2.5 / 16.67 / 20 / 100 ms 10 / 50 / 60 / 400 Hz 4.7/19/22/102 ms
<b>Smoothing of measured values</b>				
<ul style="list-style-type: none"> <li>Parameterizable</li> <li>Step: None</li> <li>Step: low</li> <li>Step: Medium</li> <li>Step: High</li> </ul>	Yes Yes; 1 x cycle time Yes; 4 x cycle time Yes; 16 x cycle time Yes; 64 x cycle time	Yes Yes; 1 x cycle time Yes; 4 x cycle time Yes; 16 x cycle time Yes; 64 x cycle time	Yes Yes; 1 x cycle time Yes; 4 x cycle time Yes; 16 x cycle time Yes; 64 x cycle time	Yes Yes; 1 x cycle time Yes; 4 x cycle time Yes; 16 x cycle time Yes; 64 x cycle time
<b>Encoder</b>				
<b>Connection of signal encoders</b>				
<ul style="list-style-type: none"> <li>for current measurement as 2-wire transducer</li> <li>for current measurement as 4-wire transducer</li> <li>for resistance measurement with two-wire connection</li> <li>for resistance measurement with three-wire connection</li> <li>for resistance measurement with four-wire connection</li> </ul>		Yes Yes	Yes; Line resistances are also measured Yes Yes	
<b>Errors/accuracies</b>				
Linearity error (relative to input range), (+/-)	0.0075 %	0.0075 %	0.05 %	0.01 %
Temperature error (relative to input range), (+/-)	0.00075 %/K	0.00075 %/K	0.002 %/K	0.0004 %/K; Positive temperature
Crosstalk between the inputs, min.	-70 dB	-70 dB	-50 dB	-90 dB; max.
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.004 %	0.004 %	0.015 %	0.01 %
<b>Operational limit in overall temperature range</b>				
<ul style="list-style-type: none"> <li>Voltage, relative to input area, (+/-)</li> <li>Current, relative to input area, (+/-)</li> <li>Resistance thermometer, relative to input area, (+/-)</li> </ul>	0.1 %	0.1 %	0.175 %	0.12 %; Positive temperature
<b>Basic error limit (operational limit at 25 °C)</b>				
<ul style="list-style-type: none"> <li>Voltage, relative to input area, (+/-)</li> <li>Current, relative to input area, (+/-)</li> <li>Resistance thermometer, relative to input area, (+/-)</li> </ul>	0.075 %	0.075 %	0.125 %	0.1 %

**I/O systems**

ET 200 systems without control cabinet

ET 200pro – I/O modules

**Analog expansion modules****Technical specifications (continued)**

Article number	<b>6ES7144-4FF01-0AB0</b> ET200PRO, EM 4AI-U HF	<b>6ES7144-4GF01-0AB0</b> ET200PRO, EM 4AI-I HF	<b>6ES7144-4JF00-0AB0</b> ET200PRO, EM 4 AI-RTD HF	<b>6ES7144-4PF00-0AB0</b> ET200PRO, EM 4 AI-TC HF
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>				
<ul style="list-style-type: none"> <li>Series mode interference (peak value of interference &lt; rated value of input range), min.</li> <li>common mode voltage (USS &lt; 2.5 V), min.</li> </ul>			50 dB	42 dB
			70 dB; Interference voltage < 5 V	85 dB; Interference voltage < 10 V
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 0.5 \%)</math>, <math>f_1 =</math> interference frequency</b>				
<ul style="list-style-type: none"> <li>Series mode interference (peak value of interference &lt; rated value of input range), min.</li> <li>common mode voltage (USS &lt; 2.5 V), min.</li> </ul>	60 dB	60 dB		
	80 dB; Interference voltage < 10 V	80 dB; Interference voltage < 5 V		
<b>Interrupts/diagnostics/status information</b>				
<b>Alarms</b>				
<ul style="list-style-type: none"> <li>Diagnostic alarm</li> <li>Limit value alarm</li> <li>Hardware interrupt</li> </ul>	Yes; Parameterizable Yes Yes; (limit value alarm), can be parameterized for channel 0	Yes; Parameterizable Yes Yes; (limit value alarm), can be parameterized for channel 0	Yes; Parameterizable No	Yes; Parameterizable No
<b>Diagnostic messages</b>				
<ul style="list-style-type: none"> <li>Diagnostics</li> <li>Wire break</li> <li>Short circuit</li> <li>Group error</li> <li>Overflow/underflow</li> </ul>	Yes Yes; at 1 to 5 V Yes; at 1 to 5 V Yes	Yes Yes; at 4 to 20 mA Yes; at 4 to 20 mA Yes	Yes Yes Yes Yes	Yes Yes Yes Yes
<b>Diagnostics indication LED</b>				
<ul style="list-style-type: none"> <li>Group error SF (red)</li> </ul>	Yes	Yes	Yes	Yes
<b>Parameter</b>				
Diagnosis: wire break			Yes	Yes
Load voltage			No	
Measurement type/range			R4L / R3L / R2L/ TR4L / TR3L / TR2L	Deactivated/ +/- 80 mV/ TC-EL Type T (Cu-CuNi)/ TC-EL Type K (NiCr-Ni)/ TC-EL Type B (PtRh-PtRh)/ TC-EL Type N (NiCrSi-NiSi)/ TC-EL Type E (NiCr-CuNi)/ TC-EL Type R (PtRh-Pt)/ TC-EL Type S (PtRh-Pt)/ TC-EL Type J (Fe-Cu-Ni)/ TC-EL Type L (Fe-CuNi)
Interference frequency suppression			50 / 60 Hz	10 / 50 / 60 / 400 Hz
Group diagnostics			Yes	Yes
Overflow/underflow			Yes	Yes
Comparison point				None/internal/RTD(0)/dyn. ref. temp./fix. ref. temp.
Unit			Degrees C / Degrees F	°C/°F/K
<b>Galvanic isolation</b>				
<b>Galvanic isolation analog inputs</b>				
<ul style="list-style-type: none"> <li>between the channels</li> <li>between the channels and the backplane bus</li> <li>between the channels and the load voltage L+</li> </ul>	No Yes	No Yes	No Yes	No Yes Yes

#### Technical specifications (continued)

Article number	<b>6ES7144-4FF01-0AB0</b> ET200PRO, EM 4AI-U HF	<b>6ES7144-4GF01-0AB0</b> ET200PRO, EM 4AI-I HF	<b>6ES7144-4JF00-0AB0</b> ET200PRO, EM 4 AI-RTD HF	<b>6ES7144-4PF00-0AB0</b> ET200PRO, EM 4 AI-TC HF
<b>Permissible potential difference</b>				
between the inputs (UCM)			5 Vpp AC	20 Vpp AC
between inputs and MANA (UCM)	10 Vpp AC	5 Vpp AC		
between MANA and M internally (UISO)			500 V DC	
<b>Isolation</b>				
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC
<b>Dimensions</b>				
Width	45 mm	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm	130 mm
Depth	35 mm	35 mm	35 mm	35 mm
<b>Weights</b>				
Weight, approx.	150 g	150 g	150 g	150 g

Article number	<b>6ES7145-4FF00-0AB0</b> ET200PRO, EM 4AO-U HF	<b>6ES7145-4GF00-0AB0</b> ET200PRO, EM 4 AO-I HF
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage L+</b>		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
<b>Input current</b>		
from backplane bus 3.3 V DC, max.	10 mA	10 mA
<b>Address area</b>		
<b>Address space per module</b>		
• Address space per module, max.	8 byte	8 byte
<b>Analog outputs</b>		
Number of analog outputs	4	4
Voltage output, short-circuit protection	Yes; per channel, electronic to chassis	Yes; per module, electronic to frame
Voltage output, short-circuit current, max.	50 mA	
Current output, no-load voltage, max.		16 V
Cycle time (all channels) max.	3 ms	3 ms
<b>Output ranges, voltage</b>		
• 0 to 10 V	Yes	
• 1 V to 5 V	Yes	
• -10 V to +10 V	Yes	
<b>Output ranges, current</b>		
• 0 to 20 mA		Yes
• -20 mA to +20 mA		Yes
• 4 mA to 20 mA		Yes

**I/O systems**

ET 200 systems without control cabinet

ET 200pro – I/O modules

**Analog expansion modules****Technical specifications** (continued)

Article number	<b>6ES7145-4FF00-0AB0</b> ET200PRO, EM 4AO-U HF	<b>6ES7145-4GF00-0AB0</b> ET200PRO, EM 4 AO-I HF
<b>Connection of actuators</b>		
• for voltage output two-wire connection	Yes	
• for voltage output four-wire connection	Yes	
• for current output two-wire connection		Yes
• for current output four-wire connection		Yes
<b>Load impedance (in rated range of output)</b>		
• with voltage outputs, min.	1 000 ?	
• with voltage outputs, capacitive load, max.	1 µF	
• with current outputs, max.		600 ?
• with current outputs, inductive load, max.		1 mH
<b>Destruction limits against externally applied voltages and currents</b>		
• Voltages at the outputs towards MANA	16 V; Permanent	
• Current, max.		100 mA
<b>Cable length</b>		
• shielded, max.	30 m	30 m
<b>Analog value generation for the outputs</b>		
<b>Integration and conversion time/ resolution per channel</b>		
• Resolution with overrange (bit including sign), max.	15 bit; at -10 to +10 V; 14 bits at 1 to 5 V; 15 bits at 0 to 10 V	15 bit; at +/- 20 mA; 14 bits at 0 to 20 mA; 15 bits at 4 to 20 mA
• Conversion time (per channel)	0.7 ms	0.7 ms
<b>Settling time</b>		
• for resistive load	0.1 ms	0.1 ms
• for capacitive load	6 ms	
• for inductive load		1 ms
<b>Errors/accuracies</b>		
Output ripple (based on output area, bandwidth 0 to 50 kHz), (+/-)	0.02 %	0.02 %
Linearity error (relative to output range), (+/-)	0.1 %	0.1 %
Temperature error (relative to output range), (+/-)	0.01 %/K	0.01 %/K
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.05 %	0.05 %
<b>Operational limit in overall temperature range</b>		
• Voltage, relative to output area, (+/-)	0.2 %	
• Current, relative to output area, (+/-)		0.2 %
<b>Basic error limit (operational limit at 25 °C)</b>		
• Voltage, relative to output area, (+/-)	0.15 %	
• Current, relative to output area, (+/-)		0.15 %

**Technical specifications (continued)**

Article number	<b>6ES7145-4FF00-0AB0</b> ET200PRO, EM 4AO-U HF	<b>6ES7145-4GF00-0AB0</b> ET200PRO, EM 4 AO-I HF
<b>Interrupts/diagnostics/status information</b>		
Substitute values connectable	Yes	Yes
<b>Alarms</b>		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	No	No
<b>Diagnostic messages</b>		
• Diagnostic functions		Yes
• Diagnostic information readable	Yes	
• Wire break	No	Yes; per channel, not in zero range
• Short circuit	Yes; per channel, not in zero range	
• Short circuit encoder supply	Yes; per module	Yes; per module
<b>Diagnostics indication LED</b>		
• Group error SF (red)	Yes	Yes
<b>Parameter</b>		
Output type/range	1	1
Diagnosis: wire break		1
Diagnosis: short circuit	Outputs; sensor supply to M	Encoder supply to M
Group diagnostics	1	1
Behavior on CPU/Master STOP	1	1
<b>Galvanic isolation</b>		
<b>Galvanic isolation analog outputs</b>		
• between the channels	No	No
• between the channels and the backplane bus	Yes	Yes
<b>Dimensions</b>		
Width	45 mm	45 mm
Height	130 mm	130 mm
Depth	35 mm	35 mm
<b>Weights</b>		
Weight, approx.	150 g	150 g

## I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

### Analog expansion modules

Ordering data	Article No.	Ordering data	Article No.
<b>4AI U analog input module</b> High Feature, $\pm 10$ V; $\pm 5$ V; 0 to 10 V; 1 to 5 V, channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7144-4FF01-0AB0	<b>4AO I analog output module</b> High Feature, $\pm 20$ mA; 0 to 20 mA; 4 to 20 mA, channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7145-4GF00-0AB0
<b>4AI I analog input module</b> High Feature, $\pm 20$ mA; 0 to 20 mA; 4 to 20 mA, channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7144-4GF01-0AB0	<b>Accessories</b> <b>CM IO 4 x M12 connection module</b> 4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro	6ES7194-4CA00-0AA0
<b>4AI RTD analog input module</b> High Feature; resistances: 150, 300, 600 and 3000 Ohm; resistance thermometer: Pt100, 200, 500, 1000, Ni100, 120, 200, 500 and 1000; channel-discrete diagnostics, incl. bus module. Connection module must be ordered separately	6ES7144-4JF00-0AB0	<b>M12 compensation connectors</b> with integral PT100 for reference point compensation when connecting thermocouples	6ES7194-4AB00-0AA0
<b>Analog input module 4AI TC</b> High Feature; thermocouples: Type B, E, J, K, L, N, R, S, T; voltage measurement: $\pm 80$ mV; channel diagnostics, including bus module. Connection module must be ordered separately	6ES7144-4PF00-0AB0	<b>Module identification labels</b> for color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	6ES7194-4HA00-0AA0
<b>4AO U analog output module</b> High Feature, $\pm 10$ V; 0 to 10 V; 1 to 5 V, channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7145-4FF00-0AB0	<b>M12 sealing cap</b> for protection of unused M12 connections with ET 200pro	3RX9802-0AA00

## Overview



Fail-safe digital inputs/outputs with IP65/66/67 degree of protection for application on the machine level without control cabinet.

## Fail-safe digital inputs

- For fail-safe reading of sensor information (1 or 2 channels)
- Provide integral discrepancy evaluation for 2-out-of-2 signals
- Internal sensor supplies (incl. test function) available

## Fail-safe digital outputs

- Fail-safe 2-channel activation (sink/source output) by actuators
- Actuators can be driven by up to 2 A

All modules are certified up to SIL 3 (IEC 61508) and feature detailed diagnostics.

The modules support PROFIsafe, both in PROFIBUS, and in PROFINET configurations.

They can be used with IM151-7 F-CPU, CPU31xF-2 DP, CPU31xF-2 PN/DP and CPU416F-2.

## Technical specifications

Article number	<b>6ES7148-4FA00-0AB0</b> ET200PRO, EL-MOD., 8/16 F-DI 24V DC
<b>Product type designation</b>	
<b>Supply voltage</b>	
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Digital inputs</b>	
Number of digital inputs	16
<b>Input voltage</b>	
• Type of input voltage	DC
<b>Input current</b>	
• for signal "1", typ.	3.7 mA
<b>Dimensions</b>	
Width	90 mm
Height	130 mm
Depth	65 mm

Article number	<b>6ES7148-4FC00-0AB0</b> ET200PRO, EL-MOD, 4/8 F-DI/4 F-DO 24VDC/2A	<b>6ES7148-4FS00-0AB0</b> ET200PRO, EL-MOD, F-SWITCH PROFISAFE
<b>Product type designation</b>		
<b>Supply voltage</b>		
permissible range, lower limit (DC)	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V
<b>Digital inputs</b>		
Number of digital inputs	8	2
<b>Digital outputs</b>		
Number of digital outputs	4	3
short-circuit protection	Yes	Yes
<b>Output current</b>		
• for signal "1" rated value	2 A	
<b>Dimensions</b>		
Width	90 mm	45 mm
Height	130 mm	130 mm
Depth	65 mm	65 mm



## I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

### Fail-safe digital expansion modules

Ordering data	Article No.	Accessories	Article No.
<b>Fail-safe digital input module 8/16 F-DI PROFIsafe</b> 24 V DC, including bus module Connection module must be ordered separately	6ES7148-4FA00-0AB0	<b>Connection module</b> For the fail-safe electronic module F-switch PROFIsafe	6ES7194-4DA00-0AA0
<b>Fail-safe digital input/output module 4/8 F-DI, 4 F-DO 2 A</b> 24 V DC, including bus module Connection module must be ordered separately	6ES7148-4FC00-0AB0	<b>Connection module</b> For the fail-safe electronic module 4/8 F-DI/4 F DO, 24 V DC/2 A	6ES7194-4DC00-0AA0
<b>Fail-safe electronic module F-Switch PROFIsafe</b> Three fail-safe PP-switching outputs for safe switching of the rear panel busbar (2L+, F0, F1); two fail-safe digital inputs, 45 mm; usable up to SIL3 (IEC 61508)	6ES7148-4FS00-0AB0	<b>Connection module</b> For the fail-safe electronic module 8/16 F-DI, 24 V DC	6ES7194-4DD00-0AA0
		<b>PROFIBUS DP interface module IM154-2</b> Including termination module	6ES7154-2AA01-0AB0
		<b>PROFINET interface module IM154-4 PN</b> Including termination module	6ES7154-4AB10-0AB0
		<b>M12 sealing cap</b> For protection of unused M12 connections with ET 200pro	3RX9802-0AA00

## Overview



- PM-E 24 V DC power module

## Technical specifications

Article number	<b>6ES7148-4CA00-0AA0</b> ET200PRO, PM-E 24V DC
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Load voltage 2L+</b>	
• short-circuit protection	Yes; via an exchangeable fuse in the power module
• Reverse polarity protection	Yes; against destruction
<b>Current carrying capacity</b>	
max.	10 A; up to 55 °C (on the internal busbars of the ET 200pro)
<b>Interrupts/diagnostics/status information</b>	
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Missing load voltage	Yes
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
• Load voltage monitoring DC 24 V (green)	Yes

Article number	<b>6ES7148-4CA00-0AA0</b> ET200PRO, PM-E 24V DC
<b>Parameter</b>	
Missing load voltage	Potential group of the power module
<b>Isolation</b>	
Isolation checked with	500 V DC
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP65	Yes
• IP66	Yes
• IP67	Yes
<b>Dimensions</b>	
Width	15 mm
Height	81 mm
Depth	52 mm
<b>Weights</b>	
Weight, approx.	35 g

## I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

### PM-E power module

#### Ordering data

#### Article No.

##### PM-E 24 V DC power module

6ES7148-4CA00-0AA0

For backfeed and group formation of the 24 V DC load supply for electronic modules within an ET 200pro station.

##### Accessories

##### CM PM-E ECOFAST connecting module

6ES7194-4BA00-0AA0

For supplying 24 V load voltage, 1 ECOFAST Cu connection

##### CM PM-E direct connecting module

6ES7194-4BC00-0AA0

For supplying 24 V load voltage, up to 2 M20 screwed cable glands

##### CM PM-E 7/8" connecting module

6ES7194-4BD00-0AA0

For supplying 24 V load voltage, 1 x 7/8"

##### CM PM-E PP connection module

6ES7194-4BE00-0AA0

For supplying 24-V load voltage, 2 x push-pull, with spare fuse

##### Spare fuse

6ES7194-4HB00-0AA0

12.5 A quick-response, for interface and power modules, 10 items per package unit

##### PROFIBUS ECOFAST hybrid cable, copper

6XV1830-7AN50  
6XV1830-7AT10

Trailing-type cable (PUR casing) with two shielded copper cables for PROFIBUS DP and four copper cores of 1.5 mm<sup>2</sup> in cross-section

##### Unassembled

- 50 m
- 100 m

##### Preassembled

with ECOFAST male and female connector, fixed length

- 1.5 m
- 3 m
- 5 m
- 10 m
- 15 m
- 20 m
- 25 m
- 30 m
- 35 m
- 40 m
- 45 m
- 50 m

6XV1830-7BH15  
6XV1830-7BH30  
6XV1830-7BH50  
6XV1830-7BN10  
6XV1830-7BN15  
6XV1830-7BN20  
6XV1830-7BN25  
6XV1830-7BN30  
6XV1830-7BN35  
6XV1830-7BN40  
6XV1830-7BN45  
6XV1830-7BN50

#### Article No.

##### PROFIBUS ECOFAST hybrid cable, GP

Trailing-type cable with 4 x copper cores and 2 x copper cores, shielded, with UL approval

##### Unassembled

- 50 m
- 100 m

##### Preassembled

with ECOFAST male and female connector

- 1.5 m
- 3 m
- 5 m
- 10 m
- 15 m
- 20 m
- 25 m
- 30 m
- 35 m
- 40 m
- 45 m
- 50 m

6XV1860-4PN50  
6XV1860-4PT10

6XV1860-3PH15  
6XV1860-3PH30  
6XV1860-3PH50  
6XV1860-3PN10  
6XV1860-3PN15  
6XV1860-3PN20  
6XV1860-3PN25  
6XV1860-3PN30  
6XV1860-3PN35  
6XV1860-3PN40  
6XV1860-3PN45  
6XV1860-3PN50

##### ECOFAST cable connector, for user assembly

6GK1905-0CB00

Female connector; ordering unit 5 items

##### PROFIBUS ECOFAST hybrid plug, angled

6GK1905-0CD00

With 2 x shielded copper cores and 4 x 1.5 mm<sup>2</sup> copper cores; 5 items; with assembly instructions; female insert

##### Push-pull cable connector

6GK1907-0AB10-6AA0

For 1L+/ 2L+, unassembled

##### Cover caps for push-pull female connectors

6ES7194-4JA50-0AA0

5 units

##### Accessories for CM PM-E direct

##### Power line

6XV1830-8AH10

5-core, 5 x 1.5 mm<sup>2</sup>, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1,000 m

##### Accessories for CM PM-E 7/8"

##### 7/8" connecting cable to power supply

5-core, 5 x 1.5 mm<sup>2</sup>, trailing type, preassembled with two 7/8" connectors, 5-pin

- 1.5 m long
- 2.0 m long
- 3.0 m long
- 5.0 m long
- 10 m long
- 15 m long

6XV1822-5BH15  
6XV1822-5BH20  
6XV1822-5BH30  
6XV1822-5BH50  
6XV1822-5BN10  
6XV1822-5BN15

##### 7/8" cable connector

With axial cable outlet

- with female insert, 5 per pack

6GK1905-0FB00

### Overview



PM-O 2 x 24 V DC power module with CM PM-O PP

- PM-O 2x 24 V DC power module

### Technical specifications

Article number	<b>6ES7148-4CA60-0AA0</b> ET200PRO, PM-O DC 2X24V
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	24 V
<b>Load voltage 2L+</b>	
• short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction
<b>Current carrying capacity</b>	
max.	Output current 2 A for 1L+ and 6 A for 2L+
<b>Interrupts/diagnostics/status information</b>	
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Fuse blown	No; Indirect diagnostics (short-circuit to M for 1L+), since electronic fuse
• Missing load voltage	No
<b>Diagnostics indication LED</b>	
• Rated load voltage PWR (green)	No
• Group error SF (red)	Yes
• Load voltage monitoring DC 24 V (green)	No; Signalled in IM or in PM

Article number	<b>6ES7148-4CA60-0AA0</b> ET200PRO, PM-O DC 2X24V
<b>Parameter</b>	
Remark	Diagnosis short circuit implemented after M for 1L+
<b>Galvanic isolation</b>	
primary/secondary	No
<b>Isolation</b>	
Isolation checked with	500 V DC
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP65	Yes
• IP66	Yes
• IP67	Yes
<b>Dimensions</b>	
Width	45 mm
Height	130 mm
Depth	35 mm
<b>Weights</b>	
Weight, approx.	150 g

### Ordering data

	Article No.
<b>PM-O 2 x 24 VDC power module</b>	<b>6ES7148-4CA60-0AA0</b>
For drawing the 24 V load voltage 2L+ and electronic/encoder supply voltage 1L+ within an ET 200pro station.	

	Article No.
<b>Accessories</b>	
<b>CM PM-O PP connection module</b>	<b>6ES7194-4BH00-0AA0</b>
For drawing the 24 V load voltage and electronic/encoder supply voltage, 2 x push-pull connector	
<b>Push-pull cable connector</b>	<b>6GK1907-0AB10-6AA0</b>
For 1L+/ 2L+, unassembled	
<b>Cover caps for push-pull female connectors</b>	<b>6ES7194-4JA50-0AA0</b>
5 units	

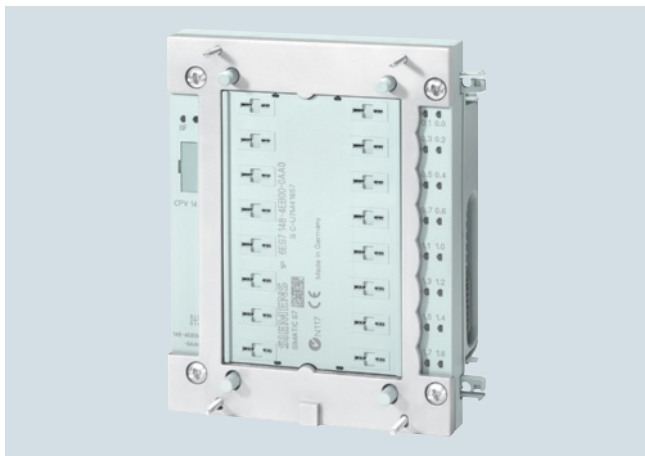
## I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

### ET 200pro pneumatic interface

#### Overview



- Interface for holding an original FESTO CPV 10 or CPV 14 compact performance valve terminal
- For using the ET 200pro in applications with flexible pneumatics
- Highly flexible pneumatics due to a variety of valve functions and choice of flow rates

#### Technical specifications

Article number	6ES7148-4EA00-0AA0	6ES7148-4EB00-0AA0
	ET200PRO, 16DO, PNEUMATIC INTERFACE CPV10	ET200PRO, 16DO, PNEUMATIC INTERFACE CPV14
<b>Product type designation</b>		
<b>Supply voltage</b>		
<b>Load voltage 2L+</b>		
• Rated value (DC)	24 V	24 V
• short-circuit protection	Yes	Yes
• Reverse polarity protection	Yes	Yes
<b>Input current</b>		
from load voltage 2L+ (without load), max.	20 mA	20 mA
from backplane bus 3.3 V DC, max.	25 mA	25 mA
<b>Power losses</b>		
Power loss, typ.	2.6 W	3.7 W
<b>Address area</b>		
<b>Address space per module</b>		
• without packing	2 byte	2 byte
<b>Digital outputs</b>		
Number of digital outputs	16	16
<b>Load resistance range</b>		
• lower limit	500 Ω	500 Ω
• upper limit	2 500 Ω	2 500 Ω
<b>Output current</b>		
• for signal "1" rated value	12 mA	16 mA
<b>Switching frequency</b>		
• with inductive load, max.	25 Hz	20 Hz
<b>Aggregate current of outputs (per group)</b>		
<b>all mounting positions</b>		
- up to 55 °C, max.	250 mA; only up to 50 °C, limited by valves	330 mA; only up to 50 °C, limited by valves

**Technical specifications (continued)**

Article number	<b>6ES7148-4EA00-0AA0</b> ET200PRO, 16DO, PNEUMATIC INTERFACE CPV10	<b>6ES7148-4EB00-0AA0</b> ET200PRO, 16DO, PNEUMATIC INTERFACE CPV14
<b>Interrupts/diagnostics/status information</b>		
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes
<b>Diagnostic messages</b>		
• Diagnostic functions	Yes	Yes
• Diagnostic information readable	Yes	Yes
<b>Diagnostics indication LED</b>		
• Group error SF (red)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
<b>Pneumatics</b>		
permissible working pressure, min.	3 bar	3 bar
permissible working pressure, max.	8 bar	8 bar
Rated flow rate	400 l/min	800 l/min
Number of connectable valves, max.	16	16
<b>Parameter</b>		
Remark	Diagnosis load voltage 2L+	Diagnosis load voltage 2L+
Behavior on CPU/Master STOP	No	
<b>Galvanic isolation</b>		
between backplane bus and all other circuit components	Yes	Yes
between the channels and backplane bus	Yes	Yes
<b>Galvanic isolation digital outputs</b>		
• between the channels and the backplane bus	Yes	Yes
<b>Permissible potential difference</b>		
between different circuits	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>		
Isolation checked with	500 V DC	500 V DC
<b>tested with</b>		
• Load voltage L+ against backplane bus	500 V DC	500 V DC
<b>Dimensions</b>		
Width	90 mm	120 mm
Height	130 mm	152 mm
Depth	47 mm	47 mm

**Ordering data**
**EM 148-P pneumatic interface**

DO 16 x P/CPV 10 for direct accommodation of FESTO valve terminal CPV 10 16 DO x P

**Article No.**
**6ES7148-4EA00-0AA0**

DO 16 x P/CPV 14 for direct accommodation of FESTO valve terminal CPV 14 16 DO x P

**6ES7148-4EB00-0AA0**
**Article No.**
**FESTO CPV10 valve terminal**

available from FESTO

**FESTO CPV 14 valve terminal**

available from FESTO

 FESTO AG & Co  
 Rüterstr. 82  
 D-73732 Esslingen  
 More addresses  
 on Internet at:  
<http://www.festo.de>

## I/O systems

ET 200 systems without control cabinet

ET 200pro – I/O modules

### SIMATIC RF170C

#### Overview



The SIMATIC RF170C is a communication module for connecting the SIMATIC identification systems to the ET 200pro distributed I/O system. The readers (SLGs) of all RFID systems as well as the MV400 code-reading systems can be operated on the SIMATIC RF170C.

Thanks to its high degree of protection and ruggedness, ET 200pro is particularly suitable for machine-level use. The modular structure with PROFIBUS and PROFINET connection systems allows them to be used in all applications. The uniform plug-in connection system ensures rapid commissioning.

#### Technical specifications

<b>Article No.</b>	<b>6GT2002-0HD00</b>
<b>Product-type designation</b>	<b>RF170C communication module</b>
<b>Suitability for installation</b>	Distributed IO ET 200pro, in conjunction with RF200/300/600, MOBY D/E//U, MV
Transmission rate at point-to-point connection serial maximum	115.2 kbit/s
<b>Interfaces</b>	
Design of interface for point-to-point connection	RS422 via connection block
Number of readers connectable	2
Design of electrical connection	
• of the backplane bus	ET 200pro backplane bus
• of the PROFIBUS interface	(according to the head module)
• of the Industrial Ethernet Interface	(according to the head module)
• for supply voltage	ET 200pro backplane bus
Version of the interface to the reader for communication	Internal plug to the connection block
<b>Mechanical data</b>	
Material	Thermoplastic (Valox 467, fiberglass reinforced)
Color	IP Basic 714
Tightening torque of screw for mounting the equipment maximum	1.5 N·m
<b>Supply voltage, current consumption, power loss</b>	
Supply voltage for DC	
• rated value	24 V
• minimum	20 V
• maximum	30 V
Current consumed at 24 V DC	
• without connected devices typical	0.13 A
• including connected devices maximum	1 A
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operating	-25 ... +55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C

<b>Article No.</b>	<b>6GT2002-0HD00</b>
<b>Product-type designation</b>	<b>RF170C communication module</b>
Protection class IP	IP 67
Resistance against shock	According to IEC 61131-2
Resistance against shock	300 m/s <sup>2</sup>
Resistance against vibration	100 m/s <sup>2</sup>
<b>Design, dimensions and weight</b>	
Width	90 mm
Height	130 mm
Depth	35 mm
Net weight	0.27 kg
Mounting type	ET 200pro rack
Cable length for RS 422 interface maximum	1000 m
<b>Product properties, functions, components general</b>	
Type of display	(see connection block)
Product function transponder file handler can be addressed	No
Protocol is supported S7 communication	Yes
<b>Product functions management, configuration</b>	
Type of parameterization	HSP
Type of programming	FB 45, FB 55 (FC 45/55 with limited functionality)
Type of computer-mediated communication	acyclic communication
<b>Standards, specifications, approvals</b>	
Verification of suitability	CE, FCC, cULus
<b>Accessories</b>	
Accessories	Connection block for RF170C

Technical specifications (continued)		Ordering data	Article No.
<b>Article No.</b>	<b>6GT2002-1HD00</b>	<b>SIMATIC RF170C communication module</b>	<b>6GT2002-0HD00</b>
<b>Product-type designation</b>	<b>Connection block for RF170C</b>	<b>Accessories</b>	
<b>Suitability for installation</b>	Connection block for RF170C	<b>Connection block for SIMATIC RF170C</b>	<b>6GT2002-1HD00</b>
<b>Interfaces</b>		For connecting 2 readers via an M12 connector	
Design of interface for point-to-point connection	RS422	<b>Reader cables for SIMATIC RF200 / RF300 / RF600 / MV400</b>	
Number of readers connectable	2	Or extension cable MOBY D and SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, CMG approved, suitable for cable carriers, straight connector	
<b>Mechanical data</b>		2 m	<b>6GT2891-4FH20</b>
Material	Die-cast zinc	5 m	<b>6GT2891-4FH50</b>
Color	Silver	10 m	<b>6GT2891-4FN10</b>
Tightening torque of screw for mounting the equipment maximum	1.5 N·m	20 m	<b>6GT2891-4FN20</b>
<b>Supply voltage, current consumption, power loss</b>		50 m	<b>6GT2891-4FN50</b>
Supply voltage for DC rated value	24 V	2 m, plug angled at reader	<b>6GT2891-4JH20</b>
Supply voltage		5 m, plug angled at reader	<b>6GT2891-4JH50</b>
• for DC	20 ... 30 V	10 m, plug angled at reader	<b>6GT2891-4JN10</b>
<b>Permitted ambient conditions</b>		<b>Reader cable for MOBY D</b>	<b>6GT2691-4FH20</b>
Ambient temperature		PUR material, CMG approved, suitable for cable carriers, 2 m	
• during operating	-25 ... +55 °C	<b>M12 sealing caps for unused reader connections</b>	<b>3RX9802-0AA00</b>
• during storage	-40 ... +70 °C	10 units minimum order quantity, price per 100 units	
• during transport	-40 ... +70 °C	<b>DVD "RFID Systems Software &amp; Documentation"</b>	<b>6GT2080-2AA20</b>
Protection class IP	IP 67		
Resistance against shock	According to IEC 61131-2		
Resistance against shock	300 m/s <sup>2</sup>		
Resistance against vibration	100 m/s <sup>2</sup>		
<b>Design, dimensions and weight</b>			
Width	90 mm		
Height	130 mm		
Depth	25 mm		
Net weight	0.5 kg		
Mounting type	4 screws included		
<b>Product properties, functions, components general</b>			
Type of display	4 LEDs per reader connection, 1 LEDs for device status		



## I/O systems

ET 200 systems without control cabinet

ET 200pro – Power supplies

3-phase, 24 V DC (ET 200pro PS, IP67)

### Overview



#### Power supply for ET200pro:

- 3-phase, 24 V DC/8 A

The SIMATIC ET 200pro PS power supply unit with degree of protection IP67 is used as the electronics/encoder supply and load voltage supply of the new SIMATIC ET 200pro distributed I/O system for use close to the machine without a cabinet. With a signaling contact for "24 V OK" and "Overtemperature", as well as a second plug-in connector for input voltage loop-through.

### Technical specifications

Article number	<b>6ES7148-4PC00-0HA0</b>
Product	SIMATIC ET 200pro PS
Power supply, type	24 V/8 A
<b>Input</b>	
Input	3-phase AC
Rated voltage value $V_{in}$ rated	400 ... 480 V
Voltage range AC	340 ... 550 V
• Note	320 ... 340 V for max. 1 min
Wide-range input	Yes
Overvoltage resistance	Implemented internally with varistors
Mains buffering at $I_{out}$ rated, min.	15 ms; at $V_{in} = 400$ V
Rated line frequency	50 ... 60 Hz
Rated line range	45 ... 66 Hz
Input current	
• at rated input voltage 400 V	0.5 A
Switch-on current limiting (+25 °C), max.	40 A
$I^2t$ , max.	3.5 A <sup>2</sup> ·s
Built-in incoming fuse	T 4 A
Protection in the mains power input (IEC 898)	Required: Circuit breaker 3RV2011-1DA10 or 3RV2711-1DD10 (UL 489)

Article number	<b>6ES7148-4PC00-0HA0</b>
Product	SIMATIC ET 200pro PS
Power supply, type	24 V/8 A
<b>Output</b>	
Output	Controlled, isolated DC voltage
Rated voltage $V_{out}$ DC	24 V
Total tolerance, static $\pm$	3 %
Static mains compensation, approx.	0.5 %
Static load balancing, approx.	0.5 %
Residual ripple peak-peak, max.	200 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	250 mV
Product function Output voltage adjustable	No
Output voltage setting	-
Status display	Green LED for 24 V OK
Signaling	max. 30 V, 10 mA; Power-Good (High-Pegel 1L+ for $V_{out}$ in range 21.3 ... 29 V); Overtemperature warning at least 30 s before switch-off (high level 1L+ when the max. internal temperature is exceeded)
On/off behavior	Overshoot of $V_{out} < 2$ %
Startup delay, max.	1.5 s
Voltage rise, typ.	40 ms
Rated current value $I_{out}$ rated	8 A
Current range	0 ... 8 A
Active power supplied typical	192 W
Short-term overload current	
• on short-circuiting during the start-up typical	50 A
• at short-circuit during operation typical	50 A
Duration of overloading capability for excess current	
• on short-circuiting during the start-up	100 ms
• at short-circuit during operation	100 ms
Parallel switching for enhanced performance	No

## Technical specifications (continued)

Article number	<b>6ES7148-4PC00-0HA0</b>
Product	SIMATIC ET 200pro PS
Power supply, type	24 V/8 A
<b>Efficiency</b>	
Efficiency at Vout rated, Iout rated, approx.	88 %
Power loss at Vout rated, Iout rated, approx.	25 W
<b>Closed-loop control</b>	
Dynamic mains compensation (Vin rated ±15 %), max.	0.5 %
Dynamic load smoothing (Iout: 50/100/50 %), Uout ± typ.	1 %
Setting time maximum	2 ms
<b>Protection and monitoring</b>	
Output overvoltage protection	< 33 V
Current limitation, typ.	9.4 A
Property of the output	Yes
Short-circuit proof	Yes
Short-circuit protection	Electronic shutdown, automatic restart
Enduring short circuit current RMS value	
• maximum	10 A
Overload/short-circuit indicator	-
<b>Safety</b>	
Primary/secondary isolation	Yes
Galvanic isolation	Protective extra low output voltage Vout according to EN 60950-1 and EN 50178
Protection class	Class I
Leakage current	
• maximum	3.5 mA
• typical	0.4 mA
CE mark	Yes
UL/CSA approval	Yes
UL/cUL (CSA) approval	UL-Listed (UL 508) according to NFPA compatibility (National Fire Protection Association), see operating instructions
Explosion protection	No
Certificate of suitability IECEx	No
Certificate of suitability NEC Class 2	No
FM approval	-
CB approval	Yes
Marine approval	No
Degree of protection (EN 60529)	IP67, enclosure type 4 indoor

Article number	<b>6ES7148-4PC00-0HA0</b>
Product	SIMATIC ET 200pro PS
Power supply, type	24 V/8 A
<b>EMC</b>	
Emitted interference	EN 55022 Class A
Supply harmonics limitation	-
Noise immunity	EN 61000-6-2
<b>Operating data</b>	
Ambient temperature	
• during operation	-25 ... +55 °C
- Note	with natural convection
• during transport	-40 ... +70 °C
• during storage	-40 ... +70 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation
<b>Mechanics</b>	
Connection technology	screw-type terminals
Connections	
• Supply input	L1, L2, L3, PE: Plug connector HAN Q4/2 (counterpart see "Electrical accessories")
• Output	L+, M: 2 x 1.5 mm <sup>2</sup> each (4-pole cable for +/- with open, labeled ends, 4 x 1.5 mm <sup>2</sup> )
• Auxiliary	Alarm signals: M12 plug-in connector 5-pin
Width of the enclosure	310 mm
Height of the enclosure	135 mm
Depth of the enclosure	90 mm
Weight, approx.	2.8 kg
Product property of the enclosure housing for side-by-side mounting	No
Installation	Can be mounted onto ET200pro mounting rail
Electrical accessories	Power connector (Input: 3RK1911-2BE30 (6 mm <sup>2</sup> )) (Output: 3RK1911-2BF10 (4 mm <sup>2</sup> ))
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

## Ordering data

## SIMATIC ET 200pro PS

Stabilized power supply in distributed I/O system design, permitting the loop-through of energy to further modules; with degree of protection IP67;  
Input: 400-480 V 3 AC  
Output: 24 V DC/8 A

## Article No.

6ES7148-4PC00-0HA0

## Article No.

## Accessories

## Power connector

For connecting to the distributed I/O system

- For X1 (6 mm<sup>2</sup>)
- For X2 (6 mm<sup>2</sup>)

**3RK1911-2BE30**  
**3RK1911-2BF10**

## Sealing cap

For 9-pin power sockets

- X2 (1 unit)
- X2 (10 units)

**3RK1902-0CJ0**  
**3RK1902-0CK00**

## I/O systems

ET 200 systems without control cabinet  
ET 200 pro - ET 200pro motor starters

### General data

#### Overview

##### ET 200pro motor starters in the ET 200pro I/O system

SIMATIC ET 200pro is a modular I/O system in the degree of protection IP65/66/67 for machine-level, cabinet-free use. ET 200pro motor starters in the high degree of protection IP65 are an integral part of ET 200pro.



ET 200pro motor starter: Isolator module, Standard starter and High Feature starter mounted on a wide module rack

##### ET 200pro motor starters

- Only two versions up to 5.5 kW
- All settings can be parameterized by bus
- Comprehensive diagnostics signals
- PROFlenergy support
- Overload can be acknowledged by remote reset
- Current unbalance monitoring
- Stall protection
- Emergency start function in the event of overload
- Current value transmission by bus
- Current limit monitoring
- Full support of acyclic services
- Direct-on-line or reversing starters
- Power bus connection can be plugged in using Han Q4/2 plug-in connectors
- Motor feeder with Han Q8/0 connector
- Conductor cross-sections up to 6 x 4 mm<sup>2</sup>
- 25 A per segment (power looped through using jumper plug)
- In the Standard and High Feature versions (with 4 DI on board)
- Electromechanical switching and electronic switching
- Electronic starter for direct activation or with integrated soft starter function
- Supplied with 400 V AC brake contact as an option
- Provision of the motor current in PROFlenergy format to higher-level systems, motor current shutdown in dead times using PROFlenergy

##### ET 200pro isolator modules (see page 9/393)

The isolator module with switch disconnecter function is used for safe disconnection of the 400 V operational voltage during repair work in the plant and provides an integrated group fusing function (i.e. additional group short-circuit protection for all downstream supplied motor starters).

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

##### Safety applications

[Safety Solution local](#) (see page 9/394)

With the Safety local modules

- Safety local isolator module and

- 400 V disconnecting module  
it is possible to achieve safety level SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) with an appropriate connection.

[Safety Solution PROFIsafe](#) (see page 9/397)

With the Safety PROFIsafe modules

- F-Switch and
- 400 V disconnecting module  
it is likewise possible to achieve safety level SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1).

##### Functionality

With the ET 200pro motor starters, any AC loads can be protected and switched.

The ET 200pro motor starters are available with both mechanical and electronic contacts.

The ET 200pro electromechanical starters are offered as direct-on-line (DSe) and reversing starters (RSe) in the versions **Standard** and **High Feature**. There are device versions with or without control for externally fed brakes with 400 V AC.

Compared to the Standard motor starter, the **High Feature mechanical motor starter** also has:

- 4 digital inputs
- Advanced parameterization options

The ET 200pro electronic starters are offered as direct-on-line starters (sDSSSt/sDSt) and reversing starters (sRSSSt/sRSt) in the High Feature version.

Compared to the High Feature mechanical motor starter, the **High Feature electronic motor starter** also has:

- Soft starting and smooth ramp-down function
- Deactivated soft start function as an electronic starter for applications with a high switching frequency
- Advanced parameterization options

As a result of the protection concept with electronic overload evaluation and the use of SIRIUS controls, size S00, additional advantages are realized on the Standard and High Feature motor starters – advantages which soon make themselves particularly felt particularly in manufacturing processes with high plant downtime costs:

- Configuration is made easier and flexibility enhanced by the fine modular structure with ET 200pro. When using the ET 200pro motor starters, the parts list per load feeder is reduced to 2 main items: the bus module and the motor starter. This makes the ET 200pro ideal for modular machine concepts or solutions for conveyor systems and in machine-tool construction.
- Expansions are easily possible through the subsequent adding of modules. The innovative plug-in technology also does away with the wiring needed up to now. Through the hot swapping function (disconnection and connection during operation) a motor starter can be replaced within seconds if necessary, without having to shut down the ET 200pro station and with it the process in the plant. The motor starters are therefore recommendable in particular for applications with special demands on availability. Storage costs are optimized in addition by the low level of variance (2 units up to 5.5 kW).

The ordering option for motor starters with a 400 V AC brake output provides the possibility of controlling motors with 400 V AC brakes. With four locally acting inputs available on the High Feature motor starter it is possible to realize autonomous special functions which work independently of the bus and the higher-level control system, e.g. as a quick stop on gate valve controls or limit position disconnectors. In parallel with this, the states of these inputs are signaled to the control system.

Type	Standard motor starters		High Feature motor starters	
		DSe, RSe	DSe, RSe	sDSSSte, sDSte, sRSSSte, sRSte
<b>Technology designation<sup>1)</sup></b>				
<b>Device functions (firmware features)</b>				
Parameterizable rated operational current		✓		
Integrated short-circuit protection		✓		
Parameterizable current limit values		--	✓ 2 limit values	
Parameterizable response in case of current limit violation		--	✓	
Zero current monitoring		✓		
Parameterizable response in case of zero current violation		✓		
Parameterizable current unbalance limit	%	-- fixed limit value (30 x I <sub>e</sub> )	✓ 30 ... 60 x I <sub>e</sub>	
Parameterizable response in case of unbalance limit violation		✓		
Motor blocking monitoring		--	✓	
Parameterizable blocking current limit	%	--	✓ 150 ... 1 000 x I <sub>e</sub>	
Parameterizable blocking time limit	s	--	✓ 1 ... 5	
Current value transmission		✓		
Group warning diagnostics		--	✓ parameterizable	
Group diagnostics		✓ parameterizable		
Emergency start		✓		
<b>Digital inputs</b>		--	✓ 4 inputs	
• Parameterizable input signal		--	✓ latching/non-latching	
• Parameterizable input level		--	✓ NC/NO	
• Parameterizable input signal delay	ms	--	✓ 10 ... 80	
• Parameterizable input signal extension	ms	--	✓ 0 ... 200	
• Parameterizable input control actions		--	✓ 12 different actions	
<b>Brake output (400 V AC)</b>		✓ order option		
Parameterizable brake enabling delay	s	✓ -2.5 ... 2.5		
Parameterizable holding time of the brake during stopping	s	✓ 0 ... 25		
Parameterizable start up type		--		✓
Parameterizable ramp-down time		--		✓
Parameterizable starting voltage		--		✓
Parameterizable stopping voltage		--		✓
Local device interface		✓		
Firmware update		✓ by specialists		
Thermal motor model		✓		
Parameterizable trip class		-- CLASS 10 fixed	✓ CLASS 5, 10, 15, 20	
Parameterizable response in case of overload of thermal motor model		--	✓ 3 possible states	
Advance warning limit for motor heating	%	--	✓ parameterizable 0 ... 95	
Advance warning limit time-related trip reserve	s	--	✓ parameterizable 0 ... 500	
Parameterizable recovery time	min	--	✓ 1 ... 30	
Parameterizable protection against voltage failure		-- permanently integrated	✓	
Reversing start function		✓ order option		
Parameterizable interlock time for reversing starters		-- 150 ms fixed	✓ 0 ... 60 s	
Integrated logbook functions		✓ 3 device logbooks		
Integrated statistics data memory		✓		
Parameterizable response in case of CPU/master stop		✓		
<b>PROFenergy profile support</b>		✓		
• Disconnection of the motor current during idle times		✓		
• Measured motor current values		✓		
<b>Device indications</b>				
• Group fault		SF LED (red)		
• Switching state		STATE LED (red, yellow, green)		
• Device status		DEVICE LED (red, yellow, green)		
• Digital inputs		--	IN 1 ... IN 4, LED	

✓ Function available

-- Function not available

- <sup>1)</sup> DS .... direct-on-line starter  
RS .... reversing starter  
DSS .. direct soft starter  
RSS .. reversing soft starter  
e ..... electronic motor protection  
te ..... full motor protection (thermal + electronic)  
s ..... electronic switching with semiconductor.

## I/O systems

ET 200 systems without control cabinet

ET 200 pro - ET 200pro motor starters

### General data

#### Technical specifications

Type	Standard motor starters		High Feature motor starters	
	Mechanically switching without inputs		Mechanically switching with inputs	Mechanically switching with inputs and soft starter function
Technology designation <sup>1)</sup>	DSe, RSe		DSe, RSe	sDSSSte, sDSte, sRSSSte, sRSte
<b>Mechanics and environment</b>				
<b>Motor starters or modules that can be connected to ET 200pro</b> With width of 110 mm	max. 8			
<b>Mounting dimensions (W x H x D)</b> • Direct-on-line starters and reversing starters	mm	110 x 230 x 150	110 x 230 x 160	
<b>Permissible ambient temperature</b> • During operation	°C	-25 ... +55 from +40 with derating		
• During storage	°C	-40 ... +70		
<b>Permissible mounting position</b>	Vertical, horizontal			
<b>Vibration resistance</b> acc. to IEC 60068, parts 2-6	g	2		
<b>Shock resistance</b> acc. to IEC 60068, parts 2-27	g/ms	Half-sine 15/11		
<b>Degree of protection</b>	IP65			
<b>Pollution degree</b>	3, IEC 60664 (IEC 61131)			
<b>Electrical specifications</b>				
<b>Power consumption at 24 V DC</b> • From auxiliary circuit L+/M (U1) • From auxiliary circuit A1/A2 (U2)	mA mA	Approx. 40 Approx. 200		
<b>Rated operational current <math>I_e</math> for power bus</b>	A	25		
<b>Rated operational voltage <math>U_e</math></b> • Approval according to EN 60947-1, Appendix N • Approval according to CSA and UL	V AC V AC V AC	400 (50/60 Hz) Up to 400 (50/60 Hz) Up to 600 (50/60 Hz)		Up to 400 (50/60 Hz) Up to 480 (50/60 Hz)
<b>Approval</b> • DIN VDE 0106, Part 101 • CSA and UL approval	V V	Up to 400 Up to 600		Up to 480 Up to 480
<b>Conductor cross-sections</b> • Incoming energy supply	mm <sup>2</sup>	max. 6 x 4		
<b>Touch protection</b>	Finger-safe			
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6		
<b>Rated insulation voltage <math>U_i</math></b>	V	400		
<b>Rated operational current <math>I_e</math> for starters</b> • AC-1/2/3 at 40 °C - At 400 V - At 500 V • AC-4 at 40 °C - At 400 V	A A A	0.15 ... 2.0/1.5 ... 12.0 0.15 ... 2.0/1.5 ... 9.0 0.15 ... 2.0/1.5 ... 4.0		0.15 ... 2.0/1.5 ... 12.0 <sup>2)</sup>
<b>Rated short-circuit breaking capacity</b>	kA	100 at 400 V		
<b>Type of coordination</b> acc. to IEC 60947-4-1	1			
<b>Power of three-phase motors at 400 V</b>	kW	max. 5.5		Max. 5.5/4 <sup>3)</sup>
<b>Utilization categories</b>	AC-1, AC-2, AC-3, AC-4			AC-53a <sup>4)</sup> (max. 9 A with deactivated soft start function up to CLASS 10)
<b>Protective separation between main and auxiliary circuits</b>	V	400, acc. to EN 60947-1, Appendix N		
<b>Endurance of contactor</b> • Mechanical • Electrical	Operating cycles Operating cycles	30 million Up to 10 million; depending on the current loading (see manual <sup>5)</sup> )		-- --
<b>Permissible switching frequency</b>	Depending on the current load, motor starting time, and relative ON period (see manual <sup>5)</sup> )			
<b>Operating times</b> for 0.85 ... 1.1 x $U_e$ • Closing delay • Opening delay	ms ms	11 ... 50 5 ... 45		-- --

1) DS .... direct-on-line starter  
RS .... reversing starter  
DSS .. direct soft starter  
RSS .. reversing soft starter  
e ..... electronic motor protection  
te ..... full motor protection (thermal + electronic)  
s ..... electronic switching with semiconductor.

2) Note:  
If the soft starter control function is deactivated, the permissible rated operational current is reduced to 9 A up to CLASS 10.

3) With parameterization as electronic starter max. 4 kW.

4) 8-hour operation.

5) <http://support.automation.siemens.com/WW/view/en/22332388>

#### More information

##### Notes on safety

System networking requires suitable protective measures (including network segmentation for IT security) in order to ensure safe plant operation.

More information on the subject of Industrial Security, see [www.siemens.com/industrialsecurity](http://www.siemens.com/industrialsecurity).

**Overview**

The functionality, device functions, and technical specifications of the Standard motor starter are described in "ET 200pro Motor Starters, General Data" ([see from page 9/388](#)).

**Selection and ordering data**

Version

Article No.

**Standard motor starters, mechanical**  
**Motor protection: thermal model**

DSe Standard

**DSe direct-on-line starters<sup>1)</sup>**

- Without brake output
- With brake output 400 V AC

**3RK1304-5□S40-4AA0**  
**3RK1304-5□S40-4AA3**

**RSe reversing starters<sup>1)</sup>**

- Without brake output
- With brake output 400 V AC

**3RK1304-5□S40-5AA0**  
**3RK1304-5□S40-5AA3**

Setting range  
Rated operational current

- 0.15 ... 2.0 A
- 1.5 ... 12.0 A

**K**  
**L**

<sup>1)</sup> Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately ([see "Accessories for ET 200pro motor starters" on page 9/398](#)).

## I/O systems

ET 200 systems without control cabinet  
ET 200 pro - ET 200pro motor starters

### High Feature motor starters

#### Overview

The functionality, device functions, and technical specifications of the High Feature motor starter are described in "ET 200pro Motor Starters, General Data" (see from page 9/388).

The High Feature motor starter differs from the Standard motor starter in having more parameters and four integrated, freely-parameterizable digital inputs.

#### Selection and ordering data

Version

Article No.

#### High Feature motor starters, mechanical Motor protection: thermal model



RSe High Feature

##### DSe direct-on-line starters<sup>1)</sup>

- Without brake output and with 4 inputs
- With brake output 400 V AC and 4 inputs

3RK1304-5□S40-2AA0  
3RK1304-5□S40-2AA3

##### RSe reversing starters<sup>1)</sup>

- Without brake output and with 4 inputs
- With brake output 400 V AC and 4 inputs

3RK1304-5□S40-3AA0  
3RK1304-5□S40-3AA3

Setting range  
Rated operational current

- 0.15 ... 2.0 A
- 1.5 ... 12.0 A

K  
L

#### High Feature motor starters<sup>2)</sup>, electronic Full motor protection, comprising thermal motor protection and thermistor motor protection



sRSSte High Feature

##### sDSSte/sDSte direct-on-line starters<sup>1)2)</sup>

- Without brake output and with 4 inputs
- With brake output 400 V AC and 4 inputs

3RK1304-5□S70-2AA0  
3RK1304-5□S70-2AA3

##### sRSSte/sRSte reversing starters<sup>1)2)</sup>

- Without brake output and with 4 inputs
- With brake output 400 V AC and 4 inputs

3RK1304-5□S70-3AA0  
3RK1304-5□S70-3AA3

Setting range  
Rated operational current

- 0.15 ... 2.0 A
- 1.5 ... 12.0 A

K  
L

<sup>1)</sup> Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for ET 200pro Motor Starters" on page 9/398).

<sup>2)</sup> The solid-state motor starters can be used not only as solid-state motor starters with a high level of switching frequency but also as fully fledged soft starters for soft starting and stopping. The changeover from motor starter to soft starter takes place through reparameterization in HW Config. Depending on the setting, this results in the following current ranges:

- Parameterization as solid-state motor starter: 0.15 to 2 A and 1.5 to 9 A (4 kW)
- Parameterization as soft starter: 0.15 to 2 A and 1.5 to 12 A (5.5 kW).



**Overview**

The isolator module with integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters) and switch disconnecter function is used for safe disconnection of the 400 V operational voltage in the plant.

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

The following properties apply to the isolator module:

- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Cabinet-free design thanks to high degree of protection IP65

The isolator module is also available in a safety version (see page 9/394 "Safety local Isolator Modules").

**Technical specifications**

Type	Isolator modules	
<b>General data</b>		
<b>Mounting dimensions (W x H x D)</b>		
• Direct-on-line starters and reversing starters	mm	110 x 230 x 170
<b>Permissible ambient temperature</b>		
• During operation	°C	-25 ... +55
• During storage	°C	-40 ... +70
<b>Permissible mounting position</b>		any
<b>Vibration resistance acc. to IEC 60068 Part 2-6</b>	g	2
<b>Shock resistance acc. to IEC 60068, parts 2-27</b>	g/ms	Half-sine 15/11
<b>Current consumption</b>		
• From auxiliary circuit L+/M (U1)	mA	Approx. 20
• From auxiliary circuit A1/A2 (U2)		--
<b>Rated operational current <math>I_e</math> for power bus</b>	A	25
<b>Rated operational voltage <math>U_e</math></b>	V	400
<b>Approvals according to</b>		
• DIN VDE 0106, Part 101	V	Up to 500
• CSA and UL	V	Up to 600
<b>Conductor cross-sections</b>		
• Incoming energy supply	mm <sup>2</sup>	max. 6 x 4

Type	Isolator modules	
<b>Degree of protection</b>		IP65
<b>Touch protection</b>		Finger-safe
<b>Pollution degree</b>		3, IEC 60664 (IEC 61131)
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6
<b>Rated insulation voltage <math>U_i</math></b>	V	400
<b>Rated operational current <math>I_e</math> for starters</b>		
• AC-1/2/3 at 40 °C		
- At 400 V	A	25
- At 500 V	A	25
<b>Rated short-circuit breaking capacity</b>	kA	50 at 400 V
<b>Type of coordination acc. to IEC 60947-4-1</b>		2
<b>Protective separation between main and auxiliary circuits</b>	V	400, acc. to DIN VDE 0106 Part 101
<b>Device functions</b>		
• Group diagnostics		Yes, parameterizable
<b>Device indications</b>		
• Group fault		SF LED (red)

**Selection and ordering data**

Version

Article No.

**ET 200pro isolator module, mechanical****Isolator module<sup>1)</sup>**

Rated operational current 25 A

**3RK1304-0HS00-6AA0**

3RK1304-0HS00-6AA0

<sup>1)</sup> Only functions when used together with the corresponding 110 mm backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see page 9/398, "Accessories for ET 200pro Motor Starters").



## I/O systems

ET 200 systems without control cabinet

ET 200 pro - ET 200pro Safety motor starters Solutions local/PROFIsafe

### Safety modules local

#### Overview

##### Safety Solution local

With the Safety local modules

- Safety local isolator module and
- 400 V disconnecting module

it is possible to achieve safety level SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) with an appropriate connection.



ET 200pro motor starters (Safety Solution local): Safety local isolator module, disconnecting module, Standard starter and High Feature starter mounted on a wide module rack

##### Safety local isolator module

The Safety local isolator module is a repair switch with integrated safety evaluation functions that can be parameterized using DIP switches.

It is used for:

- Connection of a 1- or 2-channel EMERGENCY STOP circuit up to SIL 3/PL e (protective door or EMERGENCY STOP pushbuttons) and parameterizable start behavior
- For controlling the 400 V disconnecting module by means of a safety rail signal

##### 400 V disconnecting module

The 400 V disconnecting module enables the safe disconnection of an operational voltage of 400 V up to SIL 3/PL e. For operation in a Safety Solution local application, it functions only in combination with the Safety local isolator module.

For operation in a Safety PROFIsafe application it functions only in combination with the F-Switch.

##### Functionality

###### Safety local isolator module

The Safety local isolator module features the same functions as a standard isolator module with an additional local safety function.

The Safety local isolator module contains a 3TK2841 module and is equipped with M12 terminals for the connection of external safety components.

Terminals 1 and 2 can be used to connect either 1-channel or 2-channel EMERGENCY STOP circuits or protective door circuits (IN 1, IN 2).

For monitored starts, an external START switch can be connected to terminal 3.

The required safety functions can be set using 2 slide switches located under the left M12 opening.

In the event of an EMERGENCY STOP, the Safety local isolator module trips the downstream 400 V disconnecting module. This safely separates the 400 V circuit up to SIL 3/PL e.

In combination with the 400 V disconnecting module, the Safety local isolator module can be used for safety applications up to SIL 3/PL e.

###### 400 V disconnecting module

The 400V disconnecting module can be used together with the Safety local isolator module for local safety applications and together with the F-Switch for PROFIsafe safety applications.

It contains two contactors connected in series for safety-related disconnection of the main circuit.

The auxiliary circuit supply of the device is over a safety power rail in the backplane bus module.

The 400 V disconnecting module can be used in conjunction with the Safety local isolator module or with the F-Switch for safety applications up to SIL 3/PL e.

## Technical specifications



Type		Safety local isolator module	400 V disconnecting module
<b>General data</b>			
<b>Mounting dimensions (W x H x D) in mm</b>			
• Direct-on-line starters and reversing starters	mm	110 x 230 x 170	110 x 230 x 150
<b>Permissible ambient temperature</b>			
• During operation	°C	-25 ... +55	
• During storage	°C	-40 ... +70	
<b>Permissible mounting position</b>		any	
<b>Vibration resistance acc. to IEC 60068, parts 2-6</b>		2 g	
<b>Shock resistance acc. to IEC 60068, parts 2-27</b>		Half-wave 15 g/11 ms	
<b>Current consumption</b>			
• From auxiliary circuit L+/M (U1)	mA	Approx. 20	
• From auxiliary circuit A1/A2 (U2)		--	
<b>Rated operational current <math>I_e</math> for power bus</b>	A	25	
<b>Rated operational voltage <math>U_e</math></b>	V	400 (50/60 Hz)	
<b>Approval DIN VDE 0106, part 101</b>	V	Up to 500	
<b>CSA and UL approval</b>	V	Up to 600	
<b>Conductor cross-sections</b>			
Incoming energy supply	mm <sup>2</sup>	max. 6 x 4	
<b>Degree of protection</b>		IP65	
<b>Touch protection</b>		Finger-safe	
<b>Pollution degree</b>		3, IEC 60664 (IEC 61131)	
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>	kV	6	
<b>Rated insulation voltage <math>U_i</math></b>	V	400	
<b>Rated operational current <math>I_e</math> for starters</b>			
• AC-1/2/3 at 40 °C			
- At 400 V	A	16	25
- At 500 V	A	16	25
<b>Rated short-circuit breaking capacity</b>	kA	50 at 400 V	
<b>Type of coordination acc. to IEC 60947-4-1</b>		2	
<b>Protective separation between main and auxiliary circuits</b>	V	400, acc. to DIN VDE 0106 Part 101	
<b>Operating times for 0.85 ... 1.1 x <math>U_e</math></b>			
• Closing delay	ms	--	25 ... 100
• Opening delay	ms	--	7 ... 10
<b>Device functions</b>			
• Group diagnostics		Yes, parameterizable	
<b>Device indications</b>			
• Group fault		SF LED (red)	

**I/O systems**

ET 200 systems without control cabinet

ET 200 pro - ET 200pro Safety motor starters Solutions local/PROFIsafe

**Safety modules local****Selection and ordering data**

Version	Article No.
<b>Safety modules local</b>	
 <p><b>Safety local isolator modules<sup>1)2)</sup></b> Rated operational current 16 A</p> <p>3RK1304-OHS00-7AA0</p>	<b>3RK1304-OHS00-7AA0</b>
 <p><b>400 V disconnecting modules<sup>3)4)</sup></b> Rated operational current 25 A</p> <p>3RK1304-OHS00-8AA0</p>	<b>3RK1304-OHS00-8AA0</b>

1) The Safety local isolator module only functions when used together with the 400 V disconnecting module.

2) Only in combination with the special backplane bus module for the Safety local isolator module (see page 9/402, "Accessories for ET 200pro Motor Starters").

3) The 400 V disconnecting module functions only when used together with the Safety local isolator module or with the F-Switch.

4) The 400 V disconnecting module functions only when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see page 9/402, "Accessories for ET 200pro Motor Starters").

**Overview****Safety Solution PROFIsafe**

With the Safety PROFIsafe modules

- F-Switch and
- 400 V disconnecting module

it is possible to achieve safety level SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) with an appropriate connection.

**F-Switch PROFIsafe**

Fail-safe digital inputs/outputs in degrees of protection IP65 to IP67 for machine-level, cabinet-free use.

Fail-safe digital inputs

- For the fail-safe reading in of sensor information (1-/2-channel)
- Including integrated discrepancy evaluation for 2v2 signals
- Internal sensor supplies (incl. testing) available

Fail-safe digital outputs

- 3 fail-safe PP-switching outputs for safe switching of the backplane busbars

The F-Switch is certified up to SIL 3/PL e and has detailed diagnostics.

It supports PROFIsafe in PROFIBUS configurations as well as in PROFINET configurations.

Note:

Safety characteristics see Catalog IC 10 ·2015, Chapter 16 "Appendix" → "Standards and Approvals" → "Overview".



**400 V disconnecting module**

See "Safety modules local", Overview page 9/394 and Technical specifications page 9/395.

**Functionality**

The PROFIsafe F-Switch is a fail-safe electronic module for PROFIsafe safety applications. It has two fail-safe inputs and outputs for safe switching of the 24 V supply over backplane busbars. In combination with the 400 V disconnecting module, the fail-safe disconnection of ET 200pro motor starters is possible in PROFIsafe applications up to SIL 3/PL e.

**Selection and ordering data**

Version	Article No.
<b>ET 200pro safety modules</b>	
 3RK1304-0HS00-8AA0	<b>400 V disconnecting modules<sup>1)2)</sup></b> Rated operational current 25 A  <b>3RK1304-0HS00-8AA0</b>
 6ES7148-4FS00-0AB0	<b>F-Switch PROFIsafe</b> 24 V DC, including bus module Connection module must be ordered separately  <b>6ES7148-4FS00-0AB0</b>
	<b>Connection modules for F-Switch</b> 24 V DC  <b>6ES7194-4DA00-0AA0</b>

- <sup>1)</sup> The 400 V disconnecting module functions only when used together with the Safety local isolator module or with the F-Switch.
- <sup>2)</sup> The 400 V disconnecting module functions only when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see page 9/402, "Accessories for ET 200pro Motor Starters").

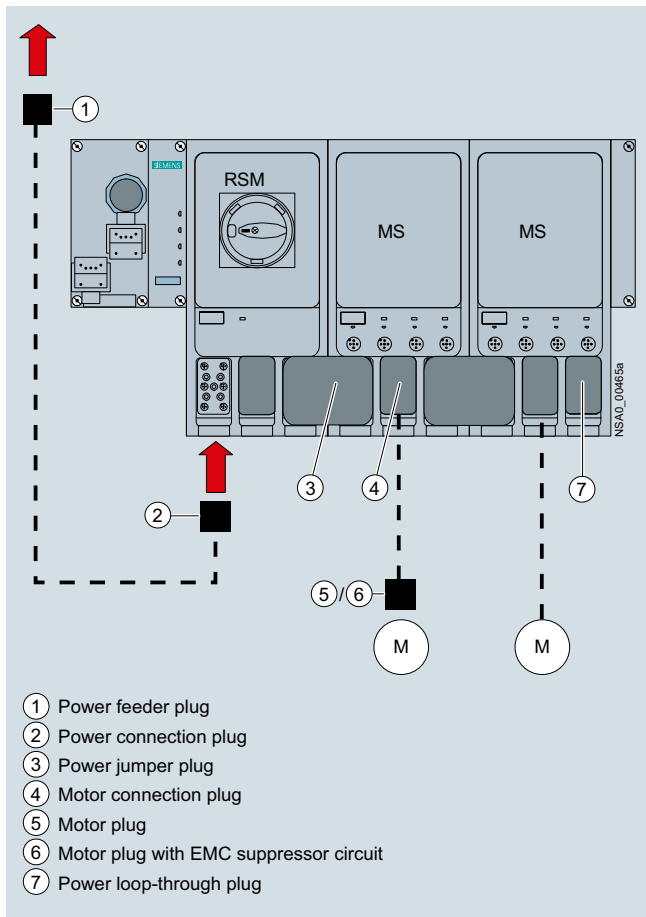
## I/O systems

ET 200 systems without control cabinet

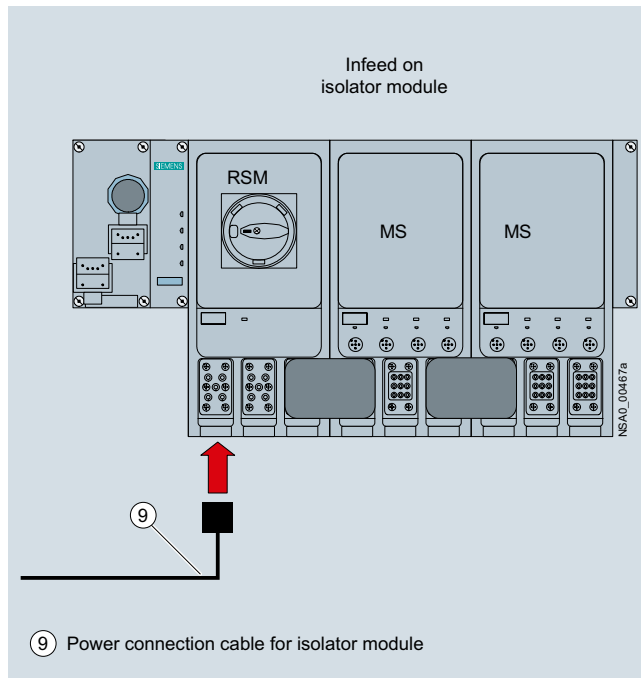
ET 200 pro - ET 200pro Safety motor starters Solutions local/PROFIsafe

### Accessories for ET 200pro motor starters

#### Overview



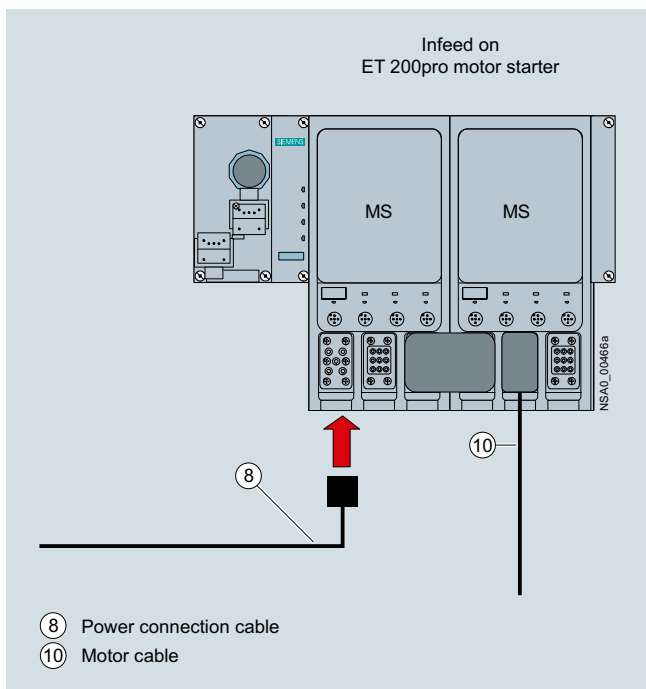
Basic design of an ET 200pro version with (from the left) connection module for IM, interface module for communication (IM), RSM isolator module, two ET 200pro motor starters (MS), and connections for power



Infeed on the RSM isolator module

#### Legend:

- ① Power feeder plug (see page 9/400)
- ② Power connection plug (see page 9/400)
- ③ Power jumper plug (see page 9/400)
- ④ Motor connection plug (see page 9/400)
- ⑤ Motor plug (see page 9/400)
- ⑥ Motor plug with EMC suppressor circuit (see page 9/400)
- ⑦ Power loop-through plug (see page 9/400)
- ⑧ Power connection cable (see page 9/400)
- ⑨ Power connection cable for isolator modules (see page 9/400)
- ⑩ Motor cable (see page 9/401)



Infeed on the ET 200pro motor starter

**Power bus**

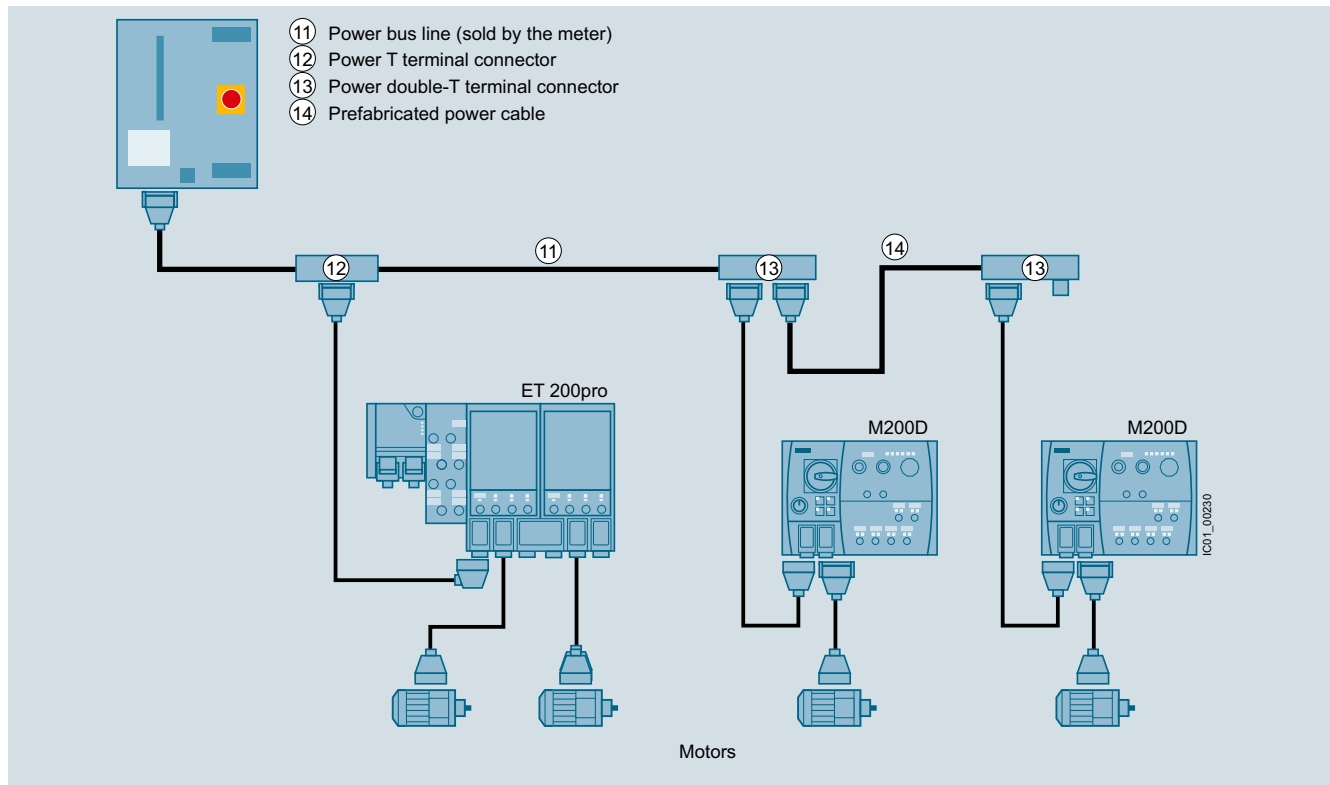
The power supply to the field devices (ET 200pro motor starters, M200D motor starters) is provided via the power bus, in which the power T terminal connectors or power double-T terminal connectors are connected by power bus cables.

**Feeders**

From the terminal connectors, spur lines with Han Q4/2 plugs lead to the field devices, from which the motors are supplied with power via motor connection cables.

**Interruption-free thanks to power terminal connectors**

In finger-safe connection technology the power T terminal connectors and power double-T terminal connectors connect the components of a feeder to the power bus. They ensure interruption-free operation, i.e. when the components are plugged in, the power bus is not interrupted.



Power supply to the motors via the power bus with power T and double-T terminal connectors linked by power bus cables, spur lines to the field devices (motor starters), and power loop-through connections to the motors via motor connection cables

**Motor control via PROFIBUS**

The interface modules (IM) for PROFIBUS can be combined with three different connection modules for connecting PROFIBUS DP and the power supply:

- Direct connection with cable glands
- ECOFAST connection with hybrid fieldbus cables (with two copper cores for data transmission with PROFIBUS DP, and four copper cores for the power supply), and ECOFAST connectors (HanBrid)<sup>1)</sup>
- M12, 7/8" connection
  - with M12 connecting cable and M12 plugs for data transmission with PROFIBUS DP
  - with 7/8" connecting cable and 7/8" plugs for the power supply<sup>2)</sup>

The connection modules with the relevant accessories can be found among the accessories for the ET 200pro interface modules IM 154-1 and IM 154-2 (see page 9/350).

<sup>1)</sup> Hybrid fieldbus connections with HanBrid sockets designed as cabinet bushings transmit data and energy from the control cabinet (IP20) to the field (IP65). They are the interface for jointly routing PROFIBUS DP and the auxiliary voltages into the hybrid fieldbus cable.

<sup>2)</sup> On the control cabinet bushings with two M12 sockets for the PROFIBUS M12 connecting cables, the 24 V supply of the motor starters is implemented via separate 7/8" connecting cables.

**Motor control via PROFINET**

The connection modules with the relevant accessories can be found among the accessories for the ET 200pro interface module IM 154-4 PN (see page 9/354).

**Motor control via Industrial Wireless LAN**

As well as wired solutions, communication can also be made via Industrial Wireless LAN (see interface module IM 154-6 PN IWLAN, page 9/357).



**I/O systems**

ET 200 systems without control cabinet

ET 200 pro - ET 200pro Safety motor starters Solutions local/PROFIsafe

**Accessories for ET 200pro motor starters****Selection and ordering data**

Version	Article No.
<b>Incoming energy supply</b>	
<b>① Power feeder plugs</b> Connector set for energy supply, e.g. for connecting to T terminal connectors, comprising a coupling enclosure, straight outgoing feeder (with bracket), pin insert for HAN Q4/2, incl. gland <ul style="list-style-type: none"> <li>• 5 male contacts 2.5 mm<sup>2</sup></li> <li>• 5 male contacts 4 mm<sup>2</sup></li> <li>• 5 male contacts 6 mm<sup>2</sup></li> </ul>	<b>3RK1911-2BS60</b> <b>3RK1911-2BS20</b> <b>3RK1911-2BS40</b>
<b>② Power connection plugs</b> Connector set for energy supply for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angular outgoing feeder, female insert for HAN Q4/2, incl. gland <ul style="list-style-type: none"> <li>• 5 female contacts 2.5 mm<sup>2</sup></li> <li>• 5 female contacts 4 mm<sup>2</sup></li> <li>• 5 female contacts 6 mm<sup>2</sup></li> </ul>	<b>3RK1911-2BE50</b> <b>3RK1911-2BE10</b> <b>3RK1911-2BE30</b>
<b>⑧ Power connection cables, assembled at one end</b> Power connection cable for ET 200pro motor starters, open at one end, for HAN Q4/2, angular, insert turned at isolator module end, 4 x 4 mm <sup>2</sup> <ul style="list-style-type: none"> <li>• Length 1.5 m</li> <li>• Length 5.0 m</li> </ul>	<b>3RK1911-0DB13</b> <b>3RK1911-0DB33</b>
<b>⑨ Power connection cables for isolator module, assembled at one end</b> Power connection cable for ET 200pro isolator modules, open at one end, for HAN Q4/2, angular, insert turned at isolator module end, 4 x 4 mm <sup>2</sup> <ul style="list-style-type: none"> <li>• Length 1.5 m</li> <li>• Length 5.0 m</li> </ul>	<b>3RK1911-0DF13</b> <b>3RK1911-0DF33</b>
<b>Power loop-through on the field device</b>	
<b>③ Power jumper plug</b>	<b>3RK1922-2BQ00</b>
<b>⑦ Power loop-through plugs</b> Connector set for power loop-through for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angular outgoing feeder, pin insert for HAN Q4/2, incl. gland <ul style="list-style-type: none"> <li>• 4 male contacts 2.5 mm<sup>2</sup></li> <li>• 4 male contacts 4 mm<sup>2</sup></li> </ul>	<b>3RK1911-2BF50</b> <b>3RK1911-2BF10</b>
<b>Motor cable</b>	
<b>④ Motor connection plugs</b> Connector set for motor cable for connection to ET 200pro motor starters, comprising a cable-end connector hood, angular outgoing feeder, pin insert for HAN Q8/0, incl. gland <ul style="list-style-type: none"> <li>• 8 male contacts 1.5 mm<sup>2</sup></li> <li>• 6 male contacts 2.5 mm<sup>2</sup></li> </ul>	<b>3RK1902-0CE00</b> <b>3RK1902-0CC00</b>
<b>⑤ Motor plugs</b> Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, female insert for HAN 10e, incl. star jumper, incl. gland <ul style="list-style-type: none"> <li>• 7 female contacts 1.5 mm<sup>2</sup></li> <li>• 7 female contacts 2.5 mm<sup>2</sup></li> </ul>	<b>3RK1911-2BM21</b> <b>3RK1911-2BM22</b>
<b>⑥ Motor plugs with EMC suppressor circuit</b> Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, female insert for HAN 10e with EMC suppressor circuit, incl. star jumper, incl. gland <ul style="list-style-type: none"> <li>• 7 female contacts 1.5 mm<sup>2</sup></li> <li>• 7 female contacts 2.5 mm<sup>2</sup></li> </ul>	<b>3RK1911-2BL21</b> <b>3RK1911-2BL22</b>

Version	Article No.	
<b>Motor cables (continued)</b>		
<p>⑩ <b>Motor cables, assembled at one end</b> Open at one end, HAN Q8, angular, length 5 m</p> <ul style="list-style-type: none"> <li>• Motor cable for motor without brake, for ET 200pro, 4 x 1.5 mm<sup>2</sup></li> <li>• Motor cable for motor with brake for ET 200pro, 6 x 1.5 mm<sup>2</sup></li> </ul>	<p><b>3RK1911-0EB31</b></p> <p><b>3RK1911-0ED31</b></p>	
<b>Power bus</b>		
<p>⑫ <b>Power T terminal connectors</b> For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cables at any point of the power bus, by insulation displacement connection, used with preassembled bus segments</p> <ul style="list-style-type: none"> <li>• 2.5 mm<sup>2</sup> / 4 mm<sup>2</sup></li> <li>• 4 mm<sup>2</sup> / 6 mm<sup>2</sup></li> </ul>	<p><b>3RK1911-2BF01</b></p> <p><b>3RK1911-2BF02</b></p>	
<p>⑬ <b>Power double-T terminal connectors</b> For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cable at any point of the power bus, by insulation displacement connection, used with preassembled bus segments, connection of two motor starters possible</p> <ul style="list-style-type: none"> <li>• 4 mm<sup>2</sup> / 6 mm<sup>2</sup></li> </ul>	<p><b>3RK1911-2BG02</b></p>	
<p><b>Sealing set (comprising 2 seals)</b> For power T/power double-T terminal connectors</p> <ul style="list-style-type: none"> <li>• For power cables with Ø 10 ... 13 mm</li> <li>• For power cables with Ø 13 ... 16 mm</li> <li>• For power cables with Ø 16 ... 19 mm</li> <li>• For power cables with Ø 19 ... 22 mm</li> <li>• Blanking plugs</li> </ul>	<p><b>3RK1911-5BA00</b></p> <p><b>3RK1911-5BA10</b></p> <p><b>3RK1911-5BA20</b></p> <p><b>3RK1911-5BA30</b></p> <p><b>3RK1911-5BA50</b></p>	
<b>Further accessories for energy connections</b>		
 <p>3RK1902-0CW00</p>	<p><b>Crimping tools for pins/sockets 4 mm<sup>2</sup> and 6 mm<sup>2</sup></b></p> <p><b>3RK1902-0CW00</b></p>	
	<p><b>Dismantling tools</b></p> <ul style="list-style-type: none"> <li>• For male and female contacts for 9-pin HAN Q4/2 inserts</li> <li>• For male and female contacts for 9-pin HAN Q8 inserts</li> </ul>	<p><b>3RK1902-0AB00</b></p> <p><b>3RK1902-0AJ00</b></p>
 <p>3RK1902-0CK00</p>	<p><b>Sealing caps</b> For 9-pin power socket connectors</p> <ul style="list-style-type: none"> <li>• 1 unit per pack</li> <li>• 10 units per pack</li> </ul>	<p><b>3RK1902-0CK00</b></p> <p><b>3RK1902-0CJ00</b></p>

More connection technology products can be found at our "Siemens Solution Partners Automation" website under "Distributed Field Installation System" technology: [www.siemens.com/automation/partnerfinder](http://www.siemens.com/automation/partnerfinder)



**I/O systems**

ET 200 systems without control cabinet

ET 200 pro - ET 200pro Safety motor starters Solutions local/PROFIsafe

**Accessories for ET 200pro motor starters**

Version	Article No.
<b>Further accessories</b>	
<b>Module racks, wide<sup>1)</sup></b> <ul style="list-style-type: none"> <li>• Length 500 mm</li> <li>• Length 1 000 mm</li> <li>• Length 2 000 mm</li> </ul>	<b>6ES7194-4GB00-0AA0</b> <b>6ES7194-4GB60-0AA0</b> <b>6ES7194-4GB20-0AA0</b>
<b>Module racks, wide, compact<sup>1)</sup></b> <ul style="list-style-type: none"> <li>• Length 500 mm</li> <li>• Length 1 000 mm</li> <li>• Length 2 000 mm</li> </ul>	<b>6ES7194-4GD00-0AA0</b> <b>6ES7194-4GD10-0AA0</b> <b>6ES7194-4GD20-0AA0</b>
<b>Backplane bus modules 110 mm<sup>2)</sup></b>	<b>3RK1922-2BA00</b>
<b>Backplane bus modules for Safety local isolator modules</b>	<b>3RK1922-2BA01</b>
<b>Handheld devices</b> For ET 200pro motor starters (or for ET 200S High Feature and M200D motor starters) for local operation. The motor starter-specific serial interface cables must be ordered separately. The RS 232 interface cable 3RK1922-2BP00 is used for the MS ET 200pro.	<b>3RK1922-3BA00</b>
<b>RS 232 interface cable</b> Serial data connection between ET 200pro (or M200D) motor starters and the RS 232 interface of a PC/PG/laptop (with the Motor Starter ES software) or the handheld device 3RK1922-3BA00.	<b>3RK1922-2BP00</b>
<b>USB interface cable, 2.5 m</b> Serial data connection between ET 200pro (or M200D) motor starters and the USB interface of a PC/PG/laptop (with the Motor Starter ES software).	<b>6SL3555-0PA00-2AA0</b>
<b>M12 sealing cap</b> For sealing unused M12 input or output sockets (one set contains ten sealing caps)	<b>3RK1901-1KA00</b>
<b>Manual SIMATIC ET 200pro Motor Starters</b>	
The manual can be downloaded free of charge in PDF format from the Internet, <a href="http://support.automation.siemens.com/WW/view/en/22332388">see http://support.automation.siemens.com/WW/view/en/22332388</a>	



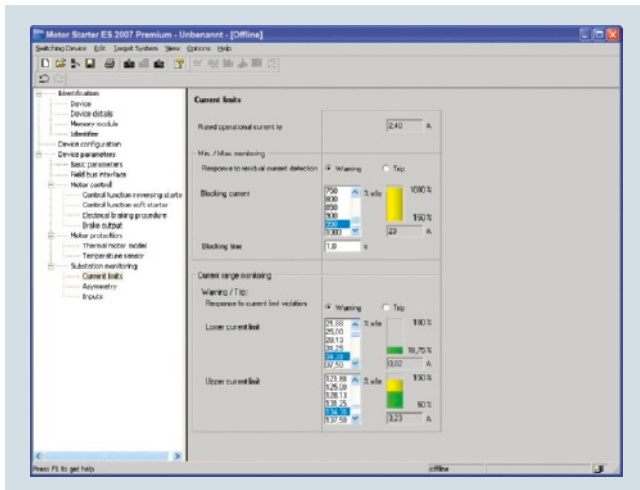
3RK1922-3BA00



3RK1901-1KA00

- 1) The wide module rack can accommodate all ET 200pro motor starters and any optional modules (isolator module, Safety local isolator module and 400 V disconnecting module).
- 2) The backplane bus module is a prerequisite for operation of the ET 200pro motor starters and the optional modules.

## Overview



Motor Starter ES for parameterization, monitoring, diagnostics and testing of motor starters

Motor Starter ES is used for start up, parameterization, diagnostics, documentation and the preventative maintenance of the motor starters in the SIMATIC ET 200S, ET 200pro, ECOFAST and M200D product families.

### Note:

For more information, see pages 9/248 to 9/251.

## I/O systems

ET 200 systems without control cabinet

ET 200pro – Add-on products for ET 200pro

### EtherNet/IP interface module

#### Overview

An interface module (EtherNet/IP adapter) is provided for operating the ET 200pro on EtherNet/IP. It can be used together with system and IO components of the ET 200pro distributed I/O system.

#### Technical specifications

Article number	ZNX:EIP-200PRO
	ETHERNET/IP HEAD ASSEMBLY FOR ET 200PRO
<b>Product type designation</b>	
<b>General information</b>	
Vendor identification (VendorID)	0008h
Device identifier (DeviceID)	0240h
<b>Supply voltage</b>	
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Input current</b>	
from supply voltage 1L+, max.	250 mA
<b>Power losses</b>	
Power loss, typ.	6 W
<b>Address area</b>	
<b>Addressing volume</b>	
• Inputs	255 byte
• Outputs	255 byte
<b>Interfaces</b>	
<b>PROFINET IO</b>	
• Automatic detection of transmission speed	Yes
• Transmission rate, max.	100 Mbit/s
• Services	See manual
<b>Interrupts/diagnostics/status information</b>	
<b>Diagnostics indication LED</b>	
• Bus fault BF (red)	Yes
• Group error SF (red)	Yes
• Monitoring 24 V voltage supply ON (green)	Yes
• Load voltage monitoring DC 24 V (green)	Yes

Article number	ZNX:EIP-200PRO
	ETHERNET/IP HEAD ASSEMBLY FOR ET 200PRO
<b>Galvanic isolation</b>	
between backplane bus and electronics	Yes
between supply voltage and electronics	Yes
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP65	Yes
• IP66	Yes
• IP67	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C
• max.	55 °C
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Dimensions</b>	
Width	135 mm
Height	130 mm
Depth	76 mm
<b>Weights</b>	
Weight, approx.	490 g

**Technical specifications** (continued)

Article number	<b>ZNX:EIP-200PR-OCM1</b> ET200PRO, CM IM DP M12 / 7/8"
<b>Product type designation</b>	
<b>Input current</b>	
from load voltage 2L+ (without load), max.	No current input, only infeed current, max. 8 A
from supply voltage 1L+, max.	No current input, only infeed current, max. 8 A
<b>Interfaces</b>	
<b>PROFIBUS DP</b>	
• Transmission rate, max.	100 Mbit/s; full-duplex, PROFINET
<b>Accessories</b>	
Function description	IM PN; 2xM12 2x7/8" interface module, power supply from 1L+ and 2L+ max. per 8 A, internal transfer 2L+ max. 8 A, 1L+ max. 5 A
belongs to product	M154-4PN High Feature
<b>Weights</b>	
Weight, approx.	540 g

**Ordering data****SIMATIC ET 200pro interface module for EtherNet/IP**

Including:

- Bus termination module for ET 200pro
- Companion disk with the manuals and the Configuration Tool

**Connecting module for EtherNet/IP**

For connecting the interface module to EtherNet/IP

**Article No.****ZNX:EIP200PRO****ZNX:EIP200PROC1**

## I/O systems

ET 200 systems without control cabinet  
ET 200eco PN

### SIMATIC ET 200eco PN

#### Overview



- Compact block I/O for processing digital, analog and IO-Link signals for connecting to the PROFINET bus system
- Cabinet-free design with degree of protection IP65/66/67 with M12 connections
- Extremely rugged and resistant metal housing and casting
- Compact module in two types of enclosures:
  - 30 mm x 200 mm x 37 mm (W x H x D, long and narrow enclosure), with 4 x M12 for digital signals
  - 60 mm x 175 mm x 37 mm (W x H x D, short and wide enclosure), with 8 x M12 for digital signals and IO-Link
  - 60 mm x 175 mm x 37 mm (W x H x D, short and wide enclosure) with 4 x M12 or 8 x M12 for analog signals
- PROFINET connection: 2 x M12 and automatic PROFINET address assignment
- Data transmission rate 100 Mbit/s
- LLDP proximity detection without PG and Fast Startup (boot up within approx 0.5 seconds)
- Supply and load voltage connection: 2 x M12
- Module variance:
  - 8 DI
  - 16 DI
  - 8 DO (2 A)
  - 8 DO (1.3 A)
  - 8 DO (0.5 A)
  - 16 DO (1.3 A)
  - 8 DI/DO (1.3 A)
  - 8 AI (U, I, TC, RTD)
  - 8 AI (TC, RTD)
  - 4 AO (U, I)
  - 4 IO-Link + 8 DI + 4 DO (1.3 A)
- Channel-specific diagnostics
- Ambient temperature range -40 °C to 60 °C

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#### Technical specifications

Article number	6ES7141-6BF00-0AB0	6ES7141-6BG00-0AB0	6ES7141-6BH00-0AB0
	ET200ECO PN, 8DI, DC24V, 4XM12	ET200ECO PN, 8DI, DC24V, 8XM12	ET200ECO PN, 16DI, DC24V, 8XM12
<b>Product type designation</b>			
<b>General information</b>			
Vendor identification (VendorID)	002AH	002AH	002AH
Device identifier (DeviceID)	0306H	0306H	0306H
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V
Reverse polarity protection	Yes	Yes	Yes
<b>Input current</b>			
Current consumption, typ.	100 mA	100 mA	100 mA
<b>Encoder supply</b>			
Number of outputs	4	8	8
<b>Output current</b>			
• nominal	100 mA; per output	100 mA; per output	100 mA; per output
<b>24 V encoder supply</b>			
• short-circuit protection	Yes	Yes	Yes

#### Technical specifications (continued)

Article number	<b>6ES7141-6BF00-0AB0</b> ET200ECO PN, 8DI, DC24V, 4XM12	<b>6ES7141-6BG00-0AB0</b> ET200ECO PN, 8DI, DC24V, 8XM12	<b>6ES7141-6BH00-0AB0</b> ET200ECO PN, 16DI, DC24V, 8XM12
<b>Power losses</b>			
Power loss, typ.	5.5 W	4.5 W	6.5 W
<b>Digital inputs</b>			
Number of digital inputs	8	8	16
• In groups of	2	1	2
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes
<b>Number of simultaneously controllable inputs</b>			
<b>all mounting positions</b>			
- up to 60 °C, max.	8	8	16
<b>Input voltage</b>			
• Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V
<b>Input current</b>			
• for signal "0", max. (permissible quiescent current)	1.5 mA	1.5 mA	1.5 mA
• for signal "1", typ.	7 mA	7 mA	7 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>			
- at "0" to "1", max.	typically 3 ms	typically 3 ms	typically 3 ms
- at "1" to "0", max.	typically 3 ms	typically 3 ms	typically 3 ms
<b>Cable length</b>			
• Unshielded, max.	30 m	30 m	30 m
<b>Interfaces</b>			
Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX
Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s
<b>PROFINET IO</b>			
• Number of PROFINET interfaces	1	1	1
• Autocrossing	Yes	Yes	Yes
• Automatic detection of transmission speed	Yes	Yes	Yes
• Integrated switch	Yes	Yes	Yes
<b>PROFINET IO Device</b>			
- IRT with the option "high flexibility" supported	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
<b>Protocols</b>			
PROFINET IO	Yes	Yes	Yes
PROFINET CBA	No	No	No
Supports protocol for PROFI-safe	No	No	No
<b>Protocols (Ethernet)</b>			
• SNMP	Yes	Yes	Yes
• DCP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
• ping	Yes	Yes	Yes
• ARP	Yes	Yes	Yes

**I/O systems**

ET 200 systems without control cabinet

ET 200eco PN

**SIMATIC ET 200eco PN****Technical specifications** (continued)

Article number	<b>6ES7141-6BF00-0AB0</b> ET200ECO PN, 8DI, DC24V, 4XM12	<b>6ES7141-6BG00-0AB0</b> ET200ECO PN, 8DI, DC24V, 8XM12	<b>6ES7141-6BH00-0AB0</b> ET200ECO PN, 16DI, DC24V, 8XM12
<b>Interrupts/diagnostics/ status information</b>			
Status indicator	Yes; Green LED	Yes; Green LED	Yes; Green LED
<b>Alarms</b>			
• Diagnostic alarm	Yes	Yes	Yes
<b>Diagnostic messages</b>			
• Diagnostic functions	Yes	Yes	Yes
• Diagnostic information readable	Yes	Yes	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED	Yes; Green "ON" LED	Yes; Green "ON" LED
• Wire break in signal transmitter cable	Yes	Yes	Yes
• Short circuit encoder supply	Yes; Per channel group	Yes; Per channel group	Yes; Per channel group
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
<b>Galvanic isolation</b>			
between the load voltages	Yes	Yes	Yes
between load voltage and all other switching components	No	No	No
between Ethernet and electronics	Yes	Yes	Yes
<b>Galvanic isolation digital inputs</b>			
• between the channels	No	No	No
<b>Permissible potential difference</b>			
between different circuits	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>			
<b>tested with</b>			
• 24 V DC circuits	500 V	500 V	500 V
• Interface	1 500 V; According to IEEE 802.3	1 500 V; According to IEEE 802.3	1 500 V; According to IEEE 802.3
<b>Degree and class of protection</b>			
Degree of protection to EN 60529			
• IP65	Yes	Yes	Yes
• IP66	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
<b>Connection method</b>			
M12	Yes	Yes	Yes
<b>Dimensions</b>			
Width	30 mm	60 mm	60 mm
Height	200 mm	175 mm	175 mm
Depth	49 mm	49 mm	49 mm
<b>Weights</b>			
Weight (without packaging)	550 g	910 g	910 g

#### Technical specifications (continued)

Article number	6ES7142-6BF50-0AB0 ET200ECO PN, 8DO, DC24V/0.5A, 4XM12	6ES7142-6BF00-0AB0 ET200ECO PN, 8DO, DC24V/1.3A, 4XM12	6ES7142-6BG00-0AB0 ET200ECO PN, 8DO, DC24V/1.3A, 8XM12	6ES7142-6BR00-0AB0 ET200ECO PN, 8 DO, DC24V/2A, 8XM12	6ES7142-6BH00-0AB0 ET200ECO PN, 16DO DC24V/1.3A, 8XM12
<b>Product type designation</b>					
<b>General information</b>					
Vendor identification (VendorID)	002AH	002AH	002AH	002AH	002AH
Device identifier (DeviceID)	0306H	0306H	0306H	0306H	0306H
<b>Supply voltage</b>					
<b>Load voltage 1L+</b>					
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	28.8 V	28.8 V
• Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
<b>Load voltage 2L+</b>					
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	28.8 V	28.8 V
• Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
<b>Input current</b>					
from load voltage 1L+ (unswitched voltage)	100 mA	4 A	4 A	4 A	4 A
from load voltage 2L+, max.	4 A	4 A	4 A	4 A	4 A
<b>Power losses</b>					
Power loss, typ.	3 W	5.5 W	5.5 W	5 W	5.5 W
<b>Digital outputs</b>					
Number of digital outputs	8	8	8	8	16
• In groups of	8	4	4	4	8
short-circuit protection	Yes	Yes	Yes	Yes	Yes
• Response threshold, typ.	0.7 A	1.8 A	1.8 A	2.8 A	1.8 A
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V
Controlling a digital input	Yes	Yes	Yes	Yes	Yes
<b>Switching capacity of the outputs</b>					
• on lamp load, max.	5 W	5 W	5 W	10 W	5 W
<b>Output current</b>					
• for signal "1" rated value	0.5 A	1.3 A; Maximum	1.3 A; Maximum	2 A	1.3 A; Maximum
• for signal "0" residual current, max.	1.5 mA	1.5 mA	1.5 mA	1.5 mA	1.5 mA
<b>Parallel switching of 2 outputs</b>					
• for increased power	No	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes	Yes
<b>Switching frequency</b>					
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz	1 Hz	1 Hz	1 Hz
<b>Aggregate current of outputs (per group)</b>					
<b>all mounting positions</b>					
- up to 55 °C, max.		3.9 A			
- up to 60 °C, max.	4 A	2.6 A	3.9 A	3.9 A	3.9 A
<b>Cable length</b>					
• Unshielded, max.	30 m	30 m	30 m	30 m	30 m



**I/O systems**

ET 200 systems without control cabinet

ET 200eco PN

**SIMATIC ET 200eco PN****Technical specifications** (continued)

Article number	<b>6ES7142-6BF50-0AB0</b> ET200ECO PN, 8DO, DC24V/0.5A, 4XM12	<b>6ES7142-6BF00-0AB0</b> ET200ECO PN, 8DO, DC24V/1.3A, 4XM12	<b>6ES7142-6BG00-0AB0</b> ET200ECO PN, 8DO, DC24V/1.3A, 8XM12	<b>6ES7142-6BR00-0AB0</b> ET200ECO PN, 8 DO, DC24V/2A, 8XM12	<b>6ES7142-6BH00-0AB0</b> ET200ECO PN, 16DO DC24V/1.3A, 8XM12
<b>Interfaces</b>					
Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX
Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s	100 Mbit/s	100 Mbit/s
<b>PROFINET IO</b>					
• Number of PROFINET interfaces	1	1	1	1	1
• Autocrossing	Yes	Yes	Yes	Yes	Yes
• Automatic detection of transmission speed	Yes	Yes	Yes	Yes	Yes
• Integrated switch	Yes	Yes	Yes	Yes	Yes
<b>PROFINET IO Device</b>					
- IRT with the option "high flexibility" supported	Yes	Yes	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes	Yes	Yes
<b>Protocols</b>					
PROFINET IO	Yes	Yes	Yes	Yes	Yes
PROFINET CBA	No	No	No	No	No
Supports protocol for PROFI-safe	No	No	No	No	No
<b>Protocols (Ethernet)</b>					
• SNMP	Yes	Yes	Yes	Yes	Yes
• DCP	Yes	Yes	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes	Yes	Yes
• ping	Yes	Yes	Yes	Yes	Yes
• ARP	Yes	Yes	Yes	Yes	Yes
<b>Interrupts/diagnostics/status information</b>					
Status indicator	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
<b>Alarms</b>					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
<b>Diagnostic messages</b>					
• Diagnostic functions	Yes	Yes	Yes	Yes	Yes
• Diagnostic information readable	Yes	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED	Yes; Green "ON" LED	Yes; Green "ON" LED	Yes; Green "ON" LED	Yes; Green "ON" LED
• Wire break in actuator cable	Yes	Yes	Yes	Yes	Yes
• Short circuit	Yes	Yes	Yes	Yes	Yes
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED

**Technical specifications** (continued)

Article number	<b>6ES7142-6BF50-0AB0</b> ET200ECO PN, 8DO, DC24V/0.5A, 4XM12	<b>6ES7142-6BF00-0AB0</b> ET200ECO PN, 8DO, DC24V/1.3A, 4XM12	<b>6ES7142-6BG00-0AB0</b> ET200ECO PN, 8DO, DC24V/1.3A, 8XM12	<b>6ES7142-6BR00-0AB0</b> ET200ECO PN, 8 DO, DC24V/2A, 8XM12	<b>6ES7142-6BH00-0AB0</b> ET200ECO PN, 16DO DC24V/1.3A, 8XM12
<b>Galvanic isolation</b>					
between the load voltages	Yes	Yes	Yes	Yes	Yes
between load voltage and all other switching components	No	No	No	No	No
between Ethernet and electronics	Yes	Yes	Yes	Yes	Yes
<b>Galvanic isolation digital outputs</b>					
• between the channels	No	No	No	No	No
<b>Permissible potential difference</b>					
between different circuits	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
<b>Isolation tested with</b>					
• 24 V DC circuits	500 V	500 V	500 V	500 V	500 V
• Interface	1 500 V; According to IEEE 802.3	1 500 V; According to IEEE 802.3	1 500 V; According to IEEE 802.3	1 500 V; According to IEEE 802.3	1 500 V; According to IEEE 802.3
<b>Degree and class of protection</b>					
Degree of protection to EN 60529					
• IP65	Yes	Yes	Yes	Yes	Yes
• IP66	Yes	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes	Yes
<b>Connection method</b>					
M12	Yes	Yes	Yes	Yes	Yes
<b>Dimensions</b>					
Width	30 mm	30 mm	60 mm	60 mm	60 mm
Height	200 mm	200 mm	175 mm	175 mm	175 mm
Depth	49 mm	49 mm	49 mm	49 mm	49 mm
<b>Weights</b>					
Weight (without packaging)	550 g	550 g	910 g	910 g	910 g

**I/O systems**

ET 200 systems without control cabinet

ET 200eco PN

**SIMATIC ET 200eco PN****Technical specifications (continued)**

Article number	<b>6ES7147-6BG00-0AB0</b> ET200ECO PN, 8 DIO, DC24V/1.3A, 8XM12
<b>Product type designation</b>	
<b>General information</b>	
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes
<b>Input current</b>	
from load voltage 1L+ (unswitched voltage)	4 A
from load voltage 2L+, max.	4 A
<b>Encoder supply</b>	
Number of outputs	8
<b>Output current</b>	
• nominal	100 mA; per output
<b>24 V encoder supply</b>	
• short-circuit protection	Yes
<b>Power losses</b>	
Power loss, typ.	6.5 W
<b>Digital inputs</b>	
Number of digital inputs	8
• In groups of	4
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Number of simultaneously controllable inputs</b>	
<b>all mounting positions</b>	
- up to 60 °C, max.	8
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	1.5 mA
• for signal "1", typ.	7 mA

Article number	<b>6ES7147-6BG00-0AB0</b> ET200ECO PN, 8 DIO, DC24V/1.3A, 8XM12
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at "0" to "1", max.	typically 3 ms
- at "1" to "0", max.	typically 3 ms
<b>Cable length</b>	
• Unshielded, max.	30 m
<b>Digital outputs</b>	
Number of digital outputs	8
• In groups of	4
short-circuit protection	Yes; Electronic
• Response threshold, typ.	1.8 A
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V
Controlling a digital input	Yes
<b>Switching capacity of the outputs</b>	
• on lamp load, max.	5 W
<b>Output current</b>	
• for signal "1" rated value	1.3 A; Maximum
• for signal "0" residual current, max.	1.5 mA
<b>Parallel switching of 2 outputs</b>	
• for increased power	No
• for redundant control of a load	Yes
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz
<b>Aggregate current of outputs (per group)</b>	
<b>all mounting positions</b>	
- up to 60 °C, max.	3.9 A
<b>Cable length</b>	
• Unshielded, max.	30 m
<b>Interfaces</b>	
Transmission procedure	100BASE-TX
Transmission rate, max.	100 Mbit/s
<b>PROFINET IO</b>	
• Number of PROFINET interfaces	1
• Autocrossing	Yes
• Automatic detection of transmission speed	Yes
• Integrated switch	Yes
<b>PROFINET IO Device</b>	
- IRT with the option "high flexibility" supported	Yes
- Prioritized startup	Yes

#### Technical specifications (continued)

Article number	<b>6ES7147-6BG00-0AB0</b>		Article number	<b>6ES7147-6BG00-0AB0</b>	
	ET200ECO PN, 8 DIO, DC24V/1.3A, 8XM12			ET200ECO PN, 8 DIO, DC24V/1.3A, 8XM12	
<b>Protocols</b>			<b>Galvanic isolation</b>		
PROFINET IO	Yes		between the load voltages	Yes	
PROFINET CBA	No		between load voltage and all other switching components	No	
Supports protocol for PROFI-safe PROFIBUS	No		between Ethernet and electronics	Yes	
<b>Protocols (Ethernet)</b>			<b>Galvanic isolation digital inputs</b>		
• TCP/IP	No		• between the channels	No	
• SNMP	Yes		<b>Galvanic isolation digital outputs</b>		
• DCP	Yes		• between the channels	No	
• LLDP	Yes		<b>Permissible potential difference</b>		
• ping	Yes		between different circuits	75V DC/60V AC	
• ARP	Yes		<b>Isolation</b>		
<b>Interrupts/diagnostics/status information</b>			<b>tested with</b>		
Status indicator	Yes; Green LED		• 24 V DC circuits	500 V	
<b>Alarms</b>			• Interface	1 500 V; According to IEEE 802.3	
• Diagnostic alarm	Yes		<b>Degree and class of protection</b>		
<b>Diagnostic messages</b>			Degree of protection to EN 60529		
• Diagnostic functions	Yes		• IP65	Yes	
• Diagnostic information readable	Yes		• IP66	Yes	
• Monitoring the supply voltage	Yes; Green "ON" LED		• IP67	Yes	
• Wire break in actuator cable	Yes		<b>Connection method</b>		
• Wire break in signal transmitter cable	Yes		M12	Yes	
• Short circuit	Yes		<b>Dimensions</b>		
• Short circuit encoder supply	Yes		Width	60 mm	
• Group error	Yes; Red/yellow "SF/MT" LED		Height	175 mm	
			Depth	49 mm	
			<b>Weights</b>		
			Weight (without packaging)	910 g	
Article number	<b>6ES7144-6KD00-0AB0</b>	<b>6ES7144-6KD50-0AB0</b>			
	ET200ECO PN, 8AI; 4 U/I; 4 RTD/TC 8XM12	ET200ECO PN, 8AI RTD/TC 8XM12			
<b>Product type designation</b>					
<b>General information</b>					
Vendor identification (VendorID)	002AH	002AH			
Device identifier (DeviceID)	0306H	0306H			
<b>Supply voltage</b>					
Rated value (DC)					
• 24 V DC	Yes	Yes			
permissible range, lower limit (DC)	20.4 V	20.4 V			
permissible range, upper limit (DC)	28.8 V	28.8 V			
Reverse polarity protection	Yes	Yes; against destruction			
<b>Input current</b>					
Current consumption, typ.	110 mA	110 mA			
<b>Encoder supply</b>					
Number of outputs	4				
<b>24 V encoder supply</b>					
• short-circuit protection	Yes; Electronic at 1.4 A				
• Output current, max.	1 A				

**I/O systems**

ET 200 systems without control cabinet

ET 200eco PN

**SIMATIC ET 200eco PN****Technical specifications (continued)**

Article number	<b>6ES7144-6KD00-0AB0</b> ET200ECO PN, 8AI; 4 U/I; 4 RTD/TC 8XM12	<b>6ES7144-6KD50-0AB0</b> ET200ECO PN, 8AI RTD/TC 8XM12
<b>Power losses</b>		
Power loss, typ.	2.8 W	2.8 W
<b>Analog inputs</b>		
Number of analog inputs	8	8
• For voltage/current measurement	4	
• For resistance/resistance thermometer measurement	4	8
permissible input voltage for voltage input (destruction limit), max.	28.8 V permanent, 35 V for max. 500 ms	
<b>Input ranges (rated values), voltages</b>		
• 0 to +10 V	Yes	
• 1 V to 5 V	Yes	
• -10 V to +10 V	Yes	
• -80 mV to +80 mV	Yes	Yes
<b>Input ranges (rated values), currents</b>		
• 0 to 20 mA	Yes	
• -20 mA to +20 mA	Yes	
• 4 mA to 20 mA	Yes	
<b>Input ranges (rated values), thermoelements</b>		
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type N	Yes	Yes
<b>Input ranges (rated values), resistance thermometer</b>		
• Ni 100	Yes	Yes
• Ni 1000	Yes	Yes
• Ni 120	Yes	Yes
• Ni 200	Yes	Yes
• Ni 500	Yes	Yes
• Pt 100	Yes	Yes
• Pt 1000	Yes	Yes
• Pt 200	Yes	Yes
• Pt 500	Yes	Yes
<b>Input ranges (rated values), resistors</b>		
• 0 to 150 ohms	Yes	Yes
• 0 to 300 ohms	Yes	Yes
• 0 to 600 ohms	Yes	Yes
• 0 to 3000 ohms	Yes	Yes
<b>Thermocouple (TC)</b>		
<b>Temperature compensation</b>		
- Parameterizable	Yes	Yes
- internal temperature compensation	Yes	Yes
- external temperature compensation with compensations socket	Yes	Yes
- external temperature compensation with Pt100		Yes
- dynamic reference temperature value		Yes
- for definable comparison point temperature		Yes
<b>Cable length</b>		
• shielded, max.	30 m	30 m

**Technical specifications** (continued)

Article number	<b>6ES7144-6KD00-0AB0</b> ET200ECO PN, 8AI; 4 U/I; 4 RTD/TC 8XM12	<b>6ES7144-6KD50-0AB0</b> ET200ECO PN, 8AI RTD/TC 8XM12
<b>Analog value creation</b>		
Analog value display	SIMATIC S7 format	SIMATIC S7 format
Measurement principle	integrating	integrating
<b>Integration and conversion time/ resolution per channel</b>		
• Resolution (incl. overrange)	15 bits + sign	15 bits + sign
• Integration time, parameterizable	Yes	Yes
• Integration time (ms)	2/16.67/20/100 ms	2/16.67/20/100 ms
• Interference voltage suppression for interference frequency f1 in Hz	500 / 60 / 50 / 10 Hz	500 / 60 / 50 / 10 Hz
• Conversion time (per channel)	4 / 19 / 22 / 102 ms	4 / 19 / 22 / 102 ms
<b>Smoothing of measured values</b>		
• Parameterizable	Yes	Yes
• Step: None	Yes; 1 x cycle time	Yes; 1 x cycle time
• Step: low	Yes; 4 x cycle time	Yes; 4 x cycle time
• Step: Medium	Yes; 16 x cycle time	Yes; 16 x cycle time
• Step: High	Yes; 64 x cycle time	Yes; 64 x cycle time
<b>Encoder</b>		
Number of connectable encoders, max.	8	8
<b>Connection of signal encoders</b>		
• for voltage measurement	Yes	
• for current measurement as 2-wire transducer	Yes	
• for current measurement as 4-wire transducer	Yes	
• for resistance measurement with two-wire connection	Yes	Yes
• for resistance measurement with three-wire connection	Yes	Yes
• for resistance measurement with four-wire connection	Yes	Yes
<b>Errors/accuracies</b>		
Linearity error (relative to input range), (+/-)	0.01 %	0.01 %
Temperature error (relative to input range), (+/-)	U: 0.0035%/°C; I: 0.006%/°C; RTD: 0.0005%/°C; TC: 0.0035%/°C	RTD: 0.0005%/°C; TC: 0.0035%/°C
Crosstalk between the inputs, min.	85 dB	-85 dB
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.008 %	0.008 %
<b>Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency</b>		
• Series mode interference (peak value of interference < rated value of input range), min.	46 dB	46 dB
• Common mode interference, min.	70 dB	70 dB

**I/O systems**

ET 200 systems without control cabinet

ET 200eco PN

**SIMATIC ET 200eco PN****Technical specifications** (continued)

Article number	<b>6ES7144-6KD00-0AB0</b> ET200ECO PN, 8AI; 4 U/I; 4 RTD/TC 8XM12	<b>6ES7144-6KD50-0AB0</b> ET200ECO PN, 8AI RTD/TC 8XM12
<b>Interfaces</b>		
Transmission procedure	100BASE-TX	100BASE-TX
Transmission rate, max.	100 Mbit/s	100 Mbit/s
<b>PROFINET IO</b>		
• Number of PROFINET interfaces	1	1
• Autocrossing	Yes	Yes
• Automatic detection of transmission speed	Yes	Yes
• Integrated switch	Yes	Yes
<b>PROFINET IO Device</b>		
- IRT with the option "high flexibility" supported	Yes	
- Prioritized startup	Yes	Yes
<b>Protocols</b>		
PROFINET IO	Yes	Yes
PROFINET CBA	No	No
Supports protocol for PROFIsafe	No	No
<b>Protocols (Ethernet)</b>		
• SNMP	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
• ping	Yes	Yes
• ARP	Yes	Yes
<b>Interrupts/diagnostics/status information</b>		
Status indicator	Yes	
<b>Alarms</b>		
• Diagnostic alarm	Yes	Yes
<b>Diagnostic messages</b>		
• Diagnostic functions	Yes	Yes
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED	Yes; Green "ON" LED
• Short circuit encoder supply	Yes; per module	
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
• Overflow/underflow	Yes	Yes
<b>Galvanic isolation</b>		
between the load voltages	Yes	Yes
between load voltage and all other switching components	No	No
between Ethernet and electronics	Yes	Yes
<b>Galvanic isolation analog inputs</b>		
• between the channels	No	No

**Technical specifications (continued)**

Article number	<b>6ES7144-6KD00-0AB0</b> ET200ECO PN, 8AI; 4 U/I; 4 RTD/TC 8XM12	<b>6ES7144-6KD50-0AB0</b> ET200ECO PN, 8AI RTD/TC 8XM12
<b>Permissible potential difference</b> between inputs and MANA (UCM)	10 Vpp AC	10 Vpp AC
<b>Isolation tested with</b>		
• 24 V DC circuits	500 V	500 V
• Interface	1 500 V; According to IEEE 802.3	1 500 V; According to IEEE 802.3
<b>Degree and class of protection</b>		
Degree of protection to EN 60529		
• IP65	Yes	Yes
• IP66	Yes	Yes
• IP67	Yes	Yes
<b>Connection method</b>		
M12	Yes	Yes
<b>Dimensions</b>		
Width	60 mm	60 mm
Height	175 mm	175 mm
Depth	49 mm	49 mm
<b>Weights</b>		
Weight (without packaging)	930 g	930 g

Article number	<b>6ES7145-6HD00-0AB0</b> ET200ECO PN, 4AO U/I 4XM12
<b>Product type designation</b>	
<b>General information</b>	
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
<b>Input current</b>	
Current consumption, typ.	280 mA
<b>Encoder supply</b>	
Number of outputs	4
<b>24 V encoder supply</b>	
• short-circuit protection	Yes; Electronic at 1.4 A
• Output current, max.	1 A

Article number	<b>6ES7145-6HD00-0AB0</b> ET200ECO PN, 4AO U/I 4XM12
<b>Power losses</b>	
Power loss, typ.	5.5 W
<b>Analog outputs</b>	
Number of analog outputs	4
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	30 mA
Current output, no-load voltage, max.	20 V
<b>Output ranges, voltage</b>	
• 0 to 10 V	Yes
• 1 V to 5 V	Yes
• -10 V to +10 V	Yes
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Connection of actuators</b>	
• for voltage output two-wire connection	Yes
• for current output two-wire connection	Yes



**I/O systems**

ET 200 systems without control cabinet

ET 200eco PN

**SIMATIC ET 200eco PN****Technical specifications (continued)**

Article number	<b>6ES7145-6HD00-0AB0</b> ET200ECO PN, 4AO U/I 4XM12
<b>Load impedance (in rated range of output)</b>	
• with voltage outputs, min.	1 kΩ
• with voltage outputs, capacitive load, max.	1 μF
• with current outputs, max.	600 Ω
• with current outputs, inductive load, max.	1 mH
<b>Destruction limits against externally applied voltages and currents</b>	
• Voltages at the outputs towards MANA	28.8 V permanent, 35 V for max. 500 ms
<b>Cable length</b>	
• shielded, max.	30 m
<b>Analog value creation</b>	
Analog value display	SIMATIC S7 format
Measurement principle	Resistor network
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution (incl. overrange)	15 bits + sign
• Conversion time (per channel)	1 ms
<b>Settling time</b>	
• for resistive load	2 ms
• for capacitive load	1.8 ms
• for inductive load	2 ms
<b>Errors/accuracies</b>	
Output ripple (based on output area, bandwidth 0 to 50 kHz), (+/-)	U: ±0.6 mVrms; I: ±0.4 nArms
Linearity error (relative to output range), (+/-)	0.02 %
Temperature error (relative to output range), (+/-)	U: 0.001%/°C; I: 0.0025%/°C
Crosstalk between the outputs, min.	70 dB
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.008 %
<b>Interfaces</b>	
Transmission procedure	100BASE-TX
Transmission rate, max.	100 Mbit/s
<b>PROFINET IO</b>	
• Number of PROFINET interfaces	1
• Autocrossing	Yes
• Automatic detection of transmission speed	Yes
• Integrated switch	Yes
<b>PROFINET IO Device</b>	
- IRT with the option "high flexibility" supported	Yes
- Prioritized startup	Yes

Article number	<b>6ES7145-6HD00-0AB0</b> ET200ECO PN, 4AO U/I 4XM12
<b>Protocols</b>	
PROFINET IO	Yes
PROFINET CBA	No
Supports protocol for PROFI-safe	No
<b>Protocols (Ethernet)</b>	
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes
<b>Interrupts/diagnostics/ status information</b>	
Status indicator	Yes
Substitute values connectable	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED
• Wire break	Yes; Channel-by-channel with current output
• Short circuit	Yes; Channel-by-channel with voltage output
• Group error	Yes; Red/yellow "SF/MT" LED
<b>Galvanic isolation</b>	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
<b>Galvanic isolation analog outputs</b>	
• between the channels	No
<b>Permissible potential difference</b>	
between M internally and the outputs	10 Vpp AC
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP65	Yes
• IP66	Yes
• IP67	Yes
<b>Connection method</b>	
M12	Yes
<b>Dimensions</b>	
Width	60 mm
Height	175 mm
Depth	49 mm
<b>Weights</b>	
Weight (without packaging)	930 g

#### Technical specifications (continued)

Article number	<b>6ES7148-6JA00-0AB0</b> ET 200ECO PN: IO-LINK MASTER
<b>Product type designation</b>	
<b>General information</b>	
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes
<b>Input current</b>	
from load voltage 1L+ (unswitched voltage)	4 A
from load voltage 2L+, max.	4 A
<b>Encoder supply</b>	
Number of outputs	6
<b>Output current</b>	
• nominal	200 mA; 100 mA per output to X5-X6
<b>24 V encoder supply</b>	
• short-circuit protection	Yes
<b>Power losses</b>	
Power loss, typ.	8 W
<b>Digital inputs</b>	
Number of digital inputs	8
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Number of simultaneously controllable inputs</b>	
<b>all mounting positions</b>	
- up to 60 °C, max.	8
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	1.5 mA
• for signal "1", typ.	7 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at "0" to "1", max.	typically 3 ms
- at "1" to "0", max.	typically 3 ms
<b>Cable length</b>	
• Unshielded, max.	30 m

Article number	<b>6ES7148-6JA00-0AB0</b> ET 200ECO PN: IO-LINK MASTER
<b>Digital outputs</b>	
Number of digital outputs	4
short-circuit protection	Yes; Electronic
• Response threshold, typ.	1.8 A
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V
Controlling a digital input	Yes
<b>Switching capacity of the outputs</b>	
• on lamp load, max.	5 W
<b>Output current</b>	
• for signal "1" rated value	1.3 A; Maximum
• for signal "0" residual current, max.	1.5 mA
<b>Parallel switching of 2 outputs</b>	
• for increased power	No
• for redundant control of a load	Yes
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz
<b>Aggregate current of outputs (per group)</b>	
<b>all mounting positions</b>	
- up to 60 °C, max.	3.9 A
<b>Cable length</b>	
• Unshielded, max.	30 m
<b>Interfaces</b>	
Transmission procedure	100BASE-TX
Transmission rate, max.	100 Mbit/s
<b>PROFINET IO</b>	
• Number of PROFINET interfaces	1
• Autocrossing	Yes
• Automatic detection of transmission speed	Yes
• Integrated switch	Yes
<b>PROFINET IO Device</b>	
- IRT with the option "high flexibility" supported	Yes
- Prioritized startup	Yes
<b>Protocols</b>	
PROFINET IO	Yes
PROFINET CBA	No
Supports protocol for PROFI-safe	No
<b>Protocols (Ethernet)</b>	
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes

**I/O systems**

ET 200 systems without control cabinet

ET 200eco PN

**SIMATIC ET 200eco PN****Technical specifications (continued)**

Article number	<b>6ES7148-6JA00-0AB0</b> ET 200ECO PN: IO-LINK MASTER
<b>IO-Link</b>	
Number of ports	4
• of which simultaneously controllable	4
Transmission rate	4.8 kBd (COM1); 38.4 kBd (COM2)
Cable length unshielded, max.	20 m
<b>Operating modes</b>	
• IO-Link	Yes
• DI	Yes
• DQ	Yes
<b>Connection of IO-Link devices</b>	
• via three-wire connection	Yes
<b>Interrupts/diagnostics/ status information</b>	
Status indicator	Yes; Green LED
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED
• Wire break in actuator cable	Yes
• Wire break in signal transmitter cable	Yes
• Short circuit	Yes
• Short circuit encoder supply	Yes
• Group error	Yes; Red/yellow "SF/MT" LED

Article number	<b>6ES7148-6JA00-0AB0</b> ET 200ECO PN: IO-LINK MASTER
<b>Galvanic isolation</b>	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
<b>Galvanic isolation digital inputs</b>	
• between the channels	No
<b>Galvanic isolation digital outputs</b>	
• between the channels	No
<b>Permissible potential difference</b>	
between different circuits	75V DC/60V AC
<b>Isolation</b>	
<b>tested with</b>	
• 24 V DC circuits	500 V
• Interface	1 500 V; According to IEEE 802.3
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP65	Yes
• IP66	Yes
• IP67	Yes
<b>Connection method</b>	
M12	Yes
<b>Dimensions</b>	
Width	60 mm
Height	175 mm
Depth	49 mm
<b>Weights</b>	
Weight (without packaging)	910 g

Ordering data	Article No.	Article No.
<b>ET 200eco PN digital input module</b> <ul style="list-style-type: none"> <li>• 8 DI 24 V DC; 4 x M12, dual assignment, degree of protection IP67</li> <li>• 8 DI 24 V DC; 8 x M12, degree of protection IP67</li> <li>• 16 DI 24 V DC; 8 x M12, dual assignment, degree of protection IP67</li> </ul>	<b>6ES7141-6BF00-0AB0</b>  <b>6ES7141-6BG00-0AB0</b>  <b>6ES7141-6BH00-0AB0</b>	<b>Accessories</b> <ul style="list-style-type: none"> <li>• PD voltage distributor, 24 V DC; 1 X 7/8", 4 X M12</li> <li>• Terminal block for ET 200eco PN, 10 A insulation displacement terminals</li> <li>• Spare fuses for terminal block, 10 units</li> <li>• Mounting rail 0.5 m</li> <li>• Profile screw for mounting rail, 50 units</li> <li>• Sealing cap M12 for IP67 modules, 10 units</li> <li>• Labels 10 x 7 mm, pastel turquoise, 816 units</li> </ul>
<b>ET 200eco PN digital output module</b> <ul style="list-style-type: none"> <li>• 8 DO 24 V DC/0.5 A; 4 x M12, dual assignment, 1 load voltage supply DO; degree of protection IP67</li> <li>• 8 DO 24 V DC/1.3 A; 4 x M12, dual assignment, degree of protection IP67</li> <li>• 8 DO 24 V DC/1.3 A; 8 x M12, degree of protection IP67</li> <li>• 8 DO 24 V DC/2 A; 8 x M12, degree of protection IP67</li> <li>• 16 DO 24 V DC/1.3 A; 8 x M12, dual assignment, degree of protection IP67</li> </ul>	<b>6ES7142-6BF50-0AB0</b>  <b>6ES7142-6BF00-0AB0</b>  <b>6ES7142-6BG00-0AB0</b>  <b>6ES7142-6BR00-0AB0</b>  <b>6ES7142-6BH00-0AB0</b>	<b>6ES7148-6CB00-0AA0</b>  <b>6ES7194-6CA00-0AA0</b>  <b>6ES7194-6HB00-0AA0</b>  <b>6ES7194-6GA00-0AA0</b> <b>6ES7194-6MA00-0AA0</b>  <b>3RX9802-0AA00</b>  <b>3RT1900-1SB10</b>
<b>ET 200eco PN digital input/output modules</b> <ul style="list-style-type: none"> <li>• 8 DI/DO 24 V DC/1.3 A; 8 x M12, degree of protection IP67</li> </ul>	<b>6ES7147-6BG00-0AB0</b>	<b>PROFINET M12 connector, for user assembly</b> IE FC M12 connector PRO, for user assembly <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 8 units</li> </ul>
<b>ET 200eco PN analog input modules</b> <ul style="list-style-type: none"> <li>• 8 AI 4 U/I + 4 RTD/TC; 8 x M12, degree of protection IP67</li> <li>• 8 AI RTD/TC; 8 x M12, degree of protection IP67</li> </ul>	<b>6ES7144-6KD00-0AB0</b>  <b>6ES7144-6KD50-0AB0</b>	<b>PROFINET M12 connecting cables</b> Preassembled connecting cables with 2 M12 connectors (D-coded) in various lengths: <ul style="list-style-type: none"> <li>0.3 m</li> <li>0.5 m</li> <li>1.0 m</li> <li>1.5 m</li> <li>2.0 m</li> <li>3.0 m</li> <li>5.0 m</li> <li>10.0 m</li> <li>15.0 m</li> </ul>
<b>ET 200eco PN analog output modules</b> <ul style="list-style-type: none"> <li>• 4 AO U/I; 4 x M12, degree of protection IP67</li> </ul>	<b>6ES7145-6HD00-0AB0</b>	<b>6XV1870-8AE30</b> <b>6XV1870-8AE50</b> <b>6XV1870-8AH10</b> <b>6XV1870-8AH15</b> <b>6XV1870-8AH20</b> <b>6XV1870-8AH30</b> <b>6XV1870-8AH50</b> <b>6XV1870-8AN10</b> <b>6XV1870-8AN15</b>
<b>ET 200eco PN IO-Link master module</b> <ul style="list-style-type: none"> <li>• 4 IO-L + 8 DI + 4 DO 24 V DC/1.3 A; 8 x M12, degree of protection IP67</li> </ul>	<b>6ES7148-6JA00-0AB0</b>	<b>M12 connector for 24 V DC load power supply</b> Connection socket for 24 V DC incoming supply; 4-pin, A-coded, 3 units  Connector for loop-through of 24 V DC; 4-pin, A-coded, 3 units
		<b>M12 plug-in power cables</b> Preassembled plug-in power cables, fitted at each end with M12 socket and plug 4 x 0.75 mm <sup>2</sup> , in various lengths: <ul style="list-style-type: none"> <li>0.3 m</li> <li>0.5 m</li> <li>1.0 m</li> <li>1.5 m</li> <li>2.0 m</li> <li>3.0 m</li> <li>5.0 m</li> <li>10.0 m</li> <li>15.0 m</li> </ul>
		<b>M12 coupler plug</b> Can be assembled, for connecting actuators or sensors, 5-pin
		<b>Y cable M12</b> For double connection of I/O by means of single cable to ET 200, 5-pin

## I/O systems

ET 200 systems without control cabinet  
IO-Link master ET 200eco PN

### IO-Link master ET 200eco PN

#### Overview



The IO-Link master module ET200eco PN is part of the compact block I/O range ET 200eco PN. It is characterized by:

- Compact block I/O for processing digital and IO-Link signals for connection to the PROFINET bus system
- Cabinet-free installation in the IP67 degree of protection with M12 connection system
- Extremely rugged and resistant metal enclosure and casting
- Compact module in enclosure size 60 mm x 175 mm x 37 mm (W x H x D, short and wide ) with 8 x M12 for digital signals and IO-Link
- PROFINET connection: 2 x M12 and automatic PROFINET address assignment
- 100 Mbit/s data transmission rate
- LLDP proximity detection without the need for a programming device
- Supply and load voltage connection: 2 x M12
- Channel-specific diagnostics

#### Technical specifications

Article number	<b>6ES7148-6JA00-0AB0</b> ET 200ECO PN: IO-LINK MASTER
<b>Product type designation</b>	
<b>General information</b>	
Vendor identification (VendorID)	002AH
Device identifier (DeviceID)	0306H
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes
<b>Input current</b>	
from load voltage 1L+ (unswitched voltage)	4 A
from load voltage 2L+, max.	4 A
<b>Encoder supply</b>	
Number of outputs	6
<b>Output current</b>	
• nominal	200 mA; 100 mA per output to X5-X6
<b>24 V encoder supply</b>	
• short-circuit protection	Yes

Article number	<b>6ES7148-6JA00-0AB0</b> ET 200ECO PN: IO-LINK MASTER
<b>Power losses</b>	
Power loss, typ.	8 W
<b>Digital inputs</b>	
Number of digital inputs	8
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Number of simultaneously controllable inputs</b>	
<b>all mounting positions</b> - up to 60 °C, max.	8
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "0", max. (permissible quiescent current)	1.5 mA
• for signal "1", typ.	7 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at "0" to "1", max.	typically 3 ms
- at "1" to "0", max.	typically 3 ms
<b>Cable length</b>	
• Unshielded, max.	30 m

#### Technical specifications (continued)

Article number	<b>6ES7148-6JA00-0AB0</b> ET 200ECO PN: IO-LINK MASTER
<b>Digital outputs</b>	
Number of digital outputs	4
short-circuit protection	Yes; Electronic
• Response threshold, typ.	1,8 A
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V
Controlling a digital input	Yes
<b>Switching capacity of the outputs</b>	
• on lamp load, max.	5 W
<b>Output current</b>	
• for signal "1" rated value	1.3 A; Maximum
• for signal "0" residual current, max.	1.5 mA
<b>Parallel switching of 2 outputs</b>	
• for increased power	No
• for redundant control of a load	Yes
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz
<b>Aggregate current of outputs (per group)</b>	
<b>all mounting positions</b>	
- up to 60 °C, max.	3.9 A
<b>Cable length</b>	
• Unshielded, max.	30 m
<b>Interfaces</b>	
Transmission procedure	100BASE-TX
Transmission rate, max.	100 Mbit/s
<b>PROFINET IO</b>	
• Number of PROFINET interfaces	1
• Autocrossing	Yes
• Automatic detection of transmission speed	Yes
• Integrated switch	Yes
<b>PROFINET IO Device</b>	
- IRT with the option "high flexibility" supported	Yes
- Prioritized startup	Yes
<b>Protocols</b>	
PROFINET IO	Yes
PROFINET CBA	No
Supports protocol for PROFI-safe	No
<b>Protocols (Ethernet)</b>	
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes

Article number	<b>6ES7148-6JA00-0AB0</b> ET 200ECO PN: IO-LINK MASTER
<b>IO-Link</b>	
Number of ports	4
• of which simultaneously controllable	4
Transmission rate	4.8 kBd (COM1); 38.4 kBd (COM2)
Cable length unshielded, max.	20 m
<b>Operating modes</b>	
• IO-Link	Yes
• DI	Yes
• DQ	Yes
<b>Connection of IO-Link devices</b>	
• via three-wire connection	Yes
<b>Interrupts/diagnostics/status information</b>	
Status indicator	Yes; Green LED
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED
• Wire break in actuator cable	Yes
• Wire break in signal transmitter cable	Yes
• Short circuit	Yes
• Short circuit encoder supply	Yes
• Group error	Yes; Red/yellow "SF/MT" LED
<b>Galvanic isolation</b>	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
<b>Galvanic isolation digital inputs</b>	
• between the channels	No
<b>Galvanic isolation digital outputs</b>	
• between the channels	No
<b>Permissible potential difference</b>	
between different circuits	75V DC/60V AC
<b>Isolation tested with</b>	
• 24 V DC circuits	500 V
• Interface	1 500 V; According to IEEE 802.3
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP65	Yes
• IP66	Yes
• IP67	Yes
<b>Connection method</b>	
M12	Yes
<b>Dimensions</b>	
Width	60 mm
Height	175 mm
Depth	49 mm
<b>Weights</b>	
Weight (without packaging)	910 g

**I/O systems**

ET 200 systems without control cabinet  
IO-Link master ET 200eco PN

**IO-Link master ET 200eco PN****Ordering data****Article No.****Article No.****IO-Link Master ET 200eco PN**

- 4 IO-L + 8 DI + 4 DO 24 V DC/  
1.3 A; 8 x M12,  
degree of protection IP67

**6ES7148-6JA00-0AB0****Accessories**

- PD voltage distributor, 24 V DC;  
1 X 7/8", 4 X M12
- Terminal block for ET 200eco PN,  
10 A insulation displacement  
terminals
- Spare fuses for terminal block,  
10 units
- Mounting rail 0.5 m
- Profile screw for mounting rail,  
50 units
- Sealing cap M12  
for IP67 modules, 10 units
- Labels 10 x 7 mm,  
pastel turquoise,  
816 units

**6ES7148-6CB00-0AA0****6ES7194-6CA00-0AA0****6ES7194-6HB00-0AA0****6ES7194-6GA00-0AA0****6ES7194-6MA00-0AA0****3RK1901-1KA00****3RT1900-1SB10****PROFINET M12 connector,  
for user assembly**

IE FC M12 connector PRO,  
for user assembly

- 1 unit
- 8 units

**6GK1901-0DB20-6AA0****6GK1901-0DB20-6AA8****PROFINET M12 connecting  
cables**

Preassembled connecting cables  
with 2 M12 connectors (D-coded),  
in various lengths:

- 0.3 m
- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10.0 m
- 15.0 m

**6XV1870-8AE30****6XV1870-8AE50****6XV1870-8AH10****6XV1870-8AH15****6XV1870-8AH20****6XV1870-8AH30****6XV1870-8AH50****6XV1870-8AN10****6XV1870-8AN15****M12 connector for  
24 V DC load power supply**

Connection socket for 24 V DC  
incoming supply;  
4-pin, A-coded, 3 units

**6GK1907-0DC10-6AA3**

Connector for loop-through  
of 24 V DC;  
4-pin, A-coded, 3 units

**6GK1907-0DB10-6AA3****M12 plug-in power cables**

Preassembled plug-in power  
cables, fitted at each end with M12  
socket and plug 4 x 0.75 mm<sup>2</sup>,  
in various lengths:

- 0.3 m
- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10.0 m
- 15.0 m

**6XV1801-5DE30****6XV1801-5DE50****6XV1801-5DH10****6XV1801-5DH15****6XV1801-5DH20****6XV1801-5DH30****6XV1801-5DH50****6XV1801-5DN10****6XV1801-5DN15****Y cable M12**

For double connection of I/O by  
means of a single-cable on ET200,  
5-pin

**6ES7194-6KA00-0XA0**

## Overview



- Compact, cost-effective I/O devices for processing digital signals
- Design without control cabinet with degree of protection IP65/67 with flexible and fast connections
- Comprises a basic module and various connection blocks for application-specific implementation options:
  - ECOFAST: 2 x RS 485 hybrid fieldbus connection with identification plug for setting the PROFIBUS address
  - M12: 2 x M12 and 2 x 7/8" with 2 rotary coding switches for assigning the PROFIBUS address
- Connection block contains T-functionality for bus and power supply so that during commissioning and service, the modules can be disconnected from and reconnected to the PROFIBUS without interruption
- Module variance: 8DI, 16DI, 8DI/8DO (1.3 A), 8DI/8DO (2.0 A), 8DO (2.0 A), 16DO (0.5 A)
- Transmission rates up to 12 Mbit/s
- Failsafe DI modules 4/8 F-DI with safety-related signal processing according to PROFIsafe

## Technical specifications

Article number	<b>6ES7141-3BF00-0XA0</b> ET200ECO, BM141, 8DI, 24V DC	<b>6ES7141-3BH00-0XA0</b> ET200ECO, BM141, 16DI, 24V DC	<b>6ES7148-3FA00-0XB0</b> ET200ECO, EL-MOD., 4/8 F-DI, 24V DC
<b>Product type designation</b>			
<b>General information</b>			
Vendor identification (VendorID)	80DBh	80DAh	
<b>FH technology</b>			
Module for failsafe applications			Yes
<b>Supply voltage</b>			
<b>Load voltage 1L+</b>			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes	Yes	No
<b>Input current</b>			
from supply voltage 1L+, max.	70 mA; Typical	70 mA; Typical	100 mA
<b>Encoder supply</b>			
Number of outputs	8	8	2
Type of output voltage	24 V DC	24 V DC	min. L+ (-1.5 V)
short-circuit protection	Yes; Electronic	Yes; Electronic	Yes
<b>Output current</b>			
• nominal	1 A; Aggregate current up to 55 °C	1 A; Aggregate current up to 55 °C	300 mA
<b>Power losses</b>			
Power loss, typ.	2.4 W	3.6 W	3 W



**I/O systems**

ET 200 systems without control cabinet

ET 200eco

**SIMATIC ET 200eco****Technical specifications (continued)**

Article number	<b>6ES7141-3BF00-0XA0</b> ET200ECO, BM141, 8DI, 24V DC	<b>6ES7141-3BH00-0XA0</b> ET200ECO, BM141, 16DI, 24V DC	<b>6ES7148-3FA00-0XB0</b> ET200ECO, EL-MOD., 4/8 F-DI, 24V DC
<b>Digital inputs</b>			
Number of digital inputs	8	16	8; 8 single channel, 4 two-channel
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes
<b>Number of simultaneously controllable inputs</b>			
• Number of simultaneously controllable inputs	8; All mounting positions up to 55 °C	16; All mounting positions up to 55 °C	8; 8 single channel, 4 two-channel
<b>Input voltage</b>			
• Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-30 to +5V
• for signal "1"	13 to 30V	13 to 30V	
<b>Input current</b>			
• for signal "1", typ.	7 mA	7 mA	3.7 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>			
- at "0" to "1", max.	3 ms; Typical	3 ms; Typical	
- at "1" to "0", max.	3 ms; Typical	3 ms; Typical	
<b>Cable length</b>			
• Unshielded, max.	30 m	30 m	30 m
<b>Encoder</b>			
<b>Connectable encoders</b>			
• 2-wire sensor	Yes	Yes	No
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	
<b>Interfaces</b>			
<b>PROFIBUS DP</b>			
• Transmission rate, max.	12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 kbit/s; 1.5 / 3 / 6 / 12 Mbit/s	12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 kbit/s; 1.5 / 3 / 6 / 12 Mbit/s	12 Mbit/s
<b>Protocols</b>			
PROFIBUS DP	Yes	Yes	Yes
<b>Interrupts/diagnostics/status information</b>			
Status indicator	Yes	Yes	
<b>Alarms</b>			
• Alarms	No	No	
<b>Diagnostic messages</b>			
• Diagnostics	Yes; Diagnostic information readable	Yes; Diagnostic information readable	
<b>Diagnostics indication LED</b>			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital input (green)	Yes	Yes	Yes
• Channel error indicator F (red)	No	No	No

**Technical specifications (continued)**

Article number	<b>6ES7141-3BF00-0XA0</b> ET200ECO, BM141, 8DI, 24V DC	<b>6ES7141-3BH00-0XA0</b> ET200ECO, BM141, 16DI, 24V DC	<b>6ES7148-3FA00-0XB0</b> ET200ECO, EL-MOD., 4/8 F-DI, 24V DC
<b>Galvanic isolation</b>			
between PROFIBUS DP and all other circuit components	Yes	Yes	Yes
<b>Galvanic isolation digital inputs</b>			
• between the channels	No	No	No
<b>Permissible potential difference</b>			
between different circuits	75V DC/60V AC	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>			
Isolation checked with	500 V DC	500 V DC	500V AC for 1 minute
<b>Standards, approvals, certificates</b>			
<b>Highest safety class achievable in safety mode</b>			
• SIL according to IEC 61508	No	No	SIL 2 (single-channel), SIL 3 (two-channel)
<b>Dimensions</b>			
Width	60 mm	60 mm	60 mm
Height	210 mm	210 mm	210 mm
Depth	28 mm	28 mm	28 mm
<b>Weights</b>			
Weight, approx.	210 g	210 g	220 g

Article number	<b>6ES7142-3BF00-0XA0</b> ET200ECO, BM142, 8DO, DC 24V/2A	<b>6ES7142-3BH00-0XA0</b> ET200ECO, BM142, 16DO 24V DC/0.5A
<b>Product type designation</b>		
<b>General information</b>		
Vendor identification (VendorID)	80DDh	80FBh
<b>Supply voltage</b>		
<b>Load voltage 1L+</b>		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes
<b>Load voltage 2L+</b>		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes
<b>Input current</b>		
from load voltage 2L+ (without load), max.	60 mA; Typical	80 mA; Typical
from supply voltage 1L+, max.	70 mA; Typical	70 mA; Typical
<b>Power losses</b>		
Power loss, typ.	4 W	4 W
<b>Digital outputs</b>		
Number of digital outputs	8	16
short-circuit protection	Yes	Yes
• Response threshold, typ.	4 A per channel	1.4 A (per channel)
Limitation of inductive shutdown voltage to	2L+ (-44 V)	2L+ (-47 V)
Controlling a digital input	Yes	Yes
<b>Switching capacity of the outputs</b>		
• on lamp load, max.	10 W	5 W

**I/O systems**

ET 200 systems without control cabinet

ET 200eco

**SIMATIC ET 200eco****Technical specifications** (continued)

Article number	<b>6ES7142-3BF00-0XA0</b> ET200ECO, BM142, 8DO, DC 24V/2A	<b>6ES7142-3BH00-0XA0</b> ET200ECO, BM142, 16DO 24V DC/0.5A
<b>Load resistance range</b>		
• lower limit	12 Ω	12 Ω
• upper limit	4 kΩ	4 kΩ
<b>Output voltage</b>		
• for signal "1", min.	2L+ (-0.8 V)	2L+ (-0.8 V)
<b>Output current</b>		
• for signal "1" rated value	2 A	0.5 A
• for signal "1" permissible range for 0 to 55 °C, min.	5 mA	5 mA
• for signal "1" permissible range for 0 to 55 °C, max.	2.4 A	1 A
• for signal "0" residual current, max.	0.5 mA	0.1 mA
<b>Parallel switching of 2 outputs</b>		
• for increased power	No	No
• for redundant control of a load	Yes	Yes
<b>Switching frequency</b>		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz; to IEC 947-5-1, DC-13	0.5 Hz; to IEC 947-5-1, DC-13
• on lamp load, max.	1 Hz	1 Hz
<b>Aggregate current of outputs (per group)</b>		
<b>all mounting positions</b> - up to 55 °C, max.	4 A; 4 A each for sockets X1, X3, X5, X7 and 4 A each for sockets X2, X4, X6, X8; note the current carrying capacity of the cable	4 A; Please note the current carrying capacity of the cable!
<b>Cable length</b>		
• Unshielded, max.	30 m	30 m
<b>Interfaces</b>		
<b>PROFIBUS DP</b>		
• Transmission rate, max.	12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 kbit/s; 1.5 / 3 / 6 / 12 Mbit/s	12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 kbit/s; 1.5 / 3 / 6 / 12 Mbit/s
<b>Protocols</b>		
PROFIBUS DP	Yes	Yes
<b>Interrupts/diagnostics/status information</b>		
Status indicator	Yes	Yes
<b>Alarms</b>		
• Alarms	No	No
<b>Diagnostic messages</b>		
• Diagnostics	Yes; Diagnostic information readable	Yes; Diagnostic information readable
<b>Diagnostics indication LED</b>		
• Group error SF (red)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
• Channel error indicator F (red)	No	No

**Technical specifications (continued)**

Article number	<b>6ES7142-3BF00-0XA0</b> ET200ECO, BM142, 8DO, DC 24V/2A	<b>6ES7142-3BH00-0XA0</b> ET200ECO, BM142, 16DO 24V DC/0.5A
<b>Galvanic isolation</b>		
between PROFIBUS DP and all other circuit components	Yes	Yes
<b>Galvanic isolation digital outputs</b>		
• between the channels	No	No
<b>Permissible potential difference</b>		
between different circuits	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>		
Isolation checked with	500 V DC	500 V DC
<b>Dimensions</b>		
Width	60 mm	60 mm
Height	210 mm	210 mm
Depth	28 mm	28 mm
<b>Weights</b>		
Weight, approx.	210 g	210 g
Article number	<b>6ES7143-3BH00-0XA0</b> ET200ECO, BM143, 8DI/DO, 2A	<b>6ES7143-3BH10-0XA0</b> ET200ECO, BM143, 8DI/8DO, 1.3A
<b>Product type designation</b>		
<b>General information</b>		
Vendor identification (VendorID)	80DCh	80FCh
<b>Supply voltage</b>		
<b>Load voltage 1L+</b>		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	No	Yes
<b>Load voltage 2L+</b>		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	No	Yes
<b>Input current</b>		
from load voltage 2L+ (without load), max.	60 mA; Typical	60 mA; Typical
from supply voltage 1L+, max.	70 mA; Typical	70 mA; Typical
<b>Encoder supply</b>		
Number of outputs	8	8
Type of output voltage	24 V DC	
short-circuit protection	Yes; Electronic	Yes; Electronic
<b>Output current</b>		
• nominal	0.75 A; up to 55°C max. 0.75 A (summation current)	1 A; Up to 55°C max. 1 A (summation current)
<b>Power losses</b>		
Power loss, typ.	5 W	5 W

**I/O systems**

ET 200 systems without control cabinet

ET 200eco

**SIMATIC ET 200eco****Technical specifications (continued)**

Article number	<b>6ES7143-3BH00-0XA0</b> ET200ECO, BM143, 8DI/DO, 2A	<b>6ES7143-3BH10-0XA0</b> ET200ECO, BM143, 8DI/8DO, 1.3A
<b>Digital inputs</b>		
Number of digital inputs	8	8
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
<b>Number of simultaneously controllable inputs</b>		
• Number of simultaneously controllable inputs	8; All mounting positions up to 55 °C	8; All mounting positions up to 55 °C
<b>Input voltage</b>		
• Type of input voltage	DC	DC
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	13 to 30V	13 to 30V
<b>Input current</b>		
• for signal "1", typ.	7 mA	7 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>		
- at "0" to "1", max.	3 ms; Typical	3 ms; Typical
- at "1" to "0", max.	3 ms; Typical	3 ms; Typical
<b>Digital outputs</b>		
Number of digital outputs	8	8
short-circuit protection	Yes	Yes
• Response threshold, typ.	4 A per channel	4 A per channel
Limitation of inductive shutdown voltage to	2L+ (-44 V)	2L+ (-44 V)
Controlling a digital input	Yes	Yes
<b>Switching capacity of the outputs</b>		
• on lamp load, max.	10 W	10 W
<b>Load resistance range</b>		
• lower limit	12 Ω	12 Ω
• upper limit	4 kΩ	4 kΩ
<b>Output voltage</b>		
• for signal "1", min.	2L+ (-0,8 V)	2L+ (-1,2 V)
<b>Output current</b>		
• for signal "1" rated value	2 A	1.3 A
• for signal "1" permissible range for 0 to 55 °C, min.	5 mA	5 mA
• for signal "1" permissible range for 0 to 55 °C, max.	2.4 A	1.8 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
<b>Parallel switching of 2 outputs</b>		
• for increased power	No	No
• for redundant control of a load	Yes	Yes
<b>Switching frequency</b>		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz; to IEC 947-5-1, DC-13	0.5 Hz; to IEC 947-5-1, DC-13
• on lamp load, max.	1 Hz	1 Hz
<b>Aggregate current of outputs (per group) all mounting positions</b>		
- up to 55 °C, max.	4 A; 4 A each for sockets X1, X3, X5, X7 and 4 A each for sockets X2, X4, X6, X8; note the current carrying capacity of the cable	5.2 A; Please note the current carrying capacity of the cable!
<b>Cable length</b>		
• Unshielded, max.	30 m	30 m

**Technical specifications (continued)**

Article number	<b>6ES7143-3BH0-0XA0</b> ET200ECO, BM143, 8DI/DO, 2A	<b>6ES7143-3BH10-0XA0</b> ET200ECO, BM143, 8DI/8DO, 1.3A
<b>Encoder</b>		
<b>Connectable encoders</b>		
• 2-wire sensor	Yes	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
<b>Interfaces</b>		
<b>PROFIBUS DP</b>		
• Transmission rate, max.	12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 kbit/s; 1.5 / 3 / 6 / 12 Mbit/s	12 Mbit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 kbit/s; 1.5 / 3 / 6 / 12 Mbit/s
<b>Protocols</b>		
PROFIBUS DP	Yes	Yes
<b>Interrupts/diagnostics/ status information</b>		
Status indicator	Yes	Yes
<b>Alarms</b>		
• Alarms	No	No
<b>Diagnostic messages</b>		
• Diagnostics	Yes; Diagnostic information readable	Yes; Diagnostic information readable
<b>Diagnostics indication LED</b>		
• Group error SF (red)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
• Status indicator digital input (green)	Yes	Yes
• Channel error indicator F (red)	No	No
<b>Galvanic isolation</b>		
between PROFIBUS DP and all other circuit components	Yes	Yes
<b>Galvanic isolation digital inputs</b>		
• between the channels	No	No
<b>Galvanic isolation digital outputs</b>		
• between the channels	No	No
<b>Permissible potential difference</b>		
between different circuits	75V DC/60V AC	75V DC/60V AC
<b>Isolation</b>		
Isolation checked with	500 V DC	500 V DC
<b>Dimensions</b>		
Width	60 mm	60 mm
Height	210 mm	210 mm
Depth	28 mm	28 mm
<b>Weights</b>		
Weight, approx.	210 g	210 g
<hr/>		
Article number	<b>6ES7194-3AA00-0AA0</b> ET200ECO, CONNECTING BLOCK ECOFAST	<b>6ES7194-3AA00-0BA0</b> ET200ECO, CONNECTING BLOCK, M12, 7/8"
<b>Product type designation</b>		
<b>Power losses</b>		
Power loss, typ.	2 W; The power loss depends on the current that you loop through via the connection block.	2 W; The power loss depends on the current that you loop through via the connection block.
<b>Dimensions</b>		
Width	79 mm	79 mm
Height	60 mm	60 mm
Depth	30 mm	29 mm
<b>Weights</b>		
Weight, approx.	313 g	392 g

**I/O systems**

ET 200 systems without control cabinet

ET 200eco

**SIMATIC ET 200eco**

Ordering data	Article No.	Article No.
<b>ET 200eco basic modules BM 141</b>		
<ul style="list-style-type: none"> <li>8 DI DC 24 V 8 x M12, individual assignment, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately</li> <li>16 DI DC 24 V 8 x M12, double assignment, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately</li> </ul>	<b>6ES7141-3BF00-0XA0</b>	
	<b>6ES7141-3BH00-0XA0</b>	
<b>ET 200eco basic module BM 142</b>		
<ul style="list-style-type: none"> <li>8 DO DC 24 V/1.2 A 8 x M12, individual assignment, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately</li> <li>16 DO DC 24 V/0.5 A 8 x M12, double assignment, IP65/67; connection block 6ES7194-3AA00-0.A0 to be ordered separately</li> </ul>	<b>6ES7142-3BF00-0XA0</b>	
	<b>6ES7142-3BH00-0XA0</b>	
<b>ET 200eco basic modules BM 143</b>		
<ul style="list-style-type: none"> <li>8 DI/8 DO, 2 A 8 x M12, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately</li> <li>8 DI/8 DO, 1.3 A 8 x M12, double assignment, IP65/67 connection block 6ES7194-3AA00-0.A0 to be ordered separately</li> </ul>	<b>6ES7143-3BH00-0XA0</b>	
	<b>6ES7143-3BH10-0XA0</b>	
<b>ET 200eco basic modules BM 148</b>		
<ul style="list-style-type: none"> <li>4/8 F-DI, 8 x M12, connection block 6ES7194-3AA00-0.A0 to be ordered separately</li> </ul>	<b>6ES7148-3FA00-0XB0</b>	
<b>ECOFAST connection block</b>	<b>6ES7194-3AA00-0AA0</b>	
For ET 200eco, 2 x ECOFAST connection RS 485 identification connector for PROFIBUS DP, address setting		
<b>M12 connection block, 7/8"</b>	<b>6ES7194-3AA00-0BA0</b>	
For ET 200eco, 2 x M12 and 2 x 7/8" 2 rotary coding switch for PROFIBUS DP, address setting		
		<b>Accessories for ECOFAST connection block</b>
		<b>PROFIBUS ECOFAST hybrid plug</b>
		<ul style="list-style-type: none"> <li>Female contact insert, straight</li> <li>Female contact insert, angled</li> <li>Male contact insert, straight</li> <li>Male contact insert, angled</li> </ul>
		<b>6GK1905-0CB00</b>
		<b>6GK1905-0CD00</b>
		<b>6GK1905-0CA00</b>
		<b>6GK1905-0CC00</b>
		<b>PROFIBUS ECOFAST terminating plug</b>
		<b>ECOFAST terminating resistor for PROFIBUS DP</b>
		<ul style="list-style-type: none"> <li>1 pack = 1 unit</li> <li>1 pack = 5 units</li> </ul>
		<b>6GK1905-0DA10</b>
		<b>6GK1905-0DA00</b>
		<b>PROFIBUS ECOFAST</b>
		Hybrid cable – Cu
		<b>M12 connection block, 7/8" accessories</b>
		<b>PROFIBUS M12 connection plug</b>
		1 pack = 5 units
		<ul style="list-style-type: none"> <li>Male contact insert</li> <li>Female contact insert</li> </ul>
		<b>6GK1905-0EA00</b>
		<b>6GK1905-0EB00</b>
		<b>PROFIBUS M12 connecting cable</b>
		For PROFIBUS DP, 1 pack = 5 units
		<ul style="list-style-type: none"> <li>Male contact insert</li> </ul>
		<b>6GK1905-0EC00</b>
		<b>PROFIBUS M12 bus termination connector</b>
		Preassembled 2-wire (inverse coded) with M12 connectors (straight) in various lengths:
		<ul style="list-style-type: none"> <li>0.3 m</li> <li>0.5 m</li> <li>1.0 m</li> <li>1.5 m</li> <li>2.0 m</li> <li>3.0 m</li> <li>5.0 m</li> <li>10.0 m</li> <li>15.0 m</li> <li>Other special lengths with 90° or 180° cable outlet</li> </ul>
		<b>6XV1830-3DE30</b>
		<b>6XV1830-3DE50</b>
		<b>6XV1830-3DH10</b>
		<b>6XV1830-3DH15</b>
		<b>6XV1830-3DH20</b>
		<b>6XV1830-3DH30</b>
		<b>6XV1830-3DH50</b>
		<b>6XV1830-3DN10</b>
		<b>6XV1830-3DN15</b>
		See <a href="http://support.automation.siemens.com/WW/view/en/26999294">http://support.automation.siemens.com/WW/view/en/26999294</a>

Ordering data	Article No.	Article No.
<b>7/8" connector</b> 1 pack = 5 units <ul style="list-style-type: none"> <li>• Male contact insert, straight</li> <li>• Male contact insert, angled</li> <li>• Female contact insert, straight</li> <li>• Female contact insert, angled</li> </ul>	<b>6GK1905-0FA00</b> <b>3RK1902-3BA00</b> <b>6GK1905-0FB00</b> <b>3RK1902-3DA00</b>	<b>Other accessories</b>
<b>7/8" sealing caps</b> 1 pack = 10 units	<b>6ES7194-3JA00-0AA0</b>	<b>Identification connector</b> For setting the PROFIBUS station address <b>6ES7194-1KB00-0XA0</b>
<b>SIMATIC NET energy cable</b> 5-wire energy cable, stranded 5 x 1.5 mm <sup>2</sup> , trailing-type <ul style="list-style-type: none"> <li>• Sold by the meter, minimum order quantity = 20 m</li> </ul>	<b>6XV1830-8AH10</b>	<b>Y circular connector M12</b> For double connection of sensors via a single cable, 5-pin; cannot be used for F DI 4/8 <b>6ES7194-1KA01-0XA0</b>
<b>7/8" connecting cable to power supply</b> Preassembled 5-wire cable with 7/8" connectors (straight) in various lengths: <ul style="list-style-type: none"> <li>• 0.3 m</li> <li>• 0.5 m</li> <li>• 1.0 m</li> <li>• 1.5 m</li> <li>• 2.0 m</li> <li>• 3.0 m</li> <li>• 5.0 m</li> <li>• 10.0 m</li> <li>• 15.0 m</li> </ul> Preassembled 5-wire cable with 7/8" connectors (straight) in various lengths: <ul style="list-style-type: none"> <li>• 3.0 m</li> <li>• 5.0 m</li> <li>• 10.0 m</li> <li>• Other special lengths with 90° or 180° cable outlet</li> </ul>	<b>6XV1822-5BE30</b> <b>6XV1822-5BE50</b> <b>6XV1822-5BH10</b> <b>6XV1822-5BH15</b> <b>6XV1822-5BH20</b> <b>6XV1822-5BH30</b> <b>6XV1822-5BH50</b> <b>6XV1822-5BN10</b> <b>6XV1822-5BN15</b>	<b>Y cable M12</b> For double connection of sensors via a single cable, 5-pin; cannot be used for F DI 4/8 <b>6ES7194-6KA00-0XA0</b>
		<b>M12 coupler plug</b> For connecting actuators or sensors, 5-pin <b>3RK1902-4BA00-5AA0</b>
		<b>M12 covering caps</b> For sealing unused I/O sockets <b>3RX9802-0AA00</b>
		<b>Labels</b> <b>3RT1900-1SB20</b>
		<b>"Distributed Safety" V5.4 F programming tool</b> Floating License for 1 user, with documentation, 3 languages (German, English, French), on CD, runs on STEP 7 V5.3 SP3 or higher <b>6ES7833-1FC02-0YA5</b>
		<b>"Distributed Safety" F programming tool</b> Upgrade from V5.x to V5.4 <b>6ES7833-1FC02-0YE5</b>
		<b>S7 Manual Collection</b> Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication) <b>6ES7998-8XC01-8YE0</b>
		<b>S7 Manual Collection update service for 1 year</b> Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates <b>6ES7998-8XC01-8YE2</b>

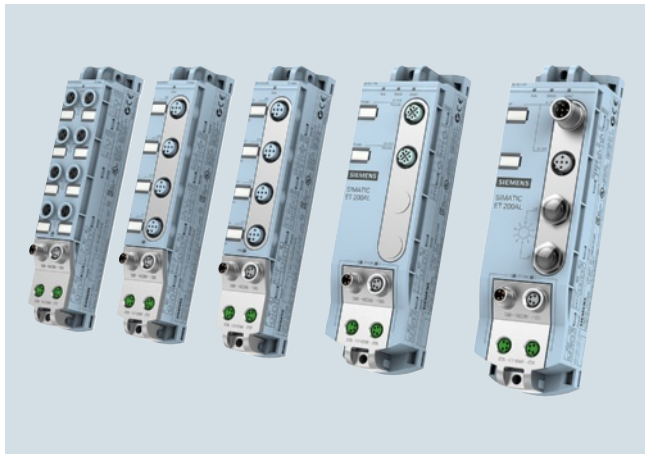


## I/O systems

ET 200 systems without control cabinet  
SIMATIC ET 200AL

### Introduction

### Overview



- Modular, distributed I/O system with compact I/O modules in IP65/67
- Especially easy and flexible installation, even in extremely confined spaces.
- Easy wiring
- Easy commissioning
- SIMATIC ET 200AL consists of the following components:
  - Interface module for communication with IO controllers on PROFINET.
  - Interface module for communication with all masters on the PROFIBUS.
  - Bus adapters for connection to the ET 200SP I/O system.
  - Different I/O modules, 300 mm wide.
- Maximum configuration of an ET 200AL station:
  - Up to 32 I/O modules with PROFINET or PROFIBUS in any combination
  - Up to 16 I/O modules at the ET 200SP I/O system in any combination
- Connection of the modules via an internal backplane bus established using bus cables (ET connection).

### Highlights

- Compact dimensions
- Low weight
- Safety-oriented collective shutdown of the outputs (available soon)
- High degree of user-friendliness due to the following design features:
  - Flexible mounting in all positions possible due to screw fastening through the front or side
  - Direct installation on even surfaces or aluminum mounting rails
  - Labels for the identification of channels, modules and slots
  - Integrated cable tie opening
  - Clear and CAX-compliant interface designations
  - Uniform coloring of the system interfaces and system cables
  - 1:1 assignment of channel status LED, I/O socket and label
  - Pin assignment on the side
- I/O module portfolio comprising digital and analog modules as well as IO-Link communication module
- Ambient temperature range from -25 °C to +55 °C
- Extensive system functions
  - All interface and I/O modules support firmware update
  - Configuration control (option handling) via user software
  - System support of PROFlenergy for energy saving purposes
  - Consistent use of identification and maintenance data IM0 to IM3/4 (electronic rating plate) for fast electronic and unambiguous identification of individual modules (Article No., serial number, etc.).

## Overview



- Interface module for linking the ET 200AL to PROFIBUS
- As DPV1 slave it handles the data exchange with the PROFIBUS master in the PLC
- Max. 32 I/O modules can be connected
- Max. data volume of 244 bytes, for input and output data respectively
- Automatic detection of baud rate 9.6 kBd ... 12 MBd
- PROFIBUS addresses 1 ... 99, can be set by means of rotary switch
- Identification and maintenance data IM0 ... IM3
- Firmware update
- Configuration management (option handling)

## Technical specifications

Article number	<b>6ES7157-1AA00-0AB0</b> ET 200AL, IM 157-1 DP
<b>Product type designation</b>	
<b>General information</b>	
HW functional status	E01
Firmware version	V1.0.0
Vendor identification (VendorID)	81A9H
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	STEP 7 V13 SP1 or higher
• PROFIBUS as of GSD version/GSD revision	GSD as of Revision 5
<b>Configuration control</b>	
for dataset	Yes
<b>Supply voltage</b>	
<b>Load voltage 1L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes; against destruction
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
Current consumption (rated value)	50 mA
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
<b>Power losses</b>	
Power loss, typ.	1.7 W
<b>Address area</b>	
<b>Address space per station</b>	
• Address space per station, max.	244 byte

Article number	<b>6ES7157-1AA00-0AB0</b> ET 200AL, IM 157-1 DP
<b>Interfaces</b>	
Number of PROFIBUS interfaces	1
<b>1st interface</b>	
• Interface type	PROFIBUS DP
<b>Interface types</b>	
- RS 485	Yes
- M12 port	Yes; 2x M12 b-coded
<b>Protocols</b>	
- PROFIBUS DP slave	Yes
<b>Interface types</b>	
<b>RS 485</b>	
• Transmission rate, max.	12 Mbit/s
<b>PROFIBUS</b>	
<b>Services</b>	
- SYNC capability	Yes
- FREEZE capability	Yes
- Direct data exchange (slave-to-slave communication)	Yes
- DPV0	Yes
- DPV1	Yes
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Alarms	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Connection display DP	Yes; Green LED
<b>Galvanic isolation</b>	
between the load voltages	Yes
between PROFIBUS DP and all other circuit components	Yes
<b>Permissible potential difference</b>	
between different circuits	60 V DC/50 V AC (basic insulation)

**I/O systems**

ET 200 systems without control cabinet  
SIMATIC ET 200AL– Interface modules

**IM 157-1 DP****Technical specifications (continued)**

Article number	<b>6ES7157-1AA00-0AB0</b> ET 200AL, IM 157-1 DP
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C
• max.	55 °C
<b>Connection method</b>	
Power supply	M8, 4-pole
<b>ET-Connection</b>	
• ET-Connection	M8, 4-pin, shielded
<b>Dimensions</b>	
Width	45 mm
Height	159 mm
Depth	34 mm; Without connector
<b>Weights</b>	
Weight, approx.	211 g

**Ordering data****Article No.**

<b>IM 157-1 DP interface module</b>	<b>6ES7157-1AA00-0AB0</b>
For connecting ET 200AL to PROFIBUS	
<b>Accessories</b>	
<b>Bus cable for backplane bus (ET connection)</b>	
4-pole, shielded	
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	<b>6ES7194-2LH03-0AA0</b>
1 m	<b>6ES7194-2LH10-0AA0</b>
2 m	<b>6ES7194-2LH20-0AA0</b>
5 m	<b>6ES7194-2LH50-0AA0</b>
10 m	<b>6ES7194-2LN10-0AA0</b>
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	<b>6ES7194-2LH03-0AB0</b>
1 m	<b>6ES7194-2LH10-0AB0</b>
2 m	<b>6ES7194-2LH20-0AB0</b>
5 m	<b>6ES7194-2LH50-0AB0</b>
10 m	<b>6ES7194-2LN10-0AB0</b>
Pre-assembled at one end, 1 M8 connector	
2 m	<b>6ES7194-2LH20-0AC0</b>
5 m	<b>6ES7194-2LH50-0AC0</b>
10 m	<b>6ES7194-2LN10-0AC0</b>

**Ordering data****Article No.****Power cable M8**

4-pin  
Pre-assembled at both ends, M8 connector and M8 socket

0.3 m	<b>6ES7194-2LH03-1AA0</b>
1 m	<b>6ES7194-2LH10-1AA0</b>
2 m	<b>6ES7194-2LH20-1AA0</b>
5 m	<b>6ES7194-2LH50-1AA0</b>
10 m	<b>6ES7194-2LN10-1AA0</b>

Pre-assembled at both ends, angled M8 connector and angled M8 socket

0.3 m	<b>6ES7194-2LH03-1AB0</b>
1 m	<b>6ES7194-2LH10-1AB0</b>
2 m	<b>6ES7194-2LH20-1AB0</b>
5 m	<b>6ES7194-2LH50-1AB0</b>
10 m	<b>6ES7194-2LN10-1AB0</b>

Pre-assembled at one end, M8 socket

2 m	<b>6ES7194-2LH20-1AC0</b>
5 m	<b>6ES7194-2LH50-1AC0</b>
10 m	<b>6ES7194-2LN10-1AC0</b>

**M8 connector for ET connection** **6ES7194-2AB00-0AA0**

4-pin, shielded

**M8 power connector** **6ES7194-2AA00-0AA0**

Male insert, 4-pin

**ET connection FastConnect stripping tool** **6ES7194-2KA00-0AA0**

Stripping tool for stripping the ET connection bus cable

**Labels** **6ES7194-2BA00-0AA0**

10 x 5 mm, RAL 9016;  
5 frames with 40 labels each

## Overview



- Interface module for linking the ET 200AL to PROFINET
- Handles data exchange with the PROFINET IO controller in the PLC
- Max. 32 I/O modules can be connected
- Max. data volume of 1430 bytes, for input and output data respectively
- Shortest bus cycle 250 µs
- Automatic power-up by means of topology recognition
- Autocrossover
- Shared device on up to 4 IO controllers
- Support for the MRP (media redundancy protocol) and MRPD (media redundancy with planned duplication) functions
- Identification and maintenance data IM0 ... IM4
- Firmware update
- Configuration management (option handling)
- PROFIenergy

## Technical specifications

Article number	<b>6ES7157-1AB00-0AB0</b> ET 200AL, IM 157-1 PN
<b>Product type designation</b>	
<b>General information</b>	
HW functional status	E01
Firmware version	V1.0.0
Vendor identification (VendorID)	002AH
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M4
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	STEP 7 V13 SP1 or higher
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1
<b>Configuration control</b>	
for dataset	Yes
<b>Supply voltage</b>	
<b>Load voltage 1L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes; against destruction
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
Current consumption (rated value)	100 mA
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
<b>Power losses</b>	
Power loss, typ.	2.9 W
<b>Address area</b>	
<b>Address space per station</b>	
• Address space per station, max.	1 430 byte

Article number	<b>6ES7157-1AB00-0AB0</b> ET 200AL, IM 157-1 PN
<b>Interfaces</b>	
Number of PROFINET interfaces	1
<b>1st interface</b>	
• Interface type	PROFINET
<b>Interface types</b>	
- Integrated switch	Yes
- M12 port	Yes; 2x M12 d-coded
<b>Protocols</b>	
- PROFINET IO Device	Yes
<b>M12 port</b>	
• 10 Mbps	Yes; for Ethernet services
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes
• Autocrossing	Yes
<b>PROFINET IO Device</b>	
<b>Services</b>	
- Open IE communication	Yes
- IRT	Yes; 250 µs, 500 µs, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Shared device	Yes
- Number of IO controllers with shared device, max.	4
<b>Open IE communication</b>	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes

## I/O systems

ET 200 systems without control cabinet  
SIMATIC ET 200AL – Interface modules

### IM 157-1 PN

#### Technical specifications (continued)

Article number	<b>6ES7157-1AB00-0AB0</b> ET 200AL, IM 157-1 PN
<b>Interrupts/diagnostics/ status information</b>	
<b>Alarms</b>	
• Alarms	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
<b>Diagnostics indication LED</b>	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Connection display LINK TX/RX	Yes; 2x green LED
<b>Galvanic isolation</b>	
between the load voltages	Yes
between PROFINET and all other circuits	Yes
<b>Permissible potential difference</b>	
between different circuits	60 V DC/50 V AC (basic insulation)
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)

Article number	<b>6ES7157-1AB00-0AB0</b> ET 200AL, IM 157-1 PN
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C
• max.	55 °C
<b>Connection method</b>	
Power supply	M8, 4-pole
<b>ET-Connection</b>	
• ET-Connection	M8, 4-pin, shielded
<b>Dimensions</b>	
Width	45 mm
Height	159 mm
Depth	34 mm; Without connector
<b>Weights</b>	
Weight, approx.	263 g

#### Ordering data

#### Article No.

#### Article No.

##### IM 157-1 PN interface module

For connecting ET 200AL  
to PROFINET

##### Accessories

##### Bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends,  
2 M8 connectors, angled

0.3 m	<b>6ES7194-2LH03-0AA0</b>
1 m	<b>6ES7194-2LH10-0AA0</b>
2 m	<b>6ES7194-2LH20-0AA0</b>
5 m	<b>6ES7194-2LH50-0AA0</b>
10 m	<b>6ES7194-2LN10-0AA0</b>

Pre-assembled at both ends,  
2 M8 connectors, angled

0.3 m	<b>6ES7194-2LH03-0AB0</b>
1 m	<b>6ES7194-2LH10-0AB0</b>
2 m	<b>6ES7194-2LH20-0AB0</b>
5 m	<b>6ES7194-2LH50-0AB0</b>
10 m	<b>6ES7194-2LN10-0AB0</b>

Pre-assembled at one end,  
1 M8 connector

2 m	<b>6ES7194-2LH20-0AC0</b>
5 m	<b>6ES7194-2LH50-0AC0</b>
10 m	<b>6ES7194-2LN10-0AC0</b>

##### Power cable M8

4-pin

Pre-assembled at both ends,  
M8 connector and M8 socket

0.3 m	<b>6ES7194-2LH03-1AA0</b>
1 m	<b>6ES7194-2LH10-1AA0</b>
2 m	<b>6ES7194-2LH20-1AA0</b>
5 m	<b>6ES7194-2LH50-1AA0</b>
10 m	<b>6ES7194-2LN10-1AA0</b>

Pre-assembled at both ends,  
angled M8 connector and angled  
M8 socket

0.3 m	<b>6ES7194-2LH03-1AB0</b>
1 m	<b>6ES7194-2LH10-1AB0</b>
2 m	<b>6ES7194-2LH20-1AB0</b>
5 m	<b>6ES7194-2LH50-1AB0</b>
10 m	<b>6ES7194-2LN10-1AB0</b>

Pre-assembled at one end,  
M8 socket

2 m	<b>6ES7194-2LH20-1AC0</b>
5 m	<b>6ES7194-2LH50-1AC0</b>
10 m	<b>6ES7194-2LN10-1AC0</b>

##### M8 connector for ET connection

4-pin, shielded

##### M8 power connector

Male insert, 4-pin

##### ET connection FastConnect stripping tool

Stripping tool for stripping the  
ET connection bus cable

##### Labels

10 x 5 mm, RAL 9016;  
5 frames with 40 labels each

## Overview



- 30 mm wide modules with parameters and diagnostic functions
- 8-channel digital input module with M8 connection
- 8-channel digital input/output module with M8 connection

## Technical specifications

Article number	<b>6ES7141-5BF00-0BA0</b> ET 200AL, DI 8X24VDC, 8XM8
<b>Product type designation</b>	
<b>General information</b>	
HW functional status	E01
Firmware version	V1.0.0
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	STEP 7 V13 SP1 or higher
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1
<b>Supply voltage</b>	
<b>Load voltage 1L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
<b>Input current</b>	
Current consumption (rated value) from load voltage 1L+ (unswitched voltage)	25 mA; without load 4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value

Article number	<b>6ES7141-5BF00-0BA0</b> ET 200AL, DI 8X24VDC, 8XM8
<b>Encoder supply</b>	
Number of outputs	8
<b>24 V encoder supply</b>	
• short-circuit protection	Yes; per module, electronic
• Output current, max.	0.7 A
<b>Power losses</b>	
Power loss, typ.	2.1 W
<b>Digital inputs</b>	
Number of digital inputs	8
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Number of simultaneously controllable inputs</b>	
<b>all mounting positions</b> - up to 55 °C, max.	8
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "1", typ.	3.2 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>	
- at "0" to "1", min.	1.2 ms
- at "0" to "1", max.	4.8 ms
- at "1" to "0", min.	1.2 ms
- at "1" to "0", max.	4.8 ms
<b>Cable length</b>	
• Unshielded, max.	30 m

## I/O systems

ET 200 systems without control cabinet  
SIMATIC ET 200AL – I/O modules

### Digital I/O modules

#### Technical specifications (continued)

Article number	<b>6ES7141-5BF00-0BA0</b> ET 200AL, DI 8X24VDC, 8XM8
<b>Encoder</b>	
<b>Connectable encoders</b>	
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
<b>Diagnostic messages</b>	
• Short circuit	Yes; Sensor supply to M; module by module
<b>Diagnostics indication LED</b>	
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; Green/red LED
<b>Galvanic isolation</b>	
between the load voltages	Yes
<b>Electrical isolation channels</b>	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the supply voltage of the electronics	No

Article number	<b>6ES7141-5BF00-0BA0</b> ET 200AL, DI 8X24VDC, 8XM8
<b>Permissible potential difference</b>	
between different circuits	60 V DC/50 V AC (basic insulation)
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C
• max.	55 °C
<b>Connection method</b>	
Inputs/outputs	M8, 3-pole
Power supply	M8, 4-pole
<b>ET-Connection</b>	
• ET-Connection	M8, 4-pin, shielded
<b>Dimensions</b>	
Width	30 mm
Height	159 mm
Depth	34 mm; Without connector
<b>Weights</b>	
Weight, approx.	145 g

Article number	<b>6ES7143-5BF00-0BA0</b> ET 200AL, DIQ 4+DQ 4X24VDC/ 0.5A, 8XM8
<b>Product type designation</b>	
<b>General information</b>	
HW functional status	E01
Firmware version	V1.0.0
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	STEP 7 V13 SP1 or higher
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1
<b>Supply voltage</b>	
<b>Load voltage 1L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes; against destruction; load increasing

Article number	<b>6ES7143-5BF00-0BA0</b> ET 200AL, DIQ 4+DQ 4X24VDC/ 0.5A, 8XM8
<b>Input current</b>	
Current consumption (rated value)	30 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
<b>Encoder supply</b>	
Number of outputs	4
<b>24 V encoder supply</b>	
• short-circuit protection	Yes; per module, electronic
• Output current, max.	0.7 A
<b>Power losses</b>	
Power loss, typ.	2.6 W
<b>Digital inputs</b>	
Number of digital inputs	4; Parameterizable as DIQ
Input characteristic curve in accordance with IEC 61131, type 3	Yes
<b>Number of simultaneously controllable inputs</b>	
<b>all mounting positions</b>	
- up to 55 °C, max.	4
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
<b>Input current</b>	
• for signal "1", typ.	3.2 mA

#### Technical specifications (continued)

Article number	<b>6ES7143-5BF00-0BA0</b> ET 200AL, DIQ 4+DQ 4X24VDC/ 0.5A, 8XM8
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
- at "0" to "1", min.	1.2 ms
- at "0" to "1", max.	4.8 ms
- at "1" to "0", min.	1.2 ms
- at "1" to "0", max.	4.8 ms
<b>Cable length</b>	
• Unshielded, max.	30 m
<b>Digital outputs</b>	
Number of digital outputs	8; 4 DQ fixed, 4 DIQ parameterizable
• In groups of	4; 2 load groups for 4 outputs each
short-circuit protection	Yes; per channel, electronic
• Response threshold, typ.	0.7 A
Limitation of inductive shutdown voltage to	2L+ (-47 V)
<b>Switching capacity of the outputs</b>	
• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	48 Ω
• upper limit	4 kΩ
<b>Output voltage</b>	
• for signal "1", min.	24 V; L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.5 mA
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz
<b>Aggregate current of the outputs</b>	
• Current per group, max.	2 A
<b>Cable length</b>	
• Unshielded, max.	30 m
<b>Encoder</b>	
<b>Connectable encoders</b>	
• 2-wire sensor	Yes
- Permissible quiescent current (2-wire sensor), max.	1.5 mA

Article number	<b>6ES7143-5BF00-0BA0</b> ET 200AL, DIQ 4+DQ 4X24VDC/ 0.5A, 8XM8
<b>Interrupts/diagnostics/ status information</b>	
Substitute values connectable	Yes; channel by channel, parameterizable
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
<b>Diagnostic messages</b>	
• Short circuit	Yes; Outputs to M; encoder supply to M; module by module
<b>Diagnostics indication LED</b>	
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; Green/red LED
<b>Galvanic isolation</b>	
between the load voltages	Yes
<b>Electrical isolation channels</b>	
• between the channels, in groups of	4; DIQ channels are isolated from DQ channels
• between the channels and the backplane bus	Yes
• between the channels and the supply voltage of the electronics	No; DIQ channels are non-isolated and DQ channels are isolated from supply voltage 1L+
<b>Permissible potential difference</b>	
between different circuits	60 V DC/50 V AC (basic insulation)
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C
• max.	55 °C
<b>Connection method</b>	
Inputs/outputs	M8, 3-pole
Power supply	M8, 4-pole
<b>ET-Connection</b>	
• ET-Connection	M8, 4-pin, shielded
<b>Dimensions</b>	
Width	30 mm
Height	159 mm
Depth	34 mm; Without connector
<b>Weights</b>	
Weight, approx.	145 g



**I/O systems**

ET 200 systems without control cabinet  
SIMATIC ET 200AL – I/O modules

**Digital I/O modules**

Ordering data	Article No.	Ordering data	Article No.
<b>Digital input module</b>		<b>Power cable M8</b>	
8 DI 24 V DC	6ES7141-5BF00-0BA0	4-pin	
<b>Digital input/output modules</b>		Pre-assembled at both ends, M8 connector and M8 socket	
4 DIO / 4 DO, 24 V DC, 0.5 A	6ES7143-5BF00-0BA0	0.3 m	6ES7194-2LH03-1AA0
<b>Accessories</b>		1 m	6ES7194-2LH10-1AA0
<b>Bus cable for backplane bus (ET connection)</b>		2 m	6ES7194-2LH20-1AA0
Shielded, 4-pin		5 m	6ES7194-2LH50-1AA0
Pre-assembled at both ends, two M8 connectors, angled		10 m	6ES7194-2LN10-1AA0
0.3 m	6ES7194-2LH03-0AA0	Pre-assembled at both ends, angled M8 connector and angled M8 socket	
1 m	6ES7194-2LH10-0AA0	0.3 m	6ES7194-2LH03-1AB0
2 m	6ES7194-2LH20-0AA0	1 m	6ES7194-2LH10-1AB0
5 m	6ES7194-2LH50-0AA0	2 m	6ES7194-2LH20-1AB0
10 m	6ES7194-2LN10-0AA0	5 m	6ES7194-2LH50-1AB0
Pre-assembled at both ends, two M8 connectors, angled		10 m	6ES7194-2LN10-1AB0
0.3 m	6ES7194-2LH03-0AB0	Pre-assembled at one end, M8 socket	
1 m	6ES7194-2LH10-0AB0	2 m	6ES7194-2LH20-1AC0
2 m	6ES7194-2LH20-0AB0	5 m	6ES7194-2LH50-1AC0
5 m	6ES7194-2LH50-0AB0	10 m	6ES7194-2LN10-1AC0
10 m	6ES7194-2LN10-0AB0	<b>M8 connector for ET connection</b>	6ES7194-2AB00-0AA0
Pre-assembled at one end, one M8 connector		Shielded, 4-pin	
2 m	6ES7194-2LH20-0AC0	<b>M8 power connector</b>	6ES7194-2AA00-0AA0
5 m	6ES7194-2LH50-0AC0	Male insert, 4-pin	
10 m	6ES7194-2LN10-0AC0	<b>ET connection FastConnect stripping tool</b>	6ES7194-2KA00-0AA0
		Stripping tool for stripping the ET connection bus cable	
		<b>Labels</b>	6ES7194-2BA00-0AA0
		10 x 5 mm, RAL 9016; 5 frames with 40 labels each	

## Overview



- 30-mm wide module with parameters and diagnostic functions
- For the connection of analog sensors without additional amplifiers
- 4-channel analog input module with M12 connection

## Technical specifications

Article number	<b>6ES7144-5KD00-0BA0</b> ET 200AL, AI 4XU/I/RTD, 4XM12
<b>Product type designation</b>	
<b>General information</b>	
HW functional status	E01
Firmware version	V1.0.0
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	STEP 7 V13 SP1 or higher
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1
<b>Supply voltage</b>	
<b>Load voltage 1L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes; against destruction
<b>Input current</b>	
Current consumption (rated value)	50 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
<b>Encoder supply</b>	
Number of outputs	4
<b>24 V encoder supply</b>	
• short-circuit protection	Yes; per channel, electronic
• Output current, max.	0.5 A; per channel, total current of all channels max. 1 A
<b>Power losses</b>	
Power loss, typ.	2.5 W

Article number	<b>6ES7144-5KD00-0BA0</b> ET 200AL, AI 4XU/I/RTD, 4XM12
<b>Analog inputs</b>	
Number of analog inputs	4
• For current measurement	4
• For voltage measurement	4
• For resistance/resistance thermometer measurement	4
permissible input voltage for voltage input (destruction limit), max.	30 V
permissible input current for current input (destruction limit), max.	50 mA
Cycle time (all channels), min.	8 ms
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
<b>Input ranges (rated values), voltages</b>	
• 0 to +10 V	Yes
• Input resistance (0 to 10 V)	10 MΩ
• 1 V to 5 V	Yes
• Input resistance (1 V to 5 V)	10 MΩ
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
• Input resistance (0 to 20 mA)	50 Ω
• 4 mA to 20 mA	Yes
• Input resistance (4 mA to 20 mA)	50 Ω
<b>Input ranges (rated values), resistance thermometer</b>	
• Ni 100	Yes; Standard/climate
• Input resistance (Ni 100)	10 MΩ
• Pt 100	Yes; Standard/climate
• Input resistance (Pt 100)	10 MΩ

## I/O systems

ET 200 systems without control cabinet  
SIMATIC ET 200AL – I/O modules

### Analog I/O modules

#### Technical specifications (continued)

Article number	<b>6ES7144-5KD00-0BA0</b> ET 200AL, AI 4XU/I/RTD, 4XM12
<b>Input ranges (rated values), resistors</b>	
• 0 to 150 ohms	Yes
• Input resistance (0 to 150 ohms)	10 MΩ
• 0 to 300 ohms	Yes
• Input resistance (0 to 300 ohms)	10 MΩ
<b>Resistance thermometer (RTD)</b>	
• Technical unit for temperature measurement	°C/°F/K
<b>Cable length</b>	
• shielded, max.	30 m
<b>Analog value generation for the inputs</b>	
Measurement principle	integrating
<b>Integration and conversion time/ resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes; channel by channel
• Integration time (ms)	0.3 / 16.7 / 20 / 60
• Conversion time (per channel)	2 / 18 / 21 / 61 ms
<b>Smoothing of measured values</b>	
• Parameterizable	Yes
• Step: None	Yes; 1 x cycle time
• Step: low	Yes; 4 x cycle time
• Step: Medium	Yes; 16 x cycle time
• Step: High	Yes; 32 x cycle time
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes
• for resistance measurement with two-wire connection	Yes
• for resistance measurement with three-wire connection	Yes

Article number	<b>6ES7144-5KD00-0BA0</b> ET 200AL, AI 4XU/I/RTD, 4XM12
<b>Errors/accuracies</b>	
Linearity error (relative to input range), (+/-)	0.025 %
Temperature error (relative to input range), (+/-)	0.01 %/K
Crosstalk between the inputs, max.	-70 dB
Repeat accuracy in steady state at 25 °C (relative to input area), (+/-)	0.01 %
<b>Operational limit in overall temperature range</b>	
• Voltage, relative to input area, (+/-)	0.35 %
• Current, relative to input area, (+/-)	0.45 %
• Resistance, relative to input area, (+/-)	0.25 %
• Resistance thermometer, relative to input area, (+/-)	0.25 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to input area, (+/-)	0.25 %
• Current, relative to input area, (+/-)	0.25 %
• Resistance, relative to input area, (+/-)	0.15 %
• Resistance thermometer, relative to input area, (+/-)	0.15 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 0.5 \%)</math>, <math>f_1 =</math> interference frequency</b>	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB
<b>Interrupts/diagnostics/ status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable
<b>Diagnostic messages</b>	
• Wire break	Yes; at 4 mA to 20 mA and 1 V to 5 V
• Short circuit	Yes; Encoder supply to M, channel by channel
• Overflow/underflow	Yes
<b>Diagnostics indication LED</b>	
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; Green/red LED

#### Technical specifications (continued)

Article number	<b>6ES7144-5KD00-0BA0</b> ET 200AL, AI 4XU//RTD, 4XM12
<b>Galvanic isolation</b>	
between the load voltages	Yes
<b>Electrical isolation channels</b>	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the supply voltage of the electronics	No
<b>Permissible potential difference</b>	
between different circuits	60 V DC/50 V AC (basic insulation)
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes

Article number	<b>6ES7144-5KD00-0BA0</b> ET 200AL, AI 4XU//RTD, 4XM12
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C
• max.	55 °C
<b>Connection method</b>	
Inputs/outputs	M12, 5-pole
Power supply	M8, 4-pole
<b>ET-Connection</b>	
• ET-Connection	M8, 4-pin, shielded
<b>Dimensions</b>	
Width	30 mm
Height	159 mm
Depth	34 mm; Without connector
<b>Weights</b>	
Weight, approx.	168 g

#### Ordering data

Ordering data	Article No.
<b>Analog input modules</b>	
4 AI U//RTD	<b>6ES7144-5KD00-0BA0</b>
<b>Accessories</b>	
<b>Bus cable for backplane bus (ET connection)</b>	
4-pin, shielded	
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	<b>6ES7194-2LH03-0AA0</b>
1 m	<b>6ES7194-2LH10-0AA0</b>
2 m	<b>6ES7194-2LH20-0AA0</b>
5 m	<b>6ES7194-2LH50-0AA0</b>
10 m	<b>6ES7194-2LN10-0AA0</b>
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	<b>6ES7194-2LH03-0AB0</b>
1 m	<b>6ES7194-2LH10-0AB0</b>
2 m	<b>6ES7194-2LH20-0AB0</b>
5 m	<b>6ES7194-2LH50-0AB0</b>
10 m	<b>6ES7194-2LN10-0AB0</b>
Pre-assembled at one end, 1 M8 connector	
2 m	<b>6ES7194-2LH20-0AC0</b>
5 m	<b>6ES7194-2LH50-0AC0</b>
10 m	<b>6ES7194-2LN10-0AC0</b>

Ordering data	Article No.
<b>Power cable M8</b>	
4-pin	
Pre-assembled at both ends, M8 connector and M8 socket	
0.3 m	<b>6ES7194-2LH03-1AA0</b>
1 m	<b>6ES7194-2LH10-1AA0</b>
2 m	<b>6ES7194-2LH20-1AA0</b>
5 m	<b>6ES7194-2LH50-1AA0</b>
10 m	<b>6ES7194-2LN10-1AA0</b>
Pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	<b>6ES7194-2LH03-1AB0</b>
1 m	<b>6ES7194-2LH10-1AB0</b>
2 m	<b>6ES7194-2LH20-1AB0</b>
5 m	<b>6ES7194-2LH50-1AB0</b>
10 m	<b>6ES7194-2LN10-1AB0</b>
Pre-assembled at one end, M8 socket	
2 m	<b>6ES7194-2LH20-1AC0</b>
5 m	<b>6ES7194-2LH50-1AC0</b>
10 m	<b>6ES7194-2LN10-1AC0</b>
<b>M8 connector for ET connection</b>	<b>6ES7194-2AB00-0AA0</b>
4-pin, shielded	
<b>M8 power connector</b>	<b>6ES7194-2AA00-0AA0</b>
Male insert, 4-pin	
<b>ET connection FastConnect stripping tool</b>	<b>6ES7194-2KA00-0AA0</b>
Stripping tool for stripping the ET connection bus cable	
<b>Labels</b>	<b>6ES7194-2BA00-0AA0</b>
10 x 5 mm, RAL 9016; 5 frames with 40 labels each	

## I/O systems

ET 200 systems without control cabinet  
SIMATIC ET 200AL – I/O modules – Communication

### CM IO-Link

#### Overview



- 30-mm wide CM IO-Link communication module
- For the connection of up to 4 IO-Link devices according to IO-Link Specification V1.0 and V1.1 and port Class B
- The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.2 and higher.

#### Technical specifications

Article number	<b>6ES7147-5JD00-0BA0</b> ET 200AL, CM 4X IO-LINK, 4XM12
<b>Product type designation</b>	
<b>General information</b>	
HW functional status	E01
Firmware version	V1.0.0
<b>Product function</b>	
• I&M data	Yes; I&M0 to I&M3
<b>Engineering with</b>	
• STEP 7 TIA Portal can be configured/integrated as of version	STEP 7 V13 SP1 or higher
• PROFIBUS as of GSD version/GSD revision	GSD as of Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3.1
<b>Supply voltage</b>	
<b>Load voltage 1L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
<b>Load voltage 2L+</b>	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
• Reverse polarity protection	Yes; against destruction; load increasing

Article number	<b>6ES7147-5JD00-0BA0</b> ET 200AL, CM 4X IO-LINK, 4XM12
<b>Input current</b>	
Current consumption (rated value)	40 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
<b>Encoder supply</b>	
Number of outputs	4
<b>24 V encoder supply</b>	
• short-circuit protection	Yes; per module, electronic
• Output current, max.	0.8 A; Total current of all ports
<b>Power losses</b>	
Power loss, typ.	2.6 W
<b>IO-Link</b>	
Number of ports	4
• of which simultaneously controllable	4
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Cycle time, min.	2 ms
Size of process data, input per port	32 byte
Size of process data, input per module	32 byte
Size of process data, output per port	32 byte
Size of process data, output per module	32 byte
Memory size for device parameter	2 kbyte; for each port
Cable length unshielded, max.	20 m
<b>Operating modes</b>	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA
<b>Connection of IO-Link devices</b>	
• Port type A	Yes; via 3-core cable
• Port type B	Yes; Additional device supply: 1.6 A total current of all ports

**Technical specifications** (continued)

Article number	<b>6ES7147-5JD00-0BA0</b> ET 200AL, CM 4X IO-LINK, 4XM12
<b>Interrupts/diagnostics/ status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes; Parameterizable
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
• Short circuit	Yes
<b>Diagnostics indication LED</b>	
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; Green/red LED
<b>Galvanic isolation</b>	
between the load voltages	Yes
<b>Electrical isolation channels</b>	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the supply voltage of the electronics	No

Article number	<b>6ES7147-5JD00-0BA0</b> ET 200AL, CM 4X IO-LINK, 4XM12
<b>Permissible potential difference</b>	
between different circuits	60 V DC/50 V AC (basic insulation)
<b>Isolation</b>	
Isolation checked with	707 V DC (type test)
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C
• max.	55 °C
<b>Connection method</b>	
Inputs/outputs	M12, 5-pole
Power supply	M8, 4-pole
<b>ET-Connection</b>	
• ET-Connection	M8, 4-pin, shielded
<b>Dimensions</b>	
Width	30 mm
Height	159 mm
Depth	34 mm; Without connector
<b>Weights</b>	
Weight, approx.	168 g

**I/O systems**

ET 200 systems without control cabinet  
SIMATIC ET 200AL – I/O modules – Communication

**CM IO-Link****Ordering data****Article No.****Article No.****CM IO-Link**

For the connection of up to 4 IO-Link devices according to IO-Link Specification V1.0 and V1.1 and port Class B

**6ES7147-5JD00-0BA0****Accessories****Bus cable for backplane bus (ET connection)**

4-pin, shielded

Pre-assembled at both ends, 2 M8 connectors

0.3 m

**6ES7194-2LH03-0AA0**

1 m

**6ES7194-2LH10-0AA0**

2 m

**6ES7194-2LH20-0AA0**

5 m

**6ES7194-2LH50-0AA0**

10 m

**6ES7194-2LN10-0AA0**

Pre-assembled at both ends, 2 M8 connectors, angled

0.3 m

**6ES7194-2LH03-0AB0**

1 m

**6ES7194-2LH10-0AB0**

2 m

**6ES7194-2LH20-0AB0**

5 m

**6ES7194-2LH50-0AB0**

10 m

**6ES7194-2LN10-0AB0**

Pre-assembled at one end, 1 M8 connector

2 m

**6ES7194-2LH20-0AC0**

5 m

**6ES7194-2LH50-0AC0**

10 m

**6ES7194-2LN10-0AC0****Power cable M8**

4-pin

Pre-assembled at both ends, M8 connector and M8 socket

0.3 m

**6ES7194-2LH03-1AA0**

1 m

**6ES7194-2LH10-1AA0**

2 m

**6ES7194-2LH20-1AA0**

5 m

**6ES7194-2LH50-1AA0**

10 m

**6ES7194-2LN10-1AA0**

Pre-assembled at both ends, angled M8 connector and angled M8 socket

0.3 m

**6ES7194-2LH03-1AB0**

1 m

**6ES7194-2LH10-1AB0**

2 m

**6ES7194-2LH20-1AB0**

5 m

**6ES7194-2LH50-1AB0**

10 m

**6ES7194-2LN10-1AB0**

Pre-assembled at one end, M8 socket

2 m

**6ES7194-2LH20-1AC0**

5 m

**6ES7194-2LH50-1AC0**

10 m

**6ES7194-2LN10-1AC0****M8 connector for ET connection****6ES7194-2AB00-0AA0**

4-pin, shielded

**M8 power connector****6ES7194-2AA00-0AA0**

Male insert, 4-pin

**ET connection FastConnect stripping tool****6ES7194-2KA00-0AA0**

Stripping tool for stripping the ET connection bus cable

**Labels****6ES7194-2BA00-0AA0**

10 x 5 mm, RAL 9016;  
5 frames with 40 labels each

#### Overview

- Pre-assembled cables in various designs and lengths:
  - For connecting the interface modules and I/O modules via the internal backplane bus (ET connection).
  - For power supply.

#### Technical specifications

Article number	<b>6ES7194-2LH03-0AA0</b>	<b>6ES7194-2LH10-0AA0</b>	<b>6ES7194-2LH20-0AA0</b>	<b>6ES7194-2LH50-0AA0</b>	<b>6ES7194-2LN10-0AA0</b>
	CONNECTING CABLE ET-CONNECTION, 0.3M	CONNECTING CABLE ET-CONNECTION, 1.0M	CONNECTING CABLE ET-CONNECTION, 2.0M	CONNECTING CABLE ET-CONNECTION, 5.0M	BUS CABLE ET-CONNECTION, 10M
<b>Product type designation</b>					
<b>General information</b>					
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded
Application/function	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
<b>Degree and class of protection</b>					
Degree of protection to EN 60529					
• IP65	Yes	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>					
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Storage/transport temperature</b>					
• Ambient temperature during storage, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during storage, max.	80 °C	80 °C	80 °C	80 °C	80 °C
• Ambient temperature during transport, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during transport, max.	80 °C	80 °C	80 °C	80 °C	80 °C



**I/O systems**

ET 200 systems without control cabinet  
SIMATIC ET 200AL – Accessories

**Cables and connectors****Technical specifications** (continued)

Article number	<b>6ES7194-2LH03-0AA0</b>	<b>6ES7194-2LH10-0AA0</b>	<b>6ES7194-2LH20-0AA0</b>	<b>6ES7194-2LH50-0AA0</b>	<b>6ES7194-2LN10-0AA0</b>
	CONNECTING CABLE ET-CONNECTION, 0.3M	CONNECTING CABLE ET-CONNECTION, 1.0M	CONNECTING CABLE ET-CONNECTION, 2.0M	CONNECTING CABLE ET-CONNECTION, 5.0M	BUS CABLE ET-CONNECTION, 10M
<b>Cables</b>					
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN
Cable length	0.3 m	1 m	2 m	5 m	10 m
Number of electrical cores	4	4	4	4	4
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km
<b>Mechanics/material</b>					
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	metal	metal	metal	metal	metal
Material of core insulation	PE	PE	PE	PE	PE
Material of cable sheath	PVC	PVC	PVC	PVC	PVC
Material property halogen-free	No	No	No	No	No
Material property silicone-free	Yes	Yes	Yes	Yes	Yes

**Technical specifications (continued)**

Article number	<b>6ES7194-2LH03-0AB0</b>	<b>6ES7194-2LH10-0AB0</b>	<b>6ES7194-2LH20-0AB0</b>	<b>6ES7194-2LH50-0AB0</b>	<b>6ES7194-2LN10-0AB0</b>
	CONNECTING CABLE ET-CON., ANGLED, 0.3M	CONNECTING CABLE ET-CON., ANGLED, 1.0M	CONNECTING CABLE ET-CON., ANGLED, 2.0M	CONNECTING CABLE ET-CON., ANGLED, 5.0M	BUS CABLE ET-CONNECTION, ANGLED, 10M
<b>Product type designation</b>					
<b>General information</b>					
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded
Application/function	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
<b>Degree and class of protection</b>					
Degree of protection to EN 60529					
• IP65	Yes	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>					
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Storage/transport temperature</b>					
• Ambient temperature during storage, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during storage, max.	80 °C	80 °C	80 °C	80 °C	80 °C
• Ambient temperature during transport, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during transport, max.	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Cables</b>					
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN
Cable length	0.3 m	1 m	2 m	5 m	10 m
Number of electrical cores	4	4	4	4	4
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km

## I/O systems

ET 200 systems without control cabinet  
SIMATIC ET 200AL – Accessories

### Cables and connectors

#### Technical specifications (continued)

Article number	<b>6ES7194-2LH03-0AB0</b> CONNECTING CABLE ET-CON., ANGLED, 0.3M	<b>6ES7194-2LH10-0AB0</b> CONNECTING CABLE ET-CON., ANGLED, 1.0M	<b>6ES7194-2LH20-0AB0</b> CONNECTING CABLE ET-CON., ANGLED, 2.0M	<b>6ES7194-2LH50-0AB0</b> CONNECTING CABLE ET-CON., ANGLED, 5.0M	<b>6ES7194-2LN10-0AB0</b> BUS CABLE ET-CONNECTION, ANGLED, 10M
<b>Mechanics/material</b>					
Type of cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	metal	metal	metal	metal	metal
Material of core insulation	PE	PE	PE	PE	PE
Material of cable sheath	PVC	PVC	PVC	PVC	PVC
Material property halogen-free	No	No	No	No	No
Material property silicone-free	Yes	Yes	Yes	Yes	Yes

Article number	<b>6ES7194-2LH20-0AC0</b> CONNECTING CABLE ET-CONNECTION, 2.0M	<b>6ES7194-2LH50-0AC0</b> CONNECTING CABLE ET-CONNECTION, 5.0M	<b>6ES7194-2LN10-0AC0</b> BUS CABLE ET-CONNECTION, 10M
<b>Product type designation</b>			
<b>General information</b>			
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded
Application/function	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
<b>Degree and class of protection</b>			
Degree of protection to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
<b>Ambient conditions</b>			
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
<b>Storage/transport temperature</b>			
• Ambient temperature during storage, min.	-40 °C	-40 °C	-40 °C
• Ambient temperature during storage, max.	80 °C	80 °C	80 °C
• Ambient temperature during transport, min.	-40 °C	-40 °C	-40 °C
• Ambient temperature during transport, max.	80 °C	80 °C	80 °C

**Technical specifications (continued)**

Article number	<b>6ES7194-2LH20-0AC0</b> CONNECTING CABLE ET- CONNECTION, 2.0M	<b>6ES7194-2LH50-0AC0</b> CONNECTING CABLE ET- CONNECTION, 5.0M	<b>6ES7194-2LN10-0AC0</b> BUS CABLE ET-CONNECTION, 10M		
<b>Cables</b>					
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN		
Cable length	2 m	5 m	10 m		
Number of electrical cores	4	4	4		
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires		
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm		
Outer diameter of core insulation	1 mm	1 mm	1 mm		
Outer diameter of cable sheath	5 mm	5 mm	5 mm		
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s <sup>2</sup>		
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm		
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm		
Bending radius for continuous bending	100 mm	100 mm	100 mm		
Color of cable sheath	green	green	green		
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange		
Weight per length	34 kg/km	34 kg/km	34 kg/km		
<b>Mechanics/material</b>					
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet		
Material of housing	metal	metal	metal		
Material of core insulation	PE	PE	PE		
Material of cable sheath	PVC	PVC	PVC		
Material property halogen-free	No	No	No		
Material property silicone-free	Yes	Yes	Yes		
<hr/>					
Article number	<b>6ES7194-2LH03-1AA0</b> POWER CABLE M8, 0.3M	<b>6ES7194-2LH10-1AA0</b> POWER CABLE M8, 1.0M	<b>6ES7194-2LH20-1AA0</b> POWER CABLE M8, 2.0M	<b>6ES7194-2LH50-1AA0</b> POWER CABLE M8, 5.0M	<b>6ES7194-2LN10-1AA0</b> POWER CABLE M8, 10M
<b>Product type designation</b>					
<b>General information</b>					
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector
Application/function	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
<b>Degree and class of protection</b>					
Degree of protection to EN 60529					
• IP65	Yes	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes	Yes
<b>Ambient conditions</b>					
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Storage/transport temperature</b>					
• Ambient temperature during storage, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during storage, max.	80 °C	80 °C	80 °C	80 °C	80 °C
• Ambient temperature during transport, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during transport, max.	80 °C	80 °C	80 °C	80 °C	80 °C

## I/O systems

ET 200 systems without control cabinet  
SIMATIC ET 200AL – Accessories

### Cables and connectors

#### Technical specifications (continued)

Article number	<b>6ES7194-2LH03-1AA0</b> POWER CABLE M8, 0.3M	<b>6ES7194-2LH10-1AA0</b> POWER CABLE M8, 1.0M	<b>6ES7194-2LH20-1AA0</b> POWER CABLE M8, 2.0M	<b>6ES7194-2LH50-1AA0</b> POWER CABLE M8, 5.0M	<b>6ES7194-2LN10-1AA0</b> POWER CABLE M8, 10M
<b>Cables</b>					
Cable designation	4 Li9Y 0.50	4 Li9Y 0.50	4 Li9Y 0.50	4 Li9Y 0.50	4 Li9Y 0.50
Cable length	0.3 m	1 m	2 m	5 m	10 m
Number of electrical cores	4	4	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm
Number of bending cycles	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km
<b>Mechanics/material</b>					
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	plastic	plastic	plastic	plastic	plastic
Material of core insulation	PP	PP	PP	PP	PP
Material of cable sheath	PVC	PVC	PVC	PVC	PVC
Material property silicone-free	Yes	Yes	Yes	Yes	Yes
<b>Product type designation</b>					
<b>General information</b>					
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled
Application/function	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
<b>Degree and class of protection</b>					
Degree of protection to EN 60529					
• IP65	Yes	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes	Yes

**Technical specifications** (continued)

Article number	<b>6ES7194-2LH03-1AB0</b> POWER CABLE M8, ANGLED, 0.3M	<b>6ES7194-2LH10-1AB0</b> POWER CABLE M8, ANGLED, 1.0M	<b>6ES7194-2LH20-1AB0</b> POWER CABLE M8, ANGLED, 2.0M	<b>6ES7194-2LH50-1AB0</b> POWER CABLE M8, ANGLED, 5.0M	<b>6ES7194-2LN10-1AB0</b> POWER CABLE M8, ANGLED, 10M
<b>Ambient conditions</b>					
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Storage/transport temperature</b>					
• Ambient temperature during storage, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during storage, max.	80 °C	80 °C	80 °C	80 °C	80 °C
• Ambient temperature during transport, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• Ambient temperature during transport, max.	80 °C	80 °C	80 °C	80 °C	80 °C
<b>Cables</b>					
Cable designation	4 Li9Y 0.50	4 Li9Y 0.50	4 Li9Y 0.50	4 Li9Y 0.50	4 Li9Y 0.50
Cable length	0.3 m	1 m	2 m	5 m	10 m
Number of electrical cores	4	4	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm
Number of bending cycles	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km
<b>Mechanics/material</b>					
Type of cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	plastic	plastic	plastic	plastic	plastic
Material of core insulation	PP	PP	PP	PP	PP
Material of cable sheath	PVC	PVC	PVC	PVC	PVC
Material property silicone-free	Yes	Yes	Yes	Yes	Yes

**I/O systems**

ET 200 systems without control cabinet  
SIMATIC ET 200AL – Accessories

**Cables and connectors****Technical specifications** (continued)

Article number	<b>6ES7194-2LH20-1AC0</b> POWER CABLE M8, 2.0M	<b>6ES7194-2LH50-1AC0</b> POWER CABLE M8, 5.0M	<b>6ES7194-2LN10-1AC0</b> POWER CABLE M8, 10M
<b>Product type designation</b>			
<b>General information</b>			
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded
Application/function	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
<b>Degree and class of protection</b>			
Degree of protection to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
<b>Ambient conditions</b>			
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
<b>Storage/transport temperature</b>			
• Ambient temperature during storage, min.	-40 °C	-40 °C	-40 °C
• Ambient temperature during storage, max.	80 °C	80 °C	80 °C
• Ambient temperature during transport, min.	-40 °C	-40 °C	-40 °C
• Ambient temperature during transport, max.	80 °C	80 °C	80 °C
<b>Cables</b>			
Cable designation	4 Li9Y 0.50	4 Li9Y 0.50	4 Li9Y 0.50
Cable length	2 m	5 m	10 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm
Number of bending cycles	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s <sup>2</sup>
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km
<b>Mechanics/material</b>			
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	plastic	plastic	plastic
Material of core insulation	PP	PP	PP
Material of cable sheath	PVC	PVC	PVC
Material property silicone-free	Yes	Yes	Yes

**Technical specifications (continued)**

Article number	<b>6ES7194-2AA00-0AA0</b> M8 POWER CONNECTOR
<b>Product type designation</b>	
<b>General information</b>	
Product description	M8 plug connector with high degree of protection, 4-pin, plastic version
Application/function	For connection to ET 200AL for 24 V DC power supply
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes
<b>Ambient conditions</b>	
Ambient temperature during assembly, min.	-30 °C
Ambient temperature during assembly, max.	85 °C
<b>Storage/transport temperature</b>	
• Ambient temperature during storage, min.	-40 °C
• Ambient temperature during storage, max.	85 °C
• Ambient temperature during transport, min.	-40 °C
• Ambient temperature during transport, max.	85 °C
<b>Mechanics/material</b>	
Type of cable outlet	180 degree cable outlet
Material of housing	plastic
<b>Dimensions</b>	
Width	14 mm
Depth	47 mm

Article number	<b>6ES7194-2AB00-0AA0</b> M8 CONNECTOR ET-CONNECTION
<b>Product type designation</b>	
<b>General information</b>	
Product description	M8 plug connector with high degree of protection, 4-pin, metal version
Application/function	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP65	Yes
• IP67	Yes
<b>Ambient conditions</b>	
Ambient temperature during assembly, min.	-30 °C
Ambient temperature during assembly, max.	80 °C
<b>Storage/transport temperature</b>	
• Ambient temperature during storage, min.	-40 °C
• Ambient temperature during storage, max.	80 °C
• Ambient temperature during transport, min.	-40 °C
• Ambient temperature during transport, max.	80 °C
<b>Mechanics/material</b>	
Type of cable outlet	180 degree cable outlet
Material of housing	metal
<b>Dimensions</b>	
Width	14 mm
Depth	47 mm



**I/O systems**

ET 200 systems without control cabinet  
SIMATIC ET 200AL – Accessories

**Cables and connectors****Ordering data****Article No.****Article No.****Bus cable for backplane bus (ET connection)**

4-pin, shielded

Pre-assembled at both ends,  
2 M8 connectors, angled

0.3 m

**6ES7194-2LH03-0AA0**

1 m

**6ES7194-2LH10-0AA0**

2 m

**6ES7194-2LH20-0AA0**

5 m

**6ES7194-2LH50-0AA0**

10 m

**6ES7194-2LN10-0AA0**Pre-assembled at both ends,  
2 M8 connectors, angled

0.3 m

**6ES7194-2LH03-0AB0**

1 m

**6ES7194-2LH10-0AB0**

2 m

**6ES7194-2LH20-0AB0**

5 m

**6ES7194-2LH50-0AB0**

10 m

**6ES7194-2LN10-0AB0**Pre-assembled at one end,  
1 M8 connector

2 m

**6ES7194-2LH20-0AC0**

5 m

**6ES7194-2LH50-0AC0**

10 m

**6ES7194-2LN10-0AC0****Power cable M8**

4-pin

Pre-assembled at both ends,  
M8 connector and M8 socket

0.3 m

**6ES7194-2LH03-1AA0**

1 m

**6ES7194-2LH10-1AA0**

2 m

**6ES7194-2LH20-1AA0**

5 m

**6ES7194-2LH50-1AA0**

10 m

**6ES7194-2LN10-1AA0**Pre-assembled at both ends,  
angled M8 connector and angled  
M8 socket

0.3 m

**6ES7194-2LH03-1AB0**

1 m

**6ES7194-2LH10-1AB0**

2 m

**6ES7194-2LH20-1AB0**

5 m

**6ES7194-2LH50-1AB0**

10 m

**6ES7194-2LN10-1AB0**Pre-assembled at one end,  
M8 socket

2 m

**6ES7194-2LH20-1AC0**

5 m

**6ES7194-2LH50-1AC0**

10 m

**6ES7194-2LN10-1AC0****M8 connector for ET connection****6ES7194-2AB00-0AA0**

4-pin, shielded

**M8 power connector****6ES7194-2AA00-0AA0**

Male insert, 4-pin

**ET connection FastConnect  
stripping tool****6ES7194-2KA00-0AA0**Stripping tool for stripping  
the ET connection bus cable

**Overview**

- Labels for the identification of channels, modules and slots of ET 200AL components
- Can be used for interface modules and I/O modules

**Ordering data****Labels**

10 x 5 mm, RAL 9016;  
5 frames with 40 labels each

**Article No.**

**6ES7194-2BA00-0AA0**

## I/O systems

### Heating control systems

#### Introduction

#### Overview



Heating control systems

#### **SIPLUS HCS heating control systems: Industrial heating processes – maximum precision and efficiency**

In manufacturing processes where temperature plays a crucial role, deviations of just a few degrees can cause enormous quality problems. To avoid this and to minimize rejection rates, high-precision and reliable, individual control of the electrical heating elements is essential.

Nearly all industrially manufactured products undergo heat treatment. Even small deviations in the heating process can result in enormous negative effects on product quality.

To increase the quality and quantity of a heat-treated product, it is important to be able to focus the energy required with the highest level of spatial and temporal precision. The SIPLUS HCS ensures utmost precision in the control of electric heating units such as infrared heaters.

Three heating control systems are available:

- With integrated power outputs – compact design
- With integrated power outputs - modular design
- Without integrated power outputs

The SIPLUS HCS family of heating control systems saves time, costs and resources when it comes to configuring, commissioning, operation and maintenance.

This is achieved by:

- Simple integration into existing automation systems such as SIMATIC and SIMOTION
- Lower wiring costs and user-friendly engineering
- Intelligent diagnostics options for swift fault detection
- Service-friendly design thanks to ready-to-use function and data blocks
- Reduced volume in the control cabinet with space savings of up to 50 %

For more information, visit <http://www.siemens.com/siplus-hcs>.

## Overview



SIPLUS HCS3200 heating control system with fixing brackets

The SIPLUS HCS3200 heating control system was developed as a compact solution for controlling linear heat emitter arrays.

Thanks to the high IP65 degree of protection, it can be used independently of a control cabinet at a distributed location near the emitters.

## Technical specifications

Article number	<b>6BK1932-0BA00-0AA0</b>	
Product description	HCS3200 fan	
<b>General data</b>		
Version of the control of the heat emitter	Half-wave control	
Type of load	Resistive load	
Reference code in accordance with DIN EN 81346-2	Q	
Degree of pollution	2	
<b>Approvals/certificates</b>		
Certificate of suitability	CE	
<b>Supply voltage</b>		
Type of voltage of supply voltage	AC	
Supply voltage with AC Rated value	V	400
• Relative negative tolerance	%	10
• Relative positive tolerance	%	10
<b>Supply voltage frequency</b>		
• 1	Hz	50
• 2	Hz	60
• Relative symmetrical tolerance	%	5
Switching capacity current per phase Maximum	A	63
Breaking capacity, short-circuit current limit (Icu) at 400 V Rated value	kA	25
Electrical isolation version	Optocoupler between main circuit and PELV	
Power carrying capacity maximum permissible	W	25 200
Electrical connection version for supply voltage	Connector, 4-pole + PE	
<b>Type of conductor cross-sections that can be connected</b>		
• for supply voltage, finely stranded with prepared core ends	3x (6 ... 25 mm <sup>2</sup> ) and 1x PE (6 ... 16 mm <sup>2</sup> )	
• for AWG cables, for supply voltage	AWG	3x (8 ... 4)

Article number	<b>6BK1932-0BA00-0AA0</b>	
<b>Power electronics</b>		
Number of outputs		
• for fans	1	
• for heating power	9	
Number of heat emitters per output Maximum	1	
<b>Output voltage at the output</b>		
• for heating power	V	400
• for fans	V	230
<b>Power carrying capacity</b>		
• per output	W	200 ... 4 000
• for fans, per output	W	60 ... 500
Output current at the output for heating power Rated value	A	10
Electrical isolation between outputs	No	
<b>Design of the short-circuit protection</b>		
• on output for fan	Safety fuse 4 A	
• for heating power, per output	Safety fuse 16 A	
Electrical connection version at the output for heater and fan	Connector, 20-pole + PE	
<b>Type of conductor cross-sections that can be connected</b>		
• For heater and fan, finely stranded with end sleeve	20x (1.5 ... 4 mm <sup>2</sup> ), 1x PE (1.5 ... 16 mm <sup>2</sup> )	
• For AWG cables, stranded	AWG	20x (18 ... 12)
<b>Measuring inputs for voltage</b>		
Product function Voltage measurement	yes	

## I/O systems

Heating control systems

SIPLUS HCS3200 heating control system

### SIPLUS HCS3200 heating control system

#### Technical specifications (continued)

Article number	<b>6BK1932-0BA00-0AA0</b>	
<b>Communications</b>		
Protocol supported PROFIBUS DP protocol	yes	
Interface design	PROFIBUS DP	
Transmission rate With PROFIBUS DP Maximum	Mbps	12
Electrical connection version of the PROFIBUS interface	ECOFAST	
<b>Display</b>		
Number of status indicators	2	
Display version as LED status indication	LED green = status indicator, LED red = fault indicator	
<b>Auxiliary circuit</b>		
Type of power supply	External	
Type of voltage	DC	
Supply voltage for the electronics	V	24
• Relative symmetrical toler- ance of input voltage	%	20
Current consumption for the electronics Maximum	A	0.25
<b>Monitoring functions</b>		
Product function Temperature monitoring	yes	
Temperature monitoring version	NTC thermistor	
Diagnosics function	Voltage diagnostics	
• Fuse blown	yes	
• Wire break	yes	
• Heat emitter defect	yes	
<b>Mechanical features</b>		
Installation position	Vertical	
Type of mounting	Screw mounting	
Type of ventilation	Self-ventilation	
<b>Shock resistance</b>		
• according to IEC 60068-2-27	15 g / 11 ms / 3 shocks / axis	
• according to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks / axis	
<b>Vibration resistance</b>		
• during operation according to IEC 60068-2-6	10 ... 58 Hz / 0.15 mm, 58 ... 150 Hz / 1 g	
• during storage according to IEC 60068-2-6	5 ... 9 Hz / 3.5 mm, 9 ... 500 Hz / 1 g	
IP degree of protection	IP65	
<b>Dimensions</b>		
• Width	mm	300
• Height	mm	380
• Depth	mm	200

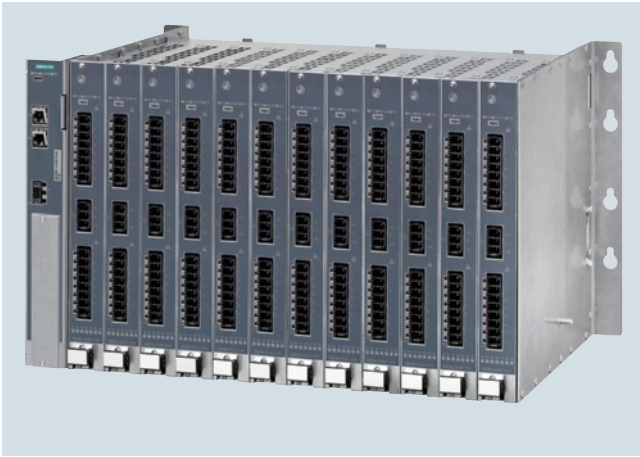
Article number	<b>6BK1932-0BA00-0AA0</b>	
<b>Electromagnetic compatibility</b>		
Conducted interference BURST according to IEC 61000-4-4	2 kV power supply lines / 1 kV signal cables	
Conducted interference SURGE according to IEC 61000-4-5	On supply lines: 1 kV symmetrical, 2 kV asymmetrical, (24 V DC supply only with external protective measure) for PROFIBUS DP cable: asymmetrical 1 kV	
Conducted interference as high frequency radiation according to IEC 61000-4-6	10 V (0.15 ... 80 MHz)	
Electrostatic discharging according to IEC 61000-4-2	4 kV contact discharging / 8 kV air discharging	
Field-based interference according to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)	
EMC interference emission	in accordance with IEC 61000-6-4:2007 + A1:2011	
Overvoltage category	III	
<b>Climatic environmental conditions</b>		
<b>Ambient temperature</b>		
• During operation	°C	0 ... 50
• During storage	°C	-40 ... +70
• During transport	°C	-40 ... +70
<b>Atmospheric pressure</b>		
• During operation	hPa	860 ... 1 080
• During storage	hPa	660 ... 1 080
<b>Relative humidity</b>		
• at 25 °C during operation, maximum	%	95
• at 50 °C during operation, maximum	%	50
Installation altitude at height above sea level Maximum	m	2 000

#### Ordering data

#### Article No.

SIPLUS HCS3200  
heating control system  
HCS3200 fan

**6BK1932-0BA00-0AA0**

**Overview**

SIPLUS HCS4200 heating control system

The SIPLUS HCS4200 heating control system controls and switches heat emitter arrays and other resistive loads in 230 V AC voltage supply systems in industrial environments.

Communication takes place via PROFINET, and together with the SIMATIC S7, SIMOTION or industrial PC, forms a modern and powerful automation system. The modular, compact and space-saving distributed I/O system can be adapted individually to suit the application.

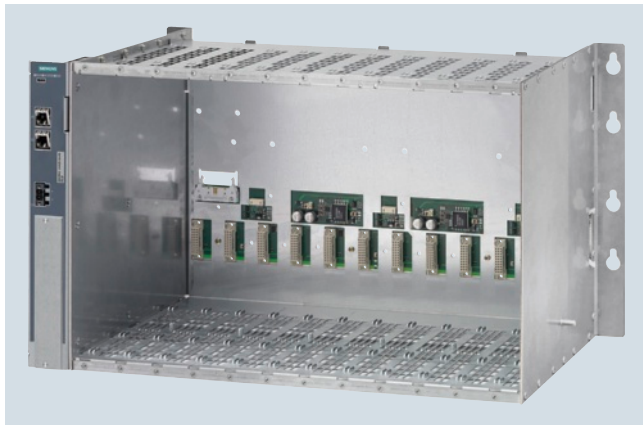
## I/O systems

Heating control systems

SIPLUS HCS4200 heating control system

### Rack

#### Overview



SIPLUS HCS4200 heating control system

The rack constitutes the basic mechanical structure of SIPLUS HCS4200.

#### Technical specifications

Article number	<b>6BK1942-0AA00-0AA0</b>	
<b>Product brand name</b>	SIPLUS	
<b>Product designation</b>	Rack4200 for 12 POM	
<b>General technical data:</b>		
<b>Equipment marking / acc. to DIN EN 81346-2</b>	K	
<b>Number of slots</b>	12	
<b>Type of power output / connectable</b>	POM4220	
<b>Supply voltage:</b>		
<b>Power capacity</b>		
• without fan / per rack / maximum	kW	88
• with fan / per rack / maximum kW		193
<b>Communication:</b>		
<b>Design of the interface</b>	system interface	
<b>Mechanical data:</b>		
<b>mounting position</b>	horizontal	
<b>Mounting type</b>	Control cabinet backplane	
<b>Type of ventilation</b>	Self ventilation or forced ventilation	
<b>Vibration resistance</b>		
• during operation / acc. to IEC 60068-2-6	10 ... 58 Hz / 0.15 mm, 58 ... 150 Hz / 1g	
• during storage / acc. to IEC 60068-2-6	5 ... 9 Hz / 3.5 mm, 9 ... 500 Hz / 1g	
<b>Shock resistance</b>		
• acc. to IEC 60068-2-29	25 g / 6 ms / 1000 shocks / axis	
• acc. to IEC 60068-2-27	15g / 11 ms / 3 shocks / axis	

Article number	<b>6BK1942-0AA00-0AA0</b>	
<b>Protection class IP</b>	IP20	
<b>Depth</b>	mm	293
<b>Height</b>	mm	285
<b>Width</b>	mm	488
<b>Electromagnetic compatibility:</b>		
<b>EMC emitted interference</b>	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011	
<b>Field-bound parasitic coupling / acc. to IEC 61000-4-3</b>	10 V/m (80 ... 1000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)	
<b>Electrostatic discharge / acc. to IEC 61000-4-2</b>	4 kV contact discharge / 8 kV air discharge	
<b>Ambient conditions:</b>		
<b>Ambient temperature</b>		
• during operation	0 ... 55	
• during storage	-25 ... +70	
• during transport	-25 ... +70	
<b>Air pressure</b>		
• during operation	860 ... 1 080	
• during storage	660 ... 1 080	
<b>Degree of pollution</b>		
2		
<b>Installation altitude / at height above sea level / maximum</b>	m	2 000
<b>Relative humidity</b>		
• at 25 °C / during operation / maximum	%	95
• at 50 °C / during operation / maximum	%	50
• at 50 °C / during operation / maximum / Note	95% at 25 °C, decreasing linearly to 50% at 50 °C	

#### Ordering data

**SIPLUS HCS4200 Rack**  
Rack for accommodating up to 12 POM4320 power output modules

**Article No.**  
**6BK1942-0AA00-0AA0**

#### Accessories

**SIPLUS HCS4200 Fan Module**  
Attached to the top of the rack for accommodating up to 4 power output modules

**Article No.**  
**6BK1942-4AA00-0AA0**

**Blanking cover (10 items)**  
For covering unoccupied slots in the rack

**Article No.**  
**6BK1942-6DA00-0AA0**

## Overview



The Central Interface Module (CIM) is the intelligent processor module of the SIPLUS HCS4200 heating control system.

## Technical specifications

Article number	<b>6BK1942-1AA00-0AA0</b>
Product brand name	SIPLUS
Product designation	CIM4210 PROFINET
<b>General technical data:</b>	
Equipment marking / acc. to DIN EN 81346-2	K
Number of slots	1
<b>Supply voltage:</b>	
Type of voltage / of the supply voltage	DC
Supply voltage / 1 / for DC / Rated value	V 24
Relative negative tolerance / of the supply voltage	% 20
Relative positive tolerance / of the supply voltage	% 20
Active power consumption	W 3
Type of electrical connection / for supply voltage	Connector, 2 x 2-pole
<b>Type of connectable conductor cross-section</b>	
• for supply voltage / solid	1x (0.2 ... 2.5 mm <sup>2</sup> )
• for supply voltage / finely stranded / with core end processing	1x (0.2 ... 2.5 mm <sup>2</sup> )
• for AWG conductors / for supply voltage	26 ... 12

Article number	<b>6BK1942-1AA00-0AA0</b>
<b>Communication:</b>	
<b>Design of the interface</b>	PROFINET IO
<b>Protocol / is supported</b>	
• PROFIBUS DP protocol	-
• PROFINET IO protocol	Yes
<b>Transfer rate</b>	
• with PROFIBUS DP / maximum	-
• with PROFINET IO / maximum Mbit/s	100
<b>Type of electrical connection</b>	
• of the PROFIBUS interface	-
• of the PROFINET interface	2 x RJ45
<b>Display:</b>	
<b>Number of status displays</b>	3
<b>Display version / as status display by LED</b>	LED green = ready, LED yellow = heating on/off, LED red = error display
<b>Mechanical data:</b>	
<b>Mounting position</b>	vertical
<b>Mounting type</b>	Screw mounting to rack
<b>Type of ventilation</b>	Forced ventilation
<b>Vibration resistance</b>	
• during operation / acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1g
• during storage / acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1g
<b>Shock resistance</b>	
• acc. to IEC 60068-2-29	25 g / 6 ms / 1000 shocks / axis
• acc. to IEC 60068-2-27	15g / 11 ms / 3 shocks / axis
<b>Protection class IP</b>	IP20
<b>Depth</b>	mm 136
<b>Height</b>	mm 285
<b>Width</b>	mm 43



**I/O systems**

Heating control systems

SIPLUS HCS4200 heating control system

**Central Interface Module (CIM)****Technical specifications (continued)**

Article number	<b>6BK1942-1AA00-0AA0</b>
<b>Electromagnetic compatibility:</b>	
<b>EMC emitted interference</b>	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011
<b>Conducted interference / due to burst / acc. to IEC 61000-4-4</b>	2 kV power supply lines, 2 kV PROFINET cables
<b>Conducted interference / due to surge / acc. to IEC 61000-4-5</b>	DC supply lines: 0.5 kV symmetric and unsymmetric PROFINET cables: 1 kV unsymmetric
<b>Conducted interference / due to high-frequency radiation / acc. to IEC 61000-4-6</b>	10 V (0.15 ... 80 MHz)
<b>Field-bound parasitic coupling / acc. to IEC 61000-4-3</b>	10 V/m (80 ... 1000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)
<b>Electrostatic discharge / acc. to IEC 61000-4-2</b>	4 kV contact discharging, 8 kV air discharging
<b>Overvoltage category</b>	III
<b>Ambient conditions:</b>	
<b>Ambient temperature</b>	
• during operation	0 ... 55
• during storage	-25 ... +70
• during transport	-25 ... +70
<b>Air pressure</b>	
• during operation	860 ... 1 080
• during storage	660 ... 1 080
<b>Degree of pollution</b>	2
<b>Installation altitude / at height above sea level / maximum</b>	m 2 000
<b>Relative humidity</b>	
• at 25 °C / during operation / maximum	% 95
• at 50 °C / during operation / maximum	% 50
• at 50 °C / during operation / maximum / Note	95% at 25 °C, decreasing linearly to 50% at 50 °C

**Ordering data**

**SIPLUS HCS4200 CIM4210 PROFINET**  
Central interface module with PROFINET communication

**Article No.****6BK1942-1AA00-0AA0**

#### Overview



The power output modules (POMs) are an essential component of the SIPLUS HCS4200 heating control system. Up to 12 power output modules can be operated on one CIM.

#### POM4220 low-end power output module:

- 16 outputs for switching ohmic loads.
- A current of up to 6.3 A can be used per output channel.
- Connection of both phases and neutral conductor via a 3-pin connector (mating connector incl. in scope of delivery!).
- Connection of the heat emitters via two 8-pin connectors (mating connector incl. in scope of delivery!).
- One fuse per output for outgoing lines.
- Heat dissipation via an optional fan module on the upper side of the rack (for 4 POM4220).
- Module simply slides into the rack.
- And is secured by one screw at the bottom and another screw at the top.
- Three diagnostic LEDs for displaying the rack errors.
- Sixteen diagnostic LEDs for displaying the channel errors.

#### Technical specifications

Article number	<b>6BK1942-2AA00-0AA0</b>	
Product brand name	SIPLUS	
Product designation	HCS POM4220 Lowend	
<b>General technical data:</b>		
Type of load	Ohmic load	
Equipment marking / acc. to DIN EN 81346-2	Q	
<b>Supply voltage:</b>		
Type of voltage / of the supply voltage	AC	
Supply voltage / with AC / Rated value	V	230
Relative negative tolerance / of the supply voltage	%	10
Relative positive tolerance / of the supply voltage	%	10
Supply voltage frequency / 1 / Rated value	Hz	50
Supply voltage frequency / 2 / Rated value	Hz	60
Relative symmetrical tolerance / of the supply voltage frequency	%	5
<b>Power capacity</b>		
• of the module / with star connection / at 40 °C / with fan / maximum	kW	16.1
• of the module / with star connection / at 40 °C / without fan / maximum	kW	7.3
• maximum permissible	kW	16.1
Switching capacity current / per phase / maximum	A	35
Short-time withstand current (SCCR) / acc. to UL 508A	-	
Design of the electrical isolation	Optocoupler and/or protective impedance between main circuit and PELV	
Recovery time / after power failure / typical	s	1
Type of electrical connection / for supply voltage	Connector, 3-pin	

Article number	<b>6BK1942-2AA00-0AA0</b>	
<b>Type of connectable conductor cross-section</b>		
• for supply voltage / finely stranded / with core end processing	1x (0.25 ... 6 mm <sup>2</sup> )	
• for AWG conductors / for supply voltage	24 ... 8	
<b>Power Electronics:</b>		
Control version / of heat emitters	Half-wave control	
Number of outputs / for heating power	16	
Number of heat emitters / per output / maximum	1	
Output voltage / at output / for heating power	V	230
<b>Power capacity</b>		
• per output	100 ... 1 449	
Output current / at output / for heating power / Rated value	A	6.3
<b>Peak current</b>		
Design of short-circuit protection / for heating power / per output	Safety fuse 6.3 A	
Melting I <sup>2</sup> t value	A <sup>2</sup> ·s	57
Design of the overvoltage protection	Transil Diode	
Galvanic isolation / between the outputs	No	
Type of electrical connection / at output / for heating and fan	Connector, 8-pole	
<b>Type of connectable conductor cross-section</b>		
• for heating and fan / solid	1x (0.2 ... 10 mm <sup>2</sup> )	
• for heating and fan / finely stranded / with core end processing	1x (0.25 ... 6 mm <sup>2</sup> )	
• for AWG conductors / stranded	24 ... 8	

## I/O systems

Heating control systems

SIPLUS HCS4200 heating control system

### Power Output Module (POM)

#### Technical specifications (continued)

Article number	<b>6BK1942-2AA00-0AA0</b>
<b>Communication:</b>	
<b>Design of the interface</b>	system interface
<b>Display:</b>	
<b>Number of status displays</b>	19
<b>Display version / as status display by LED</b>	LED green = ready, LED yellow = heating on/off, LED red = error display, LED red = error for each channel
<b>Auxiliary circuit:</b>	
<b>Design of the power supply</b>	Power supply via rack
<b>Active power consumption / maximum</b> W	1
<b>Protective and monitoring functions:</b>	
<b>Product function / Temperature monitoring</b>	Yes
<b>Type of the temperature monitoring</b>	NTC thermistor
<b>Diagnostics function</b>	Voltage diagnostics
• Tripped fuse	Yes
• Cable break	Yes
• Heat emitter failure	Yes
<b>Mechanical data:</b>	
<b>mounting position</b>	vertical
<b>Mounting type</b>	Screw mounting to rack
<b>Type of ventilation</b>	Self ventilation or forced ventilation
<b>Vibration resistance</b>	
• during operation / acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1g
• during storage / acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1g
<b>Shock resistance</b>	
• acc. to IEC 60068-2-29	25 g / 6 ms / 1000 shocks / axis
• acc. to IEC 60068-2-27	15g / 11 ms / 3 shocks / axis
<b>Protection class IP</b>	IP20
<b>Depth</b>	mm 281
<b>Height</b>	mm 285
<b>Width</b>	mm 36

Article number	<b>6BK1942-2AA00-0AA0</b>
<b>Electromagnetic compatibility:</b>	
<b>EMC emitted interference</b>	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011 2 kV power supply lines, 2 kV load lines
<b>Conducted interference / due to burst / acc. to IEC 61000-4-4</b>	
<b>Conducted interference / due to surge / acc. to IEC 61000-4-5</b>	Supply and load lines: 1 kV symmetric, 2 kV unsymmetric PROFINET cables: 1 kV unsymmetric
<b>Conducted interference / due to high-frequency radiation / acc. to IEC 61000-4-6</b>	10 V (0.15 ... 80 MHz)
<b>Field-bound parasitic coupling / acc. to IEC 61000-4-3</b>	10 V/m (80 ... 1000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)
<b>Electrostatic discharge / acc. to IEC 61000-4-2</b>	4 kV contact discharging, 8 kV air discharging
<b>Overvoltage category</b>	III
<b>Ambient conditions:</b>	
<b>Ambient temperature</b>	
• during operation	0 ... 55
• during storage	-25 ... +70
• during transport	-25 ... +70
<b>Air pressure</b>	
• during operation	860 ... 1 080
• during storage	660 ... 1 080
<b>Degree of pollution</b>	2
<b>Installation altitude / at height above sea level / maximum</b>	2 000
<b>Relative humidity</b>	
• at 25 °C / during operation / maximum	% 95
• at 50 °C / during operation / maximum	% 50
• at 50 °C / during operation / maximum / Note	95% at 25 °C, decreasing linearly to 50% at 50 °C

#### Ordering data

#### Article No.

**SIPLUS HCS4200 POM4220 Low-End**

**6BK1942-2AA00-0AA0**

Power output module with 16 outputs for connecting resistive loads

**Overview**

SIPLUS HCS4300 heating control systems

The SIPLUS HCS4300 heating control system controls and switches heat emitter arrays and other resistive loads in 400 V/480 V voltage supply systems in industrial environments.

Communication takes place via PROFINET and provides, together with the SIMATIC S7, for example, a highly modern and powerful automation system.

## I/O systems

Heating control system

SIPLUS HCS4300 heating control system

### Central Interface Module (CIM)

#### Overview



The Central Interface Module (CIM) is the intelligent processor module of the SIPLUS HCS4300 heating control system.

#### Technical specifications

Article number	<b>6BK1943-1AA00-0AA0</b>	
Product brand name	SIPLUS	
Product designation	CIM4310 PROFINET	
<b>General technical data:</b>		
Equipment marking / acc. to DIN EN 81346-2	K	
Number of slots	1	
Type of power output / connectable	POM4320	
<b>Power supply:</b>		
Type of voltage / of the supply voltage	DC	
Supply voltage / 1 / for DC / Rated value	V	24
Relative negative tolerance / of the supply voltage	%	20
Relative positive tolerance / of the supply voltage	%	20
Active power consumption	W	3
Type of electrical connection / for supply voltage	Connector, 2 x 2-pole	
Type of connectable conductor cross-section		
• for supply voltage		
- solid	1x (0.2 ... 2.5 mm <sup>2</sup> )	
- finely stranded / with core end processing	1x (0.2 ... 2.5 mm <sup>2</sup> )	
• for AWG conductors / for supply voltage	26 ... 12	

Article number	<b>6BK1943-1AA00-0AA0</b>	
<b>Communication:</b>		
Design of the interface	PROFINET IO	
<b>Protocol</b>		
• is supported		
- PROFIBUS DP protocol	-	
- PROFINET IO protocol	Yes	
<b>Transfer rate</b>		
• with PROFIBUS DP / maximum	-	
• with PROFINET IO / maximum Mbit/s	100	
<b>Type of electrical connection</b>		
• of the PROFIBUS interface	-	
• of the PROFINET interface	2 x RJ45	
<b>Number of status displays</b>		
3		
<b>Display version / as status display by LED</b>		
LED green = ready, LED yellow = heating on/off, LED red = error display		
<b>Mechanical data:</b>		
Mounting position	vertical	
Mounting type	Screw mounting to POM	
Type of ventilation	Forced ventilation	
<b>Shock resistance</b>		
• acc. to IEC 60068-2-27	15g / 11 ms / 3 shocks / axis	
• acc. to IEC 60068-2-29	25 g / 6 ms / 1000 shocks / axis	
<b>Vibration resistance</b>		
• during operation / acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1g	
• during storage / acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1g	
<b>Protection class IP</b>		
IP20		
Width	mm	56
Height	mm	285
Depth	mm	136

Technical specifications (continued)		Ordering data	Article No.
Article number	<b>6BK1943-1AA00-0AA0</b>	<b>HCS4300 CIM heating controller</b>	<b>6BK1 943-1AA00-0AA0</b>
<b>Electrical data:</b>		<b>CIM4310 PROFINET</b>	
<b>Conducted interference / due to burst / acc. to IEC 61000-4-4</b>	2 kV power supply lines, 2 kV PROFINET cables	<b>Central Interface Module</b>	
<b>Conducted interference / due to surge / acc. to IEC 61000-4-5</b>	DC supply lines: 0.5 kV symmetric and unsymmetric PROFINET cables: 1 kV unsymmetric		
<b>Conducted interference / due to high-frequency radiation / acc. to IEC 61000-4-6</b>	10 V (0.15 ... 80 MHz)		
<b>Electrostatic discharge / acc. to IEC 61000-4-2</b>	4 kV contact discharge / 8 kV air discharge		
<b>Field-bound parasitic coupling / acc. to IEC 61000-4-3</b>	10 V/m (80 ... 1000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)		
<b>EMC emitted interference</b>	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011		
<b>Overvoltage category</b>	III		
<b>Ambient conditions:</b>			
<b>Ambient temperature</b>			
• during operation	°C 0 ... 55		
• during storage	°C -25 ... +70		
• during transport	°C -25 ... +70		
<b>Air pressure</b>			
• during operation	hPa 860 ... 1 080		
• during storage	hPa 660 ... 1 080		
<b>Relative humidity</b>			
• at 25 °C / during operation / maximum	% 95		
• at 50 °C / during operation - maximum	% 50		
Note	95% at 25 °C, decreasing linearly to 50% at 50 °C		
<b>Degree of pollution</b>	2		
<b>Installation altitude / at height above sea level / maximum</b>	2 000		

## I/O systems

Heating control systems

SIPLUS HCS4300 heating control system

### Power Output Module (POM)

#### Overview



- Module (encapsulated) in metal enclosure
- 9 outputs for connecting resistive loads
- A current of up to 16 A per output can be used
- Connection of the phases via rear busbar adapter or connecting terminals
- 2-pin connection of heat emitter via mating connectors (mating connectors are included in scope of supply!)
- 2 fuses per output for supply and return circuit in a plug and pull fuse module
- Heat dissipation by fan mounted on top
- Internal serial interface
- Three diagnostics LEDs for indicating module faults
- Nine diagnostics LEDs for indicating channel faults

#### Technical specifications

Article number	<b>6BK1943-2AA00-0AA0</b>	
product brand name	SIPLUS	
Product designation	POM4320_IEC_STROMSCHIENEN-MONTAGE	
<b>General technical data:</b>		
Type of load	Ohmic load	
Equipment marking / acc. to DIN EN 81346-2	Q	
<b>Supply voltage:</b>		
Supply voltage / with AC / Rated value	V	400
Relative negative tolerance / of the supply voltage	%	10
Relative positive tolerance / of the supply voltage	%	30
Supply voltage frequency / 1 / Rated value	Hz	50
Supply voltage frequency / 2 / Rated value	Hz	60
Relative symmetrical tolerance / of the supply voltage frequency	%	5
<b>Power capacity</b>		
• of the module / with delta connection / at 40 °C / with fan / maximum	kW	69.1
• maximum permissible	kW	69.1
Switching capacity current / per phase / maximum	A	83
Short-time withstand current (SCCR) / acc. to UL 508A	-	-
Design of the electrical isolation	Optocoupler and/or protective impedance between main circuit and PELV	
Recovery time / after power failure / typical	s	1
Type of electrical connection / for supply voltage	Busbar adapter, 3-pole + PE for 60 mm busbar system	

Article number	<b>6BK1943-2AA00-0AA0</b>	
<b>Type of connectable conductor cross-section</b>		
• for supply voltage / solid	-	-
• for supply voltage / finely stranded / with core end processing	-	-
• for AWG conductors / for supply voltage	-	-
<b>Power Electronics:</b>		
Control version / of heat emitters	Half-wave control	
Number of outputs / for heating power	9	
Number of heat emitters / per output / maximum	1	
Output voltage / at output / for heating power	V	400
<b>Power capacity</b>		
• per output	200 ... 7 680	
Output current / at output / for heating power / Rated value	A	16
Peak current	A	150
Design of short-circuit protection / for heating power / per output	Fuse 16 A	
Melting I <sup>2</sup> t value	A <sup>2</sup> ·s	250
Design of the overvoltage protection	Transil Diode	
Galvanic isolation / between the outputs	No	
Type of electrical connection / at output / for heating and fan	Connector, 3-pole	
<b>Type of connectable conductor cross-section</b>		
• for heating and fan / solid	1x (0.2 ... 10 mm <sup>2</sup> )	
• for heating and fan / finely stranded / with core end processing	1x (0.25 ... 6 mm <sup>2</sup> )	
• for AWG conductors / stranded	24 ... 8	

**Technical specifications (continued)**

Article number	<b>6BK1943-2AA00-0AA0</b>
<b>Measuring inputs</b>	
Product function / voltage detection	Yes
<b>Communication:</b>	
Design of the interface	system interface
<b>Display:</b>	
Number of status displays	12
Display version / as status display by LED	LED green = ready, LED yellow = heating on/off, LED red = error display, LED red = error for each channel
<b>Auxiliary circuit:</b>	
Design of the power supply	Power supply via CIM
Active power consumption / W maximum	8
<b>Protective and monitoring functions:</b>	
Product function / Temperature monitoring	Yes
Type of the temperature monitoring	NTC thermistor
Diagnostics function	Voltage diagnostics
• Tripped fuse	Yes
• Cable break	Yes
• Heat emitter failure	Yes
<b>Mechanical data:</b>	
mounting position	vertical
Mounting type	Busbar mounting
Type of ventilation	Self-ventilation
<b>Vibration resistance</b>	
• during operation / acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1g
• during storage / acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1g
<b>Shock resistance</b>	
• acc. to IEC 60068-2-29	25 g / 6 ms / 1000 shocks / axis
• acc. to IEC 60068-2-27	15g / 11 ms / 3 shocks / axis
Protection class IP	IP20
Depth	mm 250
Height	mm 340
Width	mm 104

Article number	<b>6BK1943-2AA00-0AA0</b>
<b>Electromagnetic compatibility:</b>	
Conducted interference / due to burst / acc. to IEC 61000-4-4	2 kV power supply lines, 2 kV load lines
Conducted interference / due to surge / acc. to IEC 61000-4-5	on supply and load lines: 1 kV symmetric, 2 kV unsymmetric
Conducted interference / due to high-frequency radiation / acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)
Field-bound parasitic coupling / acc. to IEC 61000-4-3	10 V/m (80 ... 1000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)
Electrostatic discharge / acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge
Overvoltage category	III
<b>Ambient conditions:</b>	
<b>Ambient temperature</b>	
• during operation	0 ... 55
• during storage	-25 ... +70
• during transport	-25 ... +70
<b>Air pressure</b>	
• during operation	860 ... 1 080
• during storage	660 ... 1 080
<b>Degree of pollution</b>	
	2
Installation altitude / at height above sea level / maximum	m 2 000
<b>Relative humidity</b>	
• at 25 °C / during operation / maximum	% 95
• at 50 °C / during operation / maximum	% 50
• at 50 °C / during operation / maximum / Note	95% at 25 °C, decreasing linearly to 50% at 50 °C

**Ordering data****Article No.**

SIPLUS HCS4300  
heating controller POM  
POM4320 IEC  
for busbar mounting

**6BK1 943-2AA00-0AA0**



## I/O systems

### PROFIBUS components

#### Power Rail Booster

##### Overview



- Device for low-cost PROFIBUS DP transfer over contact conductors and slip rings to degree of protection IP20
- Permissible baud rates from 9600 bit/s to 500 kbit/s, self-optimizing
- Permissible busbar length:  
From 25 m at 500 kbit/s to 1200 m at 9600 bit/s
- Configuring with PRB Checker software
- Up to 125 nodes per segment
- Transparent for data communication:  
The power rail booster does not reserve DP addresses
- Easy to install due to connection without terminating resistor and filter element
- Diagnostics LED for power supply, bus activity and group errors
- Isolated electronic changeover contact for external group error display or diagnostic alarm
- Uninterruptible communication beyond segment limits using the "PRB segment controller"

##### Technical specifications

Degree of protection	IP20
Dimensions (W x H x D, with connector) in mm	90 x 132 x 75
Supply voltage	24 V DC
Power consumption	max. 20 W
Data transmission rate, max.	500 kbit/s, self-adjusting
Cable length (depends on baud rate), max.	1200 m
Shock-hazard protected voltage	Yes, to EN 61131-2
Stations per PRB segment, max.	125
Operation without terminating resistance	Yes
Operation without filter	Yes
Wiring options: Line / star	Yes / Yes

##### Ordering data

##### Article No.

##### Power Rail Booster

Signal amplifier for PROFIBUS DP transmission over contact cables, max. 500 kbit/s

**6ES7972-4AA02-0XA0**

##### PRB segment controller

Automatic change-over switch between PRB segments

**6ES7972-4AA50-0XA0**

**Overview**


- RS 485 repeater with online line diagnostics for PROFIBUS DP
- DP standard PROFIBUS slave (DP-V1)
- Automatic determination of fault types and locations
- Data transmission rate 9.6 kbit/s to 12 Mbit/s
- Connection through FastConnect using the insulation displacement method

**Technical specifications**

Article number	<b>6ES7972-0AB01-0XA0</b> SIMATIC S7, DIAGNOSIS-REPEATER
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	Yes
• 24 V DC	
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Interfaces</b>	
Bus cables	FastConnect insulation displacement, 10 clamping cycles possible
<b>PROFIBUS DP</b>	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	Yes
• IP20	

Article number	<b>6ES7972-0AB01-0XA0</b> SIMATIC S7, DIAGNOSIS-REPEATER
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	0 °C
• max.	60 °C
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Relative humidity</b>	
• Operation, max.	95 %; at 25 °C
<b>Connection method</b>	
Power supply	Terminal block
<b>Dimensions</b>	
Width	80 mm
Height	125 mm
Depth	67.5 mm
<b>Weights</b>	
Weight, approx.	300 g

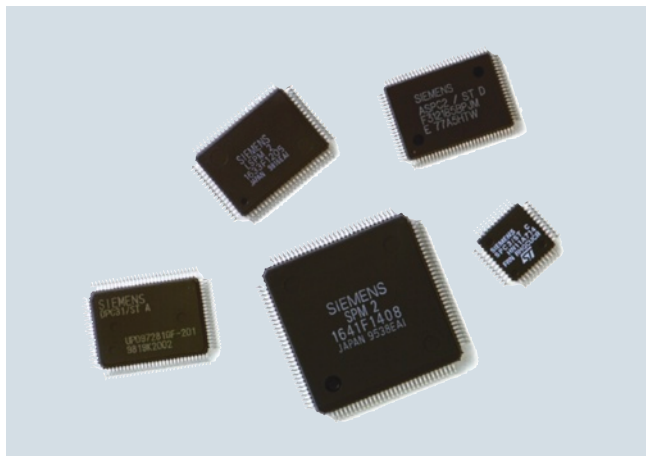
## I/O systems

### PROFIBUS components

#### Diagnostics repeater for PROFIBUS DP

Ordering data	Article No.		Article No.
<b>RS 485 Diagnostics Repeater</b> For connection of 1 or 2 segments to PROFIBUS DP; with online diagnostics functions for monitoring the bus cables	<b>6ES7972-0AB01-0XA0</b>		
<b>Accessories</b>			
<b>RS 485 bus connector with 90° cable outlet</b> With screw terminals Max. transfer rate 12 Mbit/s <ul style="list-style-type: none"> <li>Without PG interface</li> <li>With PG interface</li> </ul>	<b>6ES7972-0BA12-0XA0</b> <b>6ES7972-0BB12-0XA0</b>		
<b>PROFIBUS FastConnect bus connector RS 485 with 90° cable outlet</b> With insulation displacement terminals Max. data transfer rate 12 Mbit/s Without PG interface <ul style="list-style-type: none"> <li>1 unit</li> <li>100 units</li> </ul> With PG interface <ul style="list-style-type: none"> <li>1 unit</li> <li>100 units</li> </ul> Without PG interface, grounding via control cabinet cover <ul style="list-style-type: none"> <li>1 unit</li> </ul> With PG interface, grounding via control cabinet cover <ul style="list-style-type: none"> <li>1 unit</li> </ul>	<b>6ES7972-0BA52-0XA0</b> <b>6ES7972-0BA52-0XB0</b>  <b>6ES7972-0BB52-0XA0</b> <b>6ES7972-0BB52-0XB0</b>  <b>6ES7972-0BA70-0XA0</b>  <b>6ES7972-0BB70-0XA0</b>		
<b>RS 485 bus connector with angled cable outlet (35°)</b> With screw terminals, max. transfer rate 12 Mbit/s <ul style="list-style-type: none"> <li>Without PG interface</li> <li>With PG interface</li> </ul>	<b>6ES7972-0BA42-0XA0</b> <b>6ES7972-0BB42-0XA0</b>	<b>PROFIBUS FastConnect RS 485 bus connector with angular cable outlet (35°)</b> With insulation displacement terminals, max. transfer rate 12 Mbit/s <ul style="list-style-type: none"> <li>Without PG interface</li> <li>With PG interface</li> </ul>	<b>6ES7972-0BA60-0XA0</b> <b>6ES7972-0BB60-0XA0</b>
		<b>PROFIBUS FastConnect Stripping Tool</b> Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	<b>6GK1 905-6AA00</b>
		<b>PROFIBUS FC Standard Cable</b> Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	<b>6XV1 830-0EH10</b>
		<b>S7 Manual Collection</b> Electronic manuals on DVD, multilingual: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)	<b>6ES7998-8XC01-8YE0</b>
		<b>S7 Manual Collection update service for 1 year</b> Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>
		<b>Connecting cable for PROFIBUS</b> 12 Mbit/s, for PG connection to PROFIBUS DP, preassembled with 2 x 9-pin sub D connector, 3.0 m	<b>6ES7901-4BD00-0XA0</b>

## Overview



- Easy connection of field devices to PROFIBUS
- Integrated low power management
- Different ASICs for the different functional requirements and application areas

## Technical specifications

	LSPM 2	SPC 3	SPC 3LV	DPC 31
Protocol	PROFIBUS DP	PROFIBUS DP	PROFIBUS DP	PROFIBUS DP, PROFIBUS PA
Application range	simple slave application	intelligent slave application	intelligent slave application	intelligent slave application
Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s	12 Mbit/s
Bus access	in ASIC	in ASIC	in ASIC	in ASIC
Automatic determination of transmission rate	yes	yes	yes	yes
Microprocessor required	no	yes	yes	integrated
Scope of firmware	not required	6 to 24 KB	6 to 24 KB	approx. 38 KB
Message buffer	-	1.5 KB	1.5 KB	6 KB
Power supply	5 V DC	5 V DC	3.3 V DC	3.3 V DC
Power loss, max.	0.35 W	0.5 W	<0.5 W	0.2 W
Permissible ambient temperature	-40 °C ... +75 °C	-40 °C ... +85 °C	-40 °C ... +85 °C	-40 °C ... +85 °C
Housing	MQFP, 80-pin	PQFP, 44-pin	PQFP, 44-pin	PQFP, 100-pin
Frame size	4 cm <sup>2</sup>	2 cm <sup>2</sup>	2 cm <sup>2</sup>	4 cm <sup>2</sup>
Delivery quantities (pcs.)	6/66/330/4950	6/96/750/960/4800	5/160/800/1000/4800	STEP B: 6/60/300/5100 STEP C1: 6/66/660/4620

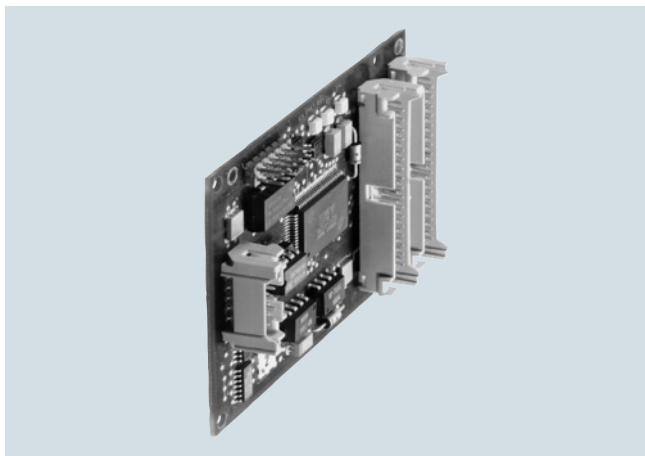
	SPC 4-2	ASPC 2	SIM 1-2	FOCSI
Protocol	PROFIBUS DP PROFIBUS FMS PROFIBUS PA	PROFIBUS DP PROFIBUS FMS PROFIBUS PA	PROFIBUS PA	-
Application range	Intelligent slave application	Master application	Medium Attachment	Medium Management Unit
Transmission rate, max.	12 Mbit/s	12 Mbit/s	31.25 kbit/s	12 Mbit/s
Bus access	in ASIC	in ASIC	-	-
Automatic determination of transmission rate	yes	yes	-	-
Microprocessor required	yes	yes	-	-
Scope of firmware	3 ... 30 KB	80 KB	not required	not required
Message buffer	3 KB	1 MB (external)	-	-
Voltage supply	5 V DC, 3.3 V	5 V DC	via bus	3.3 V DC
Power loss, max.	0.6 W at 5V 0.01 W at 3.3 V	0.9 W	0.05 W	0.75 W
Permissible ambient temperature	-40 °C ... +85 °C	-40 °C ... +85 °C	-40 °C ... +85 °C	-40 °C ... +85 °C
Housing	TQFP, 44-pin	P-MQFP, 100-pin	MLPQ, 40-pin	TQFP, 44-pin
Frame size	2 cm <sup>2</sup>	4 cm <sup>2</sup>	36 mm <sup>2</sup>	2 cm <sup>2</sup>
Delivery quantities (pcs.)	5/160	6/66/660/4620	30/60/1000	40

## I/O systems

### PROFIBUS components

#### PROFIBUS DP ASICs

Ordering data	Article No.	Article No.	
<b>ASIC ASPC 2</b> For constructing master interfaces (quantity discount) <ul style="list-style-type: none"> <li>• 6 units (lead-free)</li> <li>• 66 units (lead-free)</li> <li>• 660 units (lead-free)</li> <li>• 4620 units (lead-free)</li> </ul>	6ES7195-0AA05-0XA0 6ES7195-0AA15-0XA0 6ES7195-0AA25-0XA0 6ES7195-0AA35-0XA0	<b>ASIC DPC 31 STEP C1</b> For constructing intelligent DP slave interfaces (quantity discount) <ul style="list-style-type: none"> <li>• 6 units (lead-free)</li> <li>• 66 units (lead-free)</li> <li>• 660 units (lead-free)</li> <li>• 4620 units (lead-free)</li> </ul>	6ES7195-0BF02-0XA0 6ES7195-0BF12-0XA0 6ES7195-0BF22-0XA0 6ES7195-0BF32-0XA0
<b>ASIC LSPM 2</b> For constructing simple slave interfaces (quantity discount) <ul style="list-style-type: none"> <li>• 6 units (lead-free)</li> <li>• 66 units (lead-free)</li> <li>• 330 units (lead-free)</li> <li>• 4950 units (lead-free)</li> </ul>	6ES7195-0BA02-0XA0 6ES7195-0BA12-0XA0 6ES7195-0BA22-0XA0 6ES7195-0BA32-0XA0	<b>ASIC SPC 4-2</b> For constructing intelligent DP slave interfaces (quantity discount) <ul style="list-style-type: none"> <li>• 5 units for laboratory development (lead-free)</li> <li>• 160 units (lead-free, 1 tray)</li> </ul>	6GK1588-3AA00 6GK1588-3AA15
<b>ASIC SPC 3</b> For constructing intelligent DP slave interfaces (quantity discount) <ul style="list-style-type: none"> <li>• 6 units (lead-free)</li> <li>• 96 units (lead-free)</li> <li>• 960 units (lead-free)</li> <li>• 4800 units (lead-free)</li> <li>• 750 units (lead-free) T&amp;R</li> </ul>	6ES7195-0BD04-0XA0 6ES7195-0BD14-0XA0 6ES7195-0BD24-0XA0 6ES7195-0BD34-0XA0 6ES7195-0BD44-0XA0	<b>ASIC SIM 1-2</b> For connection according to IEC H1 for PROFIBUS PA with a transmission rate of 31.25 kbit/s <ul style="list-style-type: none"> <li>• 60 units (in tube)</li> <li>• 1000 units (tape &amp; reel)</li> </ul>	6GK1588-3BB02 6GK1588-3BB21
<b>ASIC SPC 3LV</b> For constructing intelligent DP slave interfaces (quantity discount) <ul style="list-style-type: none"> <li>• 5 units (lead-free)</li> <li>• 160 units (lead-free)</li> <li>• 800 units (lead-free)</li> <li>• 4800 units (lead-free)</li> <li>• 1000 units (lead-free) T&amp;R</li> </ul>	6ES7195-0BG00-0XA0 6ES7195-0BG10-0XA0 6ES7195-0BG20-0XA0 6ES7195-0BG30-0XA0 6ES7195-0BG40-0XA0	<b>Accessories</b>	
<b>ASIC DPC 31 STEP B</b> For constructing intelligent DP slave interfaces (quantity discount) <ul style="list-style-type: none"> <li>• 6 units (lead-free)</li> <li>• 60 units (lead-free)</li> <li>• 300 units (lead-free)</li> <li>• 5100 units (lead-free)</li> </ul>	6ES7195-0BE02-0XA0 6ES7195-0BE12-0XA0 6ES7195-0BE22-0XA0 6ES7195-0BE32-0XA0	<b>Firmware for Siemens ASIC SPC 3</b> <ul style="list-style-type: none"> <li>• DP firmware</li> <li>• DPV1 firmware</li> <li>• DPV1 firmware upgrade</li> </ul>	6ES7195-2BA00-0XA0 6ES7195-2BA01-0XA0 6ES7195-2BA02-0XA0
		<b>Firmware for Siemens ASIC DPC 31</b> <ul style="list-style-type: none"> <li>• DPV1 firmware</li> </ul>	6ES7195-2BB00-0XA0

**Overview**


- PC slave board IM 182-1 for the connection of AT-compatible PCs as DP slaves

**Technical specifications**

Article number	<b>6ES7182-0AA01-0XA0</b> IM 182-1 PC SLAVE BOARD F. PROFIBUS DP
<b>Product type designation</b>	
<b>General information</b>	
Application/function	Slave applications
ASIC	SPC 3
• Scope of firmware	4 to 24 KB (incl. test program)
<b>Supply voltage</b>	
Rated value (DC)	
• 5 V DC	Yes
<b>Input current</b>	
Current consumption, typ.	250 mA
<b>Processor</b>	
Microprocessor type	Processor of the PG/PC

Article number	<b>6ES7182-0AA01-0XA0</b> IM 182-1 PC SLAVE BOARD F. PROFIBUS DP
<b>Interfaces</b>	
<b>PROFIBUS DP</b>	
• Transmission rate, max.	12 Mbit/s
<b>Protocols</b>	
PROFIBUS DP	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	0 °C
• max.	60 °C
<b>Dimensions</b>	
Width	168 mm
Height	105 mm

**Ordering data**

Ordering data	Article No.
<b>SIMATIC S5/S7 IM 182-1 PC slave board</b>	<b>6ES7182-0AA01-0XA0</b>
For PROFIBUS DP, max. 12 Mbit/s	

Accessories	Article No.
<b>Firmware for Siemens ASIC SPC 3 and IM 182-1</b>	
• DP firmware	<b>6ES7195-2BA00-0XA0</b>
• DPV1 firmware	<b>6ES7195-2BA01-0XA0</b>
• DPV1 firmware upgrade	<b>6ES7195-2BA02-0XA0</b>

## I/O systems

### SIPLUS PROFIBUS components for ET 200

#### SIPLUS diagnostics repeater for PROFIBUS

##### Overview



- RS 485 repeater with online line diagnostics for PROFIBUS DP
- PROFIBUS DP standard slave (DP-V1)
- Automatic determination of fault type and location
- Transmission rate from 9.6 kbit/s to 12 Mbit/s
- Connection via FastConnect IDC

##### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

##### SIPLUS diagnostics repeater for PROFIBUS DP

**Article No.** 6AG1972-0AB01-4XA0

**BasedOn Article No.** 6ES7972-0AB01-0AA0

Ambient temperature range	0 °C ... +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components.
Technical data	The technical data of the standard product applies except for the ambient conditions.
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

##### Ordering data

###### SIPLUS RS 485 diagnostics repeater

For connecting up to 2 segments to PROFIBUS DP, with on-line diagnostics functions for monitoring the bus lines

Exposure to media

**6AG1972-0AB01-4XA0**

###### Accessories

###### RS 485 bus connector with 90° cable outlet

Max. transfer rate 12 Mbit/s

Extended temperature range and exposure to media

- without PG interface
- with PG interface

**6AG1972-0BA12-2XA0**  
**6AG1972-0BB12-2XA0**

###### RS 485 bus connector with angled cable outlet

(Extended temperature range -40°C ... +70°C and medial exposure)

Max. transfer rate 12 Mbit/s

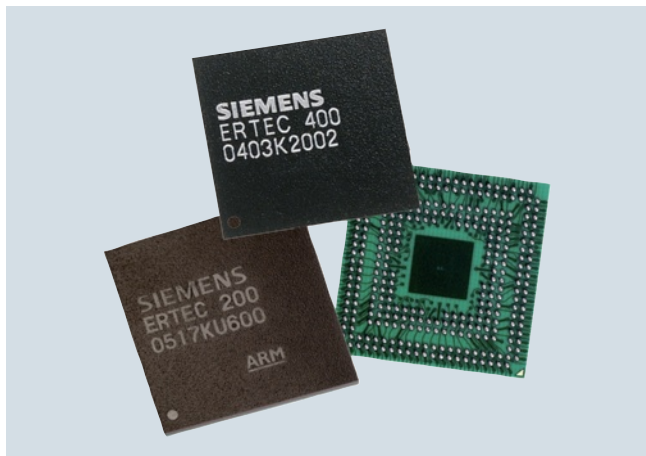
- without PG interface
- with PG interface

**6AG1972-0BA42-7XA0**  
**6AG1972-0BB42-7XA0**

###### Additional accessories

See SIMATIC RS 485 diagnostics repeater, page 9/476

## Overview



With the Industrial Ethernet ASICs of the ERTEC family (Enhanced Real-Time Ethernet Controller), devices and systems can be connected to PROFINET without great effort. The high-performance Ethernet controllers with 32-bit microprocessor as well as integral real-time switch for Real Time Ethernet have been specially developed for industrial use.

These Ethernet controllers handle all the data transmission for PROFINET with Real-Time (RT) and Isochronous Real-Time (IRT) and thus offload the application processor. Thanks to the integral 2-port switch (ERTEC 200 and ERTEC 200P) or 4-port switch (ERTEC 400), there are no costs for external switches. Flexible topologies such as star, tree and linear topologies can be implemented without any other external network components.

- ERTEC 200P  
with an integral 2-port switch and maximum performance for compact and modular PROFINET field devices. The ERTEC 200P is designed for cycle times up to 31.25  $\mu$ s. In conjunction with a high-speed ARM 926 CPU, it meets all the requirements for powerful PROFINET implementation.
- ERTEC 200  
with an integral 2-port switch for developing compact or modular PROFINET field devices.
- ERTEC 400  
with 4 integral ports and one integral PCI interface for developing network components and field devices with specific requirements regarding communication capabilities.

The EK-ERTEC 200P PN IO, DK-ERTEC 200 PN IO and DK-ERTEC 400 PN IO development kits enable the uncomplicated development of PROFINET field devices thanks to fast and simple integration of the PROFINET IO functionalities based on the ERTEC.

## Technical specifications

	ERTEC 400	ERTEC 200	ERTEC 200P
Transmission rate	10/100 Mbit/s	10/100 Mbit/s	100 Mbit/s
Interfaces			
• Ethernet / PHY interface	4 x PHY interface	2 x Ethernet interface (PHY integrated) or alternatively 2 x PHY interface (for connection of optical PHYs)	2 x Ethernet interface (PHY integrated) or alternatively 2 x PHY interface (for connection of optical PHYs)
- In connection with the corresponding PHY types:	• Half/full duplex Support for copper and fiber-optic cables; autosensing; autocrossover	• Half/full duplex Support for copper and fiber-optic cables (PHY for copper integrated); autosensing; autocrossover	Half/full duplex Support for copper and fiber-optic cables (PHY for copper integrated); autosensing; autocrossover
• Local Bus Unit (LBU)	Local bus master interface for connecting an external host with access to internal areas of the ERTEC; 16 bit data bit width	Local bus master interface for connecting an external host with access to internal areas of the ERTEC; 16 bit data bit width	XHIG (external host interface); 16/32 bit data bit width
• External memory interface (EMIF)			
- SDRAM controller	128 MB/16 bit or 256 MB/32 bit	64 MB/16 bit or 128 MB/32 bit	128 MB/16 bit or 256 MB/32 bit
- SRAM controller	4 x 16 MB for asynchronous blocks (SRAM, flash, I/O 8/16/32 bit)	4 x 16 MB for asynchronous blocks (SRAM, flash, I/O 8/16/32 bit)	4 x 16 MB for asynchronous blocks (SRAM, flash, I/O 8/16/32 bit)
- Chip-select support	yes	yes	yes
• IO interfaces	32 parameterizable I/O (GPIO); multifunctional outputs	45 parameterizable I/O (GPIO); multifunctional outputs	up to 96 parameterizable I/O (GPIO); multifunctional outputs
• Intelligent switching and PROFINET IRT prioritization/timing	yes	yes	yes
ARM processor			
• Integral ARM946 processor	32-bit ARM system	32-bit ARM system	32-bit ARM system
- Adjustable operating frequency	50/100/150 MHz	50/100/150 MHz	125/250 MHz



**I/O systems**

## PROFINET components

**Enhanced Real-Time Ethernet Controllers ERTEC****Technical specifications** (continued)

	<b>ERTEC 400</b>	<b>ERTEC 200</b>	<b>ERTEC 200P</b>
Supply voltage			
• Core (VDD Core)	1.5 V +/- 10 %	1.5 V +/- 10 %	1.2 V +5%/-0.1 V
• I/Os (VDD IO)	3.3 V +/- 10 %	3.3 V +/- 10 %	3.3 V +5%/-10%
• External host interface (XHIF)	-	-	1.8 V +5%/-10%
• PHY	-	-	1.5 V +5%/-10%
• External host interface (XHIF)	-	-	1.8 V/3.3 V +5%/-10%
Perm. ambient conditions			
• Operating temperature	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
• Transport/storage temperature	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
• Relative humidity	Max. 95 % at +25 °C	Max. 95 % at +25 °C	Max. 95 % at +25 °C
Constructional design			
• Housing	Plastic FBGA 304 Pin	Plastic FBGA 304 Pin	Plastic FBGA 400 Pin
• Pinning Ball Pitch	0.8 mm	0.8 mm	0.8 mm
Dimensions (W x H x D) in mm - ERTEC	19 x 1 x 19	19 x 1 x 19	17 x 1 x 17
Supported communications protocols			
• General Ethernet protocols	In accordance with the respective software implementation that uses the ERTEC as Ethernet controller	In accordance with the respective software implementation that uses the ERTEC as Ethernet controller	In accordance with the respective software implementation that uses the ERTEC as Ethernet controller
• PROFINET in combination with a PROFINET Software Stack	Real-Time communication (RT); Isochronous Real-Time communication (IRT)	Real-Time communication (RT); Isochronous Real-Time communication (IRT)	Real-Time communication (RT); Isochronous Real-Time communication (IRT)

**Ordering data****Article No.****Article No.****ERTEC 200P**

ASIC for connection to Switched Ethernet 100 Mbit/s, Ethernet controller with integral 2-port switch, ARM 926 processor and integral PHYs

- 10 units (Evaluation Pack)
- 90 units (single tray)
- 450 units (drypack, 5 trays)

**6ES7195-0BH00-0XA0**  
**6ES7195-0BH10-0XA0**  
**6ES7195-0BH20-0XA0**

**Evaluation Kit  
EK-ERTEC 200P PN IO**

**6ES7195-3BE00-0YA0**

**ERTEC 200**

ASIC ERTEC 200 for connection to Switched Ethernet 10/100 Mbit/s, Ethernet controller with integral 2-port switch, ARM 946 processor and integral PHYs

- 70 units (single tray),
- 350 units (drypack, 5 trays),
- 3500 units (package, 10 drypacks)

**6GK1182-0BB01-0AA1**  
**6GK1182-0BB01-0AA2**  
**6GK1182-0BB01-0AA3**

**Evaluation Kit  
EK-ERTEC 200 PN IO**

**6ES7195-3BG00-0YA0**

**ERTEC 400**

ASIC ERTEC 400 for connection to switched Ethernet 10/100 Mbit/s, Ethernet controller with integrated 4-port switch, ARM 946 processor and PCI interface (V2.2), data preparation for real-time and isochronous real-time for PROFINET IO

- 70 units (single tray),
- 350 units (drypack, 5 trays)

**6GK1184-0BB01-0AA1**  
**6GK1184-0BB01-0AA2**

**Evaluation Kit  
DK-ERTEC 400 PN IO**

**6ES7195-3BH00-0YA0**

## Overview



With the development packages for PROFINET, compact or modular PROFINET field devices can be developed quickly and with little effort. Depending on the application, different development packages are available.

The development packages for the ASICs of the ERTEC family (Enhanced Real-Time Ethernet Controller) are suitable for the development of field devices with an integrated IRT switch (Isochronous Real-Time). The demand for real-time capability, linear topology capability, and for IT integration is therefore met perfectly.

With the help of the development package for standard Ethernet controllers, PROFINET devices can be developed on the basis of a standard Ethernet controller. Devices with RT (Real-Time) can be implemented in the field device without special hardware.

The PROFIsafe StarterKit permits the implementation of fail-safe devices. In so doing, the PROFIsafe Stack applicatively builds on the PROFINET stack.

## Ordering data

## Article No.

## Article No.

**ERTEC development kits / evaluation kits**

Evaluation Kit EK-ERTEC 200P PN IO	<b>6ES7195-3BE00-0YA0</b>
Evaluation kit EK-ERTEC 200 PN IO	<b>6ES7195-3BG00-0YA0</b>
Evaluation kit DK-ERTEC 400 PN IO	<b>6ES7195-3BH00-0YA0</b>
Development kit for standard Ethernet controller	<b>6ES7195-3BC00-0YA0</b>
PROFIsafe starter kit V3.4	<b>6ES7195-3BF02-0YA0</b>

**ERTEC ASICs****ERTEC 200P**

ASIC for connection to Switched Ethernet 100 Mbit/s, Ethernet controller with integral 2-port switch, ARM 926 processor and integral PHYs	<b>6ES7195-0BH00-0XA0</b>
• 10 units (Evaluation Pack)	<b>6ES7195-0BH10-0XA0</b>
• 90 units (single tray)	<b>6ES7195-0BH20-0XA0</b>
• 450 units (drypack, 5 trays)	

**ERTEC 200**

ASIC ERTEC 200 for connection to Switched Ethernet 10/100 Mbit/s, Ethernet controller with integral 2-port switch, ARM 946 processor and integral PHYs	<b>6GK1182-0BB01-0AA1</b>
• 70 units (single trays)	<b>6GK1182-0BB01-0AA2</b>
• 350 units (drypack, 5 trays)	<b>6GK1182-0BB01-0AA3</b>
• 3500 units (package, 10 drypacks)	

**ERTEC 400**

ASIC ERTEC 400 for connection to Switched Ethernet 10/100 Mbit/s, Ethernet controller with integral 4-port switch, ARM 946 processor and PCI interface (V2.2)	<b>6GK1184-0BB01-0AA1</b>
• 70 units (single trays)	<b>6GK1184-0BB01-0AA2</b>
• 350 units (drypack, 5 trays)	

**Accessories**

PROFINET IO product line license for one product line	<b>6ES7195-3BC10-0YA0</b>
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**I/O systems**

## PROFINET components

**PROFINET Driver****Overview**

- For connecting distributed I/O and drives to user-specific control applications via PROFINET
- Operation of the control software on a standard PC using the standard Ethernet interface of the PC
- Supplied as portable source code and can therefore be used with any operating system
- Sample application for Windows included in the scope of delivery; uses SIMATIC IPCs as example hardware

**Ordering data****PROFINET Driver**

For connecting distributed I/O and drives to user-specific control applications via PROFINET

Development license

Runtime licenses

- 10 units
- 50 units
- 200 units
- 500 units

**Article No.**

**6ES7195-3AA00-0YA0**

**6ES7195-3AA10-0XA0**

**6ES7195-3AA20-0XA0**

**6ES7195-3AA30-0XA0**

**6ES7195-3AA40-0XA0**

### Overview



- Terminates bus segments at data transmission rates of 9.6 kbit/s to 12 Mbit/s
- Power supply independent of bus station

#### Designed for Industry

- Terminal-independent bus termination through onboard power supply

### Technical specifications

Article number	<b>6ES7972-0DA00-0AA0</b> RS485 TERM. RESISTOR F. PROFIBUS/MPI
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Input current</b>	
Current consumption, typ.	30 mA
<b>Power losses</b>	
Power loss, max.	0.72 W
<b>Interfaces</b>	
Bus cables	Screw terminal block
<b>PROFIBUS DP</b>	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP20	Yes

Article number	<b>6ES7972-0DA00-0AA0</b> RS485 TERM. RESISTOR F. PROFIBUS/MPI
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	0 °C
• max.	60 °C
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Relative humidity</b>	
• Operation, max.	95 %; at +25 °C
<b>Connection method</b>	
Power supply	Screw terminal block
<b>Dimensions</b>	
Width	60 mm
Height	70 mm
Depth	43 mm
<b>Weights</b>	
Weight, approx.	95 g

### Ordering data

#### Article No.

#### Active RS 485 terminating element for PROFIBUS

For terminating bus segments for transmission rates of 9.6 kbit/s to 12 Mbit/s

**6ES7972-0DA00-0AA0**

## I/O systems

### Network components for PROFIBUS

#### Repeater RS 485 for PROFIBUS

##### Overview



- Automatic detection of transmission rates
- Transmission rates from 9.6 kbit/s to 12 Mbit/s are possible, incl. 45.45 kbit/s
- 24 V DC voltage display
- Indication of bus activity segment 1 and 2
- The separation of segment 1 and segment 2 by means of switches is possible
- Separation of the right segment with an inserted terminating resistor
- Decoupling of segment 1 and segment 2 in the case of static interference

##### Designed for Industry

- For increasing the expansion
- Electrical isolation of segments
- Commissioning support
  - Switches for separation of segments
  - Bus activity display
  - Segment separation in the case of an incorrectly inserted terminating resistor

In this context, please also note the diagnostics repeater that provides extensive diagnostics functions for physical line diagnostics in addition to the normal repeater functionality. This is described on page 9/475.

##### Technical specifications

Article number	<b>6ES7972-0AA02-0XA0</b> REPEATER RS485 F. PROFIBUS/MPI
<b>Product type designation</b>	
<b>Supply voltage</b>	
Rated value (DC)	Yes
• 24 V DC	20.4 V
permissible range, lower limit (DC)	28.8 V
permissible range, upper limit (DC)	
<b>Input current</b>	
Current consumption, max.	100 mA; 100 mA without loads at PG/OP socket; 130 mA load at PG/OP socket (5 V/90 mA); 200 mA load at PG/OP socket (24 V/100 mA)
<b>Interfaces</b>	
Bus cables	2 terminal blocks
<b>PROFIBUS DP</b>	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	Yes
• IP20	
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	0 °C
• max.	60 °C
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Relative humidity</b>	
• Operation, max.	95 %; at 25 °C
<b>Connection method</b>	
Power supply	Terminal block
<b>Dimensions</b>	
Width	45 mm
Height	128 mm
Depth	67 mm
<b>Weights</b>	
Weight, approx.	350 g

##### Ordering data

##### Article No.

**RS 485 repeater for PROFIBUS** **6ES7972-0AA02-0XA0**

Transfer rate up to max. 12 Mbit/s,  
24 V DC, enclosure IP20

## Overview



- Used to complete bus segments at rates of 9.6 kbit/s to 12 Mbit/s
- Power supply independent of the bus participants.

**Designed for Industry**

- End-device independent bus termination due to own power supply

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

**SIPLUS active RS 485 terminating element**

<b>Article No.</b>	<b>6AG1972-0DA00-2AA0</b>
<b>Based on Article No.</b>	<b>6ES7972-0DA00-0AA0</b>
Ambient temperature range	-25 °C ... +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
<b>Ambient conditions</b>	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080...795 hPa (-1 000 ... +2 000 m) See ambient temperature range 795...658 hPa (+2,000 ... +3,500 m) Derating 10 K 658...540 hPa (+3 500 ... +5 000m) Derating 20K

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

**Ordering data****Article No.****SIPLUS active RS 485 terminating element for PROFIBUS**

To complete bus segments for transmission rates of 9.6 kbit/s to 12 Mbit/s

Extended temperature range and exposure to media

**6AG1972-0DA00-2AA0**

**Accessories**

See SIMATIC active RS 485 terminating element for PROFIBUS, page 9/485

## I/O systems

### SIPLUS network components for PROFIBUS

#### SIPLUS RS 485 repeater

##### Overview



- Automatically detects transmission rate
- 45.45 kbit/s transmission rate is possible
- 24 V DC voltage display
- Bus activity segment 1 and 2 display
- The separation of segment 1 and segment 2 on switch is possible
- Separation of the right segment with an inserted terminator
- Decoupling of segment 1 and segment 2 with static interference

##### Designed for Industry

- To increase the number of participants and the extension
- Electrical isolation of segments
- Commissioning support
  - Segment separation switch
  - Bus activity display
  - Segment separation with an incorrectly inserted terminator

Please also note in this context the diagnostics repeater that provides extensive diagnostics functions for physical line diagnostics in addition to the normal repeater functionality. This is described on page 9/480.

##### Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For further technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

##### Technical specifications

Article number	<b>6AG1972-0AA02-7XA0</b>
Based on	<b>6ES7972-0AA02-0XA0</b> SIPLUS DP RS485-REPEATER
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• Min.	-25 °C
• max.	70 °C
<b>Storage/transport temperature</b>	
• Min.	-40 °C
• max.	70 °C
<b>Extended ambient conditions</b>	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

##### Ordering data

###### SIPLUS RS 485 repeater for PROFIBUS

Transfer rate up to max. 12 Mbit/s, 24 V DC, enclosure IP20

Extended temperature range and exposure to media

###### Accessories

##### Article No.

**6AG1972-0AA02-7XA0**

See SIMATIC RS 485 repeater for PROFIBUS, page 9/486

**Overview**


- Maximum data exchange of 256-byte input data and 256-byte output data between two PROFINET networks
- Maximum of 16 input/output ranges for the exchange of data
- Electrical isolation between the two PROFINET IO subnets
- Redundant power supply
- Supported Ethernet services
  - ping
  - arp
  - network diagnostics (SNMP/MIB-2)
- Diagnostic interrupts
- ReturnOfSubmodule interrupts

**Ordering data**
**Article No.**
**PN/PN coupler**

For connecting  
two PROFINET networks

**6ES7158-3AD01-0XA0**
**Power supply connector**

Spare part;  
for connecting  
the 24 V DC supply voltage

- with push-in terminals
- with screw-type terminals

**6ES7193-4JB00-0AA0**  
**6ES7193-4JB50-0AA0**



**I/O systems**

## Network transitions

**DP/DP coupler****Overview**

- For interconnecting two PROFIBUS DP networks
- The interchange of data between both DP networks takes place by internal copying in the coupler.

**Technical specifications**

<b>DP/DP coupler</b>	
PROFIBUS transmission rate	max. 12 Mbit/s
Interfaces	• PROFIBUS DP
Supply voltage	24 V DC
Current consumption typ.	150 mA
Mounting	Upright (DIP switches above)
Perm. environmental conditions	
• Operating temperature	
- horizontal mounting	0°C ... +60°C
- all other mounting positions	0°C ... +40°C
• Transport/storage temperature	-40 °C ... +70 °C
• Relative humidity	10-95 % at +25 °C
Design	
• Dimensions (W x H x D) in mm	40 x 127 x 117
• Weight	approx. 250 g
Degree of protection	IP20

**Ordering data****Article No.**

<b>DP/DP coupler</b>	<b>6ES7158-0AD01-0XA0</b>
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Note:

The manual is available free on the Internet.

## SIMATIC control systems



10/2

### **SIMATIC TDC multiprocessor control system**

- 10/2 UR5213 rack
- 10/3 CPU551 processor module
- 10/4 MC5xx program memory module
- 10/5 CP51M1 communication module
- 10/6 SM500 I/O module
- 10/8 GlobalDataMemory
- 10/9 Accessories for SIMATIC TDC

### **Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

[www.siemens.com/simatic/  
printmaterial](http://www.siemens.com/simatic/printmaterial)

## SIMATIC control systems

### SIMATIC TDC multiprocessor control system

#### UR5213 rack

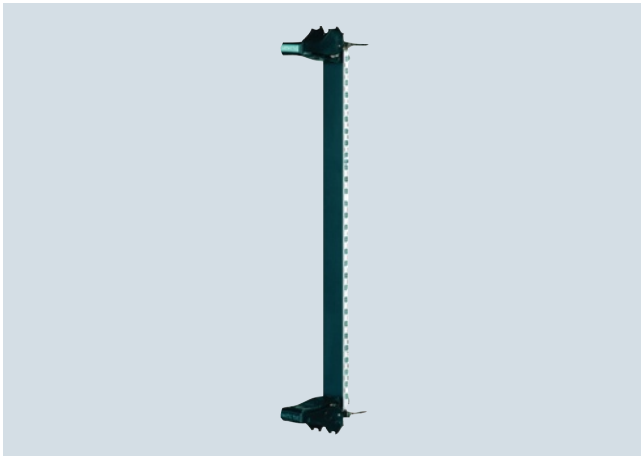
##### Overview



The UR5213 rack is the basis for SIMATIC TDC. System power supply and system fan are integrated. A high-performance 64-bit backplane bus supports high-speed data exchange between the inserted modules.

##### SR51 slot cover

The SR51 slot cover is used for covering any slots that are not used in the rack. It is required to ensure the EMC properties and ventilation of the system.



SR51 slot cover

##### Technical specifications

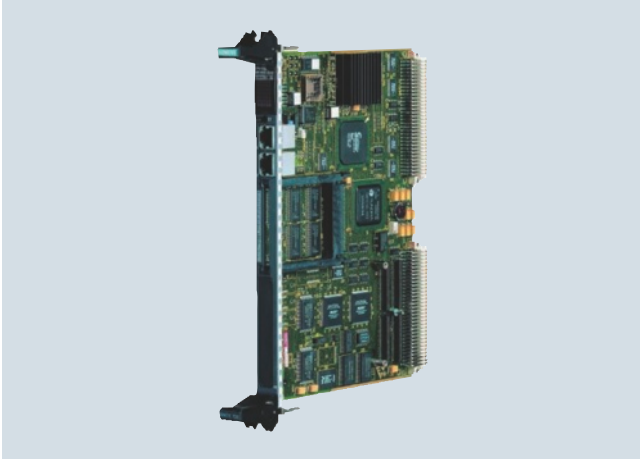
Input voltage range	85 V - 264 V AC, 47 - 63 Hz 198 V - 253 V DC
Mains buffering	Min. 20 ms
Dimensions (W x H x D) in mm	482.6 x 354.9 x 343
Weight	Approx. 20 kg
Degree of protection	IP20
Rated input current	At 120 V AC: 4.45 A At 230 V AC: 2.3 A At 220 V DC: 2.38 A
Max. inrush current	<40 A
Output voltages	+3.3 V 44 A + 5 V 36 A + 12 V 4.6 A - 12 V 4 A
Operating temperature range	0 °C to +60 °C
Storage temperature range	-40 °C to +70 °C

##### Ordering data

##### Article No.

<b>UR5213 rack, spare-part compatible successor of 6DD1682-0CH0</b>	<b>6DD1682-0CH2</b>
<b>Accessories</b>	
<b>SR51 slot cover</b>	<b>6DD1682-0DA1</b>
<b>Spare parts</b>	
<b>Backup battery</b>	<b>6ES7971-0BA00</b>

### Overview



High-performance CPU module for open and closed-loop control and arithmetic tasks.

### Technical specifications

<b>CPU551</b>	
Required space / width	1 slot
Weight	0.6 kg
Display	5x7 LED
Local service interface	Serial RS232 interface
Sampling intervals	from 100 µs
SDRAM	128 MB
Synchronous cache	8 MB
Clock frequency	500 MHz
CPU	64 Bit RISC CPU with floating point unit
SRAM	512 KB, battery buffered
<b>Power supply</b>	
Voltage / Power supply (at 25 °C)	+3.3 V, 2.0 A typical +5 V, 1.5 A typical +12 V, 0.04 A typical -12 V, 0.04 A typical
Buffer battery	3.0 V, 3 µA typical
Power loss, typical	15 W
<b>Digital inputs</b>	
Number	8 inputs, 4 with alarm capability
Galvanic isolation	Only through optional interface modules
Input voltage	24 V
• Rated voltage	-1 V ... +6 V
• For 0-signal	+13.5 V ... +33 V
• For 1-signal	
Input power	
• At 0-signal	0 mA
• At 1-signal	3 mA
Delay time	100 µs
Real-time clock, resolution	0.1 ms

### Ordering data

### Article No.

<b>CPU551 processor module</b>	<b>6DD1600-0BA3</b>
<b>Accessories</b>	
<b>MC500 memory module (4 MB)</b>	<b>6DD1610-0AH4</b>
<b>MC510 memory module (8 MB)</b>	<b>6DD1610-0AH6</b>
<b>MC521 memory module (2 MB)</b>	<b>6DD1610-0AH3</b>
<b>SB10 interface module</b>	<b>6DD1681-0AE2</b>
8 digital inputs/outputs 24 V DC	
<b>SB60 interface module</b>	<b>6DD1681-0AF4</b>
8 digital inputs 120 V AC	
<b>SB61 interface module</b>	<b>6DD1681-0EB3</b>
8 digital inputs 24/48 V DC	
<b>SU12 interface module</b>	<b>6DD1681-0AJ1</b>
with plug-in connector, 10-pole	
<b>SC66 interface cable</b>	<b>6DD1684-0GG0</b>
between CPU551 and SB10, SB60, SB61 or SU12 interface module, 2 m long	
<b>SC67 interface cable</b>	<b>6DD1684-0GH0</b>
between CPU551 and PG/PC, 7 m long	

## SIMATIC control systems

### SIMATIC TDC multiprocessor control system

#### MC5xx program memory module

##### Overview

Program memory module for the program designed with CFC.

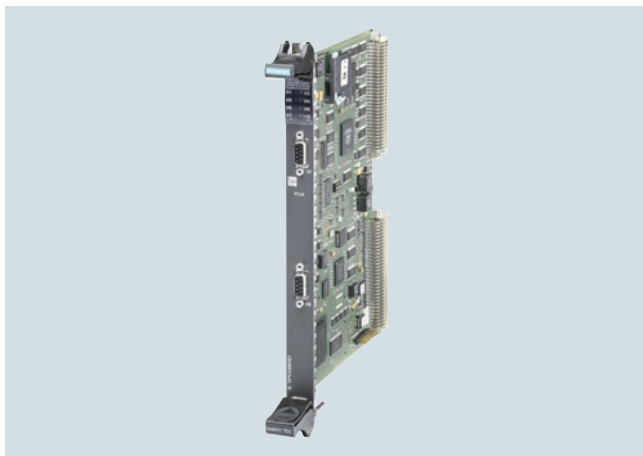
##### Ordering data

##### Article No.

<b>MC500 memory module (4 MB)</b>	<b>6DD1610-0AH4</b>
<b>MC510 memory module (8 MB)</b>	<b>6DD1610-0AH6</b>
<b>MC521 memory module (2 MB)</b>	<b>6DD1610-0AH3</b>

#### CP50M1 communication module

##### Overview



The CP50M1 communication module provides two PROFIBUS DP/MPI interfaces and an 8 MB interprocessor memory for inter-CPU communication. The interfaces can be used as PROFIBUS DP master, slave, as master and slave simultaneously or as MPI node.

##### Technical specifications

##### Power supply

Voltage / Power supply	+5 V, 1.0 A typical
Power loss, typical	5 W
Required space / width	1 slot
Weight	0.34 kg

##### Ordering data

##### Article No.

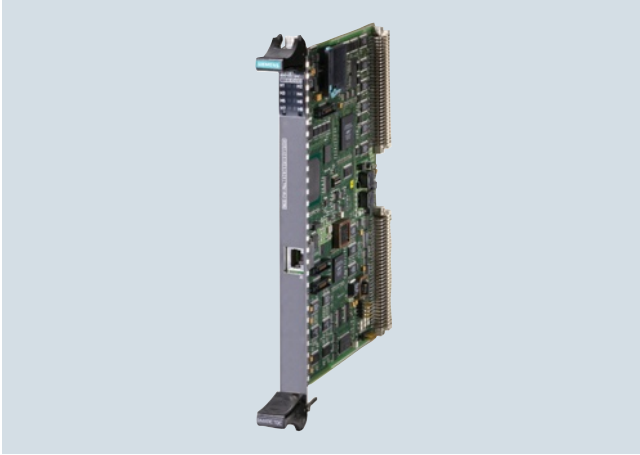
<b>CP50M1 communication module</b>	<b>6DD1661-0AD1</b>
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## SIMATIC control systems

### SIMATIC TDC multiprocessor control system

#### CP51M1 communication module

##### Overview



The CP51M1 communication module is an Industrial Ethernet interface for the SIMATIC TDC automation system.

##### Technical specifications

Up-to-date technical specifications can be taken from the user documentation provided at the start of delivery

Required space / width	1 slot
Weight	
Connection for Industrial Ethernet	RJ45
Protocols	TCP/IP and/or UDP
Message frame lengths	also larger than 2 KB
Modes of transfer	Refresh, Handshake, Multiple and Select
Autosensing	for 10 Mbit or 100 Mbit network
Default router	adjustable

##### Ordering data

##### Article No.

**CP51M1  
communication module**

**6DD1661-0AE1**

#### CP53M0 communication module

##### Overview



The CP53M0 communication module allows coupling of a SIMATIC TDC system to a SIMADYN D system for fast data exchange, e.g. when expanding existing SIMADYN D systems.

##### Technical specifications

CP53M0 communication module	
<b>Memory</b>	
Communication memory	SRAM, 128 KB
Communication buffer	SDRAM, 8 MB
<b>FOC interface</b>	
Number	2 (master mode) 1 (slave mode)
Data transfer rate	96 Mbit/s
Coding	5B/6B
<b>Voltage, currents</b>	
Voltages / currents	+5 V / 0.3 A 3.3 V / 0.5 A
<b>Power loss</b>	
Power loss, typical	3.1 W
<b>Dimensions</b>	
Number of slots required in rack	1
Dimensions W x H x D (in mm)	20 x 233 x 160
Weight	0.6 kg

##### Ordering data

##### Article No.

**CP53M0 communication module**

For connection of a SIMATIC TDC system to a SIMADYN D system or to two further SIMATIC TDC racks

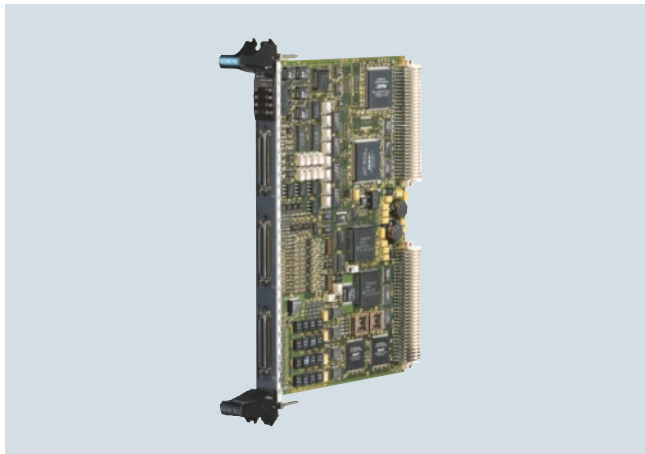
**6DD1660-0BJ0**

## SIMATIC control systems

### SIMATIC TDC multiprocessor control system

#### SM500 I/O module

##### Overview



The SM500 I/O module provides analog and digital inputs/outputs as well as incremental and absolute value encoder connections.

##### Technical specifications

###### Power supply

Voltage / Power supply (at 25°C)	+5 V typically 1.0 A +3.3 V typically 0.05 A +12 V typically 0.3 A -12 V typically 0.3 A
Typical power loss	12.5 W
Required space / width	1 slot
Weight	0.7 kg

###### Analog outputs

Number	8
Version	Output with associated ground
Galvanic isolation	No
Output voltage range	-10 V to +10 V
Output current	±10 mA
Resolution	12 bit
Typical conversion time per channel	4 µs

###### Accuracy:

• Max. differential linearity error	± 1 LSB (monotony guaranteed)
• Max. amplification error	± 0.3 %
• Max. offset error	± 24 LSB

Slew rate	Approx. 3.5 V/µs
-----------	------------------

###### Voltage output:

• Short-circuit protection to ground	yes
• Short-circuit current	Approximately 100 mA

###### Analog inputs

Number	8
Version	Differential inputs
Galvanic isolation	No
Input voltage range	-10 V to +10V
Resolution	12 bit
Max. conversion time per channel	Approx. 20 µs

Accuracy:	
• Max. differential linearity error	± 1 LSB (no missing code)
• Max. amplification error	± 0.3 %
• Max. offset error	± 5 LSB
Input resistance	20 kΩ
Input filter	34 kHz
Reverse polarity protection	Yes, as differential inputs are used

###### Integrating analog inputs (V/f)

Number	4
Version	Differential inputs
Galvanic isolation	No
Input voltage range	-10 V to +10 V
Resolution	Depending on the integration time, e.g. 15 bits for a 4 ms integration time.
Max. integration time per channel	Configurable

###### Accuracy:

• Max. amplification error	0.05 %
• Max. integral linearity error	1 %
• Max. offset error	± 2 LSB (software adjustment)

Input resistance	470 kΩ
Input filter	2 kHz
Reverse polarity protection	Yes, as differential inputs are used

###### Digital outputs

Number	16
Galvanic isolation	Only through optional interface modules
External power supply:	
• Nominal voltage	24 V
• Permissible range	20 to 30
• Short-term	35 V for max. 0.5 s
• Max. current consumption, without load	40mA

###### Output voltage range:

• With 0 signal, max.	3 V
• With 1 signal, min.	ext. supply voltage -2.5 V

###### Output current:

• With 0 signal, min.	-20 µA
• With 1 signal	
- Rated value	50 mA
- Permissible range, max.	100 mA

Delay time	100µs
------------	-------

Max. switching frequency of the outputs under resistive load	6 kHz
--	-------

Short-circuit protection to	
• Mass	yes
• Ext. power supply	No

Max. short-circuit current	250 mA
----------------------------	--------

Total current of outputs (up to 60°C)	16 x 50mA
---------------------------------------	-----------

Limiting of inductive cut-off voltage.	External power supply +1 V
--	----------------------------

###### Digital inputs

Number	16
Electrical isolation	Only through optional interface modules
Input voltage:	
• Nominal voltage	24 V
• For 0-signal	-1 V to +6 V
• For 1-signal	+13.5 V to +33 V

### Technical specifications (continued)

Input current:	
• With 0 signal	0 mA
• With 1 signal	3 mA
Delay time	100 µs
<b>Incremental encoder</b>	
Number	4
Connectable types	Incremental encoders with 90 degree track phase offset
Version	Differential inputs, switchable between 15 V (HTL) and 5 V (TTL) encoder signals
Track signals	Tracks A, B with or without zero pulse
Min. phase difference of the track signals	200 ns
Max. pulse frequency (track frequency)	1 MHz
Input voltage:	
• 15 V encoder	
- Permissible range	- 30 V to + 30 V
- With 0 signal	- 30 V to + 4 V
- With 1 signal	+ 8 V to +30 V
• 5 V encoder	
- Permissible range	- 7 V to + 7 V
- With 0 signal	- 7 V to - 0.7 V
- With 1 signal	+ 1.5 V to + 7 V
Input current	
• With 15 V encoder (typical, absolute)	5.0 mA
• With 5 V encoder (typical, absolute)	1.5 mA
Monitoring output	Not available
Monitoring input	Specification as for digital input
Interrupt reset output	
• Short-circuit protection against ground	yes
- Ext. power supply	No
- Max. short-circuit current	20 mA
Alarm input:	
• Input voltage (permissible range)	0 V to 5 V
- 0 signal, max.	< 0.5 V
- 1 signal, min.	> 2.0 V
• Input current	
- 0 signal	- 2.8 mA
- 1 signal	1.6 mA
<b>Sensor supply voltage</b>	
Number	1
Electrical isolation	No
Typical output voltage	13.5 V
Max. output current	150 mA, short-circuit-proof against ground, short-circuit current approx. 250 mA

### Absolute encoder inputs

Number	4
Version	Differential inputs, RS485 signal level
Connectable types	Single or multiterminal encoder
Protocols	SSI, EnDat
Data formats	Gray code, binary
Data direction	
• Unidirectional	SSI
• Bi-directional	EnDat
Data bits	SSI: 13+Parity, 25+Parity EnDat: variable
Max. pulse frequency	2 MHz, depending on cable length
Input voltage	
• Permissible range	RS485 signal level

### Ordering data

### Article No.

<b>I/O module SM500</b>	<b>6DD1640-0AH0</b>
<b>SB10 interface module</b>	<b>6DD1681-0AE2</b>
8 digital inputs/outputs 24 V DC	
<b>SB60 interface module</b>	<b>6DD1681-0AF4</b>
8 digital inputs 120 V AC	
<b>SB61 interface module</b>	<b>6DD1681-0EB3</b>
8 digital inputs 24/48 V DC	
<b>SB70 interface module</b>	<b>6DD1681-0AG2</b>
8 digital outputs with relays	
<b>SB71 interface module</b>	<b>6DD1681-0DH1</b>
8 digital outputs with transistors, 24/48 V DC	
<b>SU12 interface module</b>	<b>6DD1681-0AJ1</b>
with plug-in connector, 10-pole	
<b>SU13 interface module</b>	<b>6DD1681-0GK0</b>
with screw-type plug-in connector	
<b>SC62 interface cable</b>	<b>6DD1684-0GC0</b>
between SM500 or EXM 438-1 module and max. 5 SB10, SB60, SB70, SB61 SB71 and/or SU12 interface modules, 2 m long	
<b>SC63 interface cable</b>	<b>6DD1684-0GD0</b>
between SM500 or EXM 438-1 module and SU13 interface module, 2 m long	

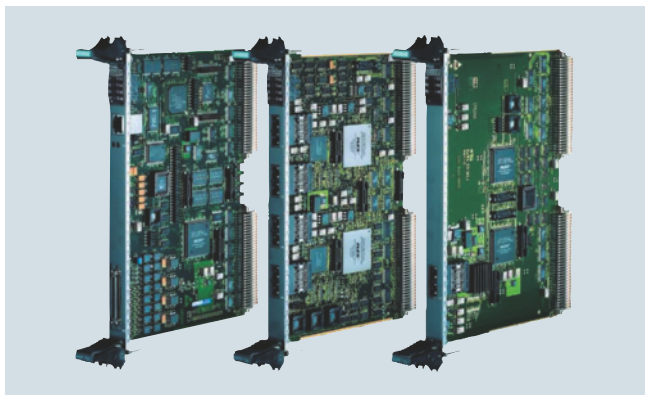


## SIMATIC control systems

### SIMATIC TDC multiprocessor control system

#### GlobalDataMemory

##### Overview



##### GlobalDataMemory

Data can be exchanged between all of the CPU modules in the system, over all of the networked subracks, using the memory in the GlobalDataMemory (GDM).

Up to 44 subracks can be coupled in synchronism through the GDM. This means that a maximum of 836 CPU modules can be used.

##### Technical specifications

###### CP52M0

###### Power supply

Voltage/current supply (at 25 °C)	+5 V typ. 0.4 A +3.3 V typ. 0.7 A +12 V typ. 0.01 A -12 V typ. 0.01 A
Power loss, typical	4.5 W
Space requirement / width	1 slot
Weight	0.6 kg

###### Digital outputs

Number	16
Electrical isolation	No
External power supply voltage	
• Rated value	24 V
• Permissible range	20 to 30
• Briefly	35 V, for max. 0.5 s
• Max. current drain (without load)	40 mA
Output voltage range	
• For a 0-signal, max.	3 V
• For a 1-signal min	External power supply -2.5 V

###### CP52M0

Output current	
• For a 0-signal, min.	-20 µA
• For a 1-signal	
- Nominal value	50 mA
- Permissible range, max.	100 mA
Delay time	100 µs
Max. switching frequency of the outputs for an ohmic load	6 kHz
Short-circuit protection with respect to	
• Ground	Yes
• Ext. power supply	No
Max. short-circuit current	250 mA
Summed current of the outputs (up to 60 °C)	16 x 50 mA
Limiting, of inductive switch-off voltages	External power supply voltage + 1 V

###### CP52IO

###### Power supply

Voltage/current supply (at 25 °C)	+5 V typ. 3 A +3.3 V typ. 0.8 A
Power loss, typical	18 W
Space requirement / width	1 slot
Weight	0.6 kg

###### CP52A0

###### Power supply

Voltage/current supply (at 25 °C)	+5 V typ. 1.5 A +3.3 V typ. 0.4 A
Power loss, typical	9 W
Space requirement / width	1 slot
Weight	0.6 kg

##### Ordering data

##### Article No.

<b>CP52M0 memory module</b>	<b>6DD1660-0BF0</b>
<b>CP52IO interface module</b>	<b>6DD1660-0BG0</b>
<b>CP52A0 access module</b>	<b>6DD1660-0BH0</b>

#### Overview SB60 interface module



Interface module for connecting 8 digital inputs with 120 V DC/AC to 24 V DC conversion.

#### Overview SC66 interface cable



Interface cable for the SIMATIC TDC CPU551 processor module and the SB10, SB60, SB61 and SU12 interface modules.

#### Overview SB70 interface module



The interface module is used to connect 8 digital outputs with conversion of the 24 V DC voltage on the module side to a max. of 120 V DC/AC on the plant side using relays.

#### Overview SC67 service cable



Service cable for the SIMATIC TDC CPU551 module and a local configuration / service PC.

## SIMATIC control systems

### SIMATIC TDC multiprocessor control system

#### Accessories for SIMATIC TDC

##### Technical specifications

###### SB60 Interface module

Number of digital inputs for	8
• Input voltage	120 V DC/AC
Insulating voltage	<ul style="list-style-type: none"> <li>• Safe isolation assured between inputs and outputs</li> <li>• Galvanic isolation assured between input circuits</li> <li>• 1125 V AC test voltage</li> </ul>
Connectable conductor cross-section	1.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.31 kg

###### SB70 interface module

Number of digital outputs	8
• Output voltage, max.	120 V DC/AC
Relay switching current	
• at 120 V AC	2 A
• at 120 V DC	0.2 A
Galvanic isolation	via relay
Insulating voltage	<ul style="list-style-type: none"> <li>• Safe isolation assured between inputs and outputs</li> <li>• Galvanic isolation assured between input circuits</li> <li>• 1125 V AC test voltage</li> </ul>
Connectable conductor cross-section	1.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.32 kg

##### Ordering data

##### Article No.

<b>SB60 interface module</b>	<b>6DD1681-0AF4</b>
8 digital inputs, 120 V AC	
<b>SB70 interface module</b>	<b>6DD1681-0AG2</b>
8 digital outputs with relays	
<b>SC66 interface cable</b>	<b>6DD1684-0GG0</b>
between CPU551 and SB10, SB60, SB61 or SU12 interface module, 2 m long	
<b>SC67 service cable</b>	<b>6DD1684-0GH0</b>
between CPU551 and PG/PC, 7 m long	

##### Note:

Information on SC62, SC63 and SC64 interface cables, and SB10, SB61, SB71, SU12 and SU13 interface modules, see catalog section 6, page 6/88.

## Software for SIMATIC controllers



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11/2	Software for SIMATIC controllers
11/3	Information on software licensing
11/3	Software Update Service
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11/7	STEP 7 Safety (TIA Portal)
<b>11/9</b>	<b>STEP 7 programming software</b>
11/9	STEP 7
11/11	STEP 7 Professional
11/13	STEP 7 Micro/WIN
11/14	S7-SCL
11/16	S7-GRAPH
11/18	S7-PLCSIM
<b>11/19</b>	<b>Options for programming and design</b>
11/19	CFC
11/21	S7 Distributed Safety
11/22	S7 F/FH Systems - Introduction
11/23	S7 F/FH Systems - S7 F Systems
11/24	S7 F/FH Systems - SIMATIC Safety Matrix
11/25	Software redundancy
11/26	SIMATIC iMap
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<b>11/29</b>	<b>Options for diagnostics and service</b>
11/29	S7-PDIAG
11/30	TeleService
11/33	PRODAVE
<b>11/34</b>	<b>Options for engineering and drive technology</b>
11/34	PID Professional (TIA Portal)
11/35	Standard PID Control
11/37	Modular PID Control
11/40	PID Self-Tuner
11/41	S7-Technology
11/42	Easy Motion Control
11/43	D7-SYS
11/44	Drive ES engineering software
<b>11/45</b>	<b>Software for joint tasks in the maintenance sector</b>
11/45	SIMATIC PDM
<b>11/50</b>	<b>Software for joint tasks in the administration sector</b>
11/50	Version Cross Manager
11/50	Version Trail
11/51	ADDM - Data Management
11/51	KNX/EIB2S7

**Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

[www.siemens.com/simatic/printmaterial](http://www.siemens.com/simatic/printmaterial)

## Software for SIMATIC controllers

### Introduction

#### Software for SIMATIC controllers

#### Overview



- System of seamlessly interconnected software tools for SIMATIC S7 and SIMATIC WinAC
- With user-friendly functions for all phases of an automation project
- Comprising:
  - Controller software in the TIA Portal
  - STEP 7 programming software
  - Options for programming and design
  - Options for diagnostics and service
  - Options for engineering and drive systems

### Overview Licensing

Siemens Digital Factory offers various types of software license. For further information, see catalog section 16, page 16/17

### Overview Software Update Service

- Service for automatic dispatch of all new software versions during contract lifetime
- Reduced logistics effort thanks to automatic contract extension
- Reduced costs as updates are provided free of charge

#### Ordering

- The Software Update Service is ordered in the same way as any other product. The corresponding order number is given in the ordering information of the software product in question.
- You must own the current version of the software.
- One Software Update Service is ordered for each software license installed.
- The Software Update Service runs for 1 year from date of order.
- It is extended automatically by a further year in each case, as long as it is not canceled 3 months before it expires.
- An annual lump sum is invoiced per license.

### Application

SIMATIC software is continuously enhanced and improved. The **Software Update Service** is the easiest way to regularly take advantage of these improvements. This service automatically sends new software updates when they are released so you always have the latest version.

The Software Update Service

- Saves time and effort:  
Once it is ordered, the Software Update Service is automatically renewed every year.
- Lowers costs:  
The service pays for itself after the first update as it costs less than an individually ordered update.
- Makes budgeting easier:  
Software expenditures can be accounted for early in the budgeting process and they are easier to write off.

### Design

#### Scope of delivery

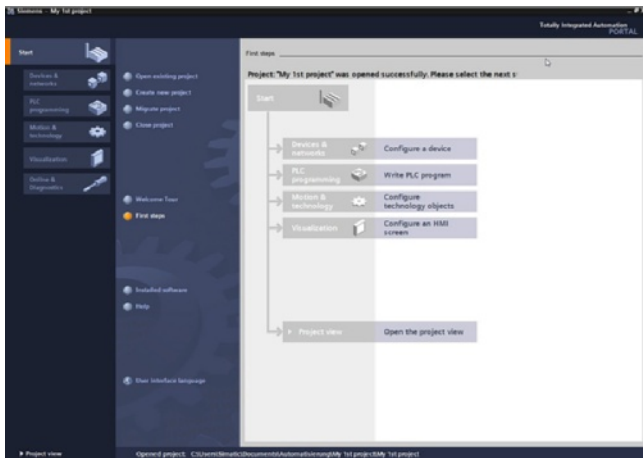
- All software versions released after ordering the Software Update Service (usually several consignments per year)
- SIMATIC Customer Support Knowledge Base CD-ROM with FAQs, tips & tricks and downloads (several issues per year)

## Software for SIMATIC controllers

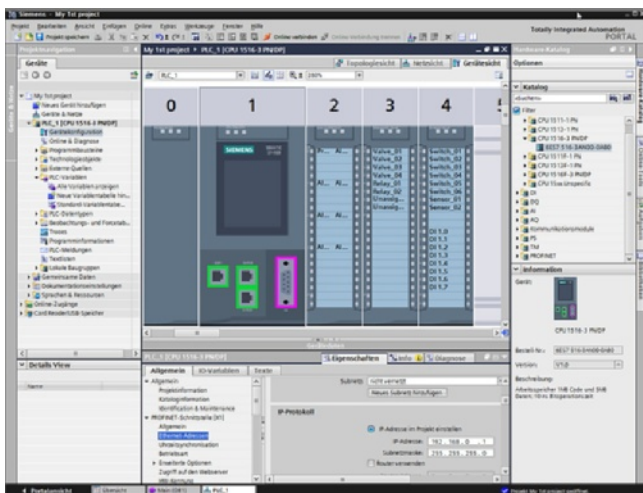
### Controller Software in the TIA Portal

#### STEP 7 (TIA Portal)

#### Overview



STEP 7 V13 SP1 (TIA Portal), portal view



STEP 7 V13 SP1 (TIA Portal), device view: configuring and parameterizing in photographically realistic representation

#### ***Intuitive, efficient and future-oriented - the engineering software for programming the SIMATIC controllers***

SIMATIC STEP 7 Professional V13 SP1 is the engineering system for the SIMATIC controllers S7-1200, S7-1500, S7-300, S7-400, WinAC and software controllers.

SIMATIC STEP 7 Basic V13 SP1 is the engineering system for the S7-1200.

STEP 7 V13 is based on the central engineering framework Totally Integrated Automation Portal (TIA Portal), which offers the user a uniform, efficient and intuitive solution to all automation tasks.

#### ***New with V13 SP1***

- Supports the new SIMATIC Open controllers
- Systematic further development of language elements for programming
- Functional enhancements for team engineering
- Scalable online security options
- "Undo" is activated in online mode
- Simulation for S7-1200 V4.0 and higher
- API engineering of STEP 7 and WinCC
- Multiple usability expansions for efficient engineering

### Technical specifications

	<b>STEP 7 Professional / Basic V13 SP1 (TIA Portal)</b>
Type of license	Floating license
Software class	A
Current version	V13 SP1
Target system	SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC, software controllers
Operating system	Windows 7 (64-bit) <ul style="list-style-type: none"> <li>• Windows 7 Professional SP1</li> <li>• Windows 7 Enterprise SP1</li> <li>• Windows 7 Ultimate SP1</li> </ul> Windows 8.1 (64-bit) <ul style="list-style-type: none"> <li>• Windows 8.1</li> <li>• Windows 8.1 Professional</li> <li>• Windows 8.1 Enterprise</li> </ul> Windows Server (64-bit) <ul style="list-style-type: none"> <li>• Windows Server 2008 R2 StdE SP1 (full installation)</li> <li>• Windows Server 2012 R2 StdE (full installation)</li> </ul>

	<b>STEP 7 Professional / Basic V13 SP1 (TIA Portal)</b>
Computer	SIMATIC Field PG M4 PREMIUM or higher (or comparable PC)
Processor	Intel Core i5-3320M 3.3GHz or higher
RAM	min. 8 GB
Hard disk	300 GB SSD
Screen	15.6" widescreen display (1920 x 1080)
Note	Includes the IEC programming languages SCL, LAD, FBD, STL and GRAPH

### Compatibility with other SIMATIC products

STEP 7 Professional / Basic V13 SP1 (incl. WinCC Basic V13 SP1) can be installed on a PC in parallel with other versions of STEP 7 V12, V5.4 or V5.5, STEP 7 Micro/WIN, WinCC flexible (from 2008), S7-PCT (from V3.3) and WinCC (from V7.0 SP2).

### Ordering data

#### STEP 7 Professional / Basic V13 SP1

Target system:  
SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC

Requirement:

Windows 7 Professional SP1 (64 bit),  
Windows 7 Enterprise SP1 (64 bit),  
Windows 7 Ultimate SP1 (64 bit),  
Windows 8.1 (64 bit),  
Windows 8.1 Professional (64 bit),  
Windows 8.1 Enterprise (64 bit),  
Windows Server 2008 R2 StdE (full installation),  
Windows Server 2012 StdE (full installation)

Form of delivery:

German, English, Chinese, Italian, French, Spanish

#### STEP 7 Professional V13 SP1, Floating License

6ES7822-1AA03-0YA5

#### STEP 7 Professional V13 SP1, Floating License, software download incl. license key<sup>1)</sup>

6ES7822-1AE03-0YA5

E-mail address required for delivery

#### STEP 7 Professional V13 SP1, Trial License

6ES7822-1AA03-0YA7

#### STEP 7 Professional 2010/V13 SP1, Floating Combo License; on DVD

6ES7810-5CC11-0YA5

#### STEP 7 Professional 2010/V13 SP1, Floating Combo License, license key download<sup>1)</sup>

6ES7810-5CE11-0YB5

without software and documentation; E-mail address required for delivery

### Article No.

#### Conversion package STEP 7 Professional V13 SP1

Only valid if ordered together with a Software Update Service 6ES7810-5CC04-0YE2 (STEP 7 Professional and STEP 7 Professional in the TIA Portal).

- Powerpack & upgrade from STEP 7 V5.5 to STEP 7 Professional 2010/V13 SP1, floating license. Prerequisite is an existing STEP 7 Software Update Service.
- Powerpack & upgrade from STEP 7 V5.5 to STEP 7 Professional 2010/V13 SP1, floating license. Prerequisite is an existing STEP 7 Software Update Service. Software download incl. license key<sup>1)</sup>  
E-mail address required for delivery

6ES7822-1AA03-0XC2

6ES7822-1AE03-0XC2

#### Upgrade STEP 7 Professional V12 to STEP 7 Professional V13 SP1, Floating License

6ES7822-1AA03-0YE5

#### Upgrade from STEP 7 Prof. V12 to STEP 7 Professional V13 SP1, Floating License, software download incl. license key<sup>1)</sup>

6ES7822-1AE03-0YE5

E-mail address required for delivery

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>



## Software for SIMATIC controllers

### Controller Software in the TIA Portal

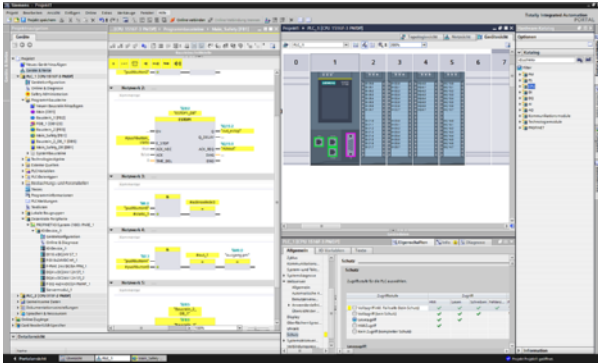
#### STEP 7 (TIA Portal)

Ordering data	Article No.	Article No.
Upgrade from STEP 7 Prof. 2006/2010 to STEP 7 Professional 2010/V13 SP1, Floating License	6ES7822-1AA03-0XE5	<b>Software Update Service</b> For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and service packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 12 weeks prior to expiration. Requires the current software version
Upgrade from STEP 7 Prof. 2006/2010 to STEP 7 Professional 2010/V13 SP1, Floating License, software download incl. license key <sup>1)</sup> E-mail address required for delivery	6ES7822-1AE03-0XE5	
Powerpack & upgrade from STEP 7 V5.4/V5.5 to STEP 7 Professional 2010/V13 SP1, Floating License.	6ES7822-1AA03-0XC5	<b>Software Update Service (Standard Edition)<sup>2)</sup></b> The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.) • STEP 7 Professional V1x • STEP 7 Professional and STEP 7 Professional in the TIA Portal • STEP 7 Basic
Powerpack & upgrade from STEP 7 V5.4/V5.5 to STEP 7 Professional 2010/V13 SP1, Floating License, software download incl. license key <sup>1)</sup> E-mail address required for delivery	6ES7822-1AE03-0XC5	
Powerpack STEP 7 Basic V13 SP1 to STEP 7 Professional V13 SP1, Floating License	6ES7822-1AA03-0YC5	<b>Software Update Service (Compact Edition)<sup>2)</sup></b> The delivery items are combined. For several contracts, only 1 package with 1 data medium set, 1 USB flash drive with the corresponding number of licenses and the corresponding number of COLs will be supplied. Delivery items to be combined must be ordered as one item. • STEP 7 Professional V1x • STEP 7 Professional and STEP 7 Professional in the TIA Portal • STEP 7 Basic
Powerpack STEP 7 Basic V13 SP1 to STEP 7 Professional V13 SP1, Floating License, software download incl. license key <sup>1)</sup> E-mail address required for delivery	6ES7822-1AE03-0YC5	
STEP 7 Basic V13 SP1, Floating License	6ES7822-0AA03-0YA5	6ES7822-1AA00-0YL5 6ES7810-5CC04-0YE2 6ES7822-0AA00-0YL0
STEP 7 Basic V13 SP1, Floating License, software download incl. license key <sup>1)</sup> E-mail address required for delivery	6ES7822-0AE03-0YA5	
STEP 7 Basic V13 SP1, Trial License	6ES7822-0AA03-0YA7	6ES7822-1AA00-0YM5 6ES7810-5CC00-0YM2 6ES7822-0AA00-0YM0
Upgrade STEP 7 Basic V12 to STEP 7 Basic V13 SP1, Floating License	6ES7822-0AA03-0YE5	
Upgrade STEP 7 Basic V12 to STEP 7 Basic V13 SP1, Floating License, software download incl. license key <sup>1)</sup> E-mail address required for delivery	6ES7822-0AE03-0YE5	<b>Software Update Service (download)<sup>2)</sup></b> The upgrades and service packs are available for downloading. E-mail address required for delivery • STEP 7 Professional V1x • STEP 7 Professional and STEP 7 Professional in the TIA Portal • STEP 7 Basic

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

<sup>2)</sup> For more information on the Software Update Service, see page 11/3.

### Overview



- For creating safety-related programs on the STEP 7 operator interface
- For seamless and easy to use integration of safety-related functions into the standard automation
- All the required configuration and programming tools are integrated into the STEP 7 operator interface and utilize a common project structure
- STEP 7 Safety Basic option package for parameter assignment and programming of the fail-safe S7-1200
- STEP 7 Safety Advanced option package for all fail-safe TIA SIMATIC controller classes (S7-1500, S7-1200, S7-300, S7-400, WinAC)

### Ordering data

### Article No.

### Article No.

#### STEP 7 Safety Advanced V13 SP1

**Task:**  
Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F controllers, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco

**Requirement:**  
STEP 7 Professional V13 SP1

Floating license for 1 user, software and documentation on DVD, license key on USB flash drive

**6ES7833-1FA13-0YA5**

Floating license for 1 user, software, documentation and license key for download<sup>2)</sup>;  
e-mail address required for delivery

**6ES7833-1FA13-0YH5**

#### Software Update Service (Standard Edition)<sup>1)</sup>

The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.)  
Requires the current software version.

**6ES7833-1FC00-0YX2**

#### Software Update Service (Compact Edition)<sup>1)</sup>

The delivery items are combined. For several contracts, only 1 package with 1 data medium set, 1 USB flash drive with the corresponding number of licenses and the corresponding number of COLs will be supplied. The deliveries that are to be grouped together must be ordered as one item.  
Requires the current software version.

**6ES7833-1FC00-0YM2**

Minimum order quantity: 5 units

#### Software Update Service (download)<sup>1)</sup>

Requires the current software version.

E-mail address required for delivery.

**6ES7833-1FC00-0YY0**

#### STEP 7 Safety Advanced Upgrade

Upgrade from Distributed Safety V5.4 SP5 to STEP 7 Safety Advanced V13 SP1 for parallel use of both versions; software and documentation on DVD, license key on USB flash drive; Combo License

**6ES7833-1FA13-0YF5**

Upgrade from Distributed Safety V5.4 SP5 to STEP 7 Safety Advanced V13 SP1 for parallel use of both versions; software, license key and documentation for download<sup>2)</sup>;  
Combo License;  
e-mail address required for delivery

**6ES7833-1FA13-0YY5**

Upgrade from STEP 7 Safety Advanced V11/V12 to STEP 7 Advanced Safety V13 SP1 for parallel use of both versions; software and documentation on DVD, license key on USB flash drive; Upgrade License

**6ES7833-1FA13-0YE5**

Upgrade from STEP 7 Safety Advanced V11/V12 to STEP 7 Advanced Safety V13 SP1 for parallel use of both versions; Upgrade License; software, license key and documentation for download<sup>2)</sup>;  
e-mail address required for delivery

**6ES7833-1FA13-0YK5**

<sup>1)</sup> For more information on the software update Service, see page 11/3.

<sup>2)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Software for SIMATIC controllers

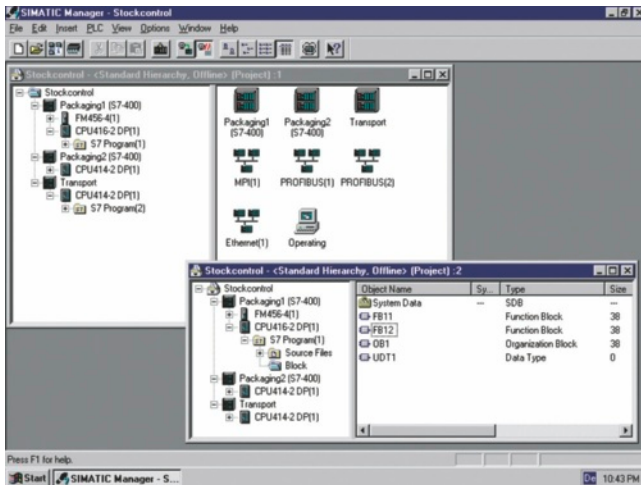
### Controller Software in the TIA Portal

#### STEP 7 Safety (TIA Portal)

Ordering data	Article No.	Article No.
<b>STEP 7 Safety Advanced Powerpack</b> Powerpack STEP 7 Safety Basic V13 SP1 to STEP 7 Safety Advanced V13 SP1; license key on USB flash drive; Floating license for 1 user  Powerpack STEP 7 Safety Basic V13 SP1 to STEP 7 Safety Advanced V13 SP1; license key for download <sup>2)</sup> ; Floating license for 1 user; e-mail address required for delivery	<b>6ES7833-1FA13-0YC5</b>  <b>6ES7833-1FA13-0YJ5</b>	<b>STEP 7 Safety Basic V13 SP1</b> Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC Requirement: STEP 7 Basic V13 SP1 and higher  Floating license for 1 user, software and documentation on DVD, license key on USB flash drive  Floating license for 1 user, software, documentation and license key for download <sup>1)</sup> ; e-mail address required for delivery
<b>STEP 7 Safety Advanced V13 SP1 Trial</b>  Trial License, valid for 21 days; software and documentation on DVD; executable with TIA Portal V13 SP1 from STEP 7 Professional V13 SP1 and higher; for configuring S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC F	<b>6ES7833-1FA13-0YA8</b>	<b>6ES7833-1FB13-0YA5</b>  <b>6ES7833-1FB13-0YH5</b>

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Overview



- STEP 7 basic software:  
The standard tool for the SIMATIC S7, SIMATIC C7 and SIMATIC WinAC automation systems.
- Makes use of the full performance capabilities of the systems
- User-friendly functions for all phases of an automation project:
  - Configuring and parameterizing the hardware
  - Definition of communication
  - Programming
  - Testing, commissioning and service
  - Documentation, archiving
  - Operating, diagnostics functions

**Components for connecting a PC to MPI and PROFIBUS**

The components described below are used to connect programming devices and PCs (incl. notebooks) to PROFIBUS and to the multipoint SIMATIC S7 MPI interface in conjunction with STEP 7.

**PC adapter USB**

- To connect a PC to the SIMATIC S7 programmable controller via the USB port.
- For connection to USB 1.1 and 2.0 interfaces.
- Can be used for SIMATIC S7-200, S7-300, S7-400 and C7.
- Supports routing.
- Automatic transmission rate and profile search.
- Noticeably improved performance (up to three times faster than the PC adapter via RS 232).
- Including subsequently updatable firmware (e.g. for function expansions or troubleshooting).
- Can be used under Windows XP, Windows Vista, Windows 7 (32/64-bit).
- Scope of delivery:
  - PC adapter USB.
  - CD "SIMATIC Software PC Adapter USB" including software and documentation.
  - USB cable, 5 m.
  - MPI cable, 0.3 m.

**CP 5512**

- For programming devices/ PCs/notebooks with PCMCIA slot.
- PCMCIA slot Type II (32-bit cardbus).
- Incl. adapter with 9-pin sub-D socket for connection to PROFIBUS.

**CP 5611/CP 5611-MPI**

- For programming devices/PCs with PCI slot
- Short PCI card (32 bit).
- CP 5611-MPI including MPI cable.

**Components for connecting the PC to Industrial Ethernet**

The PC modules described below are used to connect programming devices and AT-compatible PCs/notebooks to Industrial Ethernet in conjunction with STEP 7 and SOFTNET-PG (as of V6.0).

**CP 1512**

- For programming devices/ PCs/notebooks with PCMCIA slot.
- PCMCIA slot Type II (32-bit cardbus); 10/100 Mbit/s.
- Incl. adapter with RJ45 socket for connection to Industrial Ethernet.

**CP 1612**

- For programming devices/PCs with PCI slot
- Short PCI card (32 bit); 10/100 Mbit/s
- Incl. RJ45 socket for connection to Industrial Ethernet.

Please refer to the respective product catalog for technical information regarding product versions and supported operating systems.

You will find additional information about the online connection of PCs and SIMATIC S7/C7 controllers under "SIMATIC NET Communication Systems".

**Technical specifications**

Standard tool	STEP 7
Type of license	Floating license
Software class	A
Current version	V 5.5
Target system	SIMATIC S7-300 SIMATIC S7-400
Operating system	Windows XP Professional Windows 7 Professional, Windows 7 Ultimate
Main memory expansion in programming device/PC, min.	Depends on Microsoft Windows operating system used. Recommendation: 1 to 2 GB
Hard drive requirement in programming device/PC	Depending on scope of installation, 650 to 900 MB
Size of user program in the CPU	approx. factor 1.5 compared with STEP 5 with AWL (STL - instruction list), KOP (LAD - ladder diagram), FUP (FBD - function block diagram)
Comment	-

# Software for SIMATIC controllers

## STEP 7 programming software

### STEP 7

Ordering data	Article No.	Ordering data	Article No.
<b>STEP 7 Version 5.5</b> Target system: SIMATIC S7-300/400, SIMATIC C7, SIMATIC WinAC Requirement: Windows XP Prof., Windows 7 Professional / Ultimate Delivery package: German, English, French, Spanish, Italian; incl. license key on USB flash drive, with electronic docu- mentation Floating license on DVD Floating license, license key download without software and documentation <sup>1)</sup> ; e-mail address required for delivery Rental license for 50 hours Rental License for 50 hours, license key download without software and documentation <sup>1)</sup> ; e-mail address required for delivery Upgrade Floating license 3.x/4.x/5.x to V5.5; on DVD Trial License STEP 7 V5.5; on DVD, 14 day trial	<b>6ES7810-4CC10-0YA5</b> <b>6ES7810-4CE10-0YB5</b> <b>6ES7810-4CC10-0YA6</b> <b>6ES7810-4CE10-0YB6</b> <b>6ES7810-4CC10-0YE5</b> <b>6ES7810-4CC10-0YA7</b>	<b>STEP 7 reference manuals</b> Consisting of STL, LAD and FBD manuals as well as a reference manual for standard and system functions for SIMATIC S7-300/400 German English French Spanish Italian	<b>6ES7810-4CA10-8AW1</b> <b>6ES7810-4CA10-8BW1</b> <b>6ES7810-4CA10-8CW1</b> <b>6ES7810-4CA10-8DW1</b> <b>6ES7810-4CA10-8EW1</b>
<b>STEP 7 Version 5.5 Japanese</b> Target system: SIMATIC S7-300/400, SIMATIC C7, SIMATIC WinAC Requirement: Windows XP Professional Japanese Delivery package: English, Japanese; incl. license key on USB flash drive, with electronic documentation Floating license Japanese on DVD Upgrade Floating license Japanese 3.x/4.x/5.x to V5.5; on DVD	<b>6ES7810-4CC10-0JA5</b> <b>6ES7810-4CC10-0JE5</b>	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
<b>STEP 7 Version 5.5, Chinese</b> Target system: SIMATIC S7-300/400, SIMATIC C7, SIMATIC WinAC Requirement: Windows XP Professional Chinese Delivery package: English, Chinese; incl. license key on USB flash drive, with electronic documentation Floating license Chinese on DVD Upgrade Floating license Chinese 3.x/4.x/5.x to V5.5; on DVD	<b>6ES7810-4CC10-0KA5</b> <b>6ES7810-4CC10-0KE5</b>	<b>SIMATIC Manual Collection            update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>
<b>Documentation package            STEP 7 basic information</b> Comprising Getting Started, hardware configuration manual, programming manual, migration manual German English French Spanish Italian	<b>6ES7810-4CA10-8AW0</b> <b>6ES7810-4CA10-8BW0</b> <b>6ES7810-4CA10-8CW0</b> <b>6ES7810-4CA10-8DW0</b> <b>6ES7810-4CA10-8EW0</b>	<b>EPROM programming device,            USB prommer</b> For programming SIMATIC memory cards and EPROM modules	<b>6ES7792-0AA00-0XA0</b>
		<b>MPI cable</b> For linking SIMATIC S7 and PG through MPI (5 m)	<b>6ES7901-0BF00-0AA0</b>
		<b>Components for connecting a PC            to MPI and PROFIBUS</b> <i>For PCs with a free PCI slot:</i> <b>CP 5612</b> <i>For PCs with a free PCMCIA slot:</i> <b>CP 5512</b> For Windows XP Professional <i>For PCs without a free PCI slot:</i> <b>USB A2 PC adapter</b>	<b>6GK1561-2AA00</b> <b>6GK1551-2AA00</b> <b>6GK1571-0BA00-0AA0</b>
		<b>Components for connecting the            PC to Industrial Ethernet</b> <i>For PCs with a free PCI slot:</i> <b>Layer 2 Ethernet cards</b> <i>For PCs with a free PCMCIA slot:</i> <b>SOFTNET-IE RNA V7.1            (Win XP/Vista/Server2003)</b> <b>SOFTNET-IE RNA V8.1            (Win 7/Server2008)</b>	<b>6GK1704-1PW71-3AA0</b> <b>6GK1704-1PW08-1AA0</b>

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>

### Overview



STEP 7 Professional supports all IEC languages.

In addition to the languages recognized by STEP 7

- LAD
- FBD
- IL

The following are also available:

- "Sequential Function Chart"
- "Structured Text"

An offline simulation of programs created with these languages is included. STEP 7 Professional thus replaces the combination of the individual packages STEP 7, S7-GRAPH, S7-SCL and S7-PLCSIM.

A POWERPACK is offered to customers who use STEP 7 already and wish to change. A valid STEP 7 license is required for purchasing the POWERPACK. A separate update service is available for STEP 7 Professional.

### Technical specifications

Standard tool	STEP 7 Professional
Type of license	Floating license
Software class	A
Current version	Edition 2010
Target system	SIMATIC S7-300 SIMATIC S7-400 SIMATIC C7
Operating system	Windows XP Professional Windows 7 Professional Windows 7 Ultimate
Main memory expansion in programming device/PC, min.	Depends on Microsoft Windows operating system used. Recommendation: 1 to 2 GB
Hard drive requirement in programming device/PC	Depending on scope of installation, 700 to 1000 MB
Size of user program in the CPU	approx. factor 1.5 compared with STEP 5 with AWL (STL - instruction list), KOP (LAD - ladder diagram), FUP (FBD - function block diagram)
Comment	Includes all 5 IEC programming languages KOP (LAD - ladder diagram), FUP (FBD - function block diagram), AWL (STL - instruction list), SCL (structured control language), GRAPH and the PLC simulation software S7-PLCSIM

### Ordering data

### Article No.

Ordering data	Article No.
<b>STEP 7 Professional 2010/V13</b> Target system: SIMATIC S7-300/400, SIMATIC C7, SIMATIC WinAC Requirement: Windows XP Prof. (32-bit), Windows 7 Professional / Ultimate (32/64-bit) Available in: German, English, French, Spanish, Italian; license key on USB flash drive, with electronic documentation	
<b>Floating Combo License on DVD</b>	<b>6ES7810-5CC11-0YA5</b>
<b>Floating license, license key download<sup>1)</sup></b> without software and documentation; e-mail address required for delivery	<b>6ES7810-5CE11-0YB5</b>
<b>Rental License for 50 hours</b>	<b>6ES7810-5CC11-0YA6</b>
<b>Rental License for 50 hours, license key download<sup>1)</sup></b> without software and documentation; e-mail address required for delivery	<b>6ES7810-5CE11-0YB6</b>
<b>Upgrade of Floating license to 2010 Edition; on DVD</b>	<b>6ES7810-5CC11-0YE5</b>
<b>Powerpack Floating license for upgrading from STEP 7 to STEP 7 Professional</b>	<b>6ES7810-5CC11-0YC5</b>
<b>Trial License STEP 7 Professional 2010; on DVD, runs for 14 days</b>	<b>6ES7810-5CC11-0YA7</b>

<sup>1)</sup> For up-to-date information and download availability, see:  
<http://www.siemens.com/tia-online-software-delivery>



# Software for SIMATIC controllers

## STEP 7 programming software

### STEP 7 Professional

#### Ordering data

##### Software Update Service

For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and service packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 12 weeks prior to expiration. Requires the current software version

##### Software Update Service (Standard Edition)<sup>1)</sup>

The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.)

- STEP 7 Professional and STEP 7 Professional in the TIA Portal

6ES7810-5CC04-0YE2

##### Software Update Service (Compact Edition)<sup>1)</sup>

The delivery items are combined. For multiple contracts, only 1 package with 1 data medium set, 1 USB flash drive with the corresponding number of licenses and the corresponding number of COLs will be supplied.

Delivery items to be combined must be ordered as one item.

- STEP 7 Professional and STEP 7 Professional in the TIA Portal

6ES7810-5CC00-0YM2

##### Software Update Service (download)<sup>1)</sup>

The upgrades and service packs are available for downloading.

E-mail address required for delivery

- STEP 7 Professional and STEP 7 Professional in the TIA Portal

6ES7810-5CC04-0YY2

##### Documentation package STEP 7 basic information

Comprising Getting Started, hardware configuration manual, programming manual, migration manual

German

6ES7810-4CA10-8AW0

English

6ES7810-4CA10-8BW0

French

6ES7810-4CA10-8CW0

Spanish

6ES7810-4CA10-8DW0

Italian

6ES7810-4CA10-8EW0

##### STEP 7 reference manuals

Consisting of STL, LAD and FBD manuals as well as a reference manual for standard and system functions for SIMATIC S7-300/400

German

6ES7810-4CA10-8AW1

English

6ES7810-4CA10-8BW1

French

6ES7810-4CA10-8CW1

Spanish

6ES7810-4CA10-8DW1

Italian

6ES7810-4CA10-8EW1

#### Article No.

##### SIMATIC Manual Collection

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

6ES7998-8XC01-8YE0

##### SIMATIC Manual Collection update service for 1 year

Current "Manual Collection" DVD and the three subsequent updates

6ES7998-8XC01-8YE2

##### EPROM programming device, USB prommer

For programming SIMATIC memory cards and EPROM modules

6ES7792-0AA00-0XA0

##### MPI cable

For linking SIMATIC S7 and PG through MPI (5 m)

6ES7901-0BF00-0AA0

##### Components for connecting a PC to MPI and PROFIBUS

For PCs with a free PCI slot:

##### CP 5612

6GK1561-2AA00

For PCs with a free PCMCIA slot:

##### CP 5512

6GK1551-2AA00

For Windows XP Professional

For PCs without a free PCI slot:

##### USB A2 PC adapter

For connecting a PG/PC or Notebook to PROFIBUS or MPI; USB cable included in scope of delivery

6GK1571-0BA00-0AA0

##### Components for connecting the PC to Industrial Ethernet

For PCs with a free PCI slot:

##### Layer 2 Ethernet cards

For PCs with a free PCMCIA slot:

##### SOFTNET-IE RNA V7.1 (Win XP/Vista/Server2003)

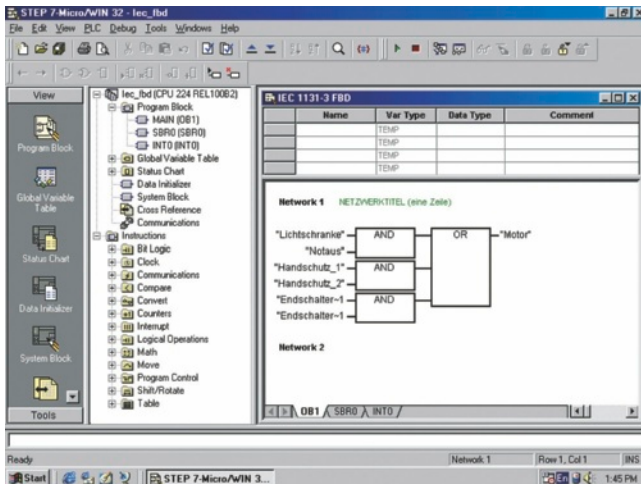
6GK1704-1PW71-3AA0

##### SOFTNET-IE RNA V8.1 (Win 7/Server2008)

6GK1704-1PW08-1AA0

<sup>1)</sup> For more information on the Software Update Service, see page 11/3.

### Overview



- The simple, easy to learn programming software under Windows 2000/XP for the SIMATIC S7-200
- A large number of wizards support the programming even of difficult automation tasks
- For fast startup and timesaving programming
- With large scope of functions
- Based on standard Windows software (user interface similar to standard applications, such as Microsoft Word, Outlook)
- With 3 standard editors STL, LAD and FBD; you can switch between these editors at any time
- Generation, exporting and importing of user-specific libraries (including standard commands and user-defined subroutines)
- Documentation CD with manuals, software tools and example programs as support

### Technical specifications

Standard tool	STEP 7 Micro/WIN
Type of license	Single license
Software class	A
Current version	V 4.0
Target system	SIMATIC S7-200
Operating system	Windows XP SP3 (32-bit) Windows 7 (32/64-bit)
Main memory expansion in programming device / PC, min.	32 MB
Hard drive requirement in programming device / PC	50 MB
Size of user program in the CPU	approx. factor of 1.0 compared with STEP 5 for STL and LAD

### Ordering data

### Article No.

#### STEP 7-Micro/WIN V4 programming software

Target system:  
All SIMATIC S7-200 CPUs

Requirement:

Windows XP (32-bit),  
Windows 7 (32/64-bit);  
on PG or PC

Delivery package:

German, English, French, Spanish,  
Italian, Chinese; with online  
documentation

Single license

**6ES7810-2CC03-0YX0**

Single license upgrade<sup>1)</sup>

**6ES7810-2CC03-0YX3**

To be ordered separately:

#### Intelligent RS 232/PPI multi-master cable

**6ES7901-3CB30-0XA0**

For connecting devices with RS 232  
interface to SIMATIC S7-200 or  
PPI network;  
master in multi-master PPI network

#### Intelligent USB/PPI multi-master cable

**6ES7901-3DB30-0XA0**

For connecting devices with USB  
interface to SIMATIC S7-200 or  
PPI network;  
master in multi-master PPI network

#### Components for connecting a PC to MPI and PROFIBUS

For PCs with a free PCI slot:

**CP 5612**

**6GK1561-2AA00**

For PCs with a free PCMCIA slot:

**CP 5512**

**6GK1551-2AA00**

For Windows XP Professional

For PCs without a free PCI slot:

**USB A2 PC adapter**

**6GK1571-0BA00-0AA0**

For connecting a PG/PC or  
Notebook to PROFIBUS or MPI;  
USB cable included in scope of  
delivery

<sup>1)</sup> Upgrade for all previous STEP 7 Micro/WIN and STEP 7 Micro/DOS versions



# Software for SIMATIC controllers

## STEP 7 programming software

### S7-SCL

#### Overview

```

FUNCTION_BLOCK FB27
VAR_INPUT
  SIG_SEL      : INT := 0;
  GRP1_SEL     : BOOL := 0;
  GRP2_SEL     : BOOL := 0;
  GRP3_SEL     : BOOL := 0;
END_VAR

VAR_OUTPUT
  SEL_OUT      : INT := 0;
  GRP1_OUT     : BOOL := 0;
  GRP2_OUT     : BOOL := 0;
  GRP3_OUT     : BOOL := 0;
END_VAR

VAR
  SELECT       : INT;
  MAX          : INT;
END_VAR

BEGIN
  SELECT := SIG_SEL;
  MAX := 0;
  IF SELECT < 0 THEN           //make it positive
    SELECT := ~SELECT;
  END_IF;
  IF SELECT > MAX THEN        //limit to MAX
    SELECT := MAX;
  END_IF;
  SEL_OUT := SELECT;

```

- PASCAL-type high-level language
- Optimized for programming programmable logic controllers
- With PLCopen Base Level certificate
- For use in SIMATIC S7-300 (recommended for CPU 314 and CPU 312C or higher), S7-400, C7 and WinAC



#### Technical specifications

<b>Engineering Tool</b>	<b>S7-SCL</b>
Current version	V5.3
Software class	A
<b>Application areas</b>	
Can be used for	Text-based high-level language programming of simple and complex calculations, CASE, loop, jump, and comparison functions
Marketing message	Programming of algorithms and calculations made easy!
Advantages	<ul style="list-style-type: none"> <li>• Clear and easy-to-read programs</li> <li>• Functional, module-based programming</li> <li>• CASE instruction replaces a large number of jump and comparison functions</li> <li>• Easily understood by PLC programmers, as the programming philosophy of LAD/FBD/STL is retained</li> <li>• Easy switchover to PLC programming for PC programmers</li> <li>• Exchangeability (porting) of subroutines in accordance with IEC 61131-3</li> <li>• Less time required for engineering compared to LAD/FBD/STL: Up to 20% for simple programs; at least 50% for demanding program structures</li> </ul>
Sectors	<ul style="list-style-type: none"> <li>• Labeling machines</li> <li>• Chemical plants (e.g. oxygen extraction, evaluation of measured values)</li> <li>• Rubber and plastics machines</li> <li>• Woodworking machines</li> <li>• Storage and logistics systems</li> <li>• Paper and printing machinery</li> <li>• Punching and cutting machines</li> <li>• Water industry</li> <li>• Coilers</li> </ul>
<b>Target systems</b>	
Can be used in	S7-300 (CPU 313 or higher and CPU 312C or higher recommended) S7-400 C7 (C7-626 or higher recommended) WinAC
<b>System prerequisites</b>	
Operating system	Windows XP Professional Windows 7 Ultimate/Professional (S7-SCL V5.3 SP5 and higher)
Required hard drive memory in the PG/PC	50 MB
Required software	STEP 7 V5.4 or higher
<b>Properties</b>	
Monitoring tags	Yes
Controlling tags	Yes
Single-step processing	Yes
Integration in CFC	Yes
<b>Program runtimes</b>	
with S7-300 (typical)	Similar to LAD/FBD/STL
with S7-400 (typical)	Similar to LAD/FBD/STL

Technical specifications (continued)		Ordering data	Article No.
<b>Engineering Tool</b>	<b>S7-SCL</b>	<b>SIMATIC S7 SCL, Version 5.3</b>	
<b>Diagnostics</b>		Task: High-level language programming	
Integration of diagnostic data in ProAgent	-	Target system: SIMATIC S7-300 (CPU 314 and higher), SIMATIC S7-400, SIMATIC C7, SIMATIC WinAC	
Integration of diagnostic data in ProTool/Pro	-	Requirement: STEP 7 V5.4 SP5 and higher	
Integration of diagnostic data in WinCC	-	Type of delivery: on CD; German, English, French, Spanish, Italian; incl. authorization diskette, with electronic documentation	
<b>Supported standards</b>		Floating license	<b>6ES7811-1CC05-0YA5</b>
IEC 61131-3	PLCopen certification • Base level ST available • Reusability Level ST available	Software Update Service (requires current software version) <sup>1)</sup>	<b>6ES7811-1CA01-0YX2</b>
<b>Available versions/licenses</b>		Upgrade floating to V5.3	<b>6ES7811-1CC05-0YE5</b>
Floating license	CD-ROM with • Tool • Electronic manual • Getting Started guide • Examples License on USB stick Certificate of License Product information	<b>SIMATIC Manual Collection</b>	<b>6ES7998-8XC01-8YE0</b>
Upgrade (floating license)	CD-ROM with • Tool • Electronic manual • Getting Started guide • Examples License on USB stick Certificate of License Product information	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
Software Update Service (SUS)		<b>SIMATIC Manual Collection update service for 1 year</b>	<b>6ES7998-8XC01-8YE2</b>
<b>Also a component part of</b>		Current "Manual Collection" DVD and the three subsequent updates	
STEP 7 Professional	Yes		
S7 Trainer Package	Yes		
PCS 7	Yes		
D7-SYS	-		

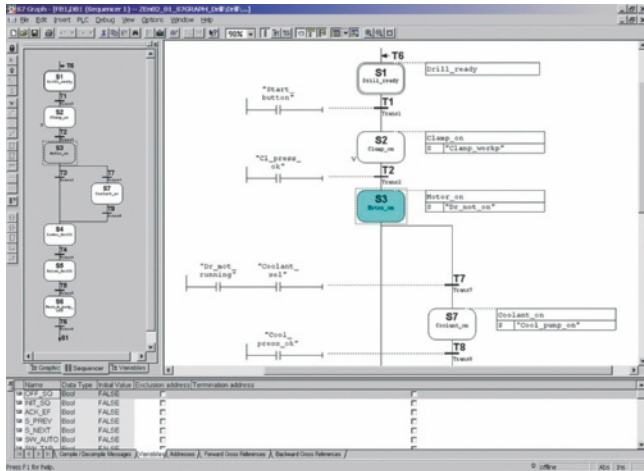
<sup>1)</sup> For more information on the Software Update Service, see page 11/3.

# Software for SIMATIC controllers

## STEP 7 programming software

### S7-GRAPH

#### Overview



- For configuring and programming sequential processes using sequencers
- Standardized representation to DIN EN 1131-3
- Clearly comprehensible program thanks to structuring of the process into separate steps
- With extensive diagnostics functions, integrated into the SIMATIC diagnostics concept
- With PLCopen Base Level certificate
- For use in SIMATIC S7-300 (recommended for CPU 315 and CPU 312C or higher), S7-400, C7 and WinAC



#### Technical specifications

Engineering Tool	S7-GRAPH
Current version	V5.3
Software class	A
Application areas	
Can be used for	Graphical programming of sequential controllers and sequencers
Marketing message	Fast, elegant way to program sequential processes easily and transparently!
Advantages	<ul style="list-style-type: none"> <li>• Can be used to optimum effect even during the design phase</li> <li>• Less configuration effort thanks to graphical structuring and programming</li> <li>• Quick and easy familiarization</li> <li>• Precise fault localization thanks to integrated diagnostics in combination with ProAgent for ProTool/Pro and WinCC</li> <li>• Less time required for engineering compared to LAD/FBD/STL: approx. 40 to 70%</li> </ul>
Sectors	<ul style="list-style-type: none"> <li>• Automotive industry (e.g. body-in-white, final assembly)</li> <li>• Electrical equipment manufacture</li> <li>• Rubber and plastics machines</li> <li>• Pick-and-place machines</li> <li>• Woodworking machines</li> <li>• Metalworking machines</li> <li>• Paper and printing machinery</li> <li>• Testing machines</li> <li>• Rolling mills</li> <li>• Coilers</li> <li>• Leisure and entertainment facilities</li> </ul>
Target systems	
Can be used in	S7-300 (CPU 314 or higher and CPU 312C or higher recommended) S7-400 C7 (C7-626 or higher recommended) WinAC
System prerequisites	
Operating system	Windows XP Professional Windows 7 Professional Windows 7 Ultimate
Required hard drive memory in the PG/PC	50 MB
Required software	STEP 7 V5.4 with SP4 or SP5 or STEP 7 V5.5 with or without SP1
Properties	
Monitoring tags	Yes
Controlling tags	Yes
Single-step processing	Yes
Integration in CFC	-
Program runtimes	
with S7-300 (typical)	3 ms per block + 1 ms per active step
with S7-400 (typical)	0.4 ms per block + 0.06 ms per active step

Technical specifications (continued)		Ordering data	Article No.
<b>Engineering Tool</b>	<b>S7-GRAPH</b>	<b>SIMATIC S7 GRAPH, Version 5.3</b>	
<b>Diagnostics</b>		Task: Configuration and programming of sequences	
Integration of diagnostic data in ProAgent	Yes	Target system: SIMATIC S7-300, SIMATIC S7-400, SIMATIC C7, SIMATIC WinAC	
Integration of diagnostic data in ProTool/Pro	Via ProAgent	Requirement: STEP 7 V5.4 with SP4/SP5 or STEP 7 V5.5 with or without SP1	
Integration of diagnostic data in WinCC	Via ProAgent	Type of delivery: on CD; German, English, French, Spanish, Italian; including license key on USB flash drive, with electronic documentation	
<b>Supported standards</b>		Floating license	<b>6ES7811-0CC06-0YA5</b>
IEC 61131-3	PLCopen certification • Base Level SFC available	Software Update Service (requires current software version) <sup>1)</sup>	<b>6ES7811-0CA01-0YX2</b>
Status of PLCopen activities	-	Floating license upgrade to V5.3	<b>6ES7811-0CC06-0YE5</b>
<b>Available versions/licenses</b>		<b>SIMATIC Manual Collection</b>	<b>6ES7998-8XC01-8YE0</b>
Floating license	CD-ROM with • Tool • Electronic manual • Getting Started guide • Examples  License key on USB stick Certificate of License Product information	Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
Upgrade (floating license)	CD-ROM with • Tool • Electronic manual • Getting Started guide • Examples  License key on USB stick Certificate of License Product information	<b>SIMATIC Manual Collection update service for 1 year</b>	<b>6ES7998-8XC01-8YE2</b>
Software Update Service (SUS)		Current "Manual Collection" DVD and the three subsequent updates	
<b>Also a component part of</b>			
STEP 7 Professional	Yes		
S7 Trainer Package	Yes		
PCS 7	-		
D7-SYS	-		

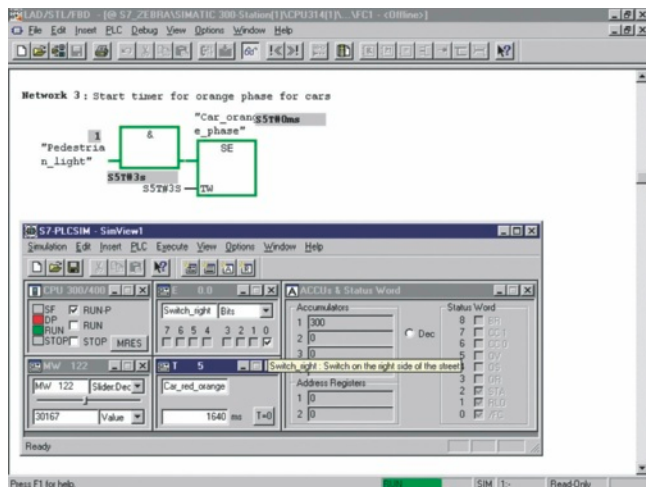
<sup>1)</sup> For more information on the Software Update Service, see page 11/3.

## Software for SIMATIC controllers

### STEP 7 programming software

#### S7-PLCSIM

#### Overview



- For functional testing of the generated SIMATIC S7 user blocks on the PG/PC, independent of the availability of the target hardware
- To transfer detection and elimination of program faults to an early phase of program development
- Permits accelerated, cost-reduced initial commissioning, and an increase in program quality
- Can be used for LAD, FBD, STL, S7-GRAPH, S7-HiGraph, S7-SCL, CFC, S7-PDIAG, WinCC (local installation)

#### Technical specifications

Engineering Tool	S7-PLCSIM
Type of license	Floating license
Software class	A
Current version	V5.4
Target system (recommended)	SIMATIC S7-300 SIMATIC S7-400 SIMATIC C7
Operating system	Windows XP Professional Windows 7 Professional Windows 7 Ultimate
Required software packages	STEP 7 V5.4 with SP4 or SP5 or STEP 7 V5.5 with or without SP1
Disk space required in PG/PC	5 MB

#### Ordering data

#### Article No.

##### S7-PLCSIM, Version 5.4

###### Task:

Function testing of SIMATIC S7 application blocks on PG/PC

###### Target system:

SIMATIC S7-300, SIMATIC S7-400, SIMATIC C7

###### Requirement:

STEP 7 V5.4 or higher incl. SP4/SP5 or STEP 7 V5.5 with or without SP1

###### Type of delivery:

on CD; English, German, French, Spanish, Italian; license key on USB flash drive, with electronic documentation

Floating license

**6ES7841-0CC05-0YA5**

Software Update Service (requires current software version)<sup>1)</sup>

**6ES7841-0CA01-0YX2**

Floating license upgrade to V5.4

**6ES7841-0CC05-0YE5**

##### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

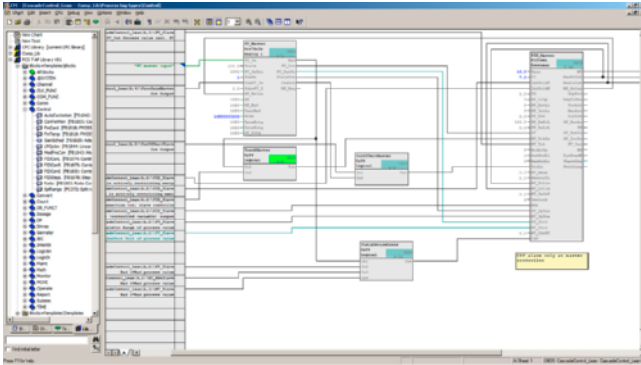
##### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

<sup>1)</sup> For more information on the Software Update Service, see page 11/3.

### Overview



- For the generation of automation programs by drawing a function chart
- With extensive libraries of ready-made software blocks to which user-created blocks can be added
- Minimized outlay and reduced error susceptibility due to the interconnection of ready-made blocks
- Optimized integration in the world of automation, for example, through guaranteed compatibility with all STEP 7 tools
- Can be used for SIMATIC S7-300 (recommended for CPU 316 or CPU 314C or higher), SIMATIC S7-400, SIMATIC WinAC and D7-SYS

### Technical specifications

EngineeringTool	CFC
Current version	V8.1
Software class	A
<b>Application areas</b>	
Can be used for	Graphical creation, interconnection and parameterization of (preconfigured) blocks and functions
Marketing message	Simply interconnect and configure instead of programming!
Advantages	<ul style="list-style-type: none"> <li>• Can be used to optimum effect even during the design phase</li> <li>• Reduced configuration effort thanks to graphical interconnection</li> <li>• High degree of reusability of diagrams that have already been created</li> <li>• Quick and easy familiarization</li> <li>• Quick and transparent interconnection of ready-made functions</li> <li>• Technological creation of the program as a whole</li> <li>• Clear representation of control loop structures</li> <li>• Short commissioning time</li> <li>• High plant availability</li> <li>• Less time required for engineering compared to LAD/FBD/STL: up to 50%</li> </ul>
Sectors	<ul style="list-style-type: none"> <li>• Automotive industry (e.g. thermostats, tire production processes)</li> <li>• Chemicals</li> <li>• Power engineering and supply</li> <li>• Rubber and plastics machines</li> <li>• Metalworking machines</li> <li>• Food and beverage machines</li> <li>• Petrochemicals</li> <li>• Rolling mills</li> <li>• Water industry</li> <li>• Coilers</li> </ul>
<b>Target systems</b>	
Can be used in	S7-300 S7-400 F/H systems WinAC
<b>System prerequisites</b>	
Operating system	MS Windows XP Professional SP3 MS Windows Server 2003 SP2 Standard MS Windows Server 2003 R2 SP2 MS Windows 7 SP1 Ultimate 32-bit MS Windows 7 SP1 Ultimate 64-bit MS Windows Server 2008 SP2 32-bit MS Windows Server 2008 R2 SP1 64-bit MS Windows 7 Professional SP1 32-bit MS Windows 7 Professional SP1 64-bit MS Windows Vista 32-bit SP2 Ultimate MS Windows Vista 32-bit SP2 Business
Required hard drive memory in the PG/PC	approx. 80 MB
Required software	STEP 7 V5.4 SP5 or higher

## Software for SIMATIC controllers

### Options for programming and design

#### CFC

#### Technical specifications (continued)

EngineeringTool	CFC
<b>Properties</b>	
Monitoring tags	Yes
Controlling tags	Yes
Single-step processing	-
Integration in CFC	Yes
<b>Program runtimes</b>	
with S7-300 (typical)	Depending on the interconnected blocks
with S7-400 (typical)	Depending on the interconnected blocks
<b>Diagnostics</b>	
Integration of diagnostic data in ProAgent	-
Integration of diagnostic data in ProTool/Pro	-
Integration of diagnostic data in WinCC	-
<b>Supported standards</b>	
IEC 61131-3	based on the IEC standard
Status of PLCopen activities	-
<b>Available versions/licenses</b>	
Floating license (S7-HiGraph) or single license (CFC)	CD-ROM with <ul style="list-style-type: none"> <li>• Tool</li> <li>• Electronic manual</li> <li>• Getting Started guide</li> <li>• Examples</li> </ul> License Key Disk Terms and Conditions Certificate of License
Floating license (S7-HiGraph) or single license (CFC)	CD-ROM with <ul style="list-style-type: none"> <li>• Tool</li> <li>• Electronic manual</li> <li>• Getting Started guide</li> <li>• Examples</li> </ul> License Key Disk Emergency Key Disk Certificate of License Terms and Conditions Product information
Software Update Service (SUS)	
<b>Also a component part of</b>	
STEP 7 Professional	-
S7 Trainer Package	-
PCS 7	Yes
D7-SYS	Yes

#### Ordering data

#### Article No.

#### SIMATIC CFC, Version 8.1

##### Task:

Graphic configuring and programming of automation applications in the form of function charts

##### Target system:

SIMATIC S7-300/400,  
SIMATIC WinAC, D7-SYS

##### Requirements:

STEP 7 V5.4 SP5 and higher

##### Type of delivery:

Engineering software and electronic documentation on CD-ROM,  
License Key on USB flash drive,  
Certificate of License

Floating license

**6ES7658-1EX18-0YA5**

Floating license upgrade from V8.0 to V8.1

**6ES7658-1EX18-0YE5**

Software Update Service

(requires current software version)<sup>1)</sup>

**6ES7658-1EX00-2YL8**

Software Update Service for multiple orders (requires current software version); the delivery items are combined. For several contracts, only 1 package (1 data medium set and the corresponding number of licenses) will be supplied. Can be ordered with 5 or more contracts<sup>1)</sup>

**6ES7658-1EX00-2YM8**

The delivery items to be combined must be ordered as one item.

#### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

#### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

<sup>1)</sup> For more information on the Software Update Service, see page 11/3.

### Overview

- For creating safety-oriented automation applications with SIMATIC S7 in LAD or FBD (STEP 7 required)
- Implementation of safety functions by making simple connections between function blocks
- With preconfigured function block library
- User-defined blocks can be created
- Optimum embedding in the automation world due to guaranteed integration with STEP 7 tools
- Scope of supply:
  - Distributed Safety editor
  - Code generator
  - Debugger
  - Libraries of standard blocks

### Ordering data

### Article No.

#### S7 Distributed Safety V5.4 programming tool

##### Task:

Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco

##### Requirement:

STEP 7 V5.3 SP3 and higher

Floating license for 1 user

**6ES7833-1FC02-0YA5**

Floating license for 1 user, license key download without software or documentation<sup>2)</sup>;

**6ES7833-1FC02-0YH5**

e-mail address required for delivery

#### S7 Distributed Safety upgrade

From V5.x to V5.4; Floating license for 1 user

**6ES7833-1FC02-0YE5**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

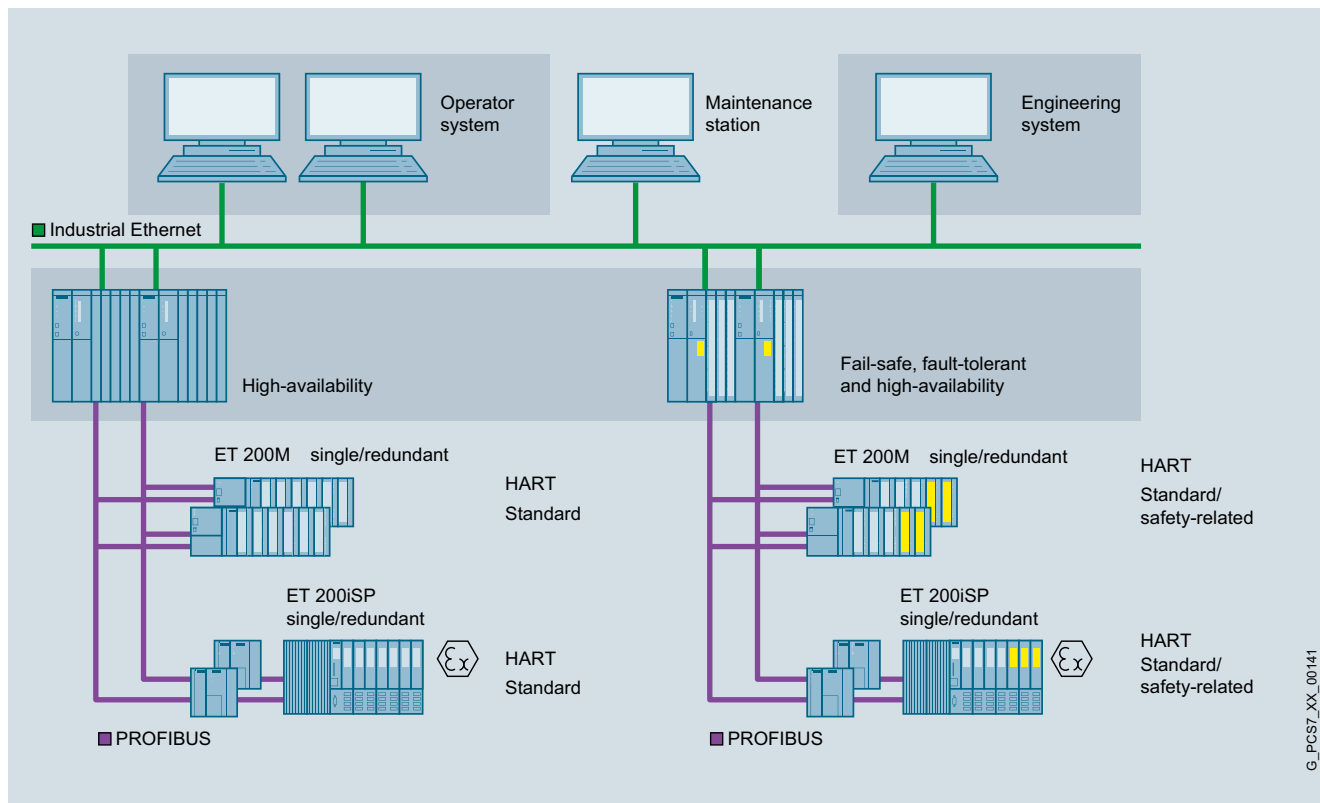


## Software for SIMATIC controllers

Options for programming and design

### S7 F/FH Systems - Introduction

#### Overview



Common engineering system for basic process control system and safety instrumented system

The process industry frequently features complex technological sequences with high safety demands, and faults and failures in the process automation could have fatal consequences for personnel, machines, plants and the environment. Therefore process safety is of particular significance. The safety technology used must reliably detect errors in the process and also its own internal errors, and automatically set the plant/application to a safe state if an error is detected.

S7 F/FH Systems is the comprehensive range of products and services from Siemens for safe, fault-tolerant applications in the process industry. This is characterized by:

- Safe communication via PROFIBUS with PROFIsafe
- Safe communication also via PROFIBUS PA with PROFIsafe
- ET 200 distributed I/O systems with safety-related I/O modules
- User-friendly process visualization, including safety-relevant fault messages, via the optional operator system
- Engineering system with S7 F Systems software package and SIMATIC Safety Matrix

- AS 412F/FH, AS 414F/FH and AS 417F/FH safety-related automation systems

The safety-related automation systems of the S7 F/FH-System are based on the hardware of the CPU 412H, CPU 414H or CPU 417H that are extended with the S7 F Systems software package to include safety functions. All F/FH systems listed are TÜV-certified and comply with the safety requirements up to SIL 3 according to IEC 61508. There are two design variants:

- Single-channel (with one CPU, safety-related)
- High-availability (with redundant CPUs, safety-related and fault-tolerant)



## Software for SIMATIC controllers

Options for programming and design

### S7 F/FH Systems - SIMATIC Safety Matrix

#### Overview

Head Tag	Func.	Limit/Trip	English	Cause Description	Action	Output Tag	Effect Description
PS_100	FALSE			Feed Pump High Pressure Switch	1	N	Feed pump
LSLH_100	TRUE			Tank_100 Level switch high	2	S S S	Feed block valve
LSL_200	TRUE			Hopper_200 Level switch Low	3	N N N 2S	Feed block valve
PSH_200	TRUE			Hopper_200 High Pressure	4	N N N V	Hopper Feed block valve
PT_100	H 38.00	PSIG		Feed pressure	5	S S S S	Tank Drain block valve
LT_100	H 50.00	Feet		Tank Level	6	2S N N	ESD shutdown
PT_101	H 26.00	D 3.0	in_H2O	Tank Pressure	7		Tank reset valve
PT_102							
PT_103							
LT_200	H 50.00	ft		Hopper Level	8	2S	
TS_101	FALSE						
TS_102	AND	FALSE		Tank_100 High Temperature switch	9		
TS_103	FALSE						

The SIMATIC Safety Matrix which can be used in addition to the CFC is an innovative safety lifecycle tool from Siemens that can be used not only for user-friendly configuration of safety applications, but also for their operation and service. The tool, which is based on the proven principle of a cause & effect matrix, is ideally suited to processes where defined statuses require specific safety reactions.

The SIMATIC Safety Matrix not only means that programming of the safety logic is significantly simpler and more convenient, but also much faster than in the conventional manner. During the risk analysis of a plant, the configuration engineer can assign exactly defined reactions (effects) to events (causes) which may occur during a process.

#### Ordering data

#### Article No.

##### SIMATIC Safety Matrix Tool V6.2

Creation, configuration, compilation, loading and online monitoring of the Safety Matrix in a SIMATIC PCS 7 environment

Including SIMATIC Safety Matrix Viewer for SIMATIC PCS 7, for operation and monitoring of the Safety Matrix in a SIMATIC PCS 7 environment with several operator control levels

1 language (English), executes with Windows XP Prof. SP3, Windows Server 2003 SP2, Windows 7 Ultimate, Windows Server 2008 R2

Type of supply: Certificate of License and authorization diskette for Safety Matrix Tool and Safety Matrix Viewer; software and electronic documentation on CD

Floating license for 1 installation

**6ES7833-1SM02-0YA5**

Floating license upgrade from V5.x/V6.x to V6.2

**6ES7833-1SM02-0YE5**

##### SIMATIC Safety Matrix Editor V6.2

Creation and checking of the Safety Matrix logic on an external computer without a SIMATIC PCS 7 or STEP 7 environment

1 language (English), executes with Windows XP Prof. SP3, Windows Server 2003 SP2, Windows 7 Ultimate, Windows Server 2008 R2, single license for 1 installation

Type of supply: Certificate of License and authorization diskette; software and electronic documentation on CD

**6ES7833-1SM42-0YA5**

##### SIMATIC Safety Matrix Viewer V6.2 for SIMATIC PCS 7

Operation and monitoring of the Safety Matrix in the SIMATIC PCS 7 environment with several operating levels

Bilingual (English/German), runs on Windows XP Prof. SP3, Windows Server 2003 SP2, Windows 7 Ultimate, Windows Server 2008 R2

Type of supply: Certificate of License and authorization diskette; software and electronic documentation on CD

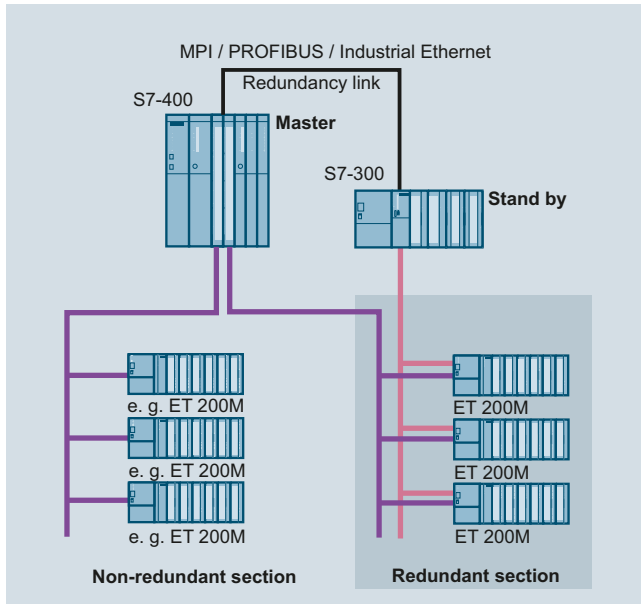
Floating license for 1 installation

Floating license upgrade from V6.x to V6.2

**6ES7833-1SM62-0YA5**

**6ES7833-1SM62-0YE5**

### Overview



- Software package for assembling fault-tolerant control systems based on software
- Designed for control systems with single-channel distributed I/O
- For use in applications with low demands on changeover speed, such as the control of hydroelectric power plants, cooling circuits, traffic flows, level control, measured data acquisition
- Inexpensive thanks to the use of standard S7-300 and S7-400 components
- I/O linking with PROFIBUS DP in redundant configuration
- Optional control via WinCC operator station

### Technical specifications

Hardware requirements	
CPU	S7-300: CPU 313C-2 DP, 314C-2 DP, 315-2 DP, 316-2 DP, 318-2 DP S7-400: all CPUs
Redundancy link of the CPUs	MPI, PROFIBUS, Industrial Ethernet; existing connections can also be used.
Suitable modules for ET 200M	IM 153-2; all DI/O, AI/O for ET 200M; FM 350-1 counter module CP 341
Software requirements	
Configuring/programming	STEP 7 V4.0
Communication configuration for redundant PROFIBUS DP	NCM S7 for PROFIBUS

### Ordering data

### Article No.

#### Program package software redundancy V1.2

##### Task:

Configuring a redundant control.

##### Target system:

SIMATIC S7-300, S7-400

##### Requirement:

STEP 7 V5.2, NCM S7 for PROFIBUS

##### Delivery package:

incl. electronic documentation (English, German, French, Spanish, Italian), 4 application examples and faceplate for WinCC on CD-ROM

Single license (for 2 CPUs)

**6ES7862-0AC01-0YA0**

Single license, without software and documentation

**6ES7862-0AC01-0YA1**

#### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

#### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

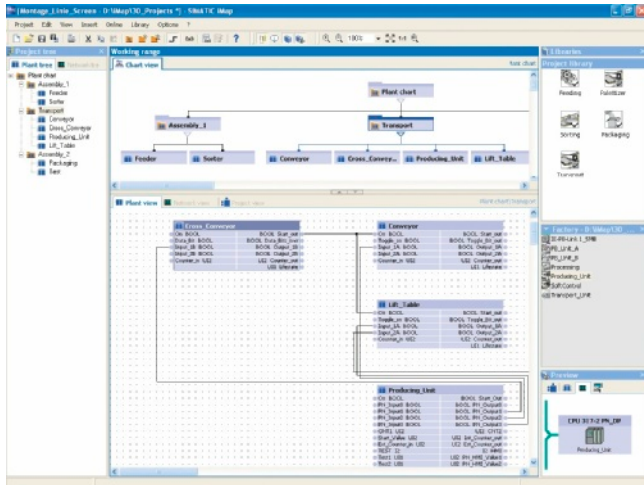
Current "Manual Collection" DVD and the three subsequent updates

# Software for SIMATIC controllers

Options for programming and design

## SIMATIC iMap

### Overview



- Component-based software tool for configuring the communication in distributed automation solutions
- For easy graphical configuration of the communication between subsystems and machine-to-machine communication in the production line
- Based on the PROFINET standard
- Open for PROFINET devices from various manufacturers on Industrial Ethernet
- Runs under Windows XP Professional and Windows 7 Ultimate/Professional

### Technical specifications

Engineering tool	SIMATIC iMap
Current version	V3.0
Software class	A
Application areas	
Keyword	SIMATIC iMap is an engineering tool for configuring communication between automation and field devices in distributed automation solutions.
Marketing message	"Time and cost savings in modular machine and plant construction with Component based Automation." "Modularization and machine-to-machine communication along the production line."
Advantages	<ul style="list-style-type: none"> <li>• Open component-based engineering tool to the PROFINET standard.</li> <li>• Simple communication between intelligent automation and field devices on PROFIBUS DP and on Ethernet.</li> <li>• Graphical configuration of communication on PROFIBUS DP and on Ethernet</li> <li>• Extremely high reusability of software components (technology modules)</li> <li>• Graphical structuring of the plant using "chart-in-chart" function</li> <li>• Convenient navigation through the project tree</li> <li>• Easy creation and structuring of technology libraries</li> <li>• PROFIBUS and Ethernet in the overview of the network view</li> <li>• Fast start-up thanks to downloading and testing directly on Ethernet (also of PROFIBUS slaves)</li> <li>• Online display of values of the technology modules on the interfaces and in the variable table</li> <li>• Diagnosis of communication in the diagnostics window</li> </ul>
Sectors	<ul style="list-style-type: none"> <li>• Automotive industry (especially in assembly, conveyor systems and in the paint shop)</li> <li>• Complex food and packaging machines</li> <li>• Conveyor systems based on PROFIBUS DP</li> <li>• Production lines with several interlinked machines</li> </ul>

Engineering tool	SIMATIC iMap
Target systems	<ul style="list-style-type: none"> <li>• SIMATIC S7 CPU 31x-2 PN/DP and SIMATIC S7 CPU 319-3 PN/DP (with integrated PROFINET interface. This can be used as a proxy function for the devices of a complete PROFIBUS segment, one line only)</li> <li>• SIMATIC WinAC PN (can be used as a proxy function for the devices of a complete PROFIBUS segment, one line only)</li> <li>• SIMATIC NET IE/PB Link (can be used as a proxy function for the devices of a complete PROFIBUS segment)</li> <li>• SIMATIC NET CP 343-1 and CP 343-1 Advanced (for connecting SIMATIC S7-300 to Ethernet), CP443-1 Advanced (for connecting SIMATIC S7-400 to Ethernet)</li> <li>• Distributed I/O stations with separate CPU (all intelligent field devices on PROFIBUS such as SIMATIC CPU 313C-2DP, CPU 314C-2DP, CPU 315-2DP, CPU 316-2DP, ET 200 IM 151 CPU, ET 200S BM 147 CPU),</li> <li>• PROFINET CBA OPC Server (for access from PC applications to data in PROFINET devices)</li> <li>• Devices on Industrial Ethernet based on the PROFINET CBA standard</li> <li>• SIMATIC OPs (within the components)</li> <li>• SIMATIC ProTool/Pro, WinCC or any other visualization system with OPC client function</li> </ul>

**Technical specifications** (continued)

Engineering tool	SIMATIC iMap
<b>System prerequisites</b>	
Operating system	Windows XP Prof. with Service Pack 2 or Windows 7 Ultimate/Professional; PC administration rights are required for installation
PG/PC hardware	Pentium processor, 1 GHz or higher
Recommended expansion of main memory in PG/PC	RAM: 512 MB or more
Hard disk space required in PG/PC	Approx. 200 MB
Software required	<ul style="list-style-type: none"> <li>• STEP 7 V5.3 Service Pack 3 or higher</li> <li>• PN OPC-Server V6.3 or higher</li> </ul> The following software must be installed before iMap (included in the iMap package): <ul style="list-style-type: none"> <li>• MS Internet Explorer V6.0 Service Pack 1 and higher</li> <li>• Adobe Acrobat Reader V5.0</li> </ul>
<b>Delivery format</b>	
Languages	English, German, French, Italian and Spanish
Single License (SL)	Yes
Upgrade License (UL)	Yes, from V2.0 to V3.0
Paper manuals	Electronically on CD
<b>Authorization/licenses</b>	
Authorization	Yes
Single License (SL)	Yes
Upgrade License (UL)	Yes
Software Update Service	Yes
Unlock Copy License	No

**Ordering data****Article No.****SIMATIC iMap V3.0****Target system:**

CPU 31x-2 PN/DP,  
CPU 319-3 PN/DP,  
SIMATIC WinAC PN,  
SIMATIC NET IE/PB Link,  
SIMATIC NET CP 343-1,  
SIMATIC NET CP 343-1 Advanced,  
SIMATIC NET CP 443-1 Advanced,  
distributed I/O devices with own CPU, PROFINET CBA OPC server, devices on the Industrial Ethernet based on the PROFINET CBA standard, SIMATIC OPs, SIMATIC ProTool/Pro

**Requirements:**

Windows XP Prof. with service pack 2 or higher or Windows 7 Ultimate/Professional; on PG or PC with Pentium processor, min. 1 GHz; STEP 7 V5.3 or higher with service pack 3, PN OPC Server V6.3 or higher

**Type of delivery:**

German, English, with electronic documentation

Floating license

**6ES7820-0CC04-0YA5**

Software Update Service (requires current software version)<sup>1)</sup>

**6ES7820-0CC01-0YX2**

Upgrade to V3.0, floating license

**6ES7820-0CC04-0YE5**

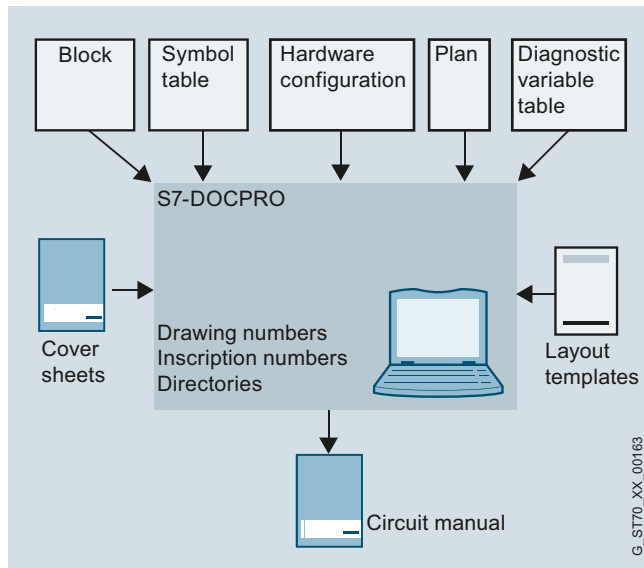
<sup>1)</sup> For more information on the Software Update Service, see page 11/3.

## Software for SIMATIC controllers

Options for programming and design

### DOCPRO

#### Overview



- For creating and managing plant documentation
- Permits structuring of project data, the preparation in the form of wiring manuals, and the printout in a unified print image.
- For use in SIMATIC S7-300, S7-400 and C7

#### Technical specifications

Engineering Tool	DOCPRO
Type of license	Floating license
Software class	A
Current version	V5.4
Target system (recommended)	SIMATIC S7-300/400 SIMATIC C7
Operating system	Windows XP Professional Windows 7 Ultimate/Professional from DOCPRO V5.4 SP1
Required software packages	STEP 7, V5.4 and higher; for operation under Windows 7 STEP 7, V5.5 and higher
Disk space required in PG/PC	5 MB

#### Ordering data

#### Article No.

##### DOCPRO, Version 5.4

**Task:**  
Creation of circuit manuals for plant documentation management

**Target system:**  
SIMATIC S7-300, SIMATIC S7-400, SIMATIC C7

**Requirement:**  
from STEP 7 V5.4

**Delivery package:**  
on CD; German, English, French, Spanish, Italian; incl. authorization diskette, with electronic documentation

Floating license

**6ES7803-0CC03-0YA5**

Software Update Service (requires current software version)<sup>1)</sup>

**6ES7803-0CA01-0YX2**

Floating license upgrade to V5.4

**6ES7803-0CC03-0YE5**

##### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

##### SIMATIC Manual Collection update service for 1 year

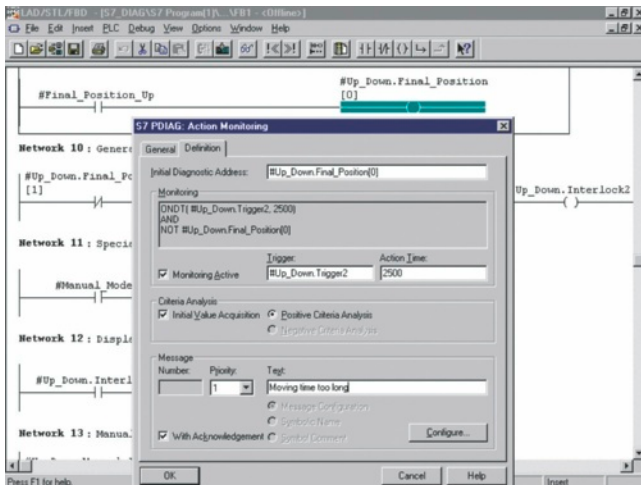
**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

<sup>1)</sup> For more information on the Software Update Service, see page 11/3.



## Overview



- For configuration of process diagnostics with SIMATIC S7
- Increases the availability of machines and production plants and supports with fault analysis and elimination on site
- For use on the SIMATIC S7-300, S7-400

## Technical specifications

Engineering Tool	S7-PDIAG
Type of license	Floating license
Software class	A
Current version	V5.3
Target system (recommended)	SIMATIC S7-300 (CPU 314 or higher) SIMATIC S7-400
Operating system	Windows XP Professional Windows 7 Ultimate/Professional
Required software packages	STEP 7 V5.4 or higher
Disk space required in PG/PC	6 MB

## Ordering data

## Article No.

### S7-PDIAG, Version 5.3

Task:  
Configuring of process diagnostics for LAD/FBD/STL

Target system:  
SIMATIC S7-300 (CPU 314 and higher); SIMATIC S7-400

Requirement:  
STEP 7 V5.4 or higher

Type of delivery:  
on CD; German, English, French, Spanish, Italian; incl. authorization diskette, with electronic documentation

Floating license

**6ES7840-0CC04-0YA5**

Software Update Service (requires current software version)<sup>1)</sup>

**6ES7840-0CA01-0YX2**

Upgrade to V5.3

**6ES7840-0CC04-0YE5**

### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD and the three subsequent updates

<sup>1)</sup> For more information on the Software Update Service, see page 11/3.

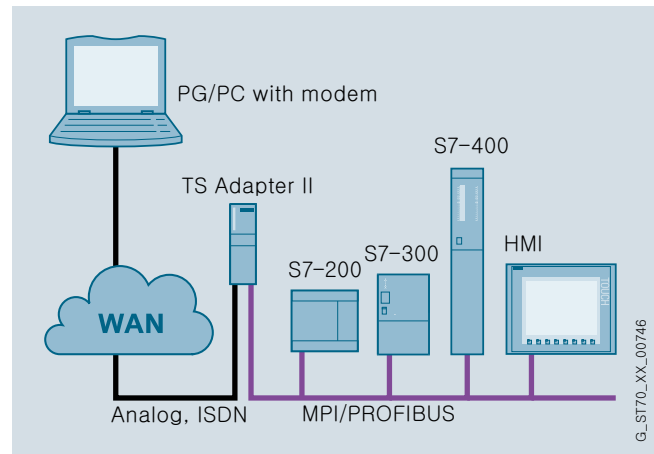
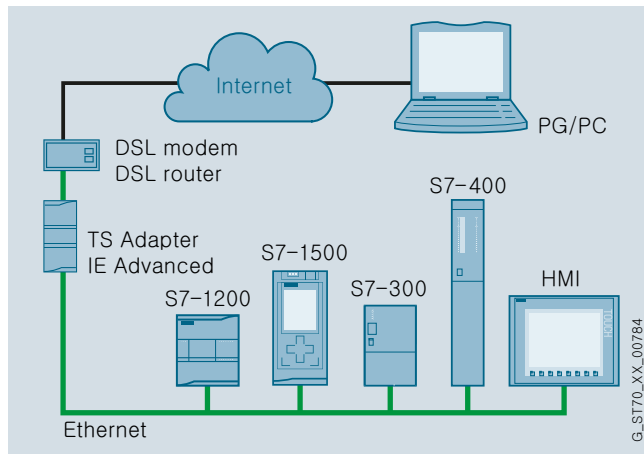


## Software for SIMATIC controllers

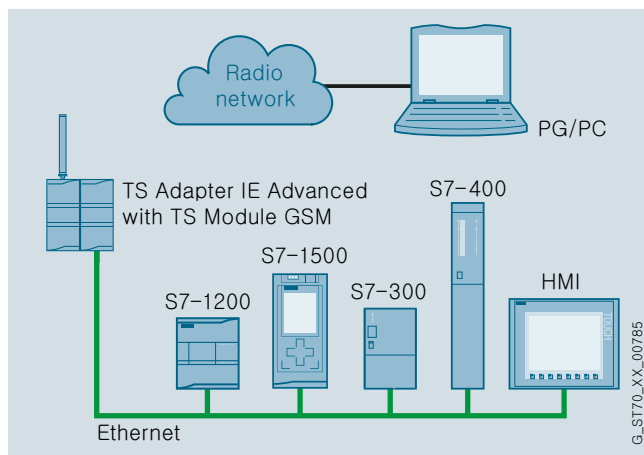
Options for diagnostics and service

### TeleService

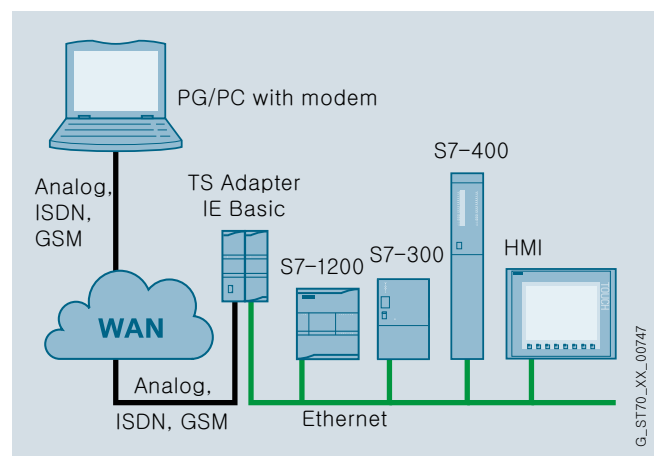
#### Overview



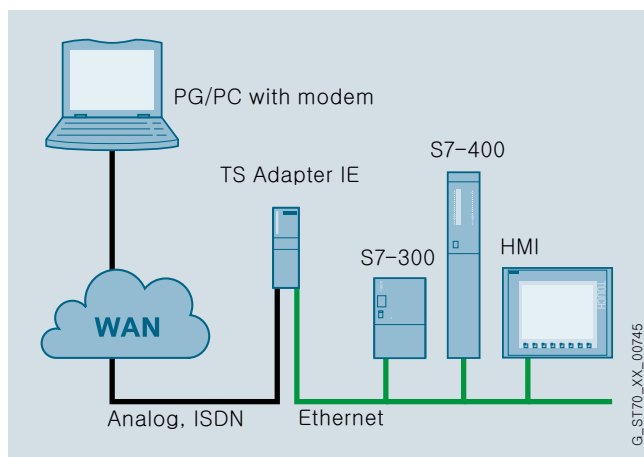
Teleservice with TS Adapter II



Teleservice with TS Adapter IE Advanced



Teleservice with TS Adapter IE Basic



Teleservice with TS Adapter IE

- For performing remote maintenance:  
A programming device/PC with an engineering tool such as STEP 7, or the TIA Portal can access automation components (e.g. S7 CPUs) which are connected to the appropriate adapters over Industrial Ethernet or PROFIBUS.
- Comprising the TeleService software and various adapters:
  - TS Adapter II for connection to PPI, MPI or PROFIBUS DP
  - TS Adapter IE, TS Adapter IE Basic or TS Adapter IE Advanced for connection to Industrial Ethernet
- Additional functions with TS Adapter II:
  - Establishing a connection from/to remote plants, e.g. for calling up process data from an automation system (PG-to-AS remote coupling).
  - Exchanging data between plants (AS-to-AS remote coupling):  
Exchange of process data between two SIMATIC automation systems.
  - Sending a **text message**:  
Sending a text message from a SIMATIC automation system via a GSM wireless modem.

### Overview (continued)

- Additional functions with TS Adapter IE:
  - Remote operation of HMI devices:  
Access to the HMI device via an Internet browser installed on the adapter
  - Sending e-mails:  
Establishing a modem link to a dial-up server (e.g. to an Internet service provider): A SIMATIC CPU can send e-mails over an e-mail server that can be accessed in this manner.
  - Standard routing:  
A modem link can be established to an Internet service provider for accessing data on the Internet.
- Additional functions with TS Adapter IE Advanced:
  - Remote connection via the Internet

### Technical specifications

	TS Adapter II
Dimensions (W x H x D) in mm	125 x 110 x 40
Weight, approx.	250 g
Interfaces	
• to S7/C7	RS 485 (up to 12 Mbit/s)
• to the PC	USB 1.1 (12 Mbit/s)
• to an external modem	RS 232 (up to 115 kbaud)
• to the analog telephone network	RJ12
• to the ISDN telephone network	RJ45
Supply voltage, external or via MPI interface	24 V DC
Current consumption	60 mA (typ.) / 120 mA (max.)
Switch-on current, max.	0.7 A; 8 µs
Degree of protection	IP20
Temperature	
• Operation	± 0 °C to +60 °C
• Storage/transport	-40 °C to +70 °C
	TS Adapter IE
Dimensions (W x H x D) in mm	125 x 110 x 40
Weight, approx.	approx. 370 g
Interfaces	
• Ethernet	RJ45 (10/100 Mbit/s)
• to an external modem	RS 232 (up to 115 kbaud)
• to the analog telephone network	RJ12
• to the ISDN telephone network	RJ45
Supply voltage, external or via MPI interface	24 V DC
Current consumption of the TSA-IE ISDN	typ. 170 mA / max. 230 mA
Current consumption of the modem TSA IE	typ. 180 mA (typ.) / max. 240 mA
Switch-on current, max.	0.7 A; 8 µs
Degree of protection	IP20
Temperature	
• Operation	± 0 °C to +60 °C
• Storage/transport	-40 °C to +70 °C

	TS Adapter IE Basic (basic unit)
Dimensions (W x H x D) in mm	30 x 100 x 75
Weight, approx.	100 g
Interfaces	
• Ethernet	RJ45 (10/100 Mbit/s)
• To the TS module	Proprietary (can only be used for TS modules)
Supply voltage, external	24 V DC
Current consumption	
• With TS module modem	typ. 50 mA, max. 80 mA
• with TS module ISDN	typ. 50 mA, max. 80 mA
• with TS module RS232	typ. 40 mA, max. 60 mA
• with TS module GSM	typ. 100 mA, max. 180 mA
Switch-on current, max.	240 mA
Degree of protection	IP20
Temperature	
• Operation	±0 °C to +60 °C (horizontal installation) ±0 °C to +40 °C (vertical installation)
• Storage	-40 °C to +70 °C

	TS module modem
Dimensions (W x H x D) in mm, approximately	30 x 100 x 75
Weight, approx.	98 g
ITU transmission standards	• V.21, V.22, V.22bis, V.23, V.32, V.32bis, V.34, V.34x, K56flex, V.90, V.92
Other features	• Error correction and data compression • a/b interface • Hayes (AT) command set • All data formats • Dial procedures: dual-tone multiple-frequency (DTMF), pulse dialing

	TS module ISDN
Dimensions (W x H x D) in mm	30 x 100 x 75
Weight, approx.	92 g
Reports	
• D channel protocols	DSS1 (Euro-ISDN), 1TR6
• B channel protocols	V.110 (9600 bit/s, 19200 bit/s, 38400 bit/s) V.120 (64 Kbit/s) X.75 (64 Kbit/s)
Other features	• Multiple subscriber number (MSN) • AT command interpreter

	TS module RS232
Dimensions (W x H x D) in mm	30 x 100 x 75
Weight, approx.	100 g
Operating mode	Full duplex, asynchronous
Signals	TXD, RXD, DSR, CTS, RTS, DTR, DCD
Data transmission rate	2 400 ... 115 200 bit/s
Message frame	8 data bits (LSB first), no parity bit, 1 stop bit
Rule	according to RS232 standard
Connector	D-sub 9-pin, male (PC COMx)

## Software for SIMATIC controllers

### Options for diagnostics and service

#### TeleService

#### Technical specifications (continued)

<b>TS module GSM</b>	
Dimensions (W x H x D) in mm	30 x 100 x 75
Weight, approx.	118 g
Transmission rate	
• GPRS Multislot Class 10	
- Up to 2 uplinks	13.4 Kbit/s ... 27 Kbit/s upload gross
- Up to 4 downlinks	40 Kbit/s ... 54 Kbit/s download gross
Interfaces	
• SIM interface	3 V/1.8 V
• Antenna connection	1 x SMA antenna socket (50 Ohm)
Frequency ranges	Quad band: 850, 900, 1800, 1900 MHz
Transmitted output power	2 W at 850 MHz, 900 MHz 1 W at 1800 MHz, 1900 MHz
<b>TS Adapter IE Advanced</b>	
<b>General information</b>	
<u>Engineering with</u>	
STEP 7 TIA Portal can be configured/ integrated as of version	V12 SP1
<u>Installation</u>	
Rail mounting possible	Yes
Wall/direct mounting possible	Yes
<u>Supply voltage</u>	
24 V DC	Yes
Permissible range	+19.2 V ... +28.8 V
<u>Input current</u>	
Current consumption, typ.	100 mA
Current consumption, max.	200 mA; incl. TS module GSM
Switch-on current, max.	4.3 A
Activation time, max.	3.1 ms
<u>Power loss</u>	
Power loss, typ.	2.4 W
<b>Interfaces</b>	
<u>Industrial Ethernet</u>	
Industrial Ethernet interface	3x Ethernet (RJ45), 100 Mbit
<b>Interrupts/diagnostics/ status information</b>	
Diagnostics display LED	RUN LED, ERROR LED, MAINT LED, LINK LED, ONLINE LED, VPN LED, RX/TX LED
<b>Insulation</b>	
Insulation tested at	707 V DC (type test)
<b>Dimensions</b>	
W x H x D	55 x 117 x 75 mm
<b>Weight</b>	
Weight, approx.	225 g

#### Ordering data

#### Article No.

##### TeleService, Version 6.1

**Task:**  
Remote maintenance by means of  
wired or radio network

**Target system:**  
SIMATIC S7-200, SIMATIC S7-300,  
SIMATIC S7-400, SIMATIC C7

**Requirement:**  
TS Adapter (STEP 7 not required)

**Delivery package:**  
on CD, German, English, French,  
Spanish, Italian; with electronic  
documentation

Floating license

**6ES7842-0CE00-0YE0**

Floating license Upgrade  
(from each previous version)

**6ES7842-0CE00-0YE4**

Software Update Service  
(requires current software version)<sup>1)</sup>

**6ES7842-0CA01-0YX2**

##### TS Adapter II modem

**6ES7972-0CB35-0XA0**

with MPI connection and RS 232;  
9-pin, male

##### TS Adapter II ISDN

**6ES7972-0CC35-0XA0**

with MPI connection and RS 232;  
9-pin, male

##### TS Adapter IE modem

**6ES7972-0EM00-0XA0**

with Ethernet connection RJ45  
(10/100 Mbit/s) and RS 232;  
9-pin, male

##### TS Adapter IE ISDN

**6ES7972-0ED00-0XA0**

with Ethernet connection RJ45  
(10/100 Mbit/s) and RS 232;  
9-pin, male

##### USB cable

**6ES7901-0AE00-0XA0**

for parameterizing the  
TS Adapter II,  
it can also be used for  
programming the connected  
devices.  
5 m long

##### TS Adapter IE Basic

**6ES7972-0EB00-0XA0**

Basic unit

##### TS module modem

**6ES7972-0MM00-0XA0**

##### TS module ISDN

**6ES7972-0MD00-0XA0**

##### TS module RS232

**6ES7972-0MS00-0XA0**

##### TS module GSM

**6GK7972-0MG00-0XA0**

##### TS Adapter IE Advanced

**6ES7972-0EA00-0XA0**

for accessing automation  
components via the Internet  
(GSM, DLS, WAN)

##### S7 mounting rail adapter

**6ES7972-0SE00-7AA0**

for mounting the  
TS Adapter IE Basic on S7-300  
mounting rail, width 60 mm

##### SIMATIC Manual Collection

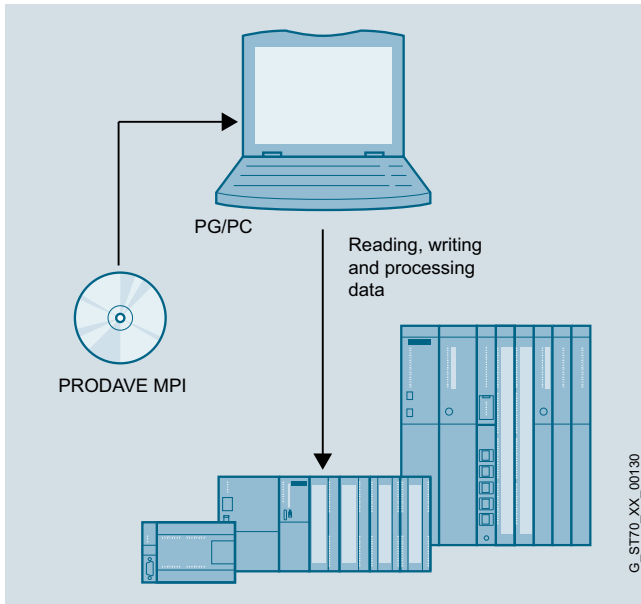
**6ES7998-8XC01-8YE0**

##### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

<sup>1)</sup> For more information on the Software Update Service, see page 11/3.

## Overview



- The toolbox for exchange of process data between SIMATIC S7, SIMATIC C7 and a PG/PC
- For autonomous handling of data traffic over MPI/PPI, PROFIBUS and Industrial Ethernet

## Technical specifications

Parameterization software	PRODAVE
Type of license	Simple license, copy license
Software class	A
Current version	V6.2
Target system	SIMATIC S7-200 SIMATIC S7-300 SIMATIC S7-400 SIMATIC C7
Operating system	Windows XP Professional, Windows 7 Professional and Ultimate (32 and 64-bit in each case)
Required software packages	-
Main memory configuration in target system	8 MB on PG/PC
Disk space required in PG/PC	2 MB
<b>Standard FBs</b>	
Required libraries	-

## Ordering data

## Article No.

### PRODAVE MPI/IE V6.2 for Windows XP Professional, Windows 7 Professional and Ultimate (32 and 64-bit in each case)

#### Task:

Data link between PG/PC and SIMATIC S7/C7 via MPI (S7-200 via PPI) or Industrial Ethernet

#### Requirements:

Windows XP Professional, Windows 7 Professional and Ultimate (32 and 64-bit in each case); CP 5611, integrated MPI or PC adapter

#### Delivery package:

CD incl. electr. documentation (German, English)

Single license

**6ES7807-4BA03-0YA0**

Copy license, without software and documentation

**6ES7807-4BA03-0YA1**

### PRODAVE MPI Mini V6.0 for Windows 95/98/ME/NT 4.0/2000 Prof./XP Prof.

#### Task:

Data link between PG/PC and SIMATIC S7/C7 via MPI (S7-200 via PPI); with reduced functional scope)

#### Requirements:

Windows 95/98/ME/NT 4.0/2000 Prof./XP Prof.; CP 5611, integrated MPI or PC adapter

#### Delivery package:

CD incl. electr. documentation (German, English)

Single license

**6ES7807-3BA01-0YA0**

Copy license, without software and documentation

**6ES7807-3BA01-0YA1**

### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

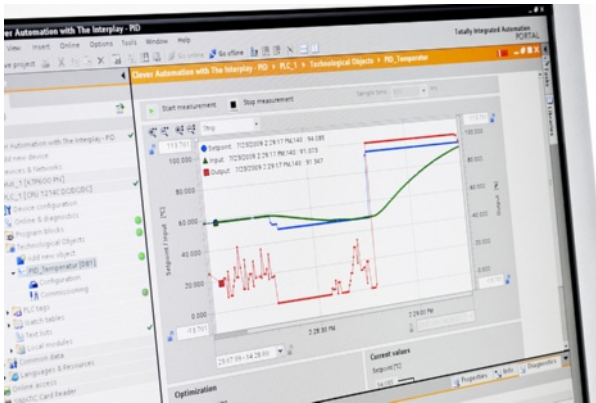
Current "Manual Collection" DVD and the three subsequent updates

## Software for SIMATIC controllers

Options for engineering and drive technology

### PID Professional (TIA Portal)

#### Overview



- PID Professional combines the two option packages Modular PID Control and Standard PID Control in the TIA Portal.
- Permits the simple integration of continuous PID controllers, pulse controllers and step controllers in the application program
- Can be used for simple to complex closed-loop control tasks in SIMATIC S7-300 (CPU 313 or higher), S7-400, and WinAC.
- The engineering software for PID Professional is already included in the STEP 7 package in V13 or higher.
- Tuning functionality by means of PID Self-Tuner (part of STEP 7 as of V11 SP1).
- Reduces engineering costs thanks to time-saving parameterization and optimization of the controller

#### Ordering data

#### Article No.

##### PID Professional for TIA Portal

Task:

Function blocks and editors for PID controllers

Requirement:

STEP 7 V13 or higher

Delivery package:

Licenses on USB flash drive / downloadable

Floating license for the engineering and single license for runtime

**6ES7860-1XA02-0XA5**

Upgrade license from Standard PID Control or Modular PID Control V5.1 to PID Professional for TIA Portal

**6ES7860-1XA02-0XE5**

Single license (certificate of license) for runtime; per CPU (all versions)

**6ES7860-1XA01-0XB0**

Floating license for the engineering; download (e-mail address required for delivery)<sup>1)</sup>

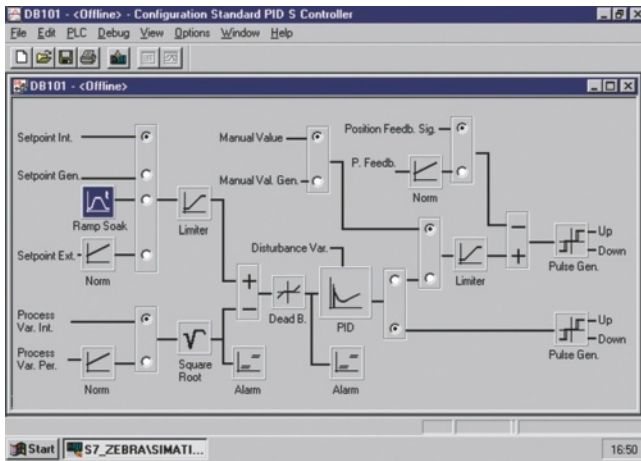
**6ES7860-1XA01-0XH5**

Upgrade from Standard PID Control or Modular PID Control V5.1 to PID Professional for TIA Portal; download (e-mail address required for delivery)<sup>1)</sup>

**6ES7860-1XA01-0XK5**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Overview



- For integrating continuous PID controllers, pulse controllers and step controllers in the application program
- Reduces engineering costs thanks to time-saving parameterization and optimization of the controller
- For use in SIMATIC S7-300 (CPU 313 or higher), S7-400 and WinAC

## Technical specifications

Parameterization software	Standard PID Control					
Type of license	Single license					
Software class	A					
Current version	V 5.2					
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7					
Required software packages	STEP 7 V5.3 SP2 or higher					
Main memory configuration in PG/PC	16 MB					
Disk space required in PG/PC	1.85 MB					
Standard function blocks	PID_CP (FB 1)		PID_ES (FB 2)		LP_SCHED (FC 1)	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	8956 bytes	7796 bytes	9104 bytes	7982 bytes	1064 bytes	976 bytes
• DB length in the memory	1168 bytes	510 bytes	1124 bytes	484 bytes	184 bytes <sup>2)</sup>	100 bytes <sup>2)</sup>
Runtimes						
• In S7-300 <sup>1)</sup>	0.18 - 4.4 ms		0.2 - 5.1 ms		0.03 - 0.3 ms	
• In S7-400 <sup>1)</sup>	0.13 - 0.35 ms		0.16 - 0.35 ms		0.03 - 0.08 ms	
Required libraries	Standard PID Control FBs					
Licensing forms	Simple license and 1 runtime license; 1 runtime license					
Software class	A					
Current version	V 5.2					
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7					
Required software packages	STEP 7 V5.3 SP2 or higher					
Main memory configuration in PG/PC	16 MB					
Disk space required in PG/PC	1.85 MB					

<sup>1)</sup> Depending on the CPU

<sup>2)</sup> With 5 control loops

## Software for SIMATIC controllers

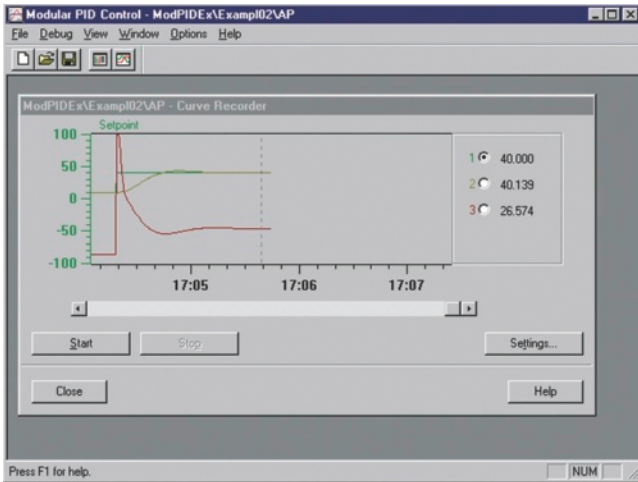
Options for engineering and drive technology

### Standard PID Control

Ordering data	Article No.		Article No.
<b>Standard PID Control parameterization tool, V5.2</b> Task: Parameterization tool for standard closed-loop controls Requirement: STEP 7, V5.3 SP2 or higher Delivery package: With electronic manual/Getting Started English, German; incl. authorization diskette  Floating license Upgrade license from V5.x to V5.2			
	<b>6ES7830-2AA22-0YX0</b>		
	<b>6ES7830-2AA22-0YX4</b>		
<b>Standard function blocks for Standard PID Control, V5.2</b> Task: Standard FBs for standard closed-loop controls Target system: SIMATIC S7-300 (CPU 313 or higher), S7-400 Type of delivery: With electronic manual/Getting Started English, German  Single license Single license without software and documentation			
	<b>6ES7860-2AA21-0YX0</b>		
	<b>6ES7860-2AA21-0YX1</b>		
		<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
		<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>

<sup>1)</sup> For more information on the Software Update Service, see page 11/3.

### Overview



- For creating complex closed-loop control structures
- Preferred for implementation in closed-loop control equipment in mid-range and high-end applications and in process engineering
- For use in SIMATIC S7-300 (CPU 313 or higher), S7-400 and WinAC

### Technical specifications

Parameterization software	Modular PID Control
Type of license	Single license
Software class	A
Current version	V 5.1
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7

Parameterization software	Modular PID Control
Required software packages	STEP 7 V5.3 SP2 or higher
Main memory configuration in PG/PC	16 MB
Disk space required in PG/PC	1.85 MB
Processor, at least	486
Windows swap area, approx.	20 MB (max. possible)

Standard function blocks	A_DEAD_B		CRP_IN		CRP_OUT	
	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
Storage space requirements						
• FB length in the memory	898 bytes	692 bytes	182 bytes	70 bytes	206 bytes	96 bytes
• DB length in the memory	186 bytes	44 bytes	122 bytes	20 bytes	114 bytes	14 bytes
Runtimes in S7-300	0.13 to 0.17 ms		0.06 ms		0.18 to 0.22 ms	
Runtimes in S7-400	0.01 to 0.03 ms		0.01 to 0.02 m		0.01 to 0.04 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	DEAD_T		DEAD_BAND		DIF	
	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
Storage space requirements						
• FB length in the memory	532 bytes	394 bytes	232 bytes	120 bytes	410 bytes	268 bytes
• DB length in the memory	142 bytes	22 bytes	114 bytes	16 bytes	158 bytes	30 bytes
Runtimes in S7-300	0.26 to 0.33 ms		0.16 to 0.21 ms		0.55 to 0.71 ms	
Runtimes in S7-400	0.02 to 0.06 m		0.01 to 0.03 ms		0.03 to 0.09 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	ERR_MON		INTEG		LAG1ST	
	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
Storage space requirements						
• FB length in the memory	558 bytes	360 bytes	488 bytes	314 bytes	534 bytes	368 bytes
• DB length in the memory	206 bytes	52 bytes	168 bytes	36 bytes	156 bytes	30 bytes
Runtimes in S7-300	0.27 to 0.35 ms		0.40 to 0.51 ms		0.52 to 0.67 ms	
Runtimes in S7-400	0.01 to 0.05 ms		0.02 to 0.07 ms		0.03 to 0.09 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	



## Software for SIMATIC controllers

### Options for engineering and drive technology

#### Modular PID Control

##### Technical specifications (continued)

Standard function blocks	LAG2ND		LIMALARM		LIMITER	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	690 bytes	516 bytes	390 bytes	240 bytes	262 bytes	140 bytes
• DB length in the memory	190 bytes	46 bytes	152 bytes	28 bytes	124 bytes	20 bytes
Runtimes in S7-300	0.88 to 1.14 ms		0.47 to 0.61 ms		0.14 to 0.17 ms	
Runtimes in S7-400	0.04 to 0.16 ms		0.02 to 0.07 ms		0.03 to 0.01 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	
Standard function blocks	LMNGEN_C		LMNGEN_S		NONLIN	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	1576 bytes	1280 bytes	2578 bytes	2152 bytes	826 bytes	672 bytes
• DB length in the memory	276 bytes	80 bytes	360 bytes	110 bytes	138 bytes	18 bytes
Runtimes in S7-300	0.32 to 0.41 ms		1.16 to 1.47 ms		0.32 to 0.41 ms	
Runtimes in S7-400	0.02 to 0.06 ms		0.06 to 0.18 ms		0.02 to 0.07 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	
Standard function blocks	NORM		OVERRIDE		PARA_CTL	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	234 bytes	122 bytes	362 bytes	214 bytes	406 bytes	232 bytes
• DB length in the memory	130 bytes	24 bytes	146 bytes	28 bytes	234 bytes	82 bytes
Runtimes in S7-300	0.33 to 0.43 ms		0.15 to 0.18 ms		0.12 to 0.15 ms	
Runtimes in S7-400	0.02 to 0.07 ms		0.01 to 0.04 ms		0.01 to 0.03 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	
Standard function blocks	PID		PULSEGEN		RMP_SOAK	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	1560 bytes	1242 bytes	1110 bytes	872 bytes	1706 bytes	1500 bytes
• DB length in the memory	340 bytes	98 bytes	190 bytes	34 bytes	212 bytes	62 bytes
Runtimes in S7-300	1.15 to 1.46 ms		0.17 to 0.20 ms		0.16 to 0.20 ms	
Runtimes in S7-400	0.06 to 0.18 ms		0.01 to 0.05 ms		0.01 to 0.04 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	
Standard function blocks	ROC_LIM		SCALE		SP_GEN	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	1242 bytes	980 bytes	136 bytes	32 bytes	658 bytes	484 bytes
• DB length in the memory	222 bytes	50 bytes	114 bytes	16 bytes	164 bytes	40 bytes
Runtimes in S7-300	0.53 to 0.68 ms		0.10 to 0.13 ms		0.27 to 0.35 ms	
Runtimes in S7-400	0.02 to 0.09 ms		0.01 to 0.02 ms		0.02 to 0.06 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

### Technical specifications (continued)

Standard function blocks	SPLT_RAN		SWITCH		LP_SCHED	
	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
Storage space requirements						
• FB length in the memory	304 bytes	180 bytes	238 bytes	116 bytes	1104 bytes	972 bytes <sup>1)</sup>
• DB length in the memory	138 bytes	28 bytes	118 bytes	18 bytes	234 bytes	64 bytes <sup>1)</sup>
Runtimes in S7-300	0.09 to 0.11 ms		0.07 to 0.09 ms		0.28 to 0.34 ms	
Runtimes in S7-400	0.01 to 0.02 ms		0.01 to 0.03 ms		0.03 to 0.08 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

<sup>1)</sup> With 5 control loops

	Standard FBs in general
Required libraries	Modular PID Control FBs
Licensing forms	Simple license and 1 runtime license; 1 runtime license
Software class	A

	Standard FBs in general
Current version	V 5.1
Required software packages	STEP 7 V5.3 SP2 or higher
Main memory configuration in PG/PC	16 MB
Disk space required in PG/PC	1.85 MB

### Ordering data

#### Modular PID Control commissioning tool, V5.1 for SIMATIC S7 and WinAC

**Task:**  
Commissioning tool for modular PID controllers

**Requirement:**  
STEP 7, V5.3 SP2 or higher

**Delivery package:**  
With electronic manual, English, German; incl. authorization diskette

Floating license

**6ES7830-1AA11-0YX0**

Upgrade license from V5.0 to V5.1

**6ES7830-1AA11-0YX4**

#### Standard function blocks for Modular PID Control, V5.1

**Task:**  
Standard FBs for modular PID controllers

**Target system:**  
SIMATIC S7-300 (CPU 313 or higher), S7-400, WinAC

**Type of delivery:**  
English, German; with electronic manual

Single license

**6ES7860-1AA10-0YX0**

Single license, without software and documentation

**6ES7860-1AA10-0YX1**

### Article No.

#### SIMATIC Manual Collection

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**6ES7998-8XC01-8YE0**

#### SIMATIC Manual Collection update service for 1 year

Current "Manual Collection" DVD and the three subsequent updates

**6ES7998-8XC01-8YE2**

<sup>1)</sup> For more information on the Software Update Service, see page 11/3.

## Software for SIMATIC controllers

Options for engineering and drive technology

### PID Self-Tuner

#### Overview

- PID Self-Tuner: For expanding existing PID controllers to create self-tuning PI or PID controllers.
- Optimization of PI or PID controllers with 3-step action (HEATING – OFF – COOLING)
- Convenient online initial setting and online adaptation during operation
- Ideally applicable to temperature controllers, but also suitable for level and flow controllers
- Can be used with SIMATIC S7-300 (CPU 313 or higher), SIMATIC S7-400 and WinAC; in combination with PID control (integrated in STEP 7), Standard PID Control, Modular PID Control, FM 355, FM 455 as well as with any PID algorithm

#### Technical specifications

Parameterization software	PID Self-Tuner			
Type of license	-			
Software class	-			
Current version	-			
Target system	-			
Operating system	-			
Required software packages	-			
Main memory configuration in PG/PC	-			
Disk space required in PG/PC	-			
<b>Standard FBs</b>	-			
<b>PID Self-Tuner</b>	<b>TUN_EC</b>		<b>TUN_ES</b>	
Storage space requirements	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	approx. 6542 bytes	approx. 5956 bytes	6332 bytes	5714 bytes
• DB length in the memory	644 bytes	294 bytes	638 bytes	288 bytes
Runtimes				
• In S7-300	1.0 ms to 1.5 ms <sup>1)</sup>		1.0 ms to 1.5 ms <sup>1)</sup>	
• In S7-400	0.06 ms to 0.19 ms <sup>1)</sup>		0.06 ms to 0.19 ms <sup>1)</sup>	
Required libraries	PID Self-Tuner FBs V5.0			
Licensing forms	-			
Software class	A			
Current version	V5.0			
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7-620			
Required software packages	STEP 7 V3.2 or higher			
Main memory configuration in PG/PC	-			
Disk space required in PG/PC	-			

<sup>1)</sup> Depending on the CPU selected

#### Ordering data

##### PID Self Tuner V5.1

**Task:**  
Online optimization for PID controller

**PLC:**  
SIMATIC S7-300 (CPU 313 or higher), S7-400, WinAC

**Type of delivery:**  
Standard function blocks, electronic manual and Getting Started (German/English);

Single license

Single license, without software and documentation

#### Article No.

6ES7860-4AA01-0YX0

6ES7860-4AA01-0YX1

#### Article No.

##### SIMATIC Manual Collection

Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

##### SIMATIC Manual Collection update service for 1 year

Current "Manual Collection" DVD and the three subsequent updates

6ES7998-8XC01-8YE0

6ES7998-8XC01-8YE2

### Overview

- Option package for creating motion control tasks for CPU 31xT-2 DP and CPU 317TF-2 DP
- Optimal embedding in the automation world thanks to total integration in the STEP 7 tools
- Programming in the standard SIMATIC programming languages LAD, FBD and STL
- Additional Engineering Tools such as S7-SCL or S7-GRAPH can be used

### Ordering data

### Article No.

#### S7-Technology V4.2

##### Task:

Option package for configuring and programming technology tasks with the SIMATIC S7 CPU 31xT-2 DP and SIMATIC S7 CPU 317TF-2 DP

##### Requirement:

STEP 7 V5.5 SP2 and higher

##### Delivery form:

On DVD; incl. documentation for CPU 31xT-2 DP, CPU 317TF-2 DP (also on DVD)

Floating license

**6ES7864-1CC42-0YA5**

Floating license for 1 user, license key download without software or documentation<sup>1)</sup>;

e-mail address required for delivery

**6ES7864-1CC42-0XH5**

Upgrade to V4.2

**6ES7864-1CC42-0YE5**

Trial license

**6ES7864-1CC42-0YA7**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Software for SIMATIC controllers

Options for engineering and drive technology

### Easy Motion Control

#### Overview



- Low-priced package for simple, controlled positioning and simple geared synchronous motion
- For use with any standard variable-speed drive, such as frequency converter or servo drive
- For incremental and absolute encoders

#### Technical specifications

##### Supported hardware:

Easy Motion Control is runnable on the following CPUs:

- S7-300.
- S7-400.
- WinAC.
- ET 200S.
- ET 200pro.

Supported modules for the measuring of actual values:

- CPU 314C (FW version 2.0 of the CPU or higher).
- ET 200S 1 Count 5V/500 kHz.
- ET 200S 1 Count 24V/100kHz.
- ET 200S 1SSI.
- SM 338.
- FM 350-1, FM 450-1.
- SIMODRIVE sensor with PROFIBUS DP.
- IM 174.
- Other modules for measuring actual values (using free driver).

Supported modules for setpoint output:

- ET 200S 2AO U.
- SM 332.
- SM 432.
- IM 174.
- Other modules for setpoint output (using free driver).

Supported drives using PROFIBUS DP:

- Micromaster 4.
- SINAMICS G120.
- SINAMICS S120.

#### Storage space requirements

##### Required main storage in byte

Block	Required main storage per block	Additional main storage required per instance
MC_Init	1086	-
MC_MoveAbsolute	3924	112
MC_MoveRelative	2982	110
MC_MoveJog	3110	110
MC_Home	2886	104
MC_StopMotion	1114	70
MC_Control	1756	58
MC_Simulation	410	64
MC_GearIn	3476	128
Input driver	1416 ... 2654	76 ... 128
Output driver	384 ... 1242	52 ... 68
Axis data block	-	294

#### Ordering data

#### Article No.

##### Easy Motion Control V2.1

Requirement:  
STEP 7 V5.3 SP2  
Type of delivery:  
Software and documentation in  
6 languages on CD

Floating license **6ES7864-0AC01-0YX0**

##### Easy Motion Control for TIA Portal

Requirement:  
STEP 7 V12 SP1 and higher  
Type of delivery:  
Software and documentation in  
6 languages on CD

Floating license and single license (Runtime) **6ES7864-2XA02-0XA5**

Floating license for downloading by e-mail, valid for V11 or higher (e-mail address required for delivery<sup>1)</sup>) **6ES7864-2XA01-0XH5**

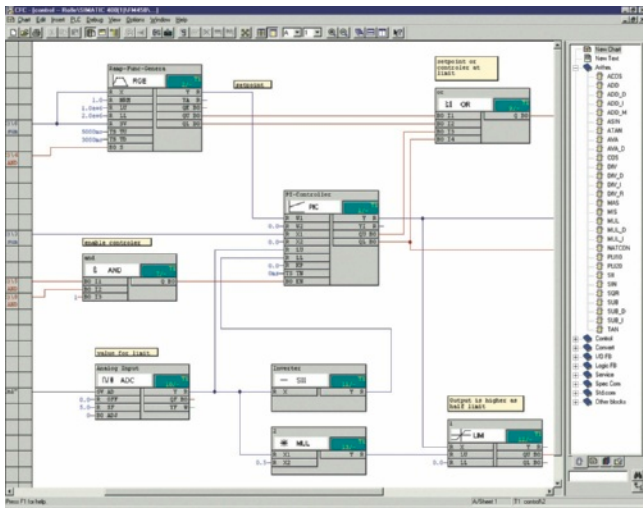
##### Easy Motion Control Runtime License

Type of delivery:  
CoL for one runtime single license (valid for Easy Motion Control V2.x and V11 or higher), without software or documentation

**6ES7864-0AF01-0YX0**

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

## Overview



- Add-on for STEP 7/CFC/SFC for configuration of control and automation tasks with T400, FM 458, SIMADYN D or SIMATIC TDC
- Contains function blocks for every application
- Scope of delivery:  
Software packages D7-SYS, CFC, SFC, TH-PO
- Optional:  
D7-FB-Gen, function block generator for the creation of customized function blocks

## Ordering data

## Article No.

### SIMATIC D7-SYS V8.0

#### Task:

Function block library for configuring closed-loop control and automation tasks

#### Target system:

SIMATIC S7-400/FM 458/  
SIMATIC TDC/T400/SIMADYN

#### Requirement:

Windows XP, Windows 7 32/64-bit,  
Windows Server 2003/2008

#### Type of delivery:

On CD, German, English,  
with electronic documentation

Floating license

**6ES7852-0CC03-0YA5**

Upgrade license V7.x and higher

**6ES7852-0CC03-0YE5**

Software Update Service<sup>1)</sup>

**6ES7852-0CC01-0YL5**

### SIMATIC D7 FB Gen V2.1

**6DD1805-5DA0**

Function block generator

### SIMATIC Manual Collection

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD,  
multilingual: LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC Based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC

### SIMATIC Manual Collection update service for 1 year

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD  
and the three subsequent updates

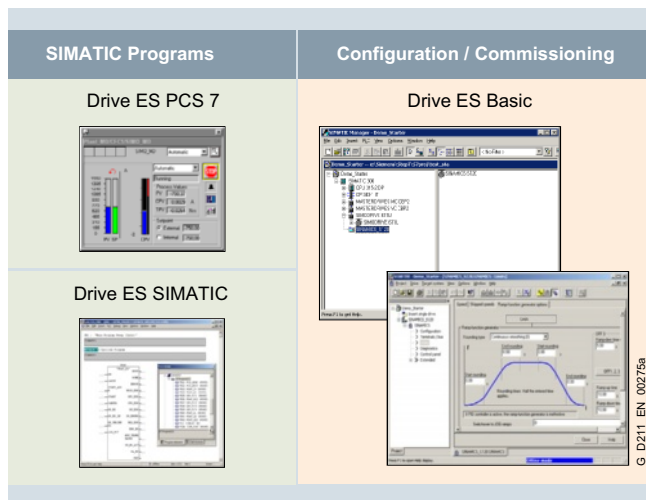
<sup>1)</sup> For more information on the Software Update Service, see page 11/3.

## Software for SIMATIC controllers

Options for engineering and drive technology

### Drive ES engineering software

#### Overview



Drive ES is the engineering system used to integrate the communication, configuration and data management functions of Siemens drive technology into the SIMATIC automation world easily, efficiently and cost-effectively.

It is based on the operator interface of the STEP 7 Manager, the essential element when it comes to engineering.

Various software packages are available for selection:

- Drive ES Basic
- Drive ES SIMATIC
- Drive ES PCS 7

Drive ES (**Drive Engineering Software**) fully integrates drives from Siemens into the world of Totally Integrated Automation.

#### Ordering data

#### Article No.

#### Article No.

##### Drive ES Basic V5.5 SPx <sup>1)</sup>

Configuration software for the integration of drives into TIA (Totally Integrated Automation)  
Precondition: STEP 7 V5.3, SP3 and higher

Supplied as: DVD  
Languages: Eng, Fr, Ger, It, Sp with electronic documentation

- Floating license, 1 user
- Floating license, (copy license), 60 users
- Upgrade from V5.x to V5.5 SPx <sup>1)</sup>

6SW1700-5JA00-5AA0

6SW1700-5JA00-5AA1

6SW1700-5JA00-5AA4

##### Drive ES SIMATIC V5.5 SPx <sup>1)</sup>

Block library for SIMATIC for the parameterization of communication with the drives  
Precondition: STEP 7 V5.3, SP3 and higher

Supplied as: CD-ROM  
Languages: Eng, Fr, Ger, It, Sp with electronic documentation

- Single-user license incl. 1 runtime license
- Runtime license (without data carrier)
- Upgrade from V5.x to V5.5 SPx <sup>1)</sup>

6SW1700-5JC00-5AA0

6SW1700-5JC00-1AC0

6SW1700-5JC00-5AA4

##### Drive ES PCS 7 V7.0 SPx <sup>1)</sup>

Block library for PCS 7 for the integration of drives  
Precondition: PCS 7 V7.0 and higher

Supplied as: CD-ROM  
Languages: Eng, Fr, Ger, It, Sp with electronic documentation

- Single-user license incl. 1 runtime license
- Runtime license (without data carrier)
- Update service for single-user license

6SW1700-7JD00-0AA0

6SW1700-5JD00-1AC0

6SW1700-0JD00-0AB2

##### Drive ES PCS 7 V7.1 SPx <sup>1)</sup>

Block library for PCS 7 for the integration of drives  
Precondition: PCS 7, V7.1 and higher

Supplied as: CD-ROM  
Languages: Eng, Fr, Ger, It, Sp with electronic documentation

- Single-user license incl. 1 runtime license
- Runtime license (without data carrier)
- Update service for single-user license
- Upgrade from V6.x to V7.1 SPx <sup>1)</sup>

6SW1700-7JD00-1AA0

6SW1700-5JD00-1AC0

6SW1700-0JD00-0AB2

6SW1700-7JD00-1AA4

##### Drive ES PCS 7 V8.0 SPx <sup>1)</sup>

Block library for PCS 7 for the integration of drives in Classic Style (as predecessor)  
Precondition: PCS 7 V8.0 and higher

Supplied as: CD-ROM  
Languages: Eng, Fr, Ger, It, Sp with electronic documentation

- Single-user license incl. 1 runtime license
- Runtime license (without data carrier)
- Update service for single-user license
- Upgrade from V6.x to V8.0 SPx <sup>1)</sup>

6SW1700-8JD00-0AA0

6SW1700-5JD00-1AC0

6SW1700-0JD00-0AB2

6SW1700-8JD00-0AA4

##### Drive ES PCS 7 APL V8.0 SPx <sup>1)</sup>

Block library for PCS 7 for the integration of drives in APL Style (Advanced Process Library)  
Precondition: PCS 7 V8.0 and higher

Supplied as: CD-ROM  
Languages: Eng, Fr, Ger, It, Sp with electronic documentation

- Single-user license incl. 1 runtime license
- Runtime license (without data carrier)
- Update service for single-user license
- Upgrade of APL V8.0 to V8.0 SP1 or Drive ES PCS 7 V6.x, V7.x, V8.x classic to Drive ES PCS 7 APL V8.0 SPx <sup>1)</sup>

6SW1700-8JD01-0AA0

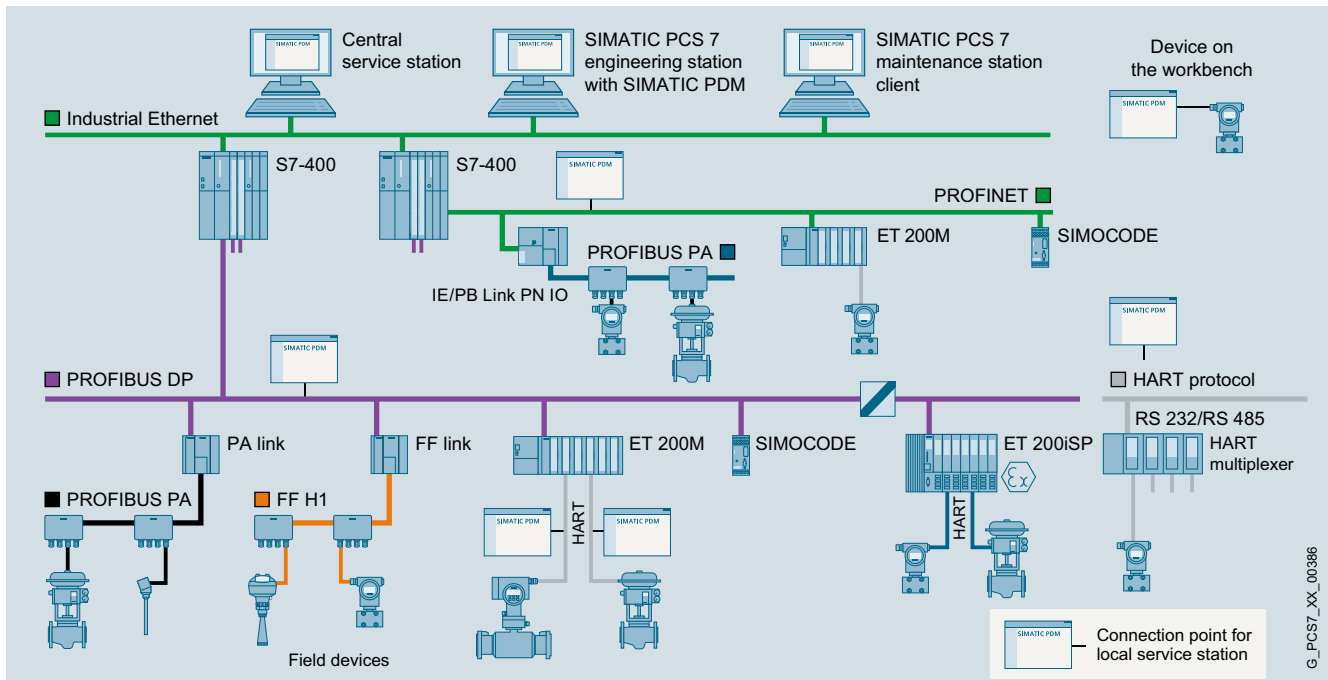
6SW1700-5JD00-1AC0

6SW1700-0JD01-0AB2

6SW1700-8JD01-0AA4

<sup>1)</sup> Orders are automatically supplied with the latest Service Pack (SP).

### Overview



#### Configuration options with SIMATIC PDM

SIMATIC PDM (Process Device Manager) is a universal, vendor-independent tool for the configuration, parameter assignment, commissioning, diagnostics and servicing of intelligent field devices (sensors and actuators) and field components (remote I/Os, multiplexers, control-room devices, compact controllers), which in the following sections will be referred to simply as devices.

Using *one* software, SIMATIC PDM enables the processing of more than 2 500 devices from Siemens and over 200 vendors worldwide on *one* homogeneous user interface.

The user interface satisfies the requirements of the VDI/VDE GMA 2187 and IEC 65/349/CD directives. Parameters and functions for all supported devices are displayed in a consistent and uniform fashion independent of their communications interface. Even complex devices with several hundred parameters can be represented clearly and processed quickly. Using SIMATIC PDM it is very easy to navigate in highly complex stations such as remote I/Os and even connected field devices.

From the viewpoint of device integration, SIMATIC PDM is the most powerful open device manager available in the world. Devices which previously were not supported can be integrated in SIMATIC PDM by importing their device descriptions (EDD). This provides security for your investment and saves you investment costs, training expenses and follow-up costs.

SIMATIC PDM supports the operative system management in particular through:

- Uniform presentation and operation of devices
- Uniform representation of diagnostics information
- Indicators for preventive maintenance and servicing
- Detection of changes in the project and device
- Increasing the operational reliability
- Reducing the investment, operating and maintenance costs

When used in SIMATIC PCS 7, SIMATIC PDM is integrated in the maintenance station of the process control system and transmits parameter data and diagnostics information. You can change directly to the SIMATIC PDM views from the diagnostics faceplates in the Maintenance Station.

As an option, SIMATIC PDM can also be started on any SIMATIC PCS 7 maintenance station client (MS Client) in order to parameterize and diagnose the devices integrated per electronic device description (EDD). In this context, SIMATIC PDM user administration based on SIMATIC Logon allows various roles with defined function privileges to be assigned to users. These function privileges refer to SIMATIC PDM system functions, e.g. writing to the device.

For all devices described per electronic device description (EDD), SIMATIC PDM delivers a range of information for display and further processing on the maintenance station, e.g.:

- Device type information (electronic rating plate)
- Detailed diagnostics information (manufacturer information, information on error diagnostics and troubleshooting, further documentation)
- Results of internal condition monitoring functions
- Status information (e.g. local configuration changes)
- Information on changes (audit trail report)
- Parameter information



## Software for SIMATIC controllers

Software for joint tasks in the maintenance sector

### SIMATIC PDM

#### Technical specifications

	<b>SIMATIC PDM V8.2</b>
Hardware	<ul style="list-style-type: none"> <li>PG/PC/notebook with processor corresponding to operating system requirements</li> </ul>
Operating systems (alternative)	<ul style="list-style-type: none"> <li>Windows 7 Professional/Ultimate/Enterprise SP1 (32-bit/64-bit)</li> <li>Windows Server 2008 R2 SP1 Standard Edition (64-bit)</li> </ul>
Integration in STEP 7/PCS 7	<ul style="list-style-type: none"> <li>SIMATIC PCS 7 V8.1 (incl. update 1)</li> <li>STEP 7 V5.5+SP4</li> </ul>

#### Ordering data

#### Article No.

##### SIMATIC PDM stand-alone product packages

##### Minimum configuration

**SIMATIC PDM Single Point V8.2** including 1 TAG; product package for operation and configuration of one field device; communication via PROFIBUS DP/PA, HART (modem, RS 232, PROFIBUS/PROFINET), Modbus, Ethernet or PROFINET

Additional functions or SIMATIC PDM TAGs are not possible

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit, floating license for 1 user

- Delivery form package (without SIMATIC PCS 7 Software Media Package)  
license key USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per ordering position
- Delivery form online (without SIMATIC PCS 7/SIMATIC PDM Software Media Package)  
license key download and online certificate of license  
Notes:  
E-mail address required;  
installation software also available separately as SIMATIC PDM Software Media Package.

**6ES7658-3HA28-0YA5**

**6ES7658-3HA28-0YH5**

#### Basic configuration for individual product packages

##### SIMATIC PDM Basic V8.2

including 4 TAGs; product package for operation and configuration of field devices and components, communication via PROFIBUS DP/PA, HART (modem, RS 232, PROFIBUS/PROFINET), Modbus, Ethernet or PROFINET

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit, floating license for 1 user

- Delivery form package (without SIMATIC PCS 7 Software Media Package)  
license key USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per ordering position
- Delivery form online (without SIMATIC PCS 7/SIMATIC PDM Software Media Package)  
license key download and online certificate of license  
Notes:  
E-mail address required;  
installation software also available separately as SIMATIC PDM Software Media Package.

**6ES7658-3AB28-0YA5**

**6ES7658-3AB28-0YH5**

#### Configuration for mobile service

##### SIMATIC PDM Service V8.2

Product package for stand-alone user in service, with

- SIMATIC PDM Basic incl. 4 TAGs
- 100 TAGs

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit, floating license for 1 user

- Delivery form package (without SIMATIC PCS 7 Software Media Package)  
license key USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per ordering position
- Delivery form online (without SIMATIC PCS 7/SIMATIC PDM Software Media Package)  
license key download and online certificate of license  
Notes:  
E-mail address required;  
installation software also available separately as SIMATIC PDM Software Media Package.

**6ES7658-3JD28-0YA5**

**6ES7658-3JD28-0YH5**

Ordering data	Article No.	Article No.	
<p><b>SIMATIC PDM system-integrated product packages</b></p> <p><b>Configuration for integration in SIMATIC S7 configuration environment</b></p> <p><b>SIMATIC PDM S7 V8.2</b></p> <p>Product package for use in a SIMATIC S7 configuration environment, with</p> <ul style="list-style-type: none"> <li>- SIMATIC PDM Basic incl. 4 TAGs</li> <li>- SIMATIC PDM Extended</li> <li>- SIMATIC PDM Integration in STEP 7/PCS 7</li> <li>- 100 TAGs</li> </ul> <p>6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit, floating license for 1 user</p> <p>Note: STEP 7 V5.5+SP4 is required to use the full functionality of SIMATIC PDM S7 V8.2!</p> <ul style="list-style-type: none"> <li>• Delivery form package (without SIMATIC PCS 7 Software Media Package) license key USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per ordering position</li> <li>• Delivery form online (without SIMATIC PCS 7/ SIMATIC PDM Software Media Package) license key download and online certificate of license</li> </ul> <p>Notes: E-mail address required; installation software also available separately as SIMATIC PDM Software Media Package.</p> <p><b>Configuration for integration in SIMATIC PCS 7 configuration environment</b></p> <p><b>SIMATIC PDM PCS 7 V8.2</b></p> <p>Product package for integration into the engineering toolset of the SIMATIC PCS 7 engineering system</p> <p>6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit</p> <p>Floating license for 1 user, with</p> <ul style="list-style-type: none"> <li>- SIMATIC PDM Basic incl. 4 TAGs</li> <li>- SIMATIC PDM Extended</li> <li>- SIMATIC PDM Integration in STEP 7/PCS 7</li> <li>- SIMATIC PDM Routing</li> <li>- 100 TAGs</li> </ul> <p>Note: SIMATIC PCS 7 V8.1 is required to use the full functionality of SIMATIC PDM PCS 7 V8.2!</p> <ul style="list-style-type: none"> <li>• Delivery form package (without SIMATIC PCS 7 Software Media Package) license key USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per ordering position</li> </ul>	<p><b>6ES7658-3KD28-0YA5</b></p> <p><b>6ES7658-3KD28-0YH5</b></p> <p><b>6ES7658-3LD28-0YA5</b></p>	<p><b>SIMATIC PDM PCS 7 V8.2 (cont.)</b></p> <ul style="list-style-type: none"> <li>• Delivery form online (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) license key download and online certificate of license</li> </ul> <p>Notes: E-mail address required; installation software also available separately as SIMATIC PDM Software Media Package.</p> <p><b>SIMATIC PDM PCS 7-FF V8.2</b></p> <p>Product package for integration into the engineering toolset of the SIMATIC PCS 7 engineering system</p> <p>6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit</p> <p>Floating license for 1 user, with</p> <ul style="list-style-type: none"> <li>- SIMATIC PDM Basic incl. 4 TAGs</li> <li>- SIMATIC PDM Extended</li> <li>- SIMATIC PDM Integration in STEP 7/PCS 7</li> <li>- SIMATIC PDM Routing</li> <li>- SIMATIC PDM Communication FOUNDATION Fieldbus</li> <li>- 100 TAGs</li> </ul> <p>Note: SIMATIC PCS 7 V8.1 is required to use the full functionality of SIMATIC PDM PCS 7-FF V8.2!</p> <ul style="list-style-type: none"> <li>• Delivery form package (without SIMATIC PCS 7 Software Media Package) license key USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per ordering position</li> <li>• Delivery form online (without SIMATIC PCS 7/ SIMATIC PDM Software Media Package) license key download and online certificate of license</li> </ul> <p>Notes: E-mail address required; installation software also available separately as SIMATIC PDM Software Media Package.</p> <p><b>SIMATIC PDM PCS 7 Server V8.2</b></p> <p>Product package for integration into the engineering toolset of the SIMATIC PCS 7 engineering system</p> <p>6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit</p> <p>Floating license for 1 user, with</p> <ul style="list-style-type: none"> <li>- SIMATIC PDM Basic incl. 4 TAGs</li> <li>- SIMATIC PDM Extended</li> <li>- SIMATIC PDM Integration in STEP 7/PCS 7</li> <li>- SIMATIC PDM Routing</li> <li>- SIMATIC PDM Server</li> <li>- 100 TAGs</li> </ul> <p>Note: SIMATIC PCS 7 V8.1 is required to use the full functionality of SIMATIC PDM PCS 7 Server V8.2!</p>	<p><b>6ES7658-3LD28-0YH5</b></p> <p><b>6ES7658-3MD28-0YA5</b></p> <p><b>6ES7658-3MD28-0YH5</b></p>

## Software for SIMATIC controllers

Software for joint tasks in the maintenance sector

### SIMATIC PDM

#### Ordering data

##### SIMATIC PDM PCS 7 Server V8.2 (continued)

- Delivery form package (without SIMATIC PCS 7 Software Media Package)  
license key USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per ordering position
  - Delivery form online (without SIMATIC PCS 7/SIMATIC PDM Software Media Package)  
license key download and online certificate of license
- Notes:  
E-mail address required;  
installation software also available separately as SIMATIC PDM Software Media Package.

#### Article No.

6ES7658-3TD28-0YA5

6ES7658-3TD28-0YH5

##### Optional product components for SIMATIC PDM V8.2

##### SIMATIC PDM Extended V8.2

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit, floating license for 1 user

- Delivery form package (without SIMATIC PCS 7/SIMATIC PDM Software Media Package)  
license key USB flash drive and certificate of license
  - Delivery form online (without SIMATIC PCS 7/SIMATIC PDM Software Media Package)  
license key download and online certificate of license
- Note:  
E-mail address required!

6ES7658-3NX28-2YB5

6ES7658-3NX28-2YH5

##### SIMATIC PDM Integration in STEP 7/SIMATIC PCS 7 V8.2

only required for integration of SIMATIC PDM into HW Config

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit, floating license for 1 user

- Delivery form package (without SIMATIC PCS 7/SIMATIC PDM Software Media Package)  
license key USB flash drive and certificate of license
  - Delivery form online (without SIMATIC PCS 7/SIMATIC PDM Software Media Package)  
license key download and online certificate of license
- Note:  
E-mail address required!

6ES7658-3BX28-2YB5

6ES7658-3BX28-2YH5

##### SIMATIC PDM Routing V8.2

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit, floating license for 1 user

- Delivery form package (without SIMATIC PCS 7/SIMATIC PDM Software Media Package)  
license key USB flash drive and certificate of license
  - Delivery form online (without SIMATIC PCS 7/SIMATIC PDM Software Media Package)  
license key download, online certificate of license
- Note:  
E-mail address required!

#### Article No.

6ES7658-3CX28-2YB5

6ES7658-3CX28-2YH5

##### SIMATIC PDM Server V8.2

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit, floating license for 1 user

- Delivery form package (without SIMATIC PCS 7/SIMATIC PDM Software Media Package)  
license key USB flash drive, certificate of license
  - Delivery form online (without SIMATIC PCS 7/SIMATIC PDM Software Media Package)  
license key download and online certificate of license
- Note:  
E-mail address required!

6ES7658-3TX28-2YB5

6ES7658-3TX28-2YH5

##### SIMATIC PDM Communication FOUNDATION Fieldbus V8.2

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit, floating license for 1 user

- Delivery form package (without SIMATIC PCS 7/SIMATIC PDM Software Media Package)  
license key USB flash drive and certificate of license
  - Delivery form online (without SIMATIC PCS 7/SIMATIC PDM Software Media Package)  
license key download and online certificate of license
- Note:  
E-mail address required!

6ES7658-3QX28-2YB5

6ES7658-3QX28-2YH5

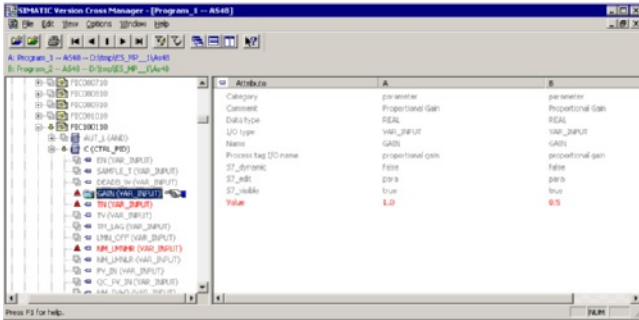
Ordering data	Article No.	Article No.
<p><b>SIMATIC PDM HART Server V8.2</b> 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit, floating license for 1 user</p> <ul style="list-style-type: none"> <li>• Delivery form package (without SIMATIC PCS 7/ SIMATIC PDM Software Media Package) license key USB flash drive and certificate of license</li> <li>• Delivery form online (without SIMATIC PCS 7/ SIMATIC PDM Software Media Package) license key download and online certificate of license <u>Note:</u> E-mail address required!</li> </ul>	<p><b>6ES7658-3EX28-2YB5</b></p> <p><b>6ES7658-3EX28-2YH5</b></p>	<p><b>SIMATIC PDM TAGs</b> TAG licenses for expanding the available TAG volume, cumulative, software class A, floating license for 1 user</p> <ul style="list-style-type: none"> <li>• Delivery form package license key on USB flash drive and certificate of license <ul style="list-style-type: none"> <li>- 10 TAGs</li> <li>- 100 TAGs</li> <li>- 1 000 TAGs</li> </ul> </li> <li>• Delivery form online license key download and online certificate of license <u>Note:</u> E-mail address required! <ul style="list-style-type: none"> <li>- 10 TAGs</li> <li>- 100 TAGs</li> <li>- 1 000 TAGs</li> </ul> </li> </ul> <p><b>6ES7658-3XC00-2YB5</b> <b>6ES7658-3XD00-2YB5</b> <b>6ES7658-3XE00-2YB5</b></p> <p><b>6ES7658-3XC00-2YH5</b> <b>6ES7658-3XD00-2YH5</b> <b>6ES7658-3XE00-2YH5</b></p>
<p><b>SIMATIC PDM Command Interface V8.2</b> 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit, floating license for 1 user</p> <ul style="list-style-type: none"> <li>• Delivery form package (without SIMATIC PCS 7/ SIMATIC PDM Software Media Package) license key USB flash drive and certificate of license</li> </ul>	<p><b>6ES7658-3SX28-2YB5</b></p>	<p>SIMATIC PDM Software Media Package</p> <p><b>SIMATIC PDM Software Media Package V8.2</b> Installation software without license, 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit</p> <p><u>Note:</u> Can only be used in conjunction with a valid license or in demo mode!</p> <ul style="list-style-type: none"> <li>• Delivery form package (without SIMATIC PCS 7 Software Media Package) SIMATIC PDM and device library software on DVD</li> <li>• Delivery form online (without SIMATIC PCS 7 Software Media Package) SIMATIC PDM and device library software download <u>Note:</u> E-mail address required!</li> </ul> <p><b>6ES7658-3GX28-0YT8</b></p> <p><b>6ES7658-3GX28-0YG8</b></p>

## Software for SIMATIC controllers

Software for joint tasks in the administration sector

### Version Cross Manager

#### Overview



The SIMATIC Version Cross Manager is a user-friendly tool for determining the differences between various versions of individual projects or multi-projects by:

- Tracing missing, additional or differing objects by comparing hardware configuration, communication, plant hierarchy, CFC/SFC plans, SFC details, block types, messages, global tags, signals and run sequences
- Graphic display of comparison results in a combination of tree and tabular formats
- Clear hierarchical structuring according to the technological hierarchy of the plant
- Color-coded identification of the differences

#### Ordering data

##### SIMATIC Version Cross Manager V7.1

Can be used with SIMATIC PCS 7 V7.1, V8.0 and V8.1

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows XP Professional 32-bit, Windows 7 Ultimate 32/64-bit, Windows Server 2003 R2 Standard 32-bit or Windows Server 2008 R2 Standard 64-bit, floating license for 1 user

- Delivery form package (without SIMATIC PCS 7 Software Media Package)  
license key USB flash drive, certificate of license as well as TIA Engineering Toolset CD

- Delivery form online (without SIMATIC PCS 7 Software Media Package)  
license key download, online certificate of license

Note:  
E-mail address required!

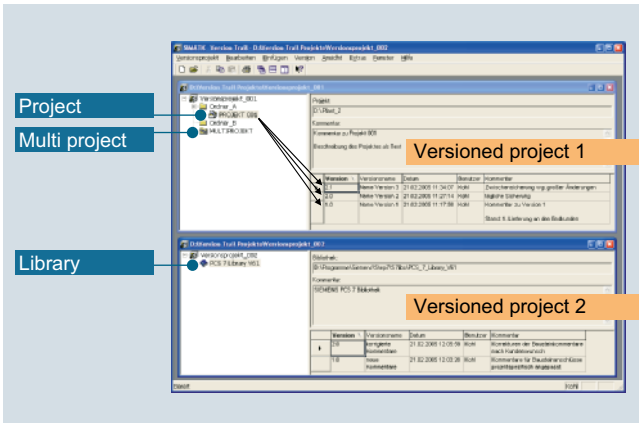
#### Article No.

**6ES7658-1CX17-2YA5**

**6ES7658-1CX17-2YH5**

### Version Trail

#### Overview



SIMATIC Version Trail is a software option for engineering which, together with the SIMATIC Logon central user administration, can assign a version history to libraries, projects and multi-projects.

#### Ordering data

##### SIMATIC Version Trail V8.1

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit, floating license for 1 user

- Delivery form package (without SIMATIC PCS 7 Software Media Package)  
license key USB flash drive, certificate of license as well as TIA Engineering Toolset CD

- Delivery form online (without SIMATIC PCS 7 Software Media Package)  
license key download, online certificate of license

Note:  
E-mail address required!

#### Article No.

**6ES7658-1FX18-2YA5**

**6ES7658-1FX18-2YH5**

##### Upgrade package (only for TIA applications)

##### SIMATIC Version Trail Upgrade from V8.0 to V8.1

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows XP Professional SP3, Windows Server 2003 R2 SP2, Windows 7 Ultimate 32/64-bit or Windows Server 2008 R2 Standard 64-bit, floating license for 1 user

- Delivery form package (without SIMATIC PCS 7 Software Media Package), license key USB flash drive, certificate of license

**6ES7658-1FX18-2YE5**

## Software for SIMATIC controllers

### Software for joint tasks in the administration sector

#### ADDM - Data Management

##### Overview



With ADDM, you are completely in control of the SIMATIC controls – around the clock and with any program version. This tool is indispensable in a modern production area and ensures user-friendly backup, comparison and management of control data.

##### Ordering data

###### ADDM Agent

Languages: English, German

- Single license without data carrier
- Single license with CD-ROM of current software version

##### Article No.

**6BQ3030-1AA00-1AB0**

**6BQ3030-4AA00-0AD0**

#### KNX/EIB2S7

##### Overview



- Software for SIMATIC S7 communication with components of a building automation unit
- For use of industry automation components in building automation
- Allows the integration of actuators/sensors on a KNX/EIB bus in automation solutions with SIMATIC S7
- For the use of information from building automation for the automation of a production plant

##### Ordering data

###### KNX/EIB2S7 program package

###### Task:

Software for connecting KNX/EIB building technology components to SIMATIC S7;

###### Delivery form:

Editor, function blocks for SIMATIC S7, samples, documentation on CD; license for editor on USB flash drive

##### Article No.

**6AV6643-7AC10-0AA1**

## Software for SIMATIC controllers

### Notes

11

## SIMATIC programming devices



### **12/2** Programming devices

12/2 Field PG M4

### **12/7** Accessories

12/7 External prommer

### **12/8** Communications software

12/8 SOFTNET for PROFIBUS

12/10 HARDNET-IE S7-REDCONNECT

12/11 SOFTNET for Industrial Ethernet

12/13 SOFTNET PN IO

12/15 OPC server for Industrial Ethernet

12/17 PN CBA OPC servers

12/19 SNMP OPC server

### **Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

[www.siemens.com/simatic/  
printmaterial](http://www.siemens.com/simatic/printmaterial)

Siemens ST 70 · 2015



# SIMATIC programming devices

## Programming devices

### Field PG M4

#### Overview



- The mobile, industry-standard programming device for automation engineers with a powerful, third-generation Intel® Core™ i processor
- Optimal for commissioning, service and maintenance of automation systems
- Ruggedness certified in accordance with US military standards (MIL-STD-810G)
- Industrial notebook with wireless technology (802.11 a, b, g, n), large 15.6" widescreen display in 16:9 format, long battery service life (>5 hours), high-speed main memory (DDR3 RAM) and integrated data backup concept
- Complete with all commonly used interfaces for industrial applications
- Can be used immediately thanks to pre-installed SIMATIC engineering software

#### Technical specifications

	SIMATIC Field PG M4
<b>General features</b>	
Design	Notebook
Processor	<ul style="list-style-type: none"> <li>• Intel Celeron 1020E processor, 2.2 GHz, 2 MB cache</li> <li>• Intel Core i5-3320M processor, up to 3.3 GHz, 3 MB Cache, iAMT 8.0</li> <li>• Intel Core i7-35x0M processor, up to 3.6 GHz, 4 MB Cache, iAMT 8.0</li> </ul>
RAM	Expandable up to 16 GB DDR3 SODIMM
Free slots for expansions	<ul style="list-style-type: none"> <li>• 1 x PC Card (Type I, Type II)</li> <li>• 1 x Express Card (34 and 54 mm)</li> </ul>
Graphics	Intel HD4000 graphics with a resolution of 2560 x 1600 pixels for i5 and i7 processors
Display	15.6" widescreen display, 16:9 format <ul style="list-style-type: none"> <li>• 1366 x 768 (HD ready)</li> <li>• 1920 x 1080 (full HD)</li> </ul>
Speakers	Built-in stereo speakers
Pointing device	Touchpad with 2 mouse buttons
Operating system	<ul style="list-style-type: none"> <li>• Windows XP Prof. SP3 32 Bit</li> <li>• Windows 7 Ultimate SP1 64 Bit</li> <li>• Dual boot (Windows XP Prof. SP3 and Windows 7 Ultimate SP1 64 Bit)</li> </ul>
Power supply	Wide-range power supply unit 100-240 V AC, 50-60 Hz, high-power 8800 mAh lithium-ion battery (running time of more than 5 hours; discharge time of more than 5 months when not in use)
Warranty conditions	24 months for hardware components (6 months for battery <sup>1)</sup> )
<b>Drives</b>	
Hard disk	Easily swappable hard drive (320 GB or 1 TB HDD) or super-fast solid-state drive (300 or 480 GB SSD)
Optical drive	Multistandard DVD+-R/+-RW

	SIMATIC Field PG M4
<b>Interfaces</b>	
PROFIBUS DP/MPI	CP 5711-compatible, 9.6 Kbit/s to 12 Mbit/s, 9-pin sub D socket; can also be used in virtual operating systems
COM 1	V.24/TTY (for SIMATIC S5; TTY as optional version); over supplied adapter on 9-pin sub-D male connector
SIMATIC Memory Card	Programming interface for SIMATIC Memory Card and S5 memory module (S5 EPROM module as optional equipment variant)
SIMATIC Micro Memory Card	Interface for SIMATIC Micro Memory Card
Media Card Reader	Interface for SMC (SIMATIC Memory Card) SD/SHC xD-Picture Card MS Pro
Ethernet	2 x Gigabit Ethernet (RJ45)
USB	2 x USB 3.0, max. 1 high current (900 mA); under Windows XP as USB 2.0  2 x USB 2.0, for High Speed USB; max. 2 High Current (500 mA) or 1 A ; of which 1 USB interface with charging function for mobile devices in power off mode
PC Card (PCMCIA)/Express Card/54	<ul style="list-style-type: none"> <li>• 1 x PC Card (Type I, Type II)</li> <li>• 1 x Express Card (34 and 54 mm)</li> </ul>
DVI-I	1 interface for external monitor (VGA monitors can be operated with a DVI/VGA adapter)
DPP (Display Port)	Interface for external monitor, max. resolution: 2560 x 1600 pixels

<sup>1)</sup> The capacity of the battery decreases for technological reasons with each charging/discharging operation and also as the result of being stored at excessively high or low temperatures. The running time per charge decreases therefore over the course of time. With normal use, the battery can be charged and discharged over a period of six months from when the Field PG is purchased. Loss of capacity is not covered by the warranty. For the battery's operation we grant a warranty of six months. We recommend replacing the battery with an original Siemens battery at the end of these six months if there is a significant drop in performance.

**Technical specifications (continued)**

	<b>SIMATIC Field PG M4</b>
WLAN <sup>2)</sup>	Integrated, IEEE802.11 a, b, g, n
Headphones/microphone	Connection in each case for 3.5 mm stereo jack
<i>Environmental conditions</i>	
Degree of protection in accordance with IEC 60529	Front IP30 when covers closed
Vibrations	Tested in accordance with IEC 60068-2-6
• Operation	10 to 58 Hz: Amplitude 0.0375 mm, 58 to 500 Hz: Acceleration 4.9 m/s <sup>2</sup>
• Transport	5 to 9 Hz: Amplitude 3.5 mm; 9 to 500 Hz: Acceleration 9.8 m/s <sup>2</sup>
Resistance to shock	Tested in accordance with IEC 60068-2-27, IEC 60068-2-29
• Operation	Half-sine 50 m/s <sup>2</sup> , 30 ms, 100 shocks
• Storage/transport	Half-sine 250 m/s <sup>2</sup> , 6 ms, 1000 shocks
<i>Electromagnetic compatibility (EMC)</i>	
• Radiated interference	EN 61000-6-3:2007, EN 61000-3-2 Class D and EN 61000-3-3
• Immunity to conducted interference on the supply lines	± 2 kV; (according to IEC 61000-4-4; burst) ± 1 kV; (according to IEC 61000-4-5; surge sym./line to line) ± 2 kV; (according to IEC 61000-4-5; surge sym./line to ground)
• Noise immunity on signal lines	± 1 kV; (according to IEC 61000-4-4; burst; length < 30 m) ± 2 kV; (according to IEC 61000-4-4; burst; length > 30 m) ± 2 kV; (according to IEC 61000-4-5; surge sym./line to ground; length > 30 m)
• Immunity to static discharge	± 4 kV discharge on contact (in accordance with IEC 61000-4-2: ESD) ± 8 kV discharge to air (in accordance with IEC 61000-4-2: ESD)
• Immunity to high frequency radio interference	10 V (with modem operation max. 3 V), with 80% amplitude modulation with 1 kHz, 10 kHz ... 80 MHz (in accordance with IEC 61000-4-6) 10 V/m (with modem operation max. 3 V/m), with 80% amplitude modulation with 1 kHz, 80 MHz ... 1000 MHz and 1.4 GHz ... 2 GHz (in accordance with IEC 61000-4-3) 1 V/m, with 80% amplitude modulation with 1 kHz, 2.0 GHz ... 2.7 GHz 1 V/m (in accordance with IEC 61000-4-3)
• Immunity to magnetic fields	100 A/m; 50/60 Hz (in accordance with IEC 61000-4-8)

	<b>SIMATIC Field PG M4</b>
Temperature	Tested in accordance with IEC 60068-2-1, IEC 60068-2-2 + 5 °C ... + 40 °C max. 10°C/h (no condensation)
• Operation <sup>3)</sup>	
• Storage/transport	- 20 °C ... + 60 °C max. 20°C/h (no condensation)
Relative humidity	Tested according to IEC 60068-2-78, IEC 60068-2-30, IEC 60068-2-14
• Operation	5% ... 80% at 25°C/h (no condensation)
• Storage/transport	5% ... 95% at 25°C/h (no condensation)
<i>Security</i>	
Safety class	Safety class II according to IEC 61140
Safety regulations	<ul style="list-style-type: none"> <li>• According to VDE 0805 in conformance with IEC 60950-1:2006</li> <li>• IEC 60950-1:2005</li> <li>• EN 60950-1:2006 with change EN 60950-1:2006/A11:2009</li> <li>• DIN EN 60950-1(VDE0805-1):2006-11 with change DIN EN 60950-1/A11 (VDE0805-1/A11):2009-11</li> <li>• UL 60950-1 Second Edition</li> <li>• CAN/CSA-C22.2 No. 60950-1-07 Second Edition</li> </ul>
<i>Dimensions and weights</i>	
Dimensions (W x H x D) in mm	385 x 53 x 275
Weight, approx.	Without battery approx. 3 kg With battery approx. 3.4 kg

<sup>2)</sup> Integral WLAN with antennas specially designed for the Field PG M4. The integrated wireless LAN is approved for operation in Europe (CE), USA (FCC), Canada (IC), Korea (KCC) and China (CCC). For operation outside these countries, the relevant national regulations must be observed.

<sup>3)</sup> Battery charging and CD/DVD writing is only possible at temperatures up to 35 °C

# SIMATIC programming devices

## Programming devices

### Field PG M4

#### Ordering data

#### Article No.

##### Field PG M4 Standard programming device

6ES7716- 0 A A ■ -0 ■ 4

Intel Celeron 1020E processor,  
2 MB cache, 2.2 GHz, 320 GB HDD  
SATA hard disk, multistandard  
DVD+-R/+ -RW drive,  
Intel HD graphics;  
without SIMATIC S5 interface,  
without SIMATIC S5 EPROMMER

##### Display

- 15.6" display, HD ready (1366 x 768) 0
- 15.6" display, full HD (1920 x 1080) 1

##### Keyboard and power cable (essential)

- Keyboard: QWERTY (& German); power supply cord: Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland 0
- Keyboard: QWERTY (& German); power supply cord: United Kingdom 1
- Keyboard: QWERTY (& German); power supply cord: Switzerland 2
- Keyboard: QWERTY (& German); power supply cord: USA 3
- Keyboard: QWERTY (& German); power supply cord: Italy 4
- Keyboard: QWERTY (& German); power supply cord: China; approval for China (CCC) 5
- Keyboard: AZERTY; power supply cord: Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland 6

##### Operating system

- Windows 7 Ultimate, SP1, 64-bit (Eng., Fr., Ger., Sp., It., selectable); STEP 5 and STEP 7 Micro/Win not pre-installed. STEP 5 cannot run on Windows 7; installed main memory: 1 x 8 GB DDR3 RAM B
- Windows 7 Ultimate, SP1, 64-bit (Eng., Fr., Ger., Sp., It., selectable); STEP 5 and STEP 7 Micro/Win not pre-installed. STEP 5 cannot run on Windows 7; installed main memory: 2 x 8 GB DDR3 RAM C

##### SIMATIC software licenses

- Trial license: STEP 7 Prof. Combo (STEP 7 Prof. V13 and STEP 7 Prof. 2010), WinCC Adv. Combo (WinCC V13 and WinCC flexible 2008), STEP 7 Micro/Win V4.1 A
- License: STEP 7 Prof. Combo (STEP 7 Prof. V13 and STEP 7 Prof. 2010), WinCC Adv. Combo (WinCC V13 and WinCC flexible 2008), STEP 7 Micro/Win V4.1 B

#### Article No.

##### Field PG M4 Premium and Premium Plus programming device

6ES7716- ■ ■ ■ ■ -0 ■ 4

Field PG M4 Premium:  
Intel Core i5 3320M processor,  
3 MB cache, 2.6 GHz (max.  
3.3 GHz with turbo boost technol-  
ogy), multistandard DVD+-R/+ -RW  
drive, Intel HD4000 graphics card

1

Field PG M4 Premium Plus:  
Intel Core i7-35x0M processor,  
4 MB Cache, 2.9 GHz (max.  
3.6 GHz with Turbo Boost technol-  
ogy), multistandard DVD+-R/+ -RW  
drive, Intel HD4000 graphics

2

##### Hard disk

- 1 TB HDD SATA (for Field PG M4 Premium and Premium Plus) B
- 300 GB SSD SATA (for Field PG M4 Premium and Premium Plus) C
- 480 GB SSD SATA (for Field PG M4 Premium and Premium Plus) D

##### SIMATIC S5 interface

- Without S5 interface, without S5 EPROMMER A
- With S5 interface, with S5 EPROMMER incl. S5 PLC cable and EPROM adapter B

##### Display

- 15.6" display, HD ready (1366 x 768) 0
- 15.6" display, full HD (1920 x 1080) 1

##### Keyboard and power cable (essential)

- Keyboard: QWERTY (& German); power supply cord: Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland 0
- Keyboard: QWERTY (& German); power supply cord: United Kingdom 1
- Keyboard: QWERTY (& German); power supply cord: Switzerland 2
- Keyboard: QWERTY (& German); power supply cord: USA 3
- Keyboard: QWERTY (& German); power supply cord: Italy 4
- Keyboard: QWERTY (& German); power supply cord: China; approval for China (CCC) 5
- Keyboard: AZERTY; power supply cord: Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland 6

Ordering data	Article No.	Article No.	
<b>Field PG M4 Premium and Premium Plus programming device</b> Operating system <ul style="list-style-type: none"> <li>Windows XP Professional SP3 32-bit MUI (Eng., Ger., Fr., It., Sp.); installed main memory: 1 x 4 GB DDR3 RAM STEP 7 Professional V13 and WinCC Advanced V13 not pre-installed.</li> <li>Windows 7 Ultimate, SP1, 64-bit (Eng., Fr., Ger., Sp., It., selectable); STEP 5 and STEP 7 Micro/Win not pre-installed. STEP 5 cannot run on Windows 7; installed main memory: 1 x 8 GB DDR3 RAM</li> <li>Windows 7 Ultimate, SP1, 64-bit (Eng., Fr., Ger., Sp., It., selectable); STEP 5 and STEP 7 Micro/Win not pre-installed. STEP 5 cannot run on Windows 7; installed main memory: 2 x 8 GB DDR3 RAM</li> <li>Dual-boot: Windows XP Professional SP3 64-bit and Windows 7 Ultimate SP1 64-bit; installed main memory: 1 x 8 GB DDR3 RAM</li> <li>Dual-boot: Windows XP Professional SP3 64-bit and Windows 7 Ultimate SP1 64-bit; installed main memory: 2 x 8 GB DDR3 RAM</li> </ul> SIMATIC software licenses <ul style="list-style-type: none"> <li>Trial license: STEP 7 Prof. Combo (STEP 7 Prof. V13 and STEP 7 Prof. 2010), WinCC Adv. Combo (WinCC V13 and WinCC flexible 2008), STEP 7 Micro/Win V4.1</li> <li>License: STEP 7 Prof. Combo (STEP 7 Prof. V13 and STEP 7 Prof. 2010), WinCC Adv. Combo (WinCC V13 and WinCC flexible 2008), STEP 7 Micro/Win V4.1</li> <li>License: STEP 7 Prof. Combo (STEP 7 Prof. V13 and STEP 7 Prof. 2010), WinCC Adv. Combo (WinCC V13 and WinCC flexible 2008), STEP 7-Micro/Win V4.1, STEP 5; incl. MPI cable</li> </ul>	6ES7716- ■■■■■ -0 ■ ■ 4 A B C D E A B C	<b>Field PG M4 Premium Plus/SSD action pack</b> With 300 GB SSD SATA hard disk, 15.6" display, full HD (1920 x 1080), Windows 7 Ultimate SP1, 64-bit (Eng., Fr., Ger., Sp., It. selectable), 2 x 8 GB DDR3 RAM; with MPI cable; without S5 interface, S5 EPROMMER. License: STEP 7 Professional V13 und WinCC Advanced V13; no license for STEP 7 Prof. 2010/ WinCC flexible 2008 <ul style="list-style-type: none"> <li>Keyboard: QWERTY (&amp; German); power supply cord: Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland</li> <li>Keyboard: QWERTY (&amp; German); power supply cord: United Kingdom</li> <li>Keyboard: QWERTY (&amp; German); power supply cord: Switzerland</li> <li>Keyboard: QWERTY (&amp; German); power supply cord: USA</li> <li>Keyboard: QWERTY (&amp; German); power supply cord: Italy</li> <li>Keyboard: QWERTY (&amp; German); power supply cord: China; approval for China (CCC)</li> <li>Keyboard: AZERTY; power supply cord: Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland</li> </ul> <b>Accessories</b> <b>Memory expansion</b> 4 GB RAM 8 GB RAM <b>AC/DC external power supply unit</b> For Field PG M4 only <b>Power cord (length 3 m)</b> For Field PG M2/M4 only for Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland For Great Britain For Switzerland For the USA For Italy For China	6ES7716-2CA10-0CD4 6ES7716-2CA11-0CD4 6ES7716-2CA12-0CD4 6ES7716-2CA13-0CD4 6ES7716-2CA14-0CD4 6ES7716-2CA15-0CD4 6ES7716-2CA16-0CD4 6ES7648-2AH60-0KA0 6ES7648-2AH70-0KA0 6ES7798-0GA03-0XA0 6ES7900-5AA00-0XA0 6ES7900-5BA00-0XA0 6ES7900-5CA00-0XA0 6ES7900-5DA00-0XA0 6ES7900-5EA00-0XA0 6ES7900-5FA00-0XA0

# SIMATIC programming devices

## Programming devices

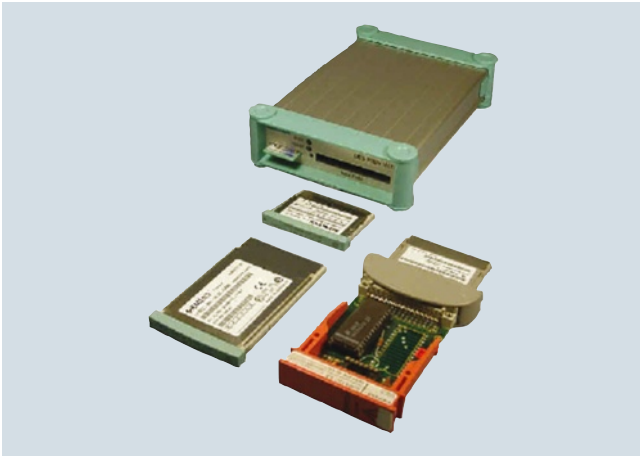
### Field PG M4

Ordering data	Article No.	Article No.
<b>Spare battery (lithium ion, 8.8 Ah)<sup>1)</sup></b> For Field PG M4 only	<b>6ES7798-0AA07-0XA0</b>	<b>Adapter serial ATA to USB 3.0</b> For using the replaceable hard disk in the hard disk kit as an external hard disk (only for Field PG M4)
<b>MPI cable</b> For connecting a PG and SIMATIC S7 via MPI; 5 m	<b>6ES7901-0BF00-0AA0</b>	<b>Rucksack for Field PG M4</b>
<b>S5 EPROM programming adapter</b> For SIMATIC S5 EPROM programming using the Field PG	<b>6ES7798-0CA00-0XA0</b>	<b>SIMATIC IPC Image &amp; Partition Creator V3.4</b> Software tool for very easy preventive data backup and efficient partition management on SIMATIC IPCs
<b>S5 PLC cable</b> For connecting programming devices to SIMATIC S5 PLCs, 5 m	<b>6ES5734-2BF00</b>	<b>Software Update Service (Standard Edition)<sup>2)</sup></b> The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.) • STEP 7 Professional and STEP 7 Professional in the TIA Portal • WinCC Advanced
<b>Replaceable hard disk kit</b> Replaceable hard disk 1 TB serial ATA; with protective pocket and Torx screwdriver; for Field PG M4 only	<b>6ES7791-2BA02-0AA0</b>	<b>6ES7810-5CC04-0YE2</b> <b>6AV6613-0AA00-0AL0</b>
<b>Replaceable SSD kit</b> Replaceable SSD 300 GB serial ATA; with protective pocket and Torx screwdriver; for Field PG M3/M4 only Replaceable SSD 480 GB serial ATA; with protective pocket and Torx screwdriver; for Field PG M3/M4	<b>6ES7791-2BA20-0AA0</b> <b>6ES7791-2BA21-0AA0</b>	

<sup>1)</sup> The capacity of the battery decreases for technological reasons with each charging/discharging cycle and also as the result of being stored at excessively high or low temperatures. The running time per charge decreases therefore over the course of time. With normal use, the battery can be charged and discharged over a period of six months from when the Field PG is purchased. Loss of capacity is not covered by the warranty. For the battery's operation we grant a warranty of six months. We recommend replacing the battery with an original Siemens battery at the end of these six months if there is a significant drop in performance.

<sup>2)</sup> For more information on the Software Update Service, see Section 11, page 11/3.

### Overview



- External EPROM programming device
- For programming SIMATIC Memory Cards, SIMATIC Micro Memory Cards as well as SIMATIC EPROM and EEPROM modules
- For connection to the PC via the USB interface

### Technical specifications

Article number	<b>6ES7792-0AA00-0XA0</b> USB PROMMER, 115/220V
<b>Product type designation</b>	
<b>General information</b>	
Design of the programming device	Desktop device
<b>Display</b>	
Design of display	without
<b>Supply voltage</b>	
Description	90 to 264 V; 47 to 63 Hz; wide range power supply unit
<b>Ambient conditions</b>	
<b>Ambient temperature in operation</b>	
• max.	40 °C
<b>Storage/transport temperature</b>	
• Min.	-20 °C
• max.	60 °C
<b>Dimensions</b>	
Width	172 mm
Height	40 mm
Depth	121 mm
<b>Weights</b>	
Weight, approx.	400 g

### Ordering data

### Article No.

**EPROM programming device  
USB prommer**  
for programming SIMATIC memory  
cards and EPROM modules

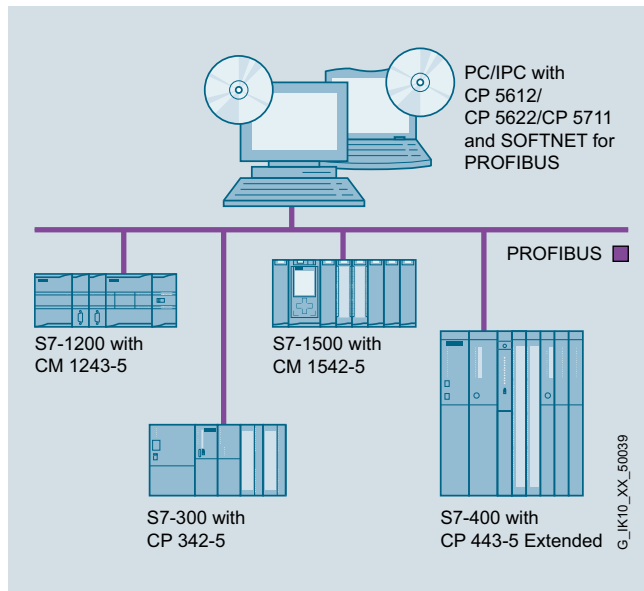
**6ES7792-0AA00-0XA0**

# SIMATIC programming devices

Communications software

## SOFTNET for PROFIBUS

### Overview



DP-M	DP-S	FMS	OPC	PG/OP	S7/S5
●	●		●	●	●

- Software for connecting PCs/programming devices and notebooks to programmable controllers
- Communication services:
  - PROFIBUS DP master Class 1 and 2 with acyclic expansions
  - PROFIBUS DP slave
  - PG/OP communication
  - S7 communication
  - Open communication (SEND/RECEIVE) based on the FDL interface
- The appropriate OPC servers and configuration tools are included in the scope of supply of the respective communications software

### Technical specifications

Performance data	CP 5612/CP 5622/CP 5711
<u>Mono protocol mode</u>	
Number of connectable DP slaves	max. 60
Number of FDL tasks waiting	max. 50
Number of PG/OP and S7 connections	max. 8
• DP master	DP-V0, DP-V1 with SOFTNET-PB DP
• DP slave	DP-V0, DP-V1 with SOFTNET-PB DP slave

### Ordering data

### Article No.

#### SOFTNET-PB S7

Software for S7 communication, incl. FDL protocol with OPC server and configuration tool, runtime software, software and electronic manual on DVD-ROM, license key on USB stick, Class A; for CP 5612 (Win 7 and higher), CP 5622 (Win 7 and higher), CP 5711

#### SOFTNET-PB S7 V13

For 32/64-bit: Windows 7 SP1 Professional/Ultimate;  
for 64-bit: Windows 8.1 Pro;  
for 64-bit: Windows Server 2008 R2 SP1; for 64-bit: Windows Server 2012 R2; German/English

- Single license for one installation

**6GK1704-5CW13-0AA0**

#### Software Update Service

For 1 year, with automatic extension; requirement: Current software version

**6GK1704-5CW00-3AL0**

#### Upgrade

- From Edition 2006 to SOFTNET-S7 Edition 2008 or V13

**6GK1704-5CW00-3AE0**

- From V6.0, V6.1, V6.2 or V6.3 to SOFTNET-S7 Edition 2008 or V13

**6GK1704-5CW00-3AE1**

#### SOFTNET-PB DP

Software for DP protocol (master Class 1 and 2), incl. FDL protocol with OPC server and configuration tool; runtime software, software and electronic manual on DVD-ROM, license key on USB stick; for CP 5612 (Win 7 and higher), CP 5622 (Win 7 and higher), CP 5711

#### SOFTNET-PB DP V13

For 32/64-bit: Windows 7 SP1 Professional/Ultimate;  
for 64-bit: Windows 8.1 Pro;  
for 64-bit: Windows Server 2008 R2 SP1; for 64-bit: Windows Server 2012 R2; German/English

- Single license for one installation

**6GK1704-5DW13-0AA0**

#### Software Update Service

For 1 year, with automatic extension; requirement: Current software version

**6GK1704-5DW00-3AL0**

#### Upgrade

- From Edition 2006 to SOFTNET-DP Edition 2008 or V13

**6GK1704-5DW00-3AE0**

- From V6.0, V6.1, V6.2 or V6.3 to SOFTNET-DP Edition 2008 or V13

**6GK1704-5DW00-3AE1**

Ordering data	Article No.	Article No.
<b>SOFTNET-PB DP slave</b> Software for DP slave, with OPC server and configuration tool, single license for one installation, runtime software, software and electronic manual on DVD-ROM, license key on USB stick, Class A; for CP 5612 (Win 7 and higher), CP 5622 (Win 7 and higher), CP 5711		<b>Software Update Service</b> For 1 year, with automatic extension; requirement: Current software version
<b>SOFTNET-PB DP slave V13</b> For 32/64-bit: Windows 7 SP1 Professional/Ultimate; for 64-bit: Windows 8.1 Pro; for 64-bit: Windows Server 2008 R2 SP1; for 64-bit: Windows Server 2012 R2; German/English • Single license for one installation	<b>6GK1704-5SW13-0AA0</b>	<b>Upgrade</b> <ul style="list-style-type: none"> <li>• From Edition 2006 to SOFTNET-DP Slave Edition 2008 or V13</li> <li>• From V6.0, V6.1, V6.2 or V6.3 to SOFTNET-DP Slave Edition 2008 or V13</li> </ul>
		<b>6GK1704-5SW00-3AL0</b>  <b>6GK1704-5SW00-3AE0</b>  <b>6GK1704-5SW00-3AE1</b>  <u>Note:</u> The Windows XP software version is still available for older CPs; see the Industry Mall: <a href="http://www.siemens.com/industrymall">http://www.siemens.com/industrymall</a> .

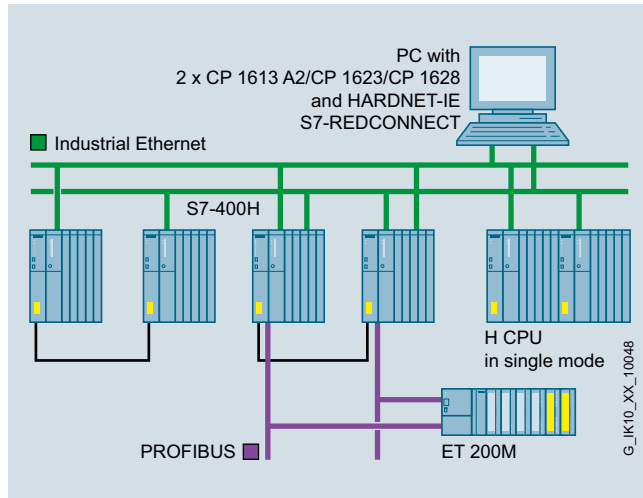


# SIMATIC programming devices

## Communications software

### HARDNET-IE S7-REDCONNECT

#### Overview



System configuration S7-REDCONNECT

ISO	TCP/UDP	PN	MRP	OPC	PG/OP	S7/S5	IT
●				●	●	●	

- For connecting PCs over redundant Industrial Ethernet to the SIMATIC S7-400H
- Protects from communication failures arising from a fault in the double bus or in redundant rings
- For redundant Layer 2 or Layer 3 Industrial Ethernet
- Can also be implemented in non-redundant networks
- No additional programming overhead for the PC and in H systems
- The appropriate OPC server and configuration tools are included in the scope of supply of the respective communications software
- Enhanced redundancy over 4-way communication (STEP 7 V5.1 + SP4 and higher)

#### Ordering data

#### Article No.

#### Article No.

##### **HARDNET-IE S7-REDCONNECT**

Software for fail-safe S7 communication via redundant networks, incl. S7 OPC server, HARDNET-IE S7, runtime software, software and electronic manual on CD-ROM, license key on USB stick, Class A;

For CP 1613 A2, CP 1623, CP 1628

##### **HARDNET-IE S7-REDCONNECT V13**

For 32/64-bit: Windows 7 SP1 Professional/Ultimate;  
for 64-bit: Windows 8.1 Pro;  
for 64-bit: Windows Server 2008 R2 SP1;  
for 64-bit: Windows Server 2012 R2  
German/English;  
single license for one installation

- On DVD
- Download <sup>1)</sup>

**6GK1716-0HB13-0AA0**  
**6GK1716-0HB13-0AK0**

##### **Software Update Service**

For one year with automatic extension; requirement: current software version

**6GK1716-0HB00-3AL0**

##### **Upgrade**

- As of Edition 2006 to S7-REDCONNECT Edition 2008 or HARDNET-IE S7-REDCONNECT V13
- From V6.0, V6.1, V6.2 or V6.3 to S7-REDCONNECT Edition 2008 or HARDNET-IE S7-REDCONNECT V13

**6GK1716-0HB00-3AE0**

**6GK1716-0HB00-3AE1**

For CP 1613 A2, CP 1623, CP 1628

##### **HARDNET-IE S7-REDCONNECT Power Pack**

For expansion from HARDNET-IE S7 to HARDNET-IE S7-REDCONNECT / from S7-1613 to S7 REDCONNECT, Single license for one installation, runtime software, software and electronic manual on CD-ROM, license key on USB stick, Class A;

##### **HARDNET-IE S7-REDCONNECT PowerPack V13**

For 32/64-bit: Windows 7 SP1 Professional/Ultimate;  
for 64-bit: Windows 8.1 Pro;  
for 64-bit: Windows Server 2008 R2 SP1;  
for Windows Server 2012 R2  
German/English;

- On DVD
- Download <sup>1)</sup>

**6GK1716-0HB13-0AC0**  
**6GK1716-0HB13-0AK1**

##### **CP 1613 A2 communications processor**

PCI card (32-bit, 33 MHz/66 MHz; 3.3 V/5 V universal keyed) for connection to Industrial Ethernet (10/100 Mbit/s) with ITP and RJ45 connection over HARDNET-IE S7 and S7-REDCONNECT.  
For operating system support, see SIMATIC NET Software

**6GK1161-3AA01**

##### **CP 1623 communications processor**

PCI Express x1 card for connection to Industrial Ethernet (10/100/1000 Mbit/s), with 2-port switch (RJ45) via HARDNET-IE S7 and S7-REDCONNECT.  
For operating system support, see SIMATIC NET Software

**6GK1162-3AA00**

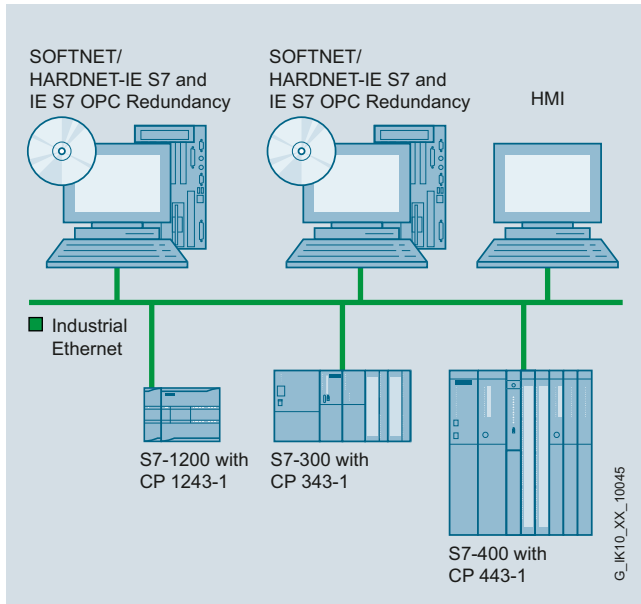
##### **CP 1628 communications processor**

PCI Express x1 card for connection to Industrial Ethernet (10/100/1 000 Mbit/s), with 2-port switch (RJ45) and integrated security (firewall, VPN) via HARDNET-IE S7 and S7-REDCONNECT.  
For operating system support, see SIMATIC NET Software

**6GK1162-8AA00**

<sup>1)</sup> For more details of Online Software Delivery, visit:  
<http://www.siemens.com/tia-online-software-delivery>  
under Ordering data.

## Overview



System configuration SOFTNET for Industrial Ethernet

ISO	TCP/UDP	PN	MRP	OPC	PG/OP	S7/S5	IT
●	●			●	●	●	

- Software for coupling programming devices/workstations to automation systems
- Communication services:
  - PG/OP communication
  - S7 communication
  - Open communication (SEND/RECEIVE)
- Can be used with
  - Layer 2 Ethernet card (PCI/PCle), e.g. CP 1612 A2
  - Integrated Industrial Ethernet interface
  - Modem/ISDN (Remote Access Service RAS)
- Complete protocol stack as a software package
- Increased availability thanks to additional option packages such as OPC Server Redundancy

## Technical specifications

Technical specifications	
<b>Performance data</b>	
<b>S7 and PG/OP communication</b> (number of operable connections)	
• SOFTNET-IE S7 Extended	Max. 255 (S7-300 / S7-400) Max. 512 (S7-1200 / S7-1500)
• SOFTNET-IE S7	Max. 64
• SOFTNET-IE S7 Lean	Max. 8

## Ordering data

### Article No.

#### SOFTNET S7 for Industrial Ethernet

Software for S7 and open communication, incl. OPC server, PG/OP communication, and NCM PC/STEP 7 Professional V12, runtime software, software and electronic manual on CD-ROM, license key on USB stick, Class A

#### SOFTNET-IE S7 V13

For 32/64-bit Windows 7 SP1 Professional/Ultimate;  
for 64-bit: Windows 8.1 Pro;  
for 64-bit: Windows Server 2008 R2 SP1;  
for 64-bit: Windows Server 2012 R2 German/English

Up to 64 connections;  
single license for one installation

- On DVD
- Download <sup>1)</sup>

**6GK1704-1CW13-0AA0**  
**6GK1704-1CW13-0AK0**

#### Software Update Service

**6GK1704-1CW00-3AL0**

For 1 year with automatic extension;  
requirement: Current software version

#### Upgrade

- From Edition 2006 to Edition 2008 or V13
- From V6.0, V6.1, V6.2 or V6.3 to Edition 2008 or V13

**6GK1704-1CW00-3AE0**

**6GK1704-1CW00-3AE1**

#### SOFTNET-IE S7 REDCONNECT VM V13

Software for fail-safe S7 communication via redundant networks, incl. S7 OPC server, runtime software, software and electronic manual on CD-ROM, license key on USB stick, Class A

for 32/64-bit: Windows 7 SP1 Professional/Ultimate;  
for 64-bit: Windows 8.1 Pro;  
for 64-bit: Windows Server 2008 R2 SP1;  
for 64-bit: Windows Server 2012 R2 German/English;

- Single license for one installation

**6GK1704-0HB13-0AA0**

<sup>1)</sup> For more details of Online Software Delivery, visit:  
<http://www.siemens.com/tia-online-software-delivery>  
under Ordering Data.

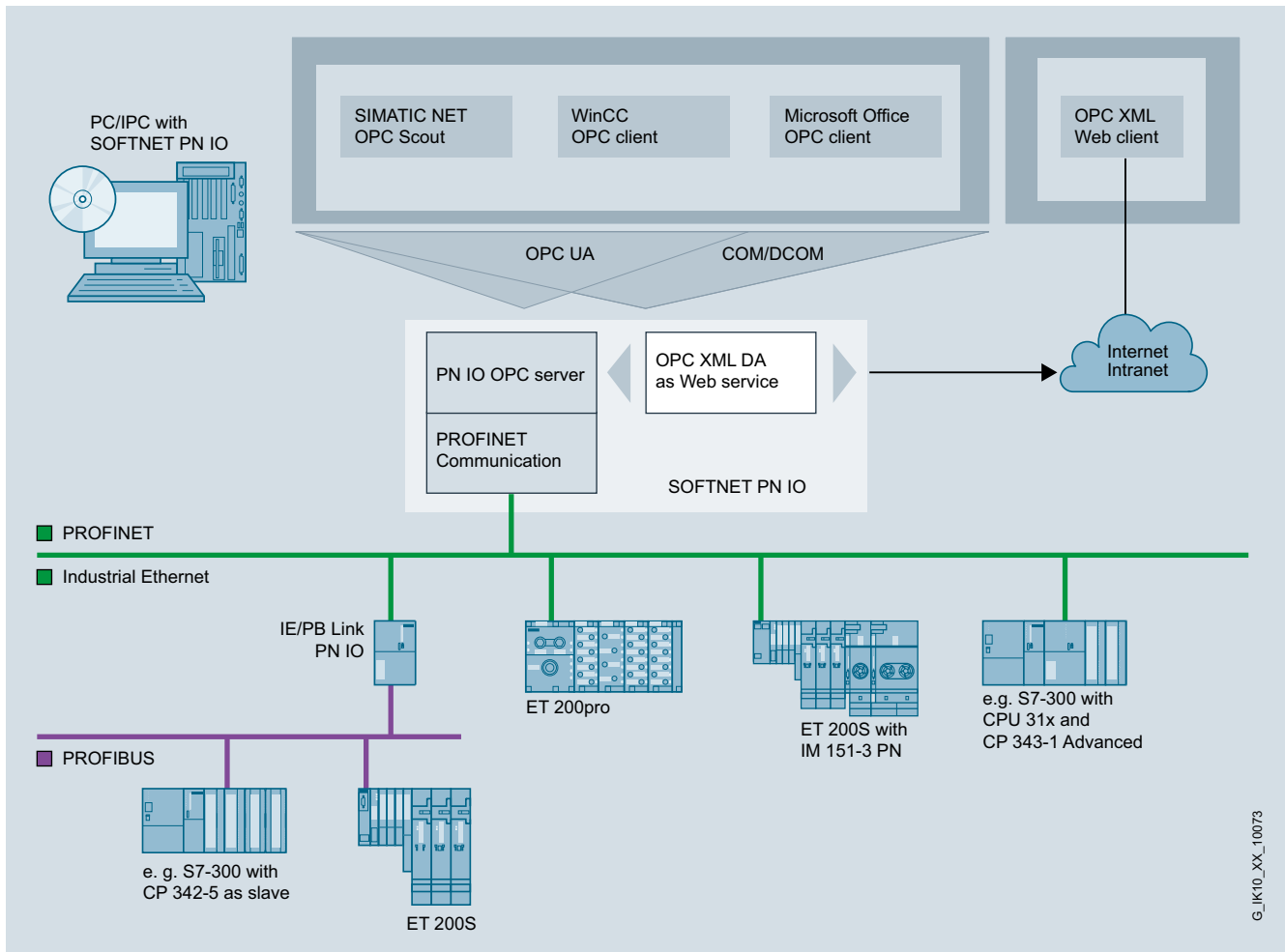
## SIMATIC programming devices

Communications software

### SOFTNET for Industrial Ethernet

Ordering data	Article No.		Article No.
<b>SOFTNET-IE S7 Lean Edition V13</b> For 32/64-bit: Windows 7 SP1 Professional/Ultimate; for 64-bit: Windows 8.1 Pro; for 64-bit: Windows Server 2008 R2 SP1 for 64-bit: Windows Server 2012 R2; up to 8 connections; German/English; Single license for one installation <ul style="list-style-type: none"> <li>• On DVD</li> <li>• Download <sup>1)</sup></li> </ul>	<b>6GK1704-1LW13-0AA0</b> <b>6GK1704-1LW13-0AK0</b>	<b>IE S7 OPC Redundancy</b> Software for redundant OPC servers in the environment of Industrial Ethernet software, S7 products, runtime software, software and electronic manual on CD-ROM, license key on USB stick, Class A	
<b>Software Update Service</b> For 1 year with automatic extension; requirement: current software version	<b>6GK1704-1LW00-3AL0</b>	<b>IE S7 OPC Redundancy V13</b> For 64-bit: Windows Server 2008 R2 SP1; German/English <ul style="list-style-type: none"> <li>• Single license for one installation</li> </ul>	<b>6GK1706-1CW13-0AA0</b>
<b>Upgrade</b> <ul style="list-style-type: none"> <li>• From Edition 2006 to Edition 2008 or V13</li> <li>• From V6.0, V6.1, V6.2 or V6.3 to Edition 2008 or V13</li> </ul>	<b>6GK1704-1LW00-3AE0</b> <b>6GK1704-1LW00-3AE1</b>		

<sup>1)</sup> For more details of Online Software Delivery, visit:  
<http://www.siemens.com/tia-online-software-delivery>  
 under Ordering Data.

**Overview**


G\_JK10\_XX\_10073

PC with SOFTNET PN IO as PROFINET IO Controller

ISO	TCP/UDP	PN	MRP	OPC	PG/OP	S7/S5	IT
	●	●		●			

G\_PN10\_XX\_01710

- Software with PROFINET IO Controller function for coupling PG/PC and IPC with PROFINET IO Devices
- Possible applications:
  - PC-based control systems
  - HMI systems
  - Test applications
- Communication services:
  - PROFINET IO controller
- Can be used with
  - Layer 2 Ethernet card (PCI/PCIe), e.g. CP 1612 A2
  - Integral Industrial Ethernet interfaces of SIMATIC programming devices/PCs
- Cost-effective solution for the low-end performance range
- OPC server for I/O connection over PROFINET included in scope of delivery

# SIMATIC programming devices

Communications software

## SOFTNET PN IO

### Technical specifications

	SOFTNET PN IO
<b>Performance data</b>	
• Number of operable IO devices	Max. 64
• Number of external IO-lines in one central rack	Max. 1
• Size of IO data areas overall	
- I/O input area	Max. 2 KB
- I/O output area	Max. 2 KB
• Size of I/O data area per connected I/O device	
- I/O input range	Max. 1433 byte
- I/O output range	Max. 1433 byte

### Ordering data

### Article No.

#### SOFTNET PN IO

Software for PROFINET IO Controller with OPC server and NCM PC / STEP 7 Professional V12, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A

#### SOFTNET-IE PN IO V12

For 32/64-bit Windows 7 Professional/Ultimate;  
for Windows Server 2008 R2 for 32/64-bit Windows 8 Pro;  
for Windows Server 2012;  
German/English

- Single license for one installation

**6GK1 704-1HW12-0AA0**

#### Software Update Service

For 1 year with automatic extension;  
requirement: current software version

**6GK1704-1HW00-3AL0**

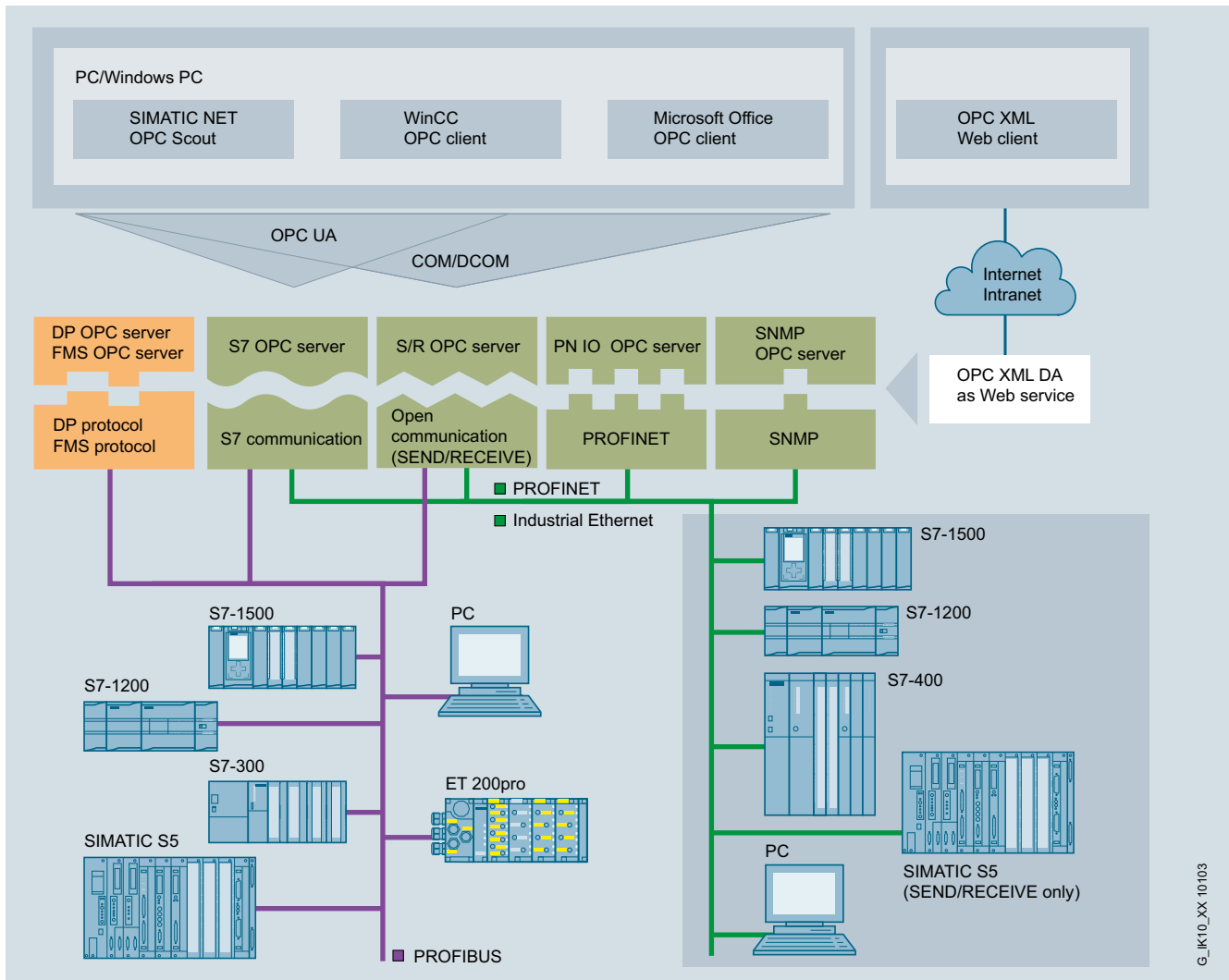
#### Upgrade

- From Edition 2006 to SOFTNET PN IO Edition 2008 or V12
- From V6.0, V6.1, V6.2 or V6.3 to SOFTNET PN IO Edition 2008 or V12

**6GK1704-1HW00-3AE0**

**6GK1704-1HW00-3AE1**

### Overview



System integration with OPC server

OPC (**O**penness, **P**roductivity & **C**ollaboration) is a standardized, open, and vendor-independent interface that is widely used in automation.

A fundamental distinction is made between the classic OPC and its consistent further development OPC UA (**U**nified **A**rchitecture). Smooth migration to the new OPC UA standard is easily possible; this offers further value added, such as security. The SIMATIC NET OPC servers offer the two interfaces OPC UA and classic OPC for SIMATIC S7 and PROFINET.

- The corresponding OPC servers are included in the scope of supply of the respective communication software
- Standardized, open, multi-vendor interface
- It permits interfacing of OPC-capable Windows applications to S7 communication, open communication (SEND/RECEIVE), PROFINET, and SNMP
- Increased availability thanks to additional option packages such as OPC server redundancy
- OPC Scout with browser functionality as an OPC client and OCX Data Control/.NET Data Control for simple OPC client creation

# SIMATIC programming devices

## Communications software

### OPC server for Industrial Ethernet

#### Technical specifications

OPC server for Industrial Ethernet	
Programming	<ul style="list-style-type: none"> <li>• Synchronous and asynchronous reading and writing of variables</li> <li>• Monitoring of variables using the OPC server with a signal to the client when a change occurs</li> <li>• Use of quantity operations; so a large amount of data can be processed in a short time.</li> </ul>
Interfaces	<ul style="list-style-type: none"> <li>• Custom Interface (C++, NET) for high OPC performance</li> <li>• Automation Interface (VB, Excel, Access, Delphi, ...) for ease-of-use</li> <li>• Graphics with OCX or .NET Data Control; for configuring instead of programming</li> <li>• OPC XML-Interface for Data Access</li> </ul>
Products	include OPC servers for:
Industrial Ethernet <ul style="list-style-type: none"> <li>• HARDNET-IE S7, SOFTNET-IE S7, SOFTNET-IE S7 Lean</li> <li>• SNMP OPC server</li> <li>• S7 OPC Redundancy</li> </ul>	S7 OPC server for S7 communication, XML-DA S5 OPC server for open communication <sup>1)</sup> , XML-DA SNMP OPC server for SNMP protocol access; XML-DA Redundant S7-OPC server for S7 communication
PROFINET <ul style="list-style-type: none"> <li>• SOFTNET-IE PN IO</li> </ul>	PN IO OPC server for PROFINET IO communication; XML-DA
PROFIBUS <ul style="list-style-type: none"> <li>• HARDNET-PB DP, SOFTNET-PB DP, SOFTNET-PB DP slave</li> <li>• FMS-5613</li> <li>• HARDNET-PB S7, SOFTNET-PB S7</li> <li>• S7 OPC Redundancy</li> </ul>	DP-OPC server for PROFIBUS DP communication; XML-DA FMS-OPC server for PROFIBUS FMS communication; XML-DA S7-OPC server for S7 communication, XML-DA Redundant S7-OPC server for S7 communication

<sup>1)</sup> also S5-compatible communication

#### Ordering data

##### SNMP OPC Server

Status monitoring of SNMP-capable devices in any OPC client systems; e.g. SIMATIC WinCC/PCS 7

##### S7 OPC Redundancy

Software for redundant OPC servers in the environment of Industrial Ethernet software, S7 products, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A

##### S7 OPC Redundancy V13

For 64-bit: Windows Server 2008 R2 SP1; German/English

- Single license for one installation

##### Software Update Service

For 1 year with automatic extension; requirement: current software version

#### Article No.

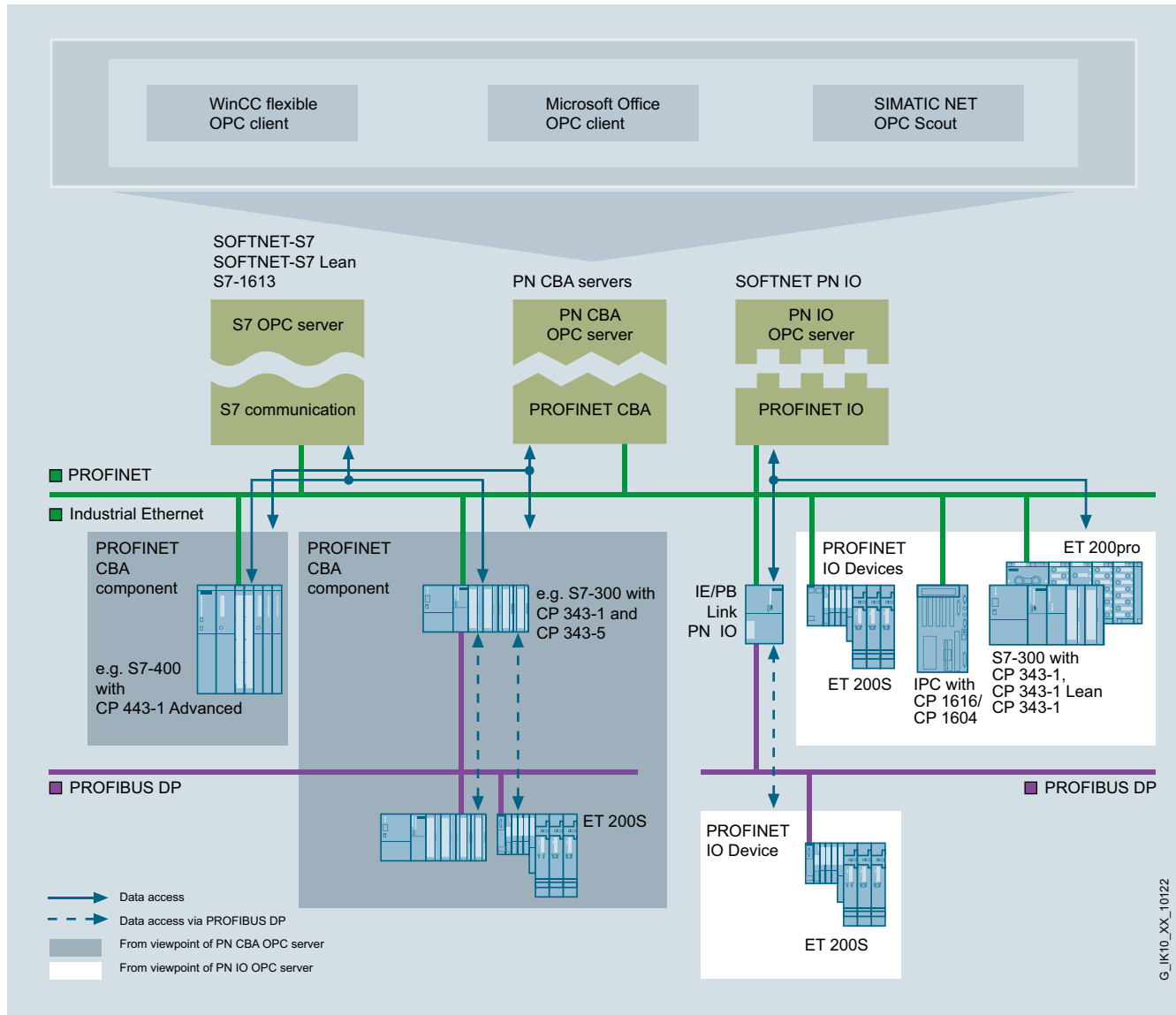
See SNMP OPC server, page 12/19

**6GK1706-1CW13-0AA0**

**6GK1706-1CW00-3AL0**

## Overview

- Access to variables in PROFINET CBA components over the OPC interface
- Use of the objects and symbols defined using the PROFINET engineering tool SIMATIC iMap and STEP 7
- Adding PROFINET functionality to existing installations. This enables it to be used in parallel with other communication protocols such as S7 communication with SOFTNET-S7 for Industrial Ethernet.
- OPC Scout as an OPC client with browser functions for the variables of the PROFINET CBA components



System integration with the PN CBA OPC server



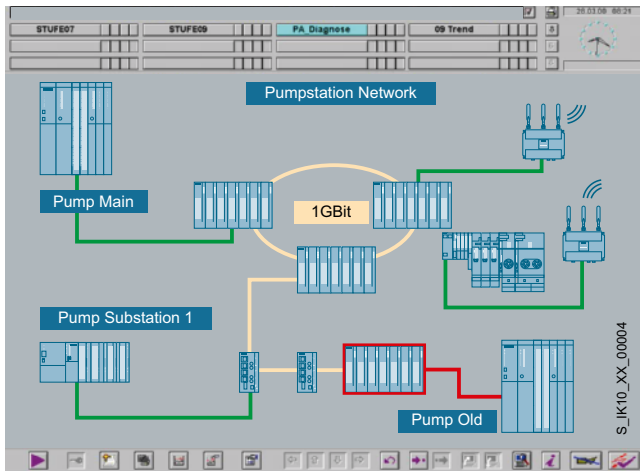
# SIMATIC programming devices

## Communications software

### PN CBA OPC servers

Technical specifications		Ordering data	Article No.
	<b>PN CBA OPC server</b>	<b>PN CBA OPC Server Edition 2008</b>	
Programming	<ul style="list-style-type: none"> <li>Open and standardized</li> <li>Synchronous and asynchronous reading and writing of variables</li> <li>Monitoring of variables by the OPC server with an alarm message to the client in the case of a change</li> <li>Use of batch operations, so a large volume of data can be processed in a short time</li> </ul>	PROFINET OPC server for CBA; runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A, for 32-bit Windows XP Professional SP 2/3; Windows Server 2003 R2 SP2; German/English	
Interfaces	<ul style="list-style-type: none"> <li>Custom Interface (C++, .NET)</li> <li>Automation Interface (Visual Basic, Excel, Access,...)</li> <li>OPC Data Control</li> <li>OPC XML Interface for Data Access</li> </ul>	<ul style="list-style-type: none"> <li>Single license for one installation</li> <li>Software Update Service for one year, with automatic extension; requirement: current software version</li> <li>Upgrade from Edition 2006 and higher to Edition 2008, single license</li> <li>Upgrade from V6.0, V6.1, V6.2 or V6.3 to Edition 2008, single license</li> </ul>	<b>6GK1706-0HB71-3AA0</b> <b>6GK1706-0HB00-3AL0</b>  <b>6GK1706-0HB00-3AE0</b>  <b>6GK1706-0HB00-3AE1</b>
Protocols	<ul style="list-style-type: none"> <li>DCOM protocol</li> </ul>		
Configuration	Configuring software for PROFINET SIMATIC iMap		
	<b>PROFINET communication (CBA)</b>	<b>Software iMap V3.0</b>	
<ul style="list-style-type: none"> <li>Number of communication partners</li> <li>Number of connections</li> </ul>	max. 228 max. 10,000	For configuring PROFINET CBA  <i>Requirement:</i> Windows 2000 Prof. with Service Pack 4 or later or Windows XP Prof. with Service Pack 1 or later or Windows Server 2003 with Service Pack 1 or later; on PG or PC with Pentium processor, min. 1 GHz; STEP 7 V5.3 or later with Service Pack 3, PN OPC Server V6.3 or later  <i>Type of supply:</i> German, English with electronic documentation	<b>6ES7820-0CC04-0YA5</b> <b>6ES7820-0CC01-0YX2</b> <b>6ES7820-0CC04-0YE5</b>

## Overview



- Status monitoring of SNMP-capable devices in any OPC client systems; e.g. SIMATIC WinCC/PCS 7
- Easy access to SNMP-capable devices over the OPC interface
- Devices without SNMP agents can be monitored using the ping mechanism
- Configuration with STEP 7 (up to STEP 7 V5.5) or NCM PC
- Ready-to-use SNMP diagnostics profiles for Siemens devices, e.g. SCALANCE X/W
- Generation of any SNMP diagnostics profiles by means of the integral MIB compiler
- Easy setup of the monitored devices with the help of an Autodiscovery function

## Ordering data

### SNMP OPC server

Including MIB compiler; single license for one installation of runtime software; software and electronic manual on CD-ROM; license key on USB stick, Class A

### SNMP OPC Server Basic

Administration of up to 20 IP addresses

- **Basic V13**  
for 32/64-bit: Windows 7 SP1 Professional/Ultimate;  
for 64-bit: Windows 8.1 Pro;  
for 64-bit: Windows Server 2008 R2 SP1;  
for 64-bit: Windows Server 2012 R2;  
single license for one installation

### Software Update Service SNMP OPC Server Basic

For 1 year with automatic extension; requirement: current software version

### Upgrade SNMP OPC Server Basic

- from Edition 2006 to Edition 2008 or V13
- from V6.0, V6.1, V6.2 or V6.3 to Edition 2008 or V13

## Article No.

6GK1706-1NW13-0AA0

6GK1706-1NW00-3AL0

6GK1706-1NW00-3AE0

6GK1706-1NW00-3AE1

## Article No.

### SNMP OPC Server Extended

Administration of up to 200 IP addresses

- **Extended V13**  
for 32/64-bit: Windows 7 SP1 Professional/Ultimate;  
for 64-bit: Windows 8.1 Pro;  
for 64-bit: Windows Server 2008 R2 SP1;  
for 64-bit: Windows Server 2012 R2  
single license for one installation

6GK1706-1NX13-0AA0

### Software Update Service SNMP OPC Server Extended

For 1 year with automatic extension; requirement: Current software version

6GK1706-1NX00-3AL0

### Upgrade SNMP OPC Server Extended

- from Edition 2006 to Edition 2008 or V13
- from V6.0, V6.1, V6.2 or V6.3 to Edition 2008 or V13

6GK1706-1NX00-3AE0

6GK1706-1NX00-3AE1

### SNMP OPC Server Power Pack

For upgrade from SNMP OPC Server Basic to SNMP OPC Server Extended

### PowerPack V13

6GK1706-1NW13-0AC0

## SIMATIC programming devices

### Notes

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## Products for specific requirements

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- 9/461 [SIPLUS HCS3200 heating control system:](#)  
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- 13/19 Fan module
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[heating control systems:](#)  
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- 13/21 [SIPLUS HCS300I heating controller](#)
- 13/22 Basic unit
- 13/23 Digital modules
- 13/24 Temperature module
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- 13/26 Current/voltage measuring modules
- 13/27 Decoupling module
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**13/29 Automatic door controls**

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- 13/84 Accessories
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**Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

[www.siemens.com/simatic/printmaterial](http://www.siemens.com/simatic/printmaterial)

## Products for specific requirements

### Telecontrol systems for comprehensive applications

#### Introduction

#### Overview

Telecontrol systems for controlling and monitoring widely distributed plants usually consist of a supervisory control system (telecontrol center) and one or more outstations connected over large distances for the automation of distributed plant sections.

It provides secure communication with reduced data volume for reliable operation in the Wide Area Network (WAN) thanks to event-driven, time-stamped transmission and monitored output of commands.

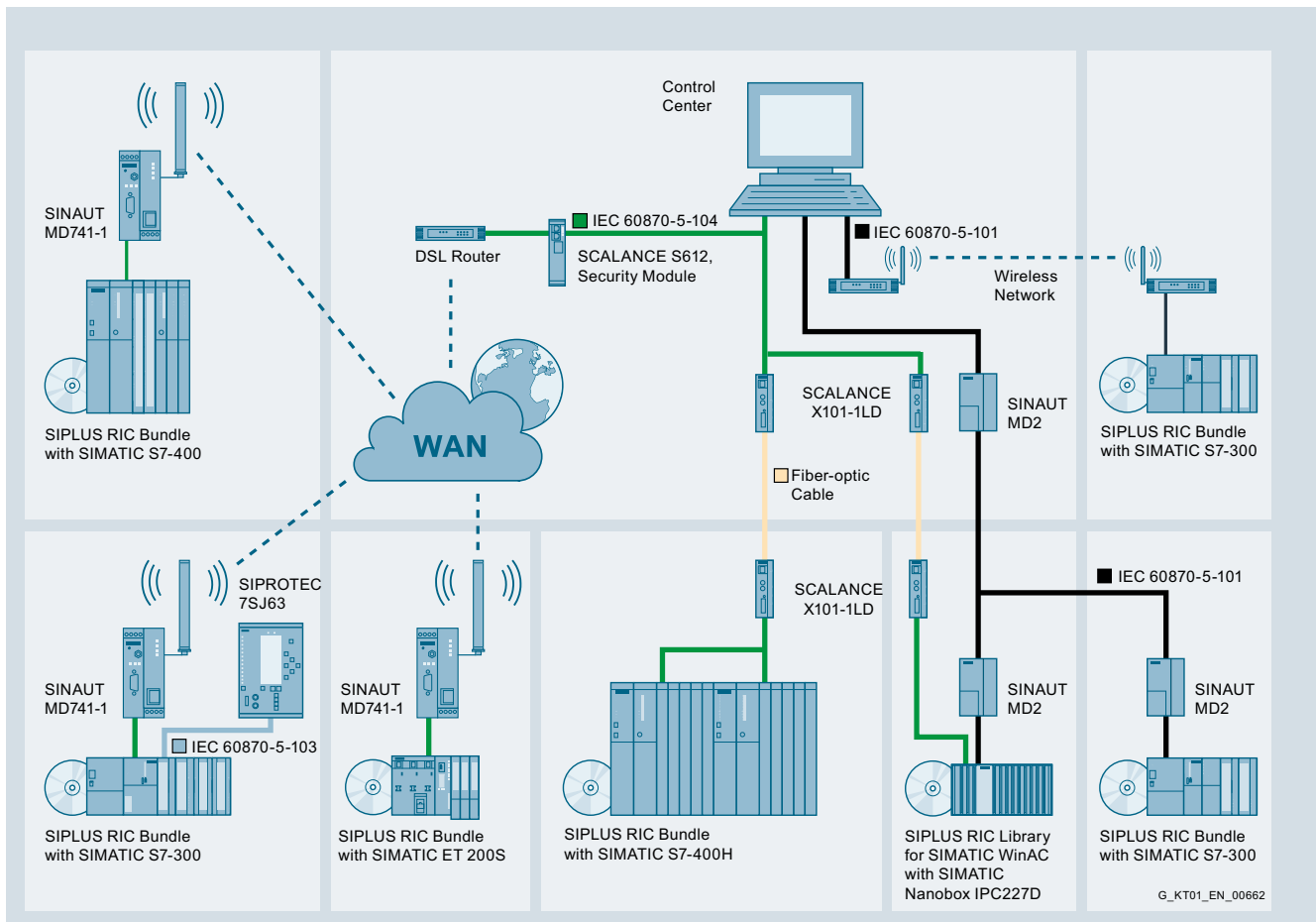
SIPLUS RIC is a versatile telecontrol system that uses the internationally standardized telecontrol protocols:

- Serial transmission IEC 60870-5-101
- Ethernet (TCP/IP) IEC 60870-51-104
- Connection of protection devices IEC 60870-5-103

#### Application

SIPLUS RIC offers maximum functionality and modularity to meet the requirements made upon the monitoring and control of spatially distributed systems, even under extreme environmental conditions.

It is therefore suitable for sectors such as oil, gas, water, wastewater, power generation/distribution, and transportation.



**Overview**

IEC 60870-5-101, IEC 60870-5-103 and IEC 60870-5-104 are standardized vendor-independent protocols. With SIPLUS RIC, they can be parameterized with the SIMATIC Manager or TIA Portal V13 SP1 without the need for additional installations.

The protocol IEC 60870-5-101 supports standard WLAN connections via dedicated lines; in the automation system the modems are coupled via RS 232 to the communication modules 1SI, CP 340, CP 341, CP 441, CP 1540 or CP 1541.

The protocol IEC 60870-5-103 permits serial communication with protection devices, e.g. SIPROTEC. Coupling takes place via the 1SI, CP 340, CP 341, CP 441, CM PTP, CP1540 or CP1541 communication modules and RS 485 interface with fiber-optic cables.

The IEC 60870-5-104 protocol supports TCP/IP-based WAN connections such as Internet/DSL or GPRS/UMTS/LTE. Either the PN interfaces of the CPUs or the CP 343-1CX10/-1EX30/-1GX30 and CP 1543 communication modules are used as interfaces. Redundancy groups and substitute routes (combinations of serial and Ethernet transmission paths) are both possible and enabled via the interfaces.

The libraries for the IEC 60870-5-101 and -104 protocols are supplied as master and slave including activation for PN-CPU and CP interface. The IEC 60870-5-103 library is only provided as master.

SIMATIC Controllers can also communicate with third-party products by means of the IEC protocols.

Information can be forwarded both from lower-level stations and protection devices to the control centers. Automatic updating of the information objects can take place which can then be forwarded with the information object and ASDU address unchanged. These addresses can however also be changed by means of parameter assignment.

## Products for specific requirements

Telecontrol systems for comprehensive applications  
SIPLUS RIC substations for IEC protocol

### SIPLUS RIC libraries for ET200SP

#### Overview



If a SIMATIC ET200SP-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC ET200 SP functions, for the following data volumes:

- 200 information points, for use with CPU 1510
- 800 information points, for use with CPU 1512

The work memory for data is used for buffering the message frames. Longer communication failure times can thus be bridged should a connection fail. The SIPLUS RIC software libraries are based on the standard TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices, thus saving hardware costs and programming overhead.

The libraries are on a CD and are supplied together with a SIMATIC Memory Card which can be used on all CPUs. Five versions with different storage capacities are available.

With SIPLUS Extreme hardware, telecontrol devices for an extended ambient temperature range (-25 ... +70°C) and exceptional exposure to media (conformal coating) can be implemented with the telecontrol protocols.

A certificate of license enabling all IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols is supplied for the SIMATIC Memory Card included in delivery.

#### Ordering data

##### SIPLUS RIC libraries for SIMATIC ET 200SP

Runtime license;  
CD with software and documentation, with SIMATIC Memory Card

- 4 MB
- 12 MB

#### Article No.

**6AG6003-8CF00-0LC0**

**6AG6003-8CF00-0LE0**

## Products for specific requirements

Telecontrol systems for comprehensive applications  
SIPLUS RIC substations for IEC protocol

### SIPLUS RIC libraries for S7-1500

#### Overview



If a SIMATIC S7-1500-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC S7-1500 functions, for the following data quantities:

- 200 information points, for use with CPU 1511
- 1 000 information points, for use with CPU 1513
- 2 000 information points, for use with CPU 1516
- 5 000 information points, for use with CPU 1518

The work memory for data is used for buffering the message frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices – this saves hardware costs and programming overhead.

The libraries on CD are supplied together with a SIMATIC Memory Card, which can be used on all CPUs. Five versions with different storage capacities are available.

With SIPLUS Extreme Hardware, telecontrol devices for an extended ambient temperature range (-25 ... +70 °C) and exceptional exposure to media (conformal coating) can be implemented using the telecontrol protocols.

A license certificate with the activation of all telecontrol protocols IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) is supplied for the SIMATIC Memory Card included in the scope of delivery.

#### Ordering data

##### SIPLUS RIC libraries for SIMATIC S7-1500

Runtime license;  
CD with software and documentation, with SIMATIC Memory Card

- 4 MB
- 12 MB
- 24 MB
- 256 MB
- 2 GB

#### Article No.

**6AG6003-7CF00-0LC0**

**6AG6003-7CF00-0LE0**

**6AG6003-7CF00-0LF0**

**6AG6003-7CF00-0LL0**

**6AG6003-7CF00-0LP0**



## Products for specific requirements

Telecontrol systems for comprehensive applications  
SIPLUS RIC substations for IEC protocol

### SIPLUS RIC libraries for ET 200S

#### Overview



If a SIMATIC ET 200S-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC ET 200S functions, for up to 200 information points.

The non-retain memory can also be used for buffering message frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard SIMATIC Manager or TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices – this saves hardware costs and programming overhead.

The libraries on CD are supplied together with a SIMATIC Memory Card, which can be used on all CPUs. Two versions with different memory sizes are available for selection.

With SIPLUS Extreme Hardware, telecontrol devices for an extended ambient temperature range (-25 ... +70 °C) and exceptional exposure to media (conformal coating) can be implemented using the telecontrol protocols.

A license certificate with the activation of all telecontrol protocols IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) is supplied for the SIMATIC Memory Card included in the scope of delivery.

#### Note:

The SIPLUS RIC libraries for ET 200S completely replace the previous SIPLUS RIC ET 200S bundles und SIPLUS RIC ET 200S extreme bundles.

#### Ordering data

##### SIPLUS RIC libraries for SIMATIC ET 200S

Runtime license;  
CD with software and documentation,  
with SIMATIC Memory Card

- 512 KB
- 2 MB

#### Article No.

**6AG6003-5CF00-0CA0**

**6AG6003-5CF00-0DA0**

## Products for specific requirements

Telecontrol systems for comprehensive applications  
SIPLUS RIC substations for IEC protocol

### SIPLUS RIC libraries for S7-300

#### Overview



If a SIMATIC S7-300-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC S7-300 functions, for the following data quantities:

- 200 information points, for use with CPU 314
- 1 000 information points, for use with CPU 315
- 2 000 information points, for use with CPU 317
- 5 000 information points, for use with CPU 319

The non-retain memory can also be used for buffering message frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard SIMATIC Manager or TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices – this saves hardware costs and programming overhead.

The libraries on CD are supplied together with a SIMATIC Memory Card, which can be used on all CPUs. Two versions with different memory sizes are available for selection.

With SIPLUS Extreme Hardware, telecontrol devices for an extended ambient temperature range (-25 ... +70 °C) and exceptional exposure to media (conformal coating) can be implemented using the telecontrol protocols.

A license certificate with the activation of all telecontrol protocols IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) is supplied for the SIMATIC Memory Card included in the scope of delivery.

#### Note:

The SIPLUS RIC libraries for S7-300 completely replace the previous SIPLUS RIC S7-300 bundles und SIPLUS RIC S7-300 extreme bundles.

#### Ordering data

##### SIPLUS RIC libraries for SIMATIC S7-300

Runtime license;  
CD with software and documentation,  
with SIMATIC Memory Card,

- 512 KB
- 2 MB

#### Article No.

**6AG6003-1CF00-0CA0**

**6AG6003-1CF00-0DA0**

## Products for specific requirements

Telecontrol systems for comprehensive applications  
SIPLUS RIC substations for IEC protocol

### SIPLUS RIC libraries for S7-400

#### Overview



If a SIMATIC S7-400 based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC S7-400 functions, for the following data quantities:

- 1 000 information points, for use with CPU 412 or CPU 412H
- 2 000 information points, for use with CPU 414 or CPU 414H
- 5 000 information points, for use with CPU 416 or CPU 416H

The non-retain memory can also be used for buffering message frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard SIMATIC Manager or TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices – this saves hardware costs and programming overhead.

The libraries are supplied on a CD and can be used on all CPUs.

With SIPLUS Extreme Hardware, telecontrol devices for an extended ambient temperature range (-25 ... +70 °C) and exceptional exposure to media (conformal coating) can be implemented using the telecontrol protocols.

A memory card or a CPU (CPU V4.x or higher and CPU 410H) is licensed. All IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols are activated via the email address [siplus-ric.automation@siemens.com](mailto:siplus-ric.automation@siemens.com).

#### Note:

The SIPLUS RIC libraries for S7-400 completely replace the previous SIPLUS RIC S7-400 bundles, SIPLUS RIC S7-400 extreme bundles, and IEC 60870 libraries for SIMATIC PCS 7.

#### Ordering data

##### SIPLUS RIC libraries for SIMATIC S7-400

Runtime license for SIMATIC S7-400 firmware version 4.x or higher; CD with software and documentation

#### Note:

If used in S7-400H systems, a license will be required for both CPUs

#### Article No.

**6AG6003-3CF00-0AA0**

## Products for specific requirements

Telecontrol systems for comprehensive applications  
SIPLUS RIC substations for IEC protocol

### SIPLUS RIC libraries for WinAC

#### Overview



If a SIMATIC WinAC RTX-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

The SIPLUS RIC software libraries are based on the standard SIMATIC Manager or TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices – this saves hardware costs and programming overhead.

The libraries are supplied on a CD and can be used for all WinAC RTX systems.

With SIPLUS Extreme Hardware, telecontrol devices for an extended ambient temperature range (-25 ... +70 °C) and exceptional exposure to media (conformal coating) can be implemented using the telecontrol protocols.

All IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols are activated via the email address [siplus-ric.automation@siemens.com](mailto:siplus-ric.automation@siemens.com).

#### Note:

The SIPLUS RIC libraries for WinAC completely replace the previous IEC 60870 libraries for WinAC.

#### Ordering data

##### SIPLUS RIC libraries for SIMATIC WinAC

Runtime license;  
CD with software and documentation

#### Article No.

**6AG6003-0CF00-0AA0**

## Products for specific requirements

### IO systems for heating units

#### Introduction

#### Overview



Heating control systems

**SIPLUS HCS heating control systems:  
Industrial heating processes – maximum precision and efficiency**

In manufacturing processes where temperature plays a crucial role, deviations of just a few degrees can cause enormous quality problems. To avoid this and to minimize rejection rates, high-precision and reliable, individual control of the electrical heating elements is essential.

Nearly all industrially manufactured products undergo heat treatment. Even small deviations in the heating process can result in enormous negative effects on product quality.

To increase the quality and quantity of a heat-treated product, it is important to be able to focus the energy required with the highest level of spatial and temporal precision.

The SIPLUS HCS ensures utmost precision in the control of electric heating units such as infrared heaters.

Three heating control systems are available:

- With integrated power outputs – compact design
- With integrated power outputs - modular design
- Without integrated power outputs

The SIPLUS HCS family of heating control systems saves time, costs and resources when it comes to configuring, commissioning, operation and maintenance.

This is achieved by:

- Simple integration into existing automation systems such as SIMATIC and SIMOTION
- Lower wiring costs and user-friendly engineering
- Intelligent diagnostics options for swift fault detection
- Service-friendly design thanks to ready-to-use function and data blocks
- Reduced volume in the control cabinet with space savings of up to 50 %

Overview of available heating control systems.

For more information, visit <http://www.siemens.com/siplus-hcs>.

**Note:**

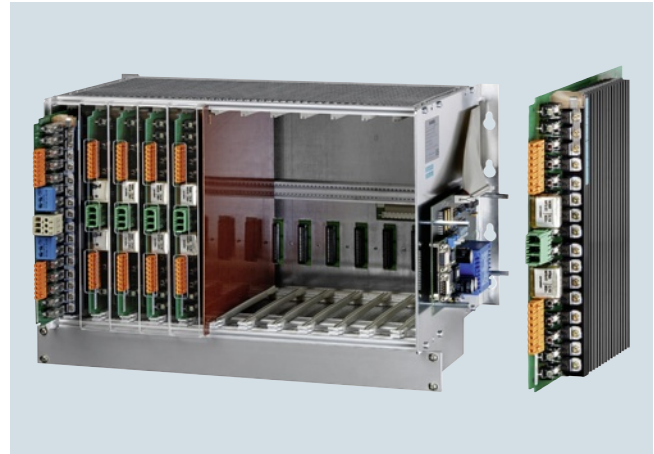
For information on the SIPLUS HCS3200, SIPLUS HCS4200 and SIPLUS HCS 4300 heating control systems, see chap. 9 in this catalog.

**Overview**

The SIPLUS HCS716I heater control system was developed as a cost-optimized controller of heat emitter arrays in thermoforming machines. It is suitable for all generally available radiation devices such as quartz, quartz material, ceramic, halogen and infrared radiation devices.

SIPLUS HCS716I can be used wherever low-cost, resistive loads of small to medium output require switching in an industrial environment.

The SIPLUS HCS716I family comprises four racks and three power output modules.



HCS716I heater controller

## Products for specific requirements

IO systems for heating units

SIPLUS HCS716I heating control system

### Rack

#### Overview

The rack is the mechanical framework of the SIPLUS HCS716I and contains all the modules required to control the power outputs.

It is available in four different versions:

- Rack hinged frame
- Rack mounting frame
- Rack mounting frame without flange
- Rack mounting frame, slim-line version and expansion frame, slim-line version

#### **Rack hinged frame**

The CPU and the control module are located at the rear of the rack. The rack is suitable for installation in a hinged frame.



Rack hinged frame 6BK1700-2AA00-0AA1

#### **Rack mounting frame**

The CPU and the control module are located on the right side of the rack. This rack is suitable for direct installation in a control cabinet.



Rack mounting frame 6BK1700-2AA10-0AA1

#### **Rack mounting frame without flange**

The CPU and the control module are also located on the right side of the rack. This rack is suitable for installation in a control cabinet. In contrast to the rack mounting frame, this version has no mounting bracket (flange) on the front.

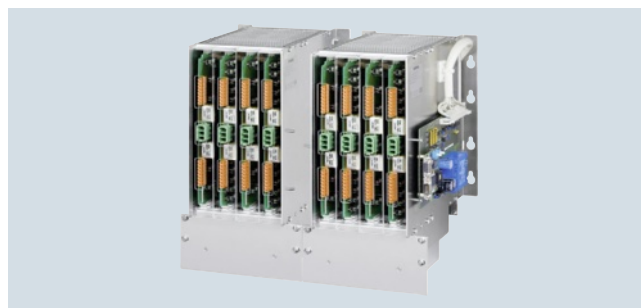


Rack mounting frame without flange 6BK1700-2AA70-0AA0

#### **Rack mounting frame, slim-line version and expansion frame, slim-line version**

The CPU and the control module are also located on the right side of the rack. This rack is suitable for direct installation in a control cabinet and accommodates up to four power output modules and can be extended with the expansion rack to take another four power output modules. It is mounted to the left of the rack mounting frame slim-line version and connected to it by means of a cable.

An additional fan unit is available as an accessory which is attached from below to the rack mounting frame, slim-line version and expansion rack, slim-line version.



Rack mounting frame, slim-line version 6BK1700-2AA80-0AA0 (right) and expansion frame, slim-line version 6BK1700-3AA00-0AA0 (left) with fan units 6BK1700-2GA10-0AA0 attached below



Fan unit 6BK1700-2GA10-0AA0



## Products for specific requirements

IO systems for heating units  
SIPLUS HCS716I heating control system

### Rack

Ordering data	Article No.		Article No.
<b>Rack hinged frame</b> Number of slots: 12 Type of power output that can be connected: LA716 / LA716I / LA716I HP Interface design: PROFIBUS DP	6BK1700-2AA00-0AA1		
<b>Rack mounting frame</b> Number of slots: 12 Type of power output that can be connected: LA716 / LA716I / LA716I HP Interface design: PROFIBUS DP	6BK1700-2AA10-0AA1		
<b>Rack mounting frame without flange</b> Number of slots: 12 Type of power output that can be connected: LA716 / LA716I / LA716I HP Interface design: PROFIBUS DP	6BK1700-2AA70-0AA0		
<b>Rack mounting frame, slim-line version</b> Number of slots: 4 Type of power output that can be connected: LA716 / LA716I / LA716I HP Interface design: PROFIBUS DP	6BK1700-2AA80-0AA0		
<b>Expansion rack slim-line version</b> Number of slots: 4 Type of power output that can be connected: LA716 / LA716I / LA716I HP Interface design: PROFIBUS DP	6BK1700-3AA00-0AA0		
		<b>Accessories</b> <i>for rack hinged frame, rack mounting frame and rack mounting frame without flange</i> <b>230 V AC fan unit with 3 fans<sup>1)</sup></b>	on request
		<b>Fan unit 115 ... 230 V AC/24 V DC with 3 fans and speed monitoring<sup>1)</sup></b>	on request
		<i>for rack mounting frame, slim-line version and expansion frame, slim-line version</i> <b>230 V AC fan unit with 1 fan</b>	6BK1700-2GA10-0AA0
		Type of mounting: in the mounting or expansion frame Installation position: horizontal	

<sup>1)</sup> Fan units for hinged frame, mounting frame, and mounting frame without flange are available from: HEITEC AG, [see www.heitec.de](http://www.heitec.de).



## Products for specific requirements

IO systems for heating units

SIPLUS HCS716I heating control system

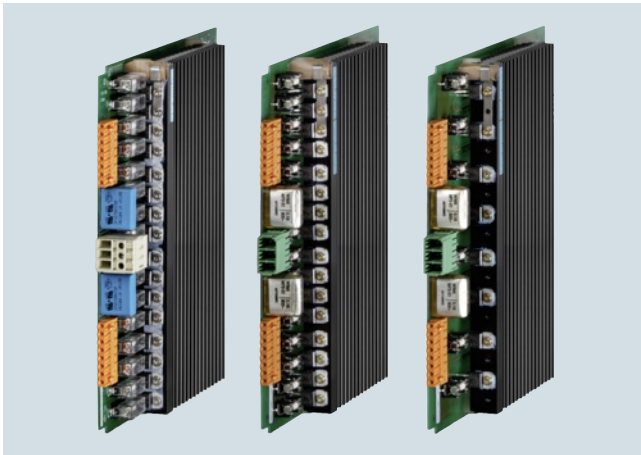
### Power output modules

#### Overview

The power output modules are an important component of the SIPLUS HCS716I heater control.

Three different power output modules can be used depending on the application:

- LA716 power output module – the **universal** version
- LA716I power output module – the **innovative** version
- LA716I HP power output module – the **HighPower** version



Power output modules LA716 (left), LA716I (center) and LA716I HP (right)

#### LA716 power output module

The **universal** power output module provides 16 channels for connecting resistive loads. Up to 650 W can be used per output channel.

#### LA716I power output module

The **innovative** power output module provides 16 channels for connecting resistive loads. Up to 1 150 W can be used per output channel.

#### LA716I HP power output module

The **HighPower** version provides 8 channels for connecting resistive loads. Up to 2,300 W can be used per output channel.

#### Ordering data

#### Article No.

##### LA716 power output module

6BK1700-2BA70-0AA1

Number of outputs for heating power: 16  
Power carrying capacity per output maximum: 650 W

##### LA716I power output module

6BK1700-4BA80-0AA0

Number of outputs for heating power: 16  
Power carrying capacity per output maximum: 1150 W

#### Article No.

##### LA716I HP power output module

6BK1700-4CA00-0AA0

Number of outputs for heating power: 8  
Power carrying capacity per output maximum: 2300 W

**Overview**

SIPLUS HCS724I heater controller

The SIPLUS HCS724I heater control system controls and switches heat emitter arrays and other resistive loads of medium to high output in the industrial environment.

The connection is made using PROFIBUS DP and provides, together with the SIMATIC S7, for example, a highly-modern and powerful automation system. As an option, a line-voltage sensing submodule can be integrated in order to compensate automatically and internally for variations in the line voltage.

## Products for specific requirements

IO systems for heating units

SIPLUS HCS724I heating control system

### Central interface module

#### Overview



The central interface module is the intelligent processor module of the SIPLUS HCS724I heater control.

#### Ordering data

##### **ZA724I central interface module**

Interface design:  
PROFIBUS DP  
Type of power output  
that can be connected:  
LA724I / LA724I HP / LA724I SSR

#### Article No.

**6BK1700-2BA30-0AA0**

## Products for specific requirements

### IO systems for heating units

### SIPLUS HCS724I heating control system

#### Power output modules

#### Overview

The power output modules are an important component of the SIPLUS HCS724I heater control.

Three different power output modules can be used depending on the application:

- LA724I power output module – the **universal** version
- LA724I HP power output module – the **HighPower** version
- LA724I SSR power output module – the **high-current** version



Power output modules LA724I (left), LA724I HP (center) and LA724I SSR (right)

#### LA724I power output module

The **universal** power output module provides 24 channels for connecting resistive loads. Up to 1 150 W can be used per output channel.

#### LA724I HP power output module

The **HighPower** power output module offers 12 channels for activating resistive loads for voltages up to 400 V/max. and 10 A per channel.

#### LA724I SSR power output module

The 24-channel power output module is the **high-current** version for controlling external solid-state relays SSR (up to 90 A/load)

#### Ordering data

#### Article No.

#### LA724I power output module

Number of outputs for heating power: 24  
Power carrying capacity per output maximum: 650 W

6BK1700-2BA00-0AA0

#### LA724I HP power output module

Number of outputs for heating power: 12  
Power carrying capacity per output maximum: 4000 W

6BK1700-4BA70-0AA0

#### Article No.

#### LA724I SSR power output module

Number of semiconductor outputs: 24

6BK1700-2BA10-0AA0

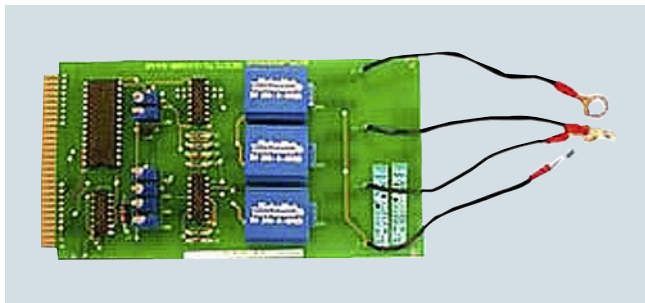
## Products for specific requirements

IO systems for heating units

SIPLUS HCS724I heating control system

### Line-voltage sensing submodule

#### Overview



The line-voltage sensing submodule is an optional module for line-voltage sensing and correction.

The line-voltage sensing submodule is plugged from the front into the enclosure of the central interface module. The slot is located in the busbar area. If the line-voltage sensing submodule is not used, the opening is sealed by the busbar cover. If the line-voltage sensing submodule is used, the cover is used for shock-hazard protection.

#### Ordering data

#### Article No.

##### Line-voltage sensing submodule<sup>1)</sup>

**6ES7171-1XX00-6AA0**

Supply voltage with AC  
rated value: 230 V

<sup>1)</sup> Inserted in the central interface module.

**Overview**

Fan module for installation underneath two power output modules

The fan module is available for reliable heat dissipation of the LA724I and LA724I HP power output modules. The fan module is a standard fan in an IP00 enclosure.

The fan module can be connected to

- 2 LA724I or LA724I HP power output modules

or

- 1 central interface module and 1 LA724I or LA724I HP power output module

**Ordering data****Article No.****Fan module**

Supply voltage with AC  
 rated value: 230 V

**6ES7171-3AA00-0AA0**

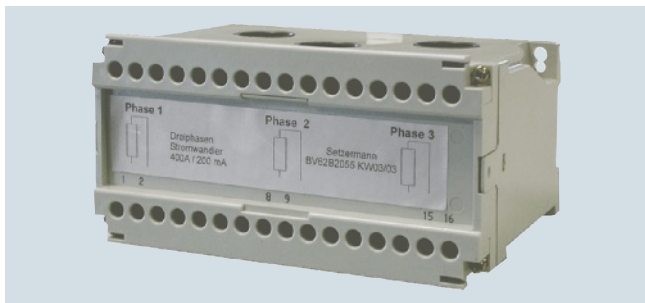
## Products for specific requirements

IO systems for heating units

SIPLUS HCS724I heating control system

### Current measuring module

#### Overview



The current measuring module is an option for diagnosis by means of current measurements and is connected to the LA724I SSR power output module.

The module is required when heat emitters are connected in parallel and failure of a single heat emitter is to be detected using a current measurement.

It is installed in the control cabinet on a stable mounting surface (recommended) or on a DIN rail.

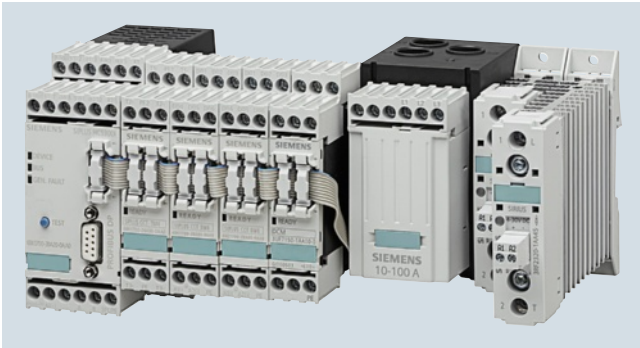
#### Ordering data

##### SM724I current measuring module

Current measuring range:  
1 ... 400 A

#### Article No.

6BK1700-2BA40-0AA0

**Overview**

SIPLUS HCS300I is an industrial heating controller which drives resistive loads via solid-state relays (SSR) or contactors. SIPLUS HCS300I was developed on the basis of the SIMOCODE system.



## Products for specific requirements

IO systems for heating units

SIPLUS HCS300I heating controller

### Basic unit

#### Overview



The basic unit handles the central functions of the SIPLUS HCS300I heating controller and communicates with the higher-level automation system.

#### Ordering data

##### Basic unit

Supply voltage 1 with DC  
rated value: 24 V  
Switching device  
can be connected:  
Maximum of 4 digital modules  
and 4 temperature modules,  
1 current detection module or  
1 current/voltage measuring  
module, 1 decoupling module

#### Article No.

**6BK1700-3BA20-0AA0**

**Products for specific requirements**IO systems for heating units  
SIPLUS HCS300I heating controller**Digital modules****Overview**

The digital modules expand the SIPLUS HCS300I heater controller with additional digital outputs via which solid-state relays (SSR) or contactors are switched.

**Ordering data****Article No.****Digital module Version 1****6BK1700-2BA80-0AA0**

Design of electrical connection at the digital outputs:  
Screw connection with removable terminal, cable assembly  
Output current at digital output with signal <1> maximum:  
500 mA

**Digital module Version 2****6BK1700-4BA50-0AA0**

Design of electrical connection at the digital outputs:  
Screw connection with removable terminal  
Output current at digital output with signal <1> maximum:  
500 mA

## Products for specific requirements

IO systems for heating units  
SIPLUS HCS300I heating controller

### Temperature modules

#### Overview



The temperature module (TM) processes analog temperature values supplied by the temperature sensors of the plant.

#### Ordering data

#### Article No.

##### Temperature module

- Number of analog inputs
- 2-wire connection: 4
  - 4-wire connection: 2

**6BK1700-4BA60-0AA0**

**Overview**

The IM current measuring module measures the load currents of the heating or cooling devices, and delivers the values to the basic unit.

The module must be selected according to the expected maximum current of all connected loads.

There are three different versions:

- 2.4 A to 25 A current measuring module
- 10 A to 100 A current measuring module
- 20 A to 200 A current measuring module

**Ordering data****Article No.****Current measuring modules**

- Current measuring range:  
2.4 ... 25 A
- Current measuring range:  
10 ... 100 A
- Current measuring range:  
20 ... 200 A

**6BK1700-3BA30-0AA0****6BK1700-3BA40-0AA0****6BK1700-3BA50-0AA0**

## Products for specific requirements

IO systems for heating units  
SIPLUS HCS300I heating controller

### Current/voltage measuring modules

#### Overview



In addition to measuring the load currents, the current/voltage measuring module UM can also be used to measure phase voltages in a single or three-phase system.

There are three different versions:

- 2.4 A to 25 A current/voltage measuring module
- 10 A to 100 A current/voltage measuring module
- 20 A to 200 A current/voltage measuring module

#### Ordering data

#### Article No.

##### Current/voltage measuring modules

- Current measuring range: 2.4 ... 25 A
- Operating frequency  
Rated value: 50 ... 60 Hz
- Operating voltage
  - at 50 Hz with AC rated value: 110 ... 690 V
  - at 60 Hz with AC rated value: 110 ... 690 V
- Current measuring range: 10 ... 100 A
- Operating frequency  
Rated value: 50 ... 60 Hz
- Operating voltage
  - at 50 Hz with AC rated value: 110 ... 690 V
  - at 60 Hz with AC rated value: 110 ... 690 V
- Current measuring range: 20 ... 200 A
- Operating frequency  
Rated value 50 ... 60 Hz
- Operating voltage
  - at 50 Hz with AC rated value: 110 ... 690 V
  - at 60 Hz with AC rated value: 110 ... 690 V

**6BK1700-3BA60-0AA0**

**6BK1700-3BA70-0AA0**

**6BK1700-3BA80-0AA0**

## Overview



A decoupling module must be used:

- When using a current/voltage measuring module, if the supply system is not grounded.
- When using a current measuring module or a current/voltage measuring module when the system bus has reached its maximum current consumption.

If a mixed configuration is planned with temperature module, digital module and current measuring module or current/voltage measuring module, it must be checked first whether a decoupling module is required.

If

$(\text{Number (temperature module)} * 2 + \text{Number (digital module)} * 1 + \text{Number (current measuring module or current/voltage measuring module)} * 4) > 14$ ,

a decoupling module is then required.

For a calculation example, see the "SIPLUS HCS300I Heater Controller" System Manual, <http://support.automation.siemens.com/WW/view/en/54439691>.

Note:

For this equation, each module type is weighted with a specific current factor, see Table.

Module	Current factor
Temperature module	2
Digital module	1
Current measuring module, current/voltage measuring module	4

## Ordering data

## Article No.

## Decoupling module

Interface design:  
System interface

**6BK1700-4BA40-0AA0**

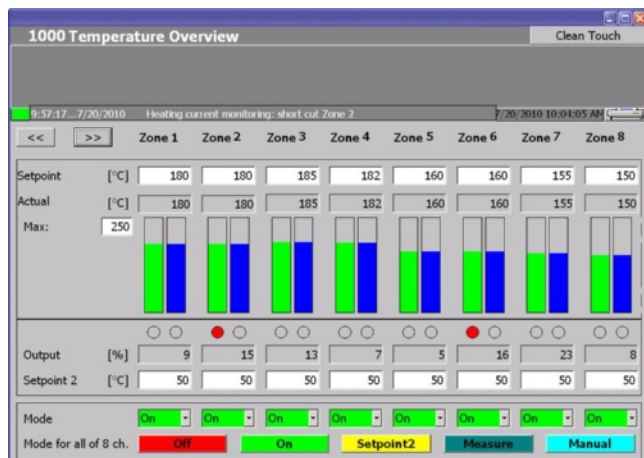
## Products for specific requirements

IO systems for heating units

SIPLUS HCS300I heating controller

TCP 3000 temperature control software (optional)

### Overview



In order to control SIPLUS HCS300I from the higher automation level, a suitable automation system such as a programmable controller (PLC) is required. In combination with the TCP 3000 temperature control software, this forms a powerful automation solution for controlling heaters or refrigerators.

The following licenses can be purchased optionally for the temperature controlling software TCP 3000:

- Initial license TCP 3000  
Type A4027462-A0443
- Runtime license TCP 3000  
Type A4027462-A0444

For additional information, please contact your local Siemens office.

### Overview



SIDOOR door control systems

"Door control system" is the general term for a controller of an access system.

The SIDOOR product family is primarily intended for the operation of sliding doors, whereby these doors can be operated both horizontally and vertically.

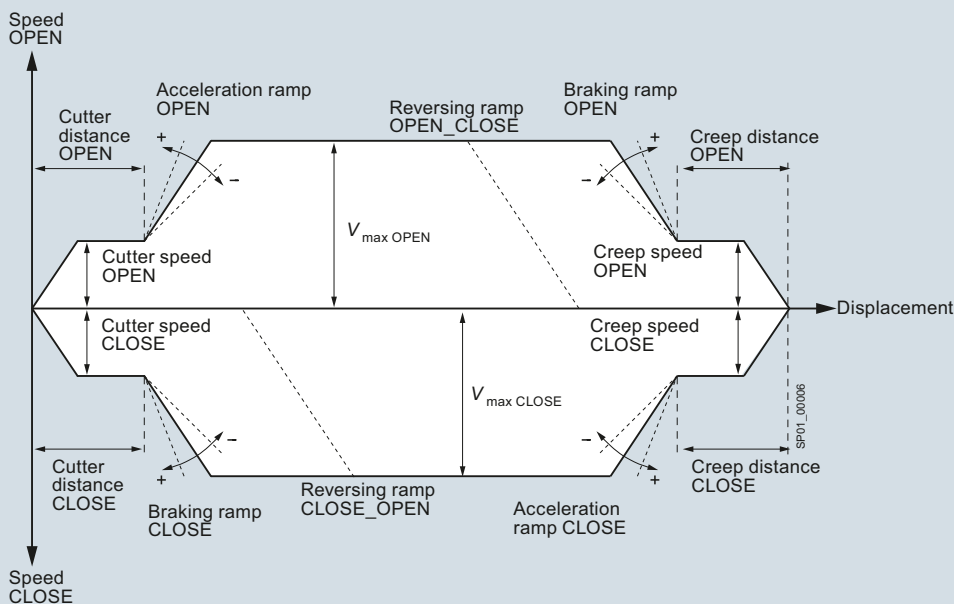
Door control systems are characterized by the fact that there are always two defined states for the open and closed position of the door.

The door is always controlled, regulated and moved between these two positions in accordance with the guidelines of the respective application.

In a defined learn run via "1-button operation", the door system independently determines the values for the door width, the dynamic door weight and the drive direction of the geared motor and stores these data in a non-volatile memory.

The optimum drive characteristics at the door are automatically calculated and are consistently adhered to.

The travel curve transitions are rounded off so that the door movement is smooth and jerk-free.



Creep speed	Reduced speed in the vicinity of the OPEN position of the elevator door (creep distance)
Cutter speed	Reduced speed in the vicinity of the CLOSED position of the elevator door (cutter distance)
Creep distance	Range of door travel in the vicinity of the OPEN position
Cutter distance	Range of door travel in the vicinity of the CLOSED position
$V_{max}$	Maximum permissible door speed

Reversing ramp OPEN_CLOSE	Travel reverses from the OPEN to the CLOSE direction
Reversing ramp CLOSE_OPEN	Travel reverses from the CLOSE to the OPEN direction

**Note:**

When reversing from the open to the close direction, the door is braked with the reversing ramp OPEN\_CLOSE, and starts the closing movement with the acceleration ramp CLOSE.

Travel curve



## Products for specific requirements

Automatic door controls  
for elevators

### Introduction

#### Overview

The elevator door drive is comprised of a controller and a maintenance-free drive unit, geared motors or gearless EC technology direct drive motor.

Controllers are electronic controllers connected to the power supply via an external power supply unit (SIDOOR NT40, SIDOOR Transformer). They are generally connected to the higher-level controller via digital or fieldbus interfaces, and can be configured via a user interface.

The SIDOOR AT12, SIDOOR AT40 and SIDOOR ATE500E controllers can be used to operate horizontally operated cabin and shaft doors at adjustable speeds and accelerations.

The SIDOOR ATD400V controller for rising doors and rolling shutters enables the operation of vertical door systems on elevators at adjustable speeds and accelerations.

Geared motors form the maintenance-free drive unit in the door drive. The geared motors are DC motors with non-self-locking gearing, and are speed-controlled. The set force and speed limits are not exceeded. The gearless motor (direct drive) is the maintenance free drive unit of the door drive.

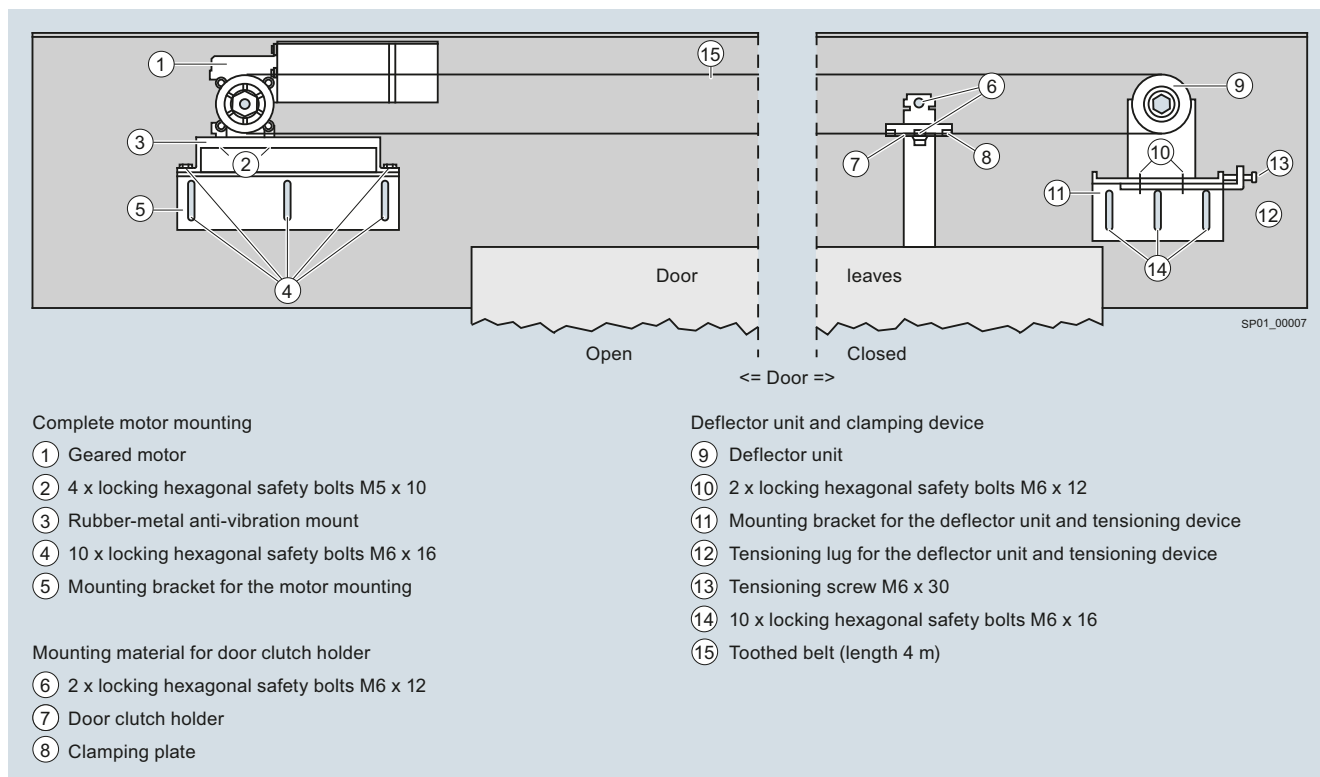
Operation of the named door drives does not require limit switches. The door width and the "OPEN"/"CLOSE" positions are determined automatically.

#### Application

The product-specific property of the elevator door controllers is based on the fact that the closing weights/closing springs integrated in the shaft doors are also taken into account.

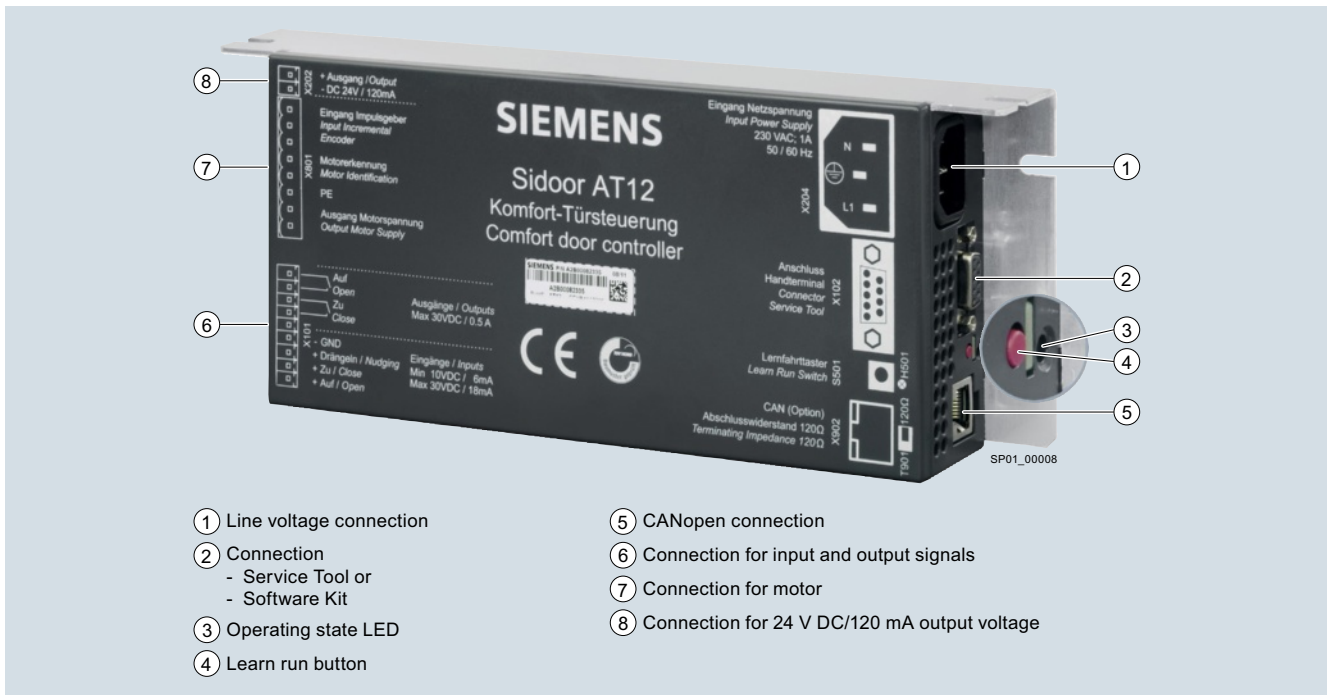
These weights/springs are integrated in the shaft doors so that open doors close automatically if the cabin is not at the relevant floor.

They must also be moved by the elevator door drive in their opening direction and support it their closing movement.



Mounting suggestion for door control systems

## Overview



- |   |  |
|---|--|
| ① Line voltage connection                           | ⑤ CANopen connection                           |
| ② Connection<br>- Service Tool or<br>- Software Kit | ⑥ Connection for input and output signals      |
| ③ Operating state LED                               | ⑦ Connection for motor                         |
| ④ Learn run button                                  | ⑧ Connection for 24 V DC/120 mA output voltage |

SIDOOR AT12 elevator door drive

SIDOOR AT12 – SIDOOR enables the quick, easy and versatile installation, configuration and operation of a wide range of elevator door systems.

- For dynamic door weights up to 120 kg
- 4 kg maximum counterweight
- Operating temperature 0 to +50 °C
- Opening width 0.3 to 2.4 m

- Integrated switch mode power supply
- Auxiliary voltage output 24 V DC, 120 mA (short circuit proof)
- CANopen interface (integrated in the controller)
- Degree of protection IP20

## Technical specifications

Type	6FB1111-1AT20-1AT1	
<b>General technical specifications</b>		
<b>Supply voltage with AC</b>	V	230
<b>Relative symmetrical tolerance of supply voltage</b>	%	15
<b>Supply voltage frequency</b>	Hz	50 ... 60
• with AC		
<b>Input voltage</b>	V	10 ... 28
• per DC input		
<b>Input current</b>	mA	6 ... 18
• per DC input		
<b>Product property</b>		
• Control inputs isolated	Yes	
• Control inputs p-switching	Yes	

Type	6FB1111-1AT20-1AT1	
<b>Output current at 24 V DC output Maximum</b>	mA	120
<b>Property of the 24 V DC output</b>		
• Note		
CAUTION: Do not supply with external voltage!		
• Short-circuit proof	Yes	
• Overload proof	Yes	
<b>Switching capacity current of output relay at 30 V</b>		
• with DC	mA	10 ... 500
<b>Opening width of door</b>	m	0.3 ... 2.4
<b>Counter weight for motor M2 maximum</b>	kg	4

## Products for specific requirements

Automatic door controls  
for elevators – Controllers

### SIDOOR AT12 elevator door drive

#### Technical specifications (continued)

Type	<b>6FB1111-1AT20-1AT1</b>	
<b>Ambient temperature</b>		
• during operation	°C	0 ... 50
• During storage	°C	-20 ... +85
<b>IP degree of protection</b>	IP20	
<b>Relative humidity</b>		
• No condensation	%	--
<b>Dimensions</b>		
• Width	mm	260
• Height	mm	45
• Depth	mm	105
<b>Standards</b>		
<b>Type of test TUV prototype tested</b>	Yes	
<b>Standard</b>		
• for EMC		EN 12015 / EN 12016
• for safety		EN 60950-1:2006
<b>Certificate of suitability</b>		
• Acc. to EN 81		yes
• CE marking		Yes
<b>Standard for communication interfaces CANopen, CiA standard 301, profile 417</b>	Yes	

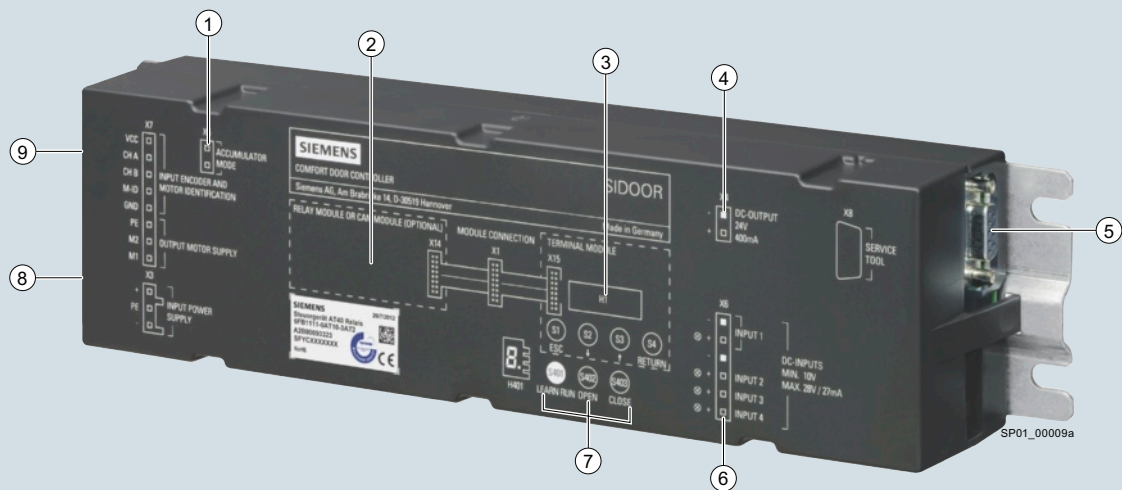
#### Ordering data

**SIDOOR AT12  
elevator door drive**  
SIDOOR control device AT12  
with integrated switch mode power  
supply

#### Article No.

**6FB1111-1AT20-1AT1**

## Overview



- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>① Connection for emergency power module</li> <li>② CAN module or relay module</li> <li>③ Terminal module</li> <li>④ Connection for 24 V DC/400 mA output voltage</li> <li>⑤ Connection <ul style="list-style-type: none"> <li>- Software Kit or</li> <li>- Service Tool</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>⑥ Connection for input signals</li> <li>⑦ Control panel</li> <li>⑧ Connector <ul style="list-style-type: none"> <li>- NT40 switch-mode power supply or</li> <li>- Mains transformer</li> </ul> </li> <li>⑨ Connection for motor</li> </ul> |
|---|---|

SIDOOR AT40 elevator door drive (relay module version)

SIDOOR AT40 – SIDOOR enables the quick, easy and versatile installation, configuration and operation of a wide range of elevator door systems.

- Version:
  - Relay module
  - CAN module
- For dynamic door weights up to 600 kg
- Automatic door weight detection
- 4 to 8 kg maximum counterweight (depending on motor version)
- Operating temperature -20 to +50 °C
- Flexible motor management (four different motor types), automatic detection
- Opening width 0.3 to 5 m

- Emergency power input via special emergency power module 24 V DC  $\pm$  15 %
- Auxiliary power output 24 V DC  $\pm$  15 %; 0.4 A (short-circuit-proof)
- Output stage short-circuit-proof
- Supports power-optimized operation in the elevator cabin
- Vandal-proof
- IP54 degree of protection for 180 to 600 kg motor versions, gear unit IP40 (SIDOOR M5: entirely IP54)

The current operating states are indicated by a 7-Segment display directly in the SIDOOR AT40 elevator door drive. They can also be displayed externally with the aid of the Software Kit or Service Tool, see "Additional Units".

## Products for specific requirements

Automatic door controls  
for elevators – Controllers

### SIDOOR AT40 elevator door drive

#### Technical specifications

Type		6FB1111-0AT10-3AT2	6FB1111-1AT10-3AT3
<b>General technical specifications</b>			
<b>Supply voltage with DC</b>	V	36	36
<b>Relative positive tolerance of supply voltage</b>	%	3	3
<b>Input voltage</b>			
• per DC input	V	10 ... 28	10 ... 28
<b>Input current</b>			
• per DC input	mA	9 ... 27	9 ... 27
<b>Product property</b>			
• Control inputs isolated		Yes	yes
• Control inputs p-switching		Yes	Yes
<b>Output current at 24 V DC output Maximum</b>	mA	400	400
<b>Property of the 24 V DC output</b>			
• Note		CAUTION: Do not supply with external voltage!	CAUTION: Do not supply with external voltage!
• Short-circuit proof		Yes	Yes
<b>Product expansion Optional</b>			
		Emergency power module	Emergency power module
<b>Switching capacity current of output relay</b>			
• at 230 V			
- with AC	mA	10 ... 1 000	10 ... 1 000
• at 50 V			
- with DC	mA	10 ... 1 000	10 ... 1 000
<b>Opening width of door</b>	m	0.3 ... 4	0.3 ... 4
<b>Counterweight</b>			
• For M2 motor max.	kg	4	4
• For M3 motor max.	kg	6	6
• For M4 motor max.	kg	8	8
<b>Ambient temperature</b>			
• During operation	°C	-20 ... +50	-20 ... +50
• During storage	°C	-40 ... +50	-40 ... +50
<b>IP degree of protection</b>		IP20	IP20
<b>Relative humidity</b>			
• No condensation	%	10 ... 93	10 ... 93
<b>Dimensions</b>			
• Width	mm	320	320
• Height	mm	60	60
• Depth	mm	80	80
<b>Standards</b>			
<b>Type of test TÜV prototype tested</b>		Yes	Yes
<b>Standard</b>			
• For EMC		EN 12015 / EN 12016	EN 12015 / EN 12016
• for safety		EN 60950-1:2006	EN 60950-1:2006
<b>Certificate of suitability</b>			
• Acc. to EN 81		Yes	Yes
• CE marking		Yes	Yes
<b>Standard for communication interfaces CANopen, CiA standard 301, profile 417</b>		No	Yes

#### Ordering data

#### Article No.

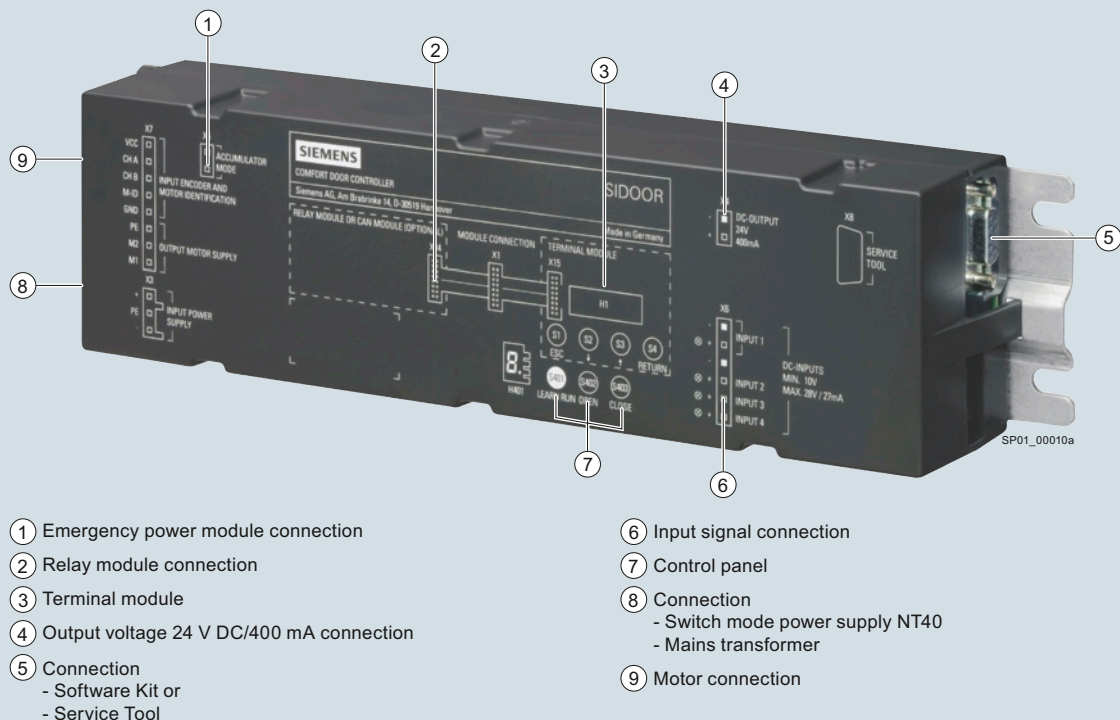
##### SIDOOR AT40 elevator door drive

- SIDOOR controller AT40 relay
- SIDOOR AT40 CAN controller

6FB1111-0AT10-3AT2

6FB1111-1AT10-3AT3

## Overview



SIDOOR ATD400V elevator door drive

SIDOOR ATD400V – the SIDOOR ATD400V elevator door drive enables the quick, easy and versatile installation, configuration and operation of vertical elevator door systems, such as rising doors and roller shutters.

- Relay module design
- For dynamic door weights up to 400 kg
- Automatic door weight detection
- Operating temperature -20 to +50 °C
- Opening width 0.3 to 4 m
- Emergency power input via special emergency power module 24 V DC  $\pm$  15 %

- Auxiliary power output 24 V DC  $\pm$  15 %; 0.4 A (short-circuit-proof)
- Output stage short-circuit-proof
- Vandal-proof
- Degree of protection:
  - motor IP54
  - gear unit IP40

The current operating states are indicated by a 7-Segment display directly in the SIDOOR AT40 elevator door drive. They can also be displayed externally with the aid of the Software Kit or Service Tool, see "Additional Units".

## Products for specific requirements

Automatic door controls  
for elevators – Controllers

### SIDOOR ATD400V elevator door drive

#### Technical specifications

Type	6FB1111-1AT10-3VE2	
<b>General technical specifications</b>		
Supply voltage with DC	V	36
Relative positive tolerance of supply voltage	%	3
<b>Input voltage</b>		
• per DC input	V	10 ... 28
<b>Input current</b>		
• per DC input	mA	9 ... 27
<b>Product property</b>		
• Control inputs isolated		yes
• Control inputs p-switching		Yes
Output current at 24 V DC output Maximum	mA	400
<b>Property of the 24 V DC output</b>		
• Note		CAUTION: Do not supply with external voltage!
• Short-circuit proof		Yes
Product expansionOptional		Emergency power module
<b>Switching capacity current of output relay</b>		
• at 230 V		
- with AC	mA	10 ... 1 000
• at 50 V		
- with DC	mA	10 ... 1 000
Opening width of door	m	0.3 ... 4
<b>Ambient temperature</b>		
• During operation	°C	-20 ... +50
• During storage	°C	-40 ... +50
IP degree of protection		IP20
<b>Relative humidity</b>		
• No condensation	%	10 ... 93
<b>Dimensions</b>		
• Width	mm	320
• Height	mm	60
• Depth	mm	80
<b>Standards</b>		
Type of test TUV prototype tested		Yes
<b>Certificate of suitability</b>		
• Acc. to EN 81		yes
• CE marking		Yes
<b>Standard</b>		
• For EMC		EN 12015 / EN 12016
• for safety		EN 60950-1:2006
Standard for communication interfaces CANopen, CiA standard 301, profile 417		No

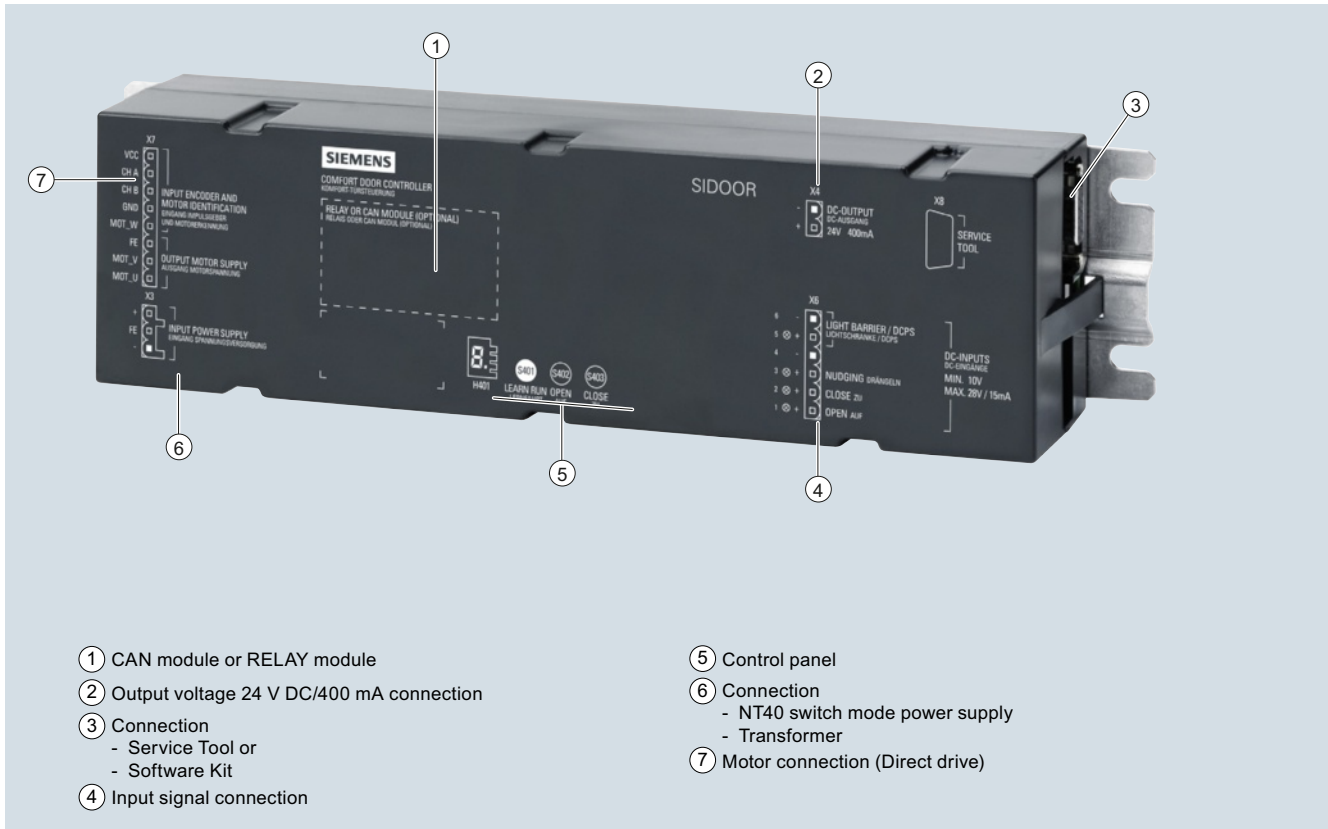
#### Ordering data

**SIDOOR ATD400V elevator door drive**  
SIDOOR controller ATD400V relay, vertical rising door/shutter gate

#### Article No.

**6FB1111-1AT10-3VE2**

## Overview



SIDOOR ATE500E elevator door drive

The SIDOOR ATE500E elevator door drive enables the quick, easy and versatile installation, configuration and operation of EC technology gearless elevator door systems.

- Design:
  - Relay module
  - CAN module
- For dynamic door weights up to 280 kg
- High control performance und optimized drive characteristic transitions
- Automatic door weight detection (single-button commissioning)
- 6 kg maximum counterweight of the coupled floor door

- Operating temperature -25 to +50 °C without restrictions
- Automatic identification of the connected motor
- Opening width 0.3 to 5 m
- Auxiliary voltage output 24 V DC  $\pm$  15 %; 0.4 A (short-circuit-proof)
- Output stage short-circuit-proof
- Optimized energy consumption during cabin operation (DCPS)
- Vandal-proof
- IP20 degree of protection
- The current operating states are indicated via a 7-segment display directly in the elevator door drive or externally using the Software Kit or Service Tool, see Additional units.

## Ordering data

## Article No.

## Controllers for elevator doors

- SIDOOR ATE500E CAN
- SIDOOR ATE500E relay

6FB1211-1AT10-7AT3

6FB1211-5AT10-7AT2



## Products for specific requirements

Automatic door controls  
for elevators – Power supplies

### Mains Transformer

#### Overview



The mains transformer is a standard power supply unit operated with 230 V AC ( $\pm 15\%$ ) 50/60 Hz from the SIDOOR product range, and can be used for all controllers which do not have an integrated power supply unit.

The SIDOOR AT12 elevator door drive has an integrated power supply unit, for example.

#### Technical specifications

Type	<b>6FB1112-0AT20-2TR0</b>	
<b>General technical specifications</b>		
Supply voltage with AC	V	230
Relative symmetrical tolerance of supply voltage	%	15
Supply voltage frequency	Hz	50 ... 60
• with AC		
Operating current of fuse protection at input during installation Maximum	A	10
IP degree of protection		IP54
Output current maximum rated value	A	15.9
<b>Dimensions</b>		
• Height	mm	65
• Diameter	mm	126
<b>Standards</b>		
Standard For EMC		EMC Directive 2004/108/EC, EN 12015, EN 12016

#### Ordering data

#### Article No.

#### Mains transformer

SIDOOR mains transformer

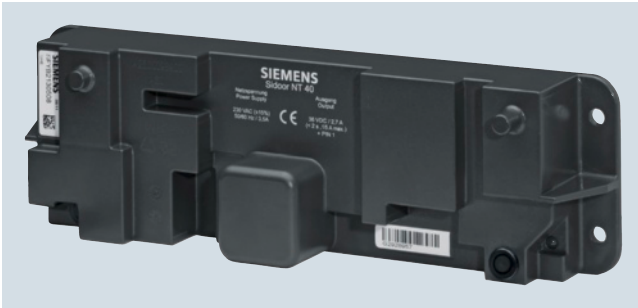
**6FB1112-0AT20-2TR0**

## Products for specific requirements

Automatic door controls  
for elevators – Power supplies

### NT40 switch mode power supply

#### Overview



The SIDOOR NT40 switch mode power supply unit is operated at 50/60 Hz, 230 V AC ( $\pm 15\%$ ) to power the following SIDOOR door controllers:

- SIDOOR AT40 and SIDOOR ATD400V elevator door drives
- SIDOOR ATD400K cold gate drive
- SIDOOR ATD400W,
- SIDOOR ATD401W, SIDOOR ATD410W, SIDOOR ATD420W and SIDOOR ATD430W machine tool door drives
- SIDOOR ATD400S platform screen door drive

It is especially suitable for door systems with high door weights.

On the output side, the power supply unit delivers a voltage of 36 V DC ( $\pm 3\%$ ) SELV at a rated output power of  $< 100$  W.

In order to enable fast acceleration/deceleration of the doors by the controller, the device can briefly ( $< 2$  s) deliver a current of 15 A (corresponds to a short-time power output of 540 W).

#### Technical specifications

Type	6FB1112-0AT20-3PS0	
<b>General technical specifications</b>		
Supply voltage with AC	V	230
Relative symmetrical tolerance of supply voltage	%	15
Supply voltage frequency	Hz	47 ... 63
• with AC		
Input current At input voltage rated value 230 V	A	0.7
Operating current of fuse protection at input During installation Maximum	A	10
Current consumption for 2 s Maximum	A	3.5
Absorbed apparent power Maximum	V·A	650
Efficiency Emitted active power at 100 W At 230 V AC	%	90
Equipment protection class		I
Overvoltage category		2
IP degree of protection		IP54
Output voltage with DC Nominal value	V	36
• Note		SELV

Type	6FB1112-0AT20-3PS0	
Output current	A	0 ... 2.5
Active power input Maximum Nominal value	W	100
Temporary overload current for a maximum of 2 s	A	15
<b>Ambient temperature</b>		
• During operation	°C	-20 ... +55
- Note		No direct exposure to the sun
• During storage	°C	-20 ... +50
• During transport	°C	-40 ... +70
<b>Relative humidity</b>		
• No condensation	%	10 ... 93
Installation altitude At height above sea level Maximum	m	2,000
<b>Dimensions</b>		
• Width	mm	270
• Height	mm	55
• Depth	mm	80
<b>Standards</b>		
<b>Standard</b>		
• for safety		EN 60950-1:2006
• For EMC		EMC Directive 2004/108/EC, EN 12015, EN 12016

#### Ordering data

#### Article No.

NT40 switch mode power supply

6FB1112-0AT20-3PS0

SIDOOR NT40 switch mode power supply

## Products for specific requirements

Automatic door controls  
for elevators – Additional units

### Software Kit

#### Overview



SIDOOR Software Kit

An installation CD is included in the scope of delivery for the SIDOOR Software Kit.

#### Note:

Certain firmware updates are provided as free downloads in the Siemens Industry Online Support. For information on the availability of further firmware available at a charge, and on how to obtain this, please contact Technical Support.

The following functionalities are available on CD:

SIDOOR User Software	The component that enables the door control system to be configured, parameters to be assigned, and analyzed.
Siemens HCS12 Firmware Loader	This component is used to update the firmware of the door controller.
SIDOOR USB to UART Bridge Driver	This driver is essential for operation of the USB adapter.

#### Ordering data

#### Article No.

##### Software Kit

SIDOOR Software Kit  
with USB adapter

**6FB1105-0AT01-6SW0**

### Service Tool

#### Overview



The Service Tool can be used to input run commands, change run parameters and read out learned parameters, door states, input/output signals and service data.

The Service Tool is connected to the various controllers by the respective cable:

- SIDOOR AT12, SIDOOR AT40 and SIDOOR ATD400V elevator door drives
- SIDOOR ATD400K cold room gate drive, SIDOOR ATD4xxW machine tool door drives
- SIDOOR ATD400S and SIDOOR ATE250S platform screen door drives

You do not need to open the cover of the controller to do this.

#### Note:

If the Service Tool is in the "Quick adjustment" or "Total adjustment" menu, the run commands of the controller are blocked via the command inputs.

#### Ordering data

#### Article No.

##### Service Tool

SIDOOR Service Tool

**6FB1105-0AT01-6ST0**

**Overview**

SIDOOR geared motors are a combination of gear unit, motor and sensor. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning.

The maintenance-free, variable speed drive unit comprises a DC motor with non-self-locking gearing.

The geared motors must be selected according to the dynamic door weight. Two different versions are available for each of the SIDOOR M2 to SIDOOR M5 geared motors:

- SIDOOR M2 geared motors (max. door weight 120 kg)
  - SIDOOR M2 L (pinion left) 6FB1103-0AT10-5MA0
  - SIDOOR M2 R (pinion right) 6FB1103-0AT11-5MA0
- SIDOOR M3 geared motors (max. door weight 180 kg)
  - SIDOOR M3 L (pinion left) 6FB1103-0AT10-4MB0
  - SIDOOR M3 R (pinion right) 6FB1103-0AT11-4MB0
- SIDOOR M4 geared motors (max. door weight 400 kg)
  - SIDOOR M4 L (pinion left) 6FB1103-0AT10-3MC0
  - SIDOOR M4 R (pinion right) 6FB1103-0AT11-3MC0
- SIDOOR M5 geared motors (max. door weight 600 kg)
  - SIDOOR M5 L (pinion left) 6FB1103-0AT10-3MD0
  - SIDOOR M5 R (pinion right) 6FB1103-0AT11-3MD0

The gear outlet direction is defined as left or right when viewing the gear unit from the front.



Geared motors:  
SIDOOR M2 L 6FB1103-0AT10-5MA0 (version with pinion left),  
SIDOOR M3 L 6FB1103-0AT10-4MB0 (version with pinion left),  
SIDOOR M4 L 6FB1103-0AT10-3MC0 (version with pinion left),  
SIDOOR M5 L 6FB1103-0AT10-3MD0 (version with pinion left)  
(Images are shown in the order from bottom to top)

**Ordering data****Article No.****SIDOOR M2 geared motors**

- SIDOOR M2 L
- SIDOOR M2 R

6FB1103-0AT10-5MA0

6FB1103-0AT11-5MA0

**SIDOOR M3 geared motors**

- SIDOOR M3 L
- SIDOOR M3 R

6FB1103-0AT10-4MB0

6FB1103-0AT11-4MB0

**SIDOOR M4 geared motors**

- SIDOOR M4 L
- SIDOOR M4 R

6FB1103-0AT10-3MC0

6FB1103-0AT11-3MC0

**SIDOOR M5 geared motors**

- SIDOOR M5 L
- SIDOOR M5 R

6FB1103-0AT10-3MD0

6FB1103-0AT11-3MD0

**Article No.**

## Products for specific requirements

Automatic door controls  
for elevators

### Direct drives

#### Overview



SIDOOR MED280 direct drive

SIDOOR direct drives are a combination of motor and sensor. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning.

The maintenance-free drive unit consists of a gearless, speed-controlled, electronically commutated motor with non-self-locking gearing.

Direct drives are designed for certain maximum dynamic door weights and can control both drive directions.

- SIDOOR MED280 direct drive for dynamic door weights up to 280 kg (6FB1203-0AT12-7DA0)

#### Ordering data

**SIDOOR MED280 Direct Drive**  
Motor for door control

#### Article No.

**6FB1203-0AT12-7DA0**

**Overview*****A comprehensive range of accessories is available for the SIDOOR elevator door systems:***

This is necessary to ensure low-noise operation of the door by the controller. The geared motors can be optimally integrated into the respective door drive system.

Rubber-metal anti-vibration mounts for geared motors

To ensure low-noise door operation, SIDOOR geared motors are integrated in the door system using rubber-metal anti-vibration mounts.

- Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for geared motors with a door weight of less than 300 kg
- Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0 for geared motors with a door weight of 300 kg or more



Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0



Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0

Mounting bracket

Two different mounting brackets are available with elongated holes:

- Mounting bracket 6FB1104-0AT01-0AS0 for the geared motors for flexible accommodation of the rubber-bonded metal
- Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit, this enables the toothed belt to be set to the required belt tension.



Mounting bracket 6FB1104-0AT01-0AS0 for mounting the geared motor



Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit

Door clutch holder

The door clutch holder serves to connect the respective door leaf by means of a toothed belt while also functioning as a toothed-belt lock. One door clutch holder per door leaf is required. The toothed-belt lock can accommodate both open ends of the toothed belt.

A door clutch holder is available for each toothed belt width:

- Width 12 mm: 6FB1104-0AT01-0CP0
- Width 14 mm: 6FB1104-0AT02-0CP0



Door clutch holder 6FB1104-0AT01-0CP0 (packaging size = 1 unit)

Deflector unit

The deflector unit 6FB1104-0AT03-0AS0 contains an embedded belt pulley which can be mounted on the door system.

The toothed belt STS is redirected via this deflector unit.



Deflector unit 6FB1104-0AT03-0AS0

## Products for specific requirements

Automatic door controls  
for elevators

### Accessories

#### Overview (continued)

##### Toothed belt STS

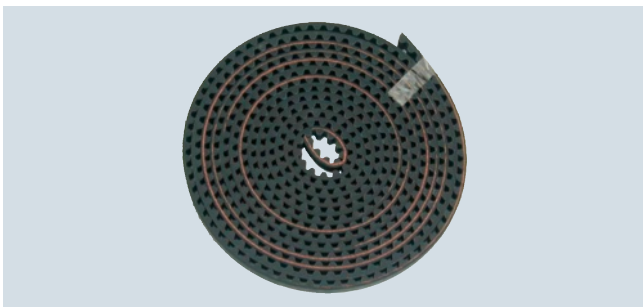
The door system is moved between the end positions of the door using the STS toothed belts. Two different toothed belt lengths can be ordered for each toothed belt width.

Toothed belt width 12 mm:

- Length 4 m: 6FB1104-0AT01-0AB0
- Length 45 m: 6FB1104-0AT02-0AB0

Toothed belt width 14 mm:

- Length 4 m: 6FB1104-0AT03-0AB0
- Length 55 m: 6FB1104-0AT04-0AB0



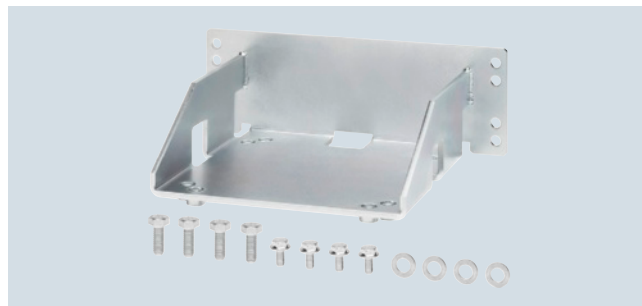
Toothed belt 6FB1104-0AT01-0AB0, length 4 m



Toothed belt 6FB1104-0AT02-0AB0, length 45 m

#### Accessories are available for the SIDOOR elevator door systems with EC technology:

Motor holder 6FB1104-0AT03-0AD0 for securing the direct drive SIDOOR MED280.



SIDOOR motor holder

##### Mounting bracket:

- for securing the SIDOOR motor holder 6FB1104-0AT01-0AS0



Mounting bracket for geared motor

- with tensioning device for mounting the deflector unit and setting the toothed belt to the required tension (large) 6FB1104-0AT05-0AS4



SIDOOR mounting bracket, large

- with tensioning device for mounting the deflector unit and setting the toothed belt to the required tension (small) 6FB1104-0AT05-0AS5



SIDOOR mounting bracket, small

**Overview (continued)**Door clutch holder

- for attaching both ends of the toothed belt, and for connecting the respective door panel to the toothed belt; width 20 mm 6FB1104-0AT05-0AS1



SIDOOR door clutch holder

Deflector unit

for securing the SIDOOR toothed belt and for fixing to the door 6FB1104-0AT07-0AS0



SIDOOR deflector unit

Toothed belt STD

as a connection between the door system and the end positions of the door.

Toothed belt width 20 mm. Length 4 m 6FB1104-0AT05-0AB0.



SIDOOR toothed belt, small

Toothed belt width 20 mm. Length 45 m 6FB1104-0AT06-0AB1



SIDOOR toothed belt, large



## Products for specific requirements

Automatic door controls  
for elevators

### Accessories

Ordering data	Article No.		Article No.
<b>Elevator door systems with EC technology</b>		<b>Elevator door systems with geared motors</b>	
<b>Motor holder for SIDOOR MED280 direct drive</b>	6FB1104-0AT03-0AD0	<b>Rubber-metal anti-vibration mounts for geared motors</b>	
<b>Mounting bracket for mounting the motor holder</b>	6FB1104-0AT01-0AS0	<ul style="list-style-type: none"> <li>SIDOOR rubber-metal anti-vibration mount for geared motors for door weights up to 300 kg</li> </ul>	6FB1104-0AT02-0AD0
<b>Mounting bracket with tensioning device for mounting the deflector unit</b>		<ul style="list-style-type: none"> <li>SIDOOR rubber-metal anti-vibration mount for geared motors for door weights from 300 kg</li> </ul>	6FB1104-0AT01-0AD0
<ul style="list-style-type: none"> <li>Large</li> <li>Small</li> </ul>	6FB1104-0AT05-0AS4	<b>Mounting bracket</b>	
	6FB1104-0AT05-0AS5	<ul style="list-style-type: none"> <li>SIDOOR mounting bracket for geared motor</li> </ul>	6FB1104-0AT01-0AS0
<b>SIDOOR door clutch holder</b>	6FB1104-0AT05-0AS1	<ul style="list-style-type: none"> <li>SIDOOR mounting bracket with tensioning device for deflector pulley</li> </ul>	6FB1104-0AT02-0AS0
For toothed belt, width 20 mm		<b>SIDOOR door clutch holder</b>	
<b>SIDOOR deflector unit</b>	6FB1104-0AT07-0AS0	<ul style="list-style-type: none"> <li>For toothed belt, width 12 mm</li> <li>For toothed belt, width 14 mm</li> </ul>	6FB1104-0AT01-0CP0
<b>SIDOOR toothed belt STD</b>		<b>Deflector unit</b>	6FB1104-0AT03-0AS0
Width 20 mm		SIDOOR deflector unit	
<ul style="list-style-type: none"> <li>4 m</li> <li>55 m</li> </ul>	6FB1104-0AT05-0AB0	<b>SIDOOR toothed belt STS</b>	
	6FB1104-0AT06-0AB1	Width 12 mm	
		<ul style="list-style-type: none"> <li>4 m</li> <li>45 m</li> </ul>	6FB1104-0AT01-0AB0
			6FB1104-0AT02-0AB0
		<b>SIDOOR toothed belt STS</b>	
		Width 14 mm	
		<ul style="list-style-type: none"> <li>4 m</li> <li>55 m</li> </ul>	6FB1104-0AT03-0AB0
			6FB1104-0AT04-0AB0

**Overview**

The machine tool door drive consists of a controller and a maintenance-free drive unit, the geared motors.

Controllers are electronic controllers connected to the power supply via an external power supply unit (SIDOOR NT40, SIDOOR Transformer). They are generally connected to the higher-level controller via digital or fieldbus interfaces, and can be configured via a user interface.

Three controllers are available for selection for machine tool doors:

- SIDOOR ATD400W, connected to the higher-level controller via the digital interface (relay-module), up to 600 kg door weight
- SIDOOR ATD410W, connected to the higher-level controller via a USS bus interface (USS module), up to 600 kg door weight
- SIDOOR ATD420W, connected to the higher-level controller via a PROFIBUS interface (PROFIBUS module), up to 600 kg door weight

The safe functions - force limitation, energy limitation and end position detection - fulfill the requirements according to EN ISO 13849-1:2008 for Category 2 and Performance Level d. The drives are suitable for power-operated guards according to EN 953:1997+A1:2009 Section 5.2.5.2 "Actuating forces".

Geared motors form the maintenance-free drive unit in the door drive. The geared motors are DC motors with non-self-locking gearing, and are speed-controlled. The set force and speed limits are not exceeded.

Operation of the named door drives does not require limit switches. The door width and the "OPEN"/"CLOSE" positions are determined automatically.

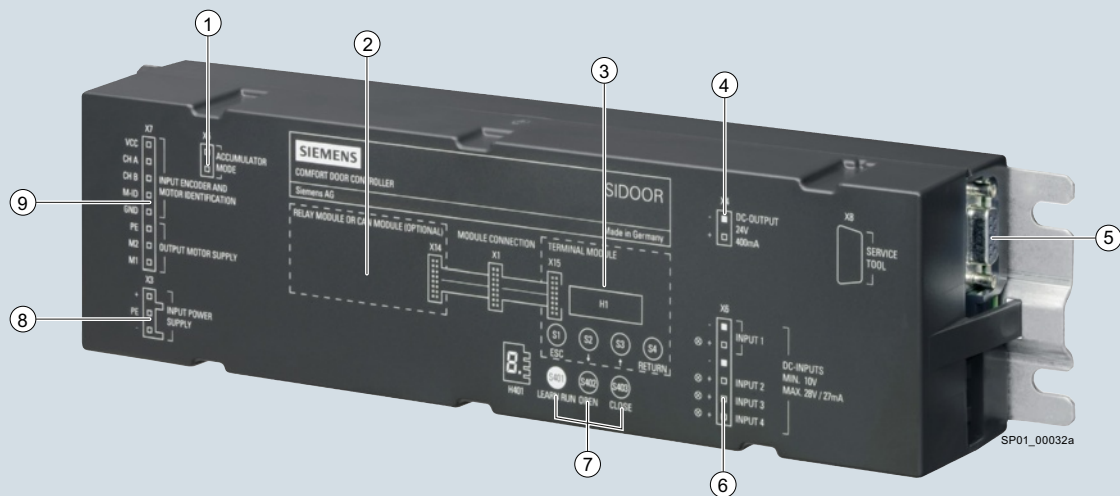
The power is transmitted by a toothed belt. The toothed belt passes over a deflector pulley and can be fitted with 2 door clutch holders. This enables it to drive both one-sided and centrally-opening doors. The accessories are not included in the scope of delivery, see "Accessories".

## Products for specific requirements

Automatic door controls  
for industry applications – Controllers

### SIDOOR ATD400K cold room gate drive

#### Overview



- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>① Emergency power module connection</li> <li>② Relay module, USS module or PROFIBUS module (according to requirements)</li> <li>③ Terminal module</li> <li>④ Output voltage 24 V DC/400 mA connection</li> <li>⑤ Connection             <ul style="list-style-type: none"> <li>- Software Kit or</li> <li>- Service Tool</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>⑥ Input signal connection</li> <li>⑦ Control panel</li> <li>⑧ Input voltage connection<br/>16.8 to 36 V DC<br/>for connection of power supply</li> <li>⑨ Motor connection</li> </ul> |
|--|---|

#### SIDOOR ATD400K cold room gate drive

The SIDOOR ATD400K door control drive optimally regulates the movement of horizontal cold room gates with doors weighing up to 400 kg.

The two drive versions offer different options for assigning the digital inputs:

- Relay module design
  - SIDOOR ATD400W RELAY LB for connection of a light barrier
  - SIDOOR ATD400W RELAY RC for connection of a gate interlock
- For dynamic door weights up to 400 kg
- Operator terminal/seven-segment display
- 4 digital inputs, 3 relay contacts
- Automatic door weight detection
- Operating temperature -20 to +50 °C
- Flexible motor management, automatic recognition of the geared motor
- Opening width 0.3 to 4 m
- Closing speeds up to 0.5 m/s
- Emergency power input via special emergency power module 24 V DC  $\pm$  15 %

- Auxiliary power output 24 V DC  $\pm$  15 %; 0.4 A (short-circuit-proof)
- Output stage short-circuit-proof
- Vandal-proof
- IP54 degree of protection for 180 to 400 kg motor versions, gear unit IP40
- The "cord-operated switch" function is supported. Pulling the cord opens the door to an adjustable width
- Pulse operation: The function remains active until a new command arrives
- Hold-open time can be parameterized
- A higher force can be set for the first 10 cm of the opening movement (boosting the door)

## Products for specific requirements

Automatic door controls  
for industry applications – Controllers

### SIDOOR ATD400K cold room gate drive

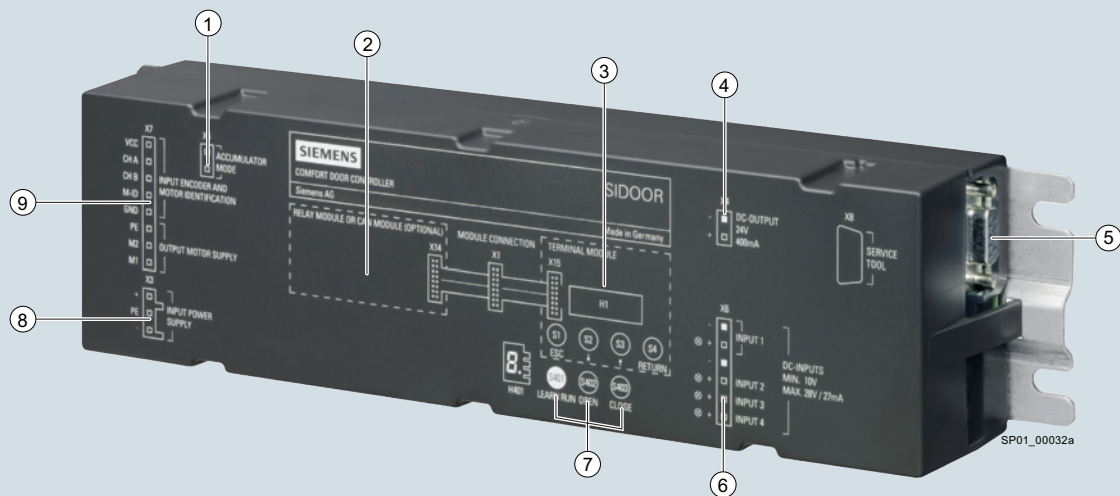
Technical specifications			Ordering data	Article No.
Type			<b>SIDOOR ATD400K cold room gate drive</b>	
		<b>6FB1141-1AT10-3KU2 6FB1141-1AT11-3KU2</b>		
<b>General technical specifications</b>				
<b>Supply voltage with DC</b>	V	36		<b>6FB1141-1AT10-3KU2</b>
<b>Relative positive tolerance of supply voltage</b>	%	3		
<b>Input voltage</b>				
• per DC input	V	10 ... 28		
<b>Input current</b>				
• per DC input	mA	9 ... 27		
<b>Product property</b>				
• Control inputs isolated		Yes		
• Control inputs p-switching		Yes		
<b>Output current at 24 V DC output Maximum</b>	mA	400		<b>6FB1141-1AT11-3KU2</b>
<b>Property of the 24 V DC output</b>				
• Note		CAUTION: Do not supply with external voltage!		
• Short-circuit proof		Yes		
<b>Product expansion Optional</b>		Emergency power module		
<b>Switching capacity current of output relay</b>				
• at 230 V				
- with AC	mA	10 ... 1 000		
• at 50 V				
- with DC	mA	10 ... 1 000		
<b>Opening width of door</b>	m	0.3 ... 4		
<b>Ambient temperature</b>				
• during operation	°C	-20 ... +50		
• During storage	°C	-40 ... +50		
<b>IP degree of protection</b>		IP20		
<b>Relative humidity</b>				
• No condensation	%	10 ... 93		
<b>Dimensions</b>				
• Width	mm	320		
• Height	mm	60		
• Depth	mm	80		
<b>Standards</b>				
<b>Type of test TUV prototype tested</b>		Yes		
<b>Certificate of suitability CE marking</b>		Yes		
<b>Standard</b>				
• For EMC		EN 61000-6-2 / EN 61000-6-3		
• for safety		EN 60335-1:2010		
<b>Performance Level (PL) according to ISO 13849-1</b>		d		
<b>Category according to ISO 13849-1</b>		2		

## Products for specific requirements

Automatic door controls  
for industry applications – Controllers

### SIDOOR ATD401W machine tool door drive

#### Overview



- |   |   |
|---|---|
| ① Emergency power module connection                                       | ⑥ Input signal connection   |
| ② Relay module, USS module or PROFIBUS module (according to requirements) | ⑦ Control panel   |
| ③ Terminal module   | ⑧ Input voltage connection<br>16.8 to 36 V DC<br>for connection of power supply |
| ④ Output voltage 24 V DC/400 mA connection                                | ⑨ Motor connection  |
| ⑤ Connection<br>- Software Kit or<br>- Service Tool                       |   |

#### SIDOOR ATD401W machine tool door drive

The SIDOOR ATD401W machine tool door drive enables the quick, easy and versatile installation, configuration and operation of a wide range of industrial door drive systems.

- Relay module design
- For dynamic door weights up to 600 kg
- Automatic determination of the door weight and friction during the learn run
- Digital inputs, for example for direct connection of a light barrier as type 2 ESPE (electro-sensitive protective equipment) according to EN 61496-1
- 3 relay outputs for position feedback and reversing feedback
- Operating temperature -20 to +50 °C
- Flexible motor management, automatic recognition of the geared motor
- Opening width 0.3 to 5 m
- Auxiliary voltage output 24 V DC  $\pm 15\%$ ; 0.4 A (short-circuit-proof)
- Output stage for the motor control is short-circuit proof
- Indicates the current operating states on a 7-segment display directly on the controller or using the Software Kit or Service Tool

## Products for specific requirements

Automatic door controls  
for industry applications – Controllers

### SIDoor ATD401W machine tool door drive

#### Technical specifications

Article No.	<b>6FB1141-1AT11-3WE2</b>
<b>General technical data:</b>	
Relative symmetrical tolerance / of the supply voltage	15 %
Relative positive tolerance / of the supply voltage	3 %
<b>Input voltage</b>	
• per DC input	10 ... 28 V
<b>Input current</b>	
• per DC input	9 ... 27 mA
<b>Product property</b>	
• Isolated control inputs	Yes
• Control inputs switching to P potential	Yes
<b>Output current / at 24 V DC output / maximum</b>	400 mA
<b>Property of the 24 V DC output</b>	
• Note	CAUTION: Do not supply with external voltage!
• Short-circuit proof	Yes

Article No.	<b>6FB1141-1AT11-3WE2</b>
<b>Product expansion / optional</b>	
	Mains transformer 6FB1112-0AT20-2TRO
<b>Switching capacity current / of the output relay / for DC / at 50 V</b>	
• minimum	0.01 A
• maximum	1 A
<b>Door opening width</b>	0.3 ... 5 m
<b>Ambient temperature</b>	
• during operation	-20 ... +50 °C
• during storage	-40 ... +70 °C
<b>Protection class IP</b>	IP20
<b>Relative humidity</b>	
• without condensation	10 ... 93 %
<b>Width</b>	320 mm
<b>Height</b>	60 mm
<b>Depth</b>	80 mm
<b>Standards:</b>	
<b>Type of test / TÜV prototype tested</b>	Yes
<b>Certificate of suitability / CE marking</b>	Yes
<b>Standard</b>	
• for EMC	EN 61000-6-2 / EN 61000-6-4
• for safety	ISO 13849-1 PLd CAT2

#### Ordering data

##### SIDoor ATD401W

Controller for machine tool doors,  
relay module design

#### Article No.

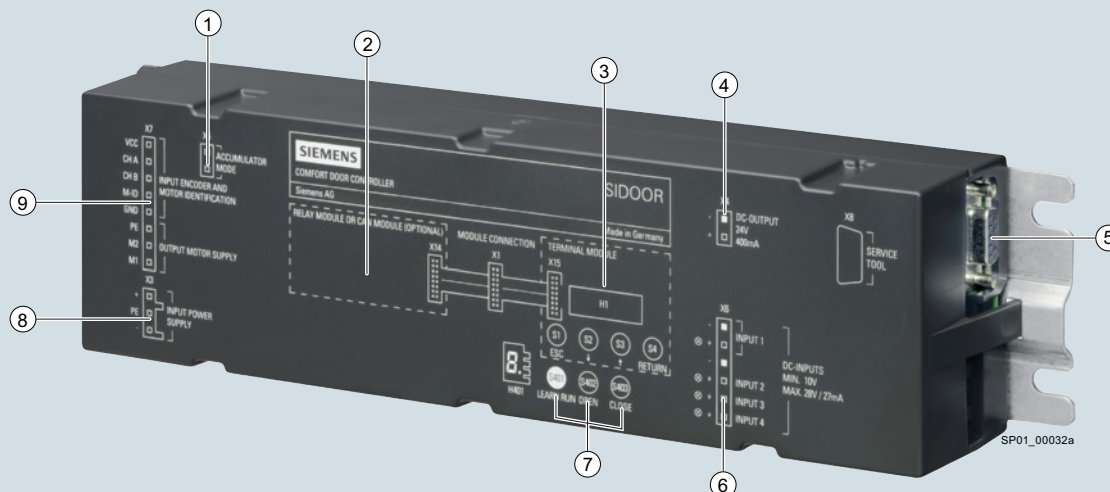
**6FB1141-1AT11-3WE2**

## Products for specific requirements

Automatic door controls  
for industry applications – Controllers

### SIDOOR ATD410W machine tool door drive

#### Overview



- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>① Emergency power module connection</li> <li>② Relay module, USS module or PROFIBUS module (according to requirements)</li> <li>③ Terminal module</li> <li>④ Output voltage 24 V DC/400 mA connection</li> <li>⑤ Connection<br/>- Software Kit or<br/>- Service Tool</li> </ul> | <ul style="list-style-type: none"> <li>⑥ Input signal connection</li> <li>⑦ Control panel</li> <li>⑧ Input voltage connection<br/>16.8 to 36 V DC<br/>for connection of power supply</li> <li>⑨ Motor connection</li> </ul> |
|--|---|

#### SIDOOR ATD410W machine tool door drive

The SIDOOR ATD410W machine tool door drive can be used to operate horizontal sliding doors. The drive system has been specially designed for use in a very wide range of machine tools. The communication-capable ATD410W controller offers complete flexibility for integration with a machine tool via USS protocol (Universal Serial Interface protocol)

- For dynamic door weights up to 600 kg
- USS module design: USS communications interface for connection to ET 200-type higher-level controllers, SIMATIC S7-1200, SIMATIC S7-1500 and SIMATIC S7-300 via USS interface
- 5 freely parameterizable digital inputs for signal acquisition, of which one input can be optionally parameterized for:
  - Connection to a light barrier as type 2 ESPE (electro-sensitive protective equipment) according to EN 61496-1
  - Connection of a pressure sensitive edge in accordance with ISO 13856-2
- 2 relay contacts for additional position signals
- Automatic determination of the door weight and friction during the learn run
- Operating temperature -20 to +50 °C

- Flexible motor management, automatic recognition of the geared motor
- Assisted drive (motor-assisted movement of the door)
- Impulse stop (door stopped automatically by applying light force)
- Impulse drive (automatic door movement after applying light force)
- Opening width 0.3 to 5 m
- Auxiliary power output 24 V DC  $\pm$  15 %; 0.4 A (short-circuit-proof)
- Output stage for the motor control is short-circuit-proof
- Displays the current operating states on a 7-segment display directly on the controller or with the Software Kit or Service Tool
- All door parameters can be assigned via the PROFIdrive profile with the function block provided. For details see the System Manual "SIDOOR AT40, ATD400V, ATD400K, ATD400W, ATD410W, ATD400S, ATE250S", ATD400T <http://support.automation.siemens.com/WW/view/en/58531074>

#### Ordering data

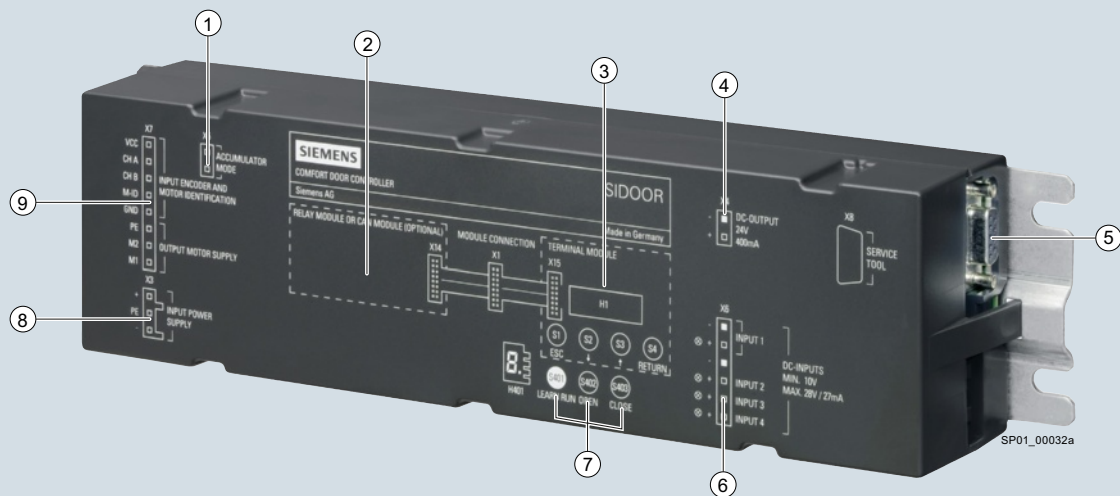
#### Article No.

**SIDOOR ATD410W**  
machine tool door drive

**6FB1141-4AT10-3WE2**

Controller

## Overview



- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>① Emergency power module connection</li> <li>② Relay module, USS module or PROFIBUS module (according to requirements)</li> <li>③ Terminal module</li> <li>④ Output voltage 24 V DC/400 mA connection</li> <li>⑤ Connection<br/>- Software Kit or<br/>- Service Tool</li> </ul> | <ul style="list-style-type: none"> <li>⑥ Input signal connection</li> <li>⑦ Control panel</li> <li>⑧ Input voltage connection<br/>16.8 to 36 V DC<br/>for connection of power supply</li> <li>⑨ Motor connection</li> </ul> |
|--|---|

## SIDOOR ATD420W machine tool door drive

The SIDOOR ATD420W machine tool door drive can be used to operate horizontal sliding doors. The drive system has been specially designed for use in a very wide range of machine tools. The communication-capable ATD420W controller offers complete flexibility for integration with a machine tool via PROFIBUS

- For dynamic door weights up to 600 kg
- Integrated PROFIBUS interface
- 5 freely parameterizable digital inputs for signal acquisition, of which one input can be optionally parameterizable for:
  - Connecting a light barrier as type 2 ESPE (electro-sensitive protective equipment) according to EN 61496-1
  - Connecting a pressure-sensitive edge according to ISO 13856-2
- 2 relay contacts for additional position signals
- Automatic determination of the door weight and friction during the learn run
- Parameter assignment and analysis of the door parameters via PROFIDrive

- Operating temperature -20 to +50 °C
- Flexible motor management, i.e. automatic recognition of the geared motor
- Assisted drive (motor-assisted movement of the door)
- Impulse stop (door stopped automatically by applying light force)
- Impulse drive (automatic door movement after applying light force)
- Opening width 0.3 to 5 m
- Auxiliary power output 24 V DC  $\pm 15\%$  and 0.4 A (short-circuit-proof)
- Output stage for the motor control is short-circuit-proof
- Displays the current operating states on a 7-segment display directly on the controller or with the Software Kit or Service Tool
- All door parameters can be assigned via the PROFIDrive profile with the function block provided. For details see the System Manual "SIDOOR AT40, ATD400V, ATD400K, ATD400W, ATD410W, ATD400S, ATE250S", ATD400T <http://support.automation.siemens.com/WW/view/en/58531074>



## Products for specific requirements

Automatic door controls  
for industry applications – Controllers

### SIDOOR ATD420W machine tool door drive

#### Technical specifications

Article number		6FB1141-2AT10-3WE2
<b>General technical data:</b>		
<b>Relative symmetrical tolerance / of the supply voltage</b>	%	15
<b>Relative positive tolerance / of the supply voltage</b>	%	3
<b>Input voltage</b>		
• per DC input	V	10 ... 28
<b>Input current</b>		
• per DC input	mA	9 ... 27
<b>Product property</b>		
• Isolated control inputs		Yes
• Control inputs switching to P potential		Yes
<b>Output current / at 24 V DC output / maximum</b>	mA	400
<b>Property of the 24 V DC output</b>		
• Note		CAUTION: Do not supply with external voltage!
• Short-circuit proof		Yes
<b>Product expansion / optional</b>		
		Mains transformer 6FB1112-0AT20-2TRO
<b>Switching capacity current / of the output relay / for DC / at 30 V</b>		
• minimum	A	0.01
• maximum	A	0.5

Article number		6FB1141-2AT10-3WE2
<b>Door opening width</b>	m	0.3 ... 5
<b>Ambient temperature</b>		
• during operation	°C	-20 ... +50
• during storage	°C	-40 ... +70
<b>Protection class IP</b>		
		IP20
<b>Relative humidity</b>		
• without condensation	%	10 ... 93
<b>Width</b>	mm	320
<b>Height</b>	mm	60
<b>Depth</b>	mm	80
<b>Standards:</b>		
<b>Type of test / TUV prototype tested</b>		Yes
<b>Certificate of suitability / CE marking</b>		
		Yes
<b>Standard</b>		
• for EMC		EN 61000-6-2 / EN 61000-6-4
• for safety		ISO 13849-1 PLd CAT2

#### Ordering data

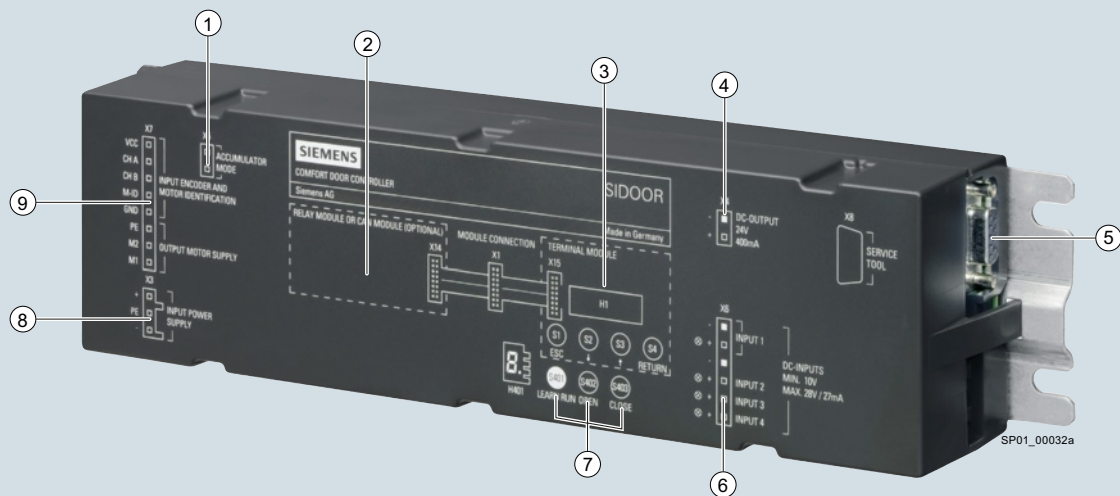
#### Article No.

#### SIDOOR ATD420W

Controller for machine tool doors,  
integrated PROFIBUS interface

6FB1141-2AT10-3WE2

## Overview



- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>① Emergency power module connection</li> <li>② Relay module, USS module or PROFIBUS module (according to requirements)</li> <li>③ Terminal module</li> <li>④ Output voltage 24 V DC/400 mA connection</li> <li>⑤ Connection<br/>- Software Kit or<br/>- Service Tool</li> </ul> | <ul style="list-style-type: none"> <li>⑥ Input signal connection</li> <li>⑦ Control panel</li> <li>⑧ Input voltage connection<br/>16.8 to 36 V DC<br/>for connection of power supply</li> <li>⑨ Motor connection</li> </ul> |
|--|---|

## SIDOOR ATD430W machine tool door drive

The SIDOOR ATD430W machine tool door drive can be used to operate horizontal sliding doors. The drive system has been specially designed for use in a very wide range of machine tools. The communication-capable ATD430W controller offers complete flexibility for integration into a machine tool via PROFINET.

- For dynamic door weights up to 600 kg
- Integrate PROFINET interface (2 RJ45 ports)
- 5 freely parameterizable digital inputs for signal acquisition, of which one input can be optionally parameterizable for:
  - Connecting a light barrier as type 2 ESPE (electro-sensitive protective equipment) according to EN 61496-1
  - Connecting a pressure-sensitive edge according to ISO 13856-2
- 2 relay contacts for additional position signals
- Automatic determination of the door weight and friction during the learn run
- Parameter assignment and analysis of the door parameters via PROFIdrive

- Operating temperature -20 to +50 °C
- Flexible motor management, i.e. automatic recognition of the geared motor
- Assisted drive (motor-assisted door movement)
- Impulse stop (door stopped automatically by applying light force)
- Impulse drive (automatic door movement after applying light force)
- Opening width 0.3 to 5 m
- Auxiliary power output 24 V DC  $\pm$ 15 % and 0.4 A (short-circuit-proof)
- Output stage for the motor control is short-circuit proof
- Indicates the current operating states on a 7-segment display directly on the controller or using the Software Kit or Service Tool
- All door parameters can be assigned via the PROFIdrive profile with the function block provided. For details, see System Manual "SIDOOR AT40, ATD400V, ATD400K, ATD4xxW, ATD400S, ATE250S, ADT400T", <http://support.automation.siemens.com/WWW/view/en/58531074>

## Products for specific requirements

Automatic door controls  
for industry applications – Controllers

### SIDOOR ATD430W machine tool door drive

#### Technical specifications

Article number		6FB1141-3AT10-3WE2	
<b>General technical data:</b>			
Relative symmetrical tolerance / of the supply voltage	%	15	
Relative positive tolerance / of the supply voltage	%	3	
<b>Input voltage</b>			
• per DC input	V	10 ... 28	
<b>Input current</b>			
• per DC input	mA	9 ... 27	
<b>Product property</b>			
• Isolated control inputs		Yes	
• Control inputs switching to P potential		Yes	
<b>Output current / at 24 V DC output / maximum</b>	mA	400	
<b>Property of the 24 V DC output</b>			
• Note		CAUTION: Do not supply with external voltage!	
• Short-circuit proof		Yes	
<b>Product expansion / optional</b>			
		Mains transformer 6FB1112-0AT20-2TRO	
<b>Switching capacity current / of the output relay / for DC / at 30 V</b>			
• minimum	A	0.01	
• maximum	A	0.5	

Article number		6FB1141-3AT10-3WE2	
<b>Door opening width</b>	m	0.3 ... 5	
<b>Ambient temperature</b>			
• during operation	°C	-20 ... +50	
• during storage	°C	-40 ... +70	
<b>Protection class IP</b>			
		IP20	
<b>Relative humidity</b>			
• without condensation	%	10 ... 93	
<b>Width</b>	mm	320	
<b>Height</b>	mm	60	
<b>Depth</b>	mm	80	
<b>Standards:</b>			
<b>Type of test / TUV prototype tested</b>		Yes	
<b>Certificate of suitability / CE marking</b>			
		Yes	
<b>Standard</b>			
• for EMC		EN 61000-6-2 / EN 61000-6-4	
• for safety		ISO 13849-1 PLd CAT2	

#### Ordering data

#### Article No.

#### SIDOOR ATD430W

Controller for machine tool doors,  
integrated PROFINET interface  
(2 RJ45 ports)

6FB1141-3AT10-3WE2

## Products for specific requirements

Automatic door controls  
for industry applications – Power supplies, Additional units

### Mains Transformer, NT40 switch mode power supply, Software Kit, Service Tool

#### Overview Mains transformer



The mains transformer is a standard power supply unit operated with 230 V AC ( $\pm 15\%$ ) 50/60 Hz from the SIDOOR product range, and can be used for all controllers which do not have an integrated power supply unit. The SIDOOR AT12 elevator door drive has an integrated power supply unit, for example.

For further information, see page 13/38.

#### Overview NT40 switch mode power supply



The SIDOOR NT40 switch mode power supply unit is operated at 50/60 Hz, 230 V AC ( $\pm 15\%$ ) to power the following SIDOOR door controllers:

- SIDOOR AT40 and SIDOOR ATD400V elevator door drives
- SIDOOR ATD400K cold room gate drive
- SIDOOR ATD401W, SIDOOR ATD410W, SIDOOR ATD420W and SIDOOR ATD430W machine tool door drives
- SIDOOR ATD400S platform screen door drive

It is especially suitable for door systems with high door weights. On the output side, the power supply unit delivers a voltage of 36 V DC ( $\pm 3\%$ ) SELV at a rated output power of  $< 100$  W.

In order to enable fast acceleration/deceleration of the doors by the controller, the device can briefly ( $< 2$  s) deliver a current of 15 A (corresponds to a short-time power output of 540 W).

For further information, see page 13/39.

#### Overview Software Kit



##### SIDOOR Software Kit

The scope of delivery of the SIDOOR Software Kit includes an installation CD.

##### Note:

Certain firmware updates are provided as free downloads in the Siemens Industry Online Support. For information on the availability of further firmware available at a charge, and on how to obtain this, please contact Technical Support.

The following functionalities are available on CD:

SIDOOR User Software	The component that enables the door control system to be configured, parameters to be assigned, and analyzed.
Siemens HCS12 Firmware Loader	This component is used to update the firmware of the door controller.
SIDOOR USB to UART Bridge Driver	This driver is essential for operation of the USB adapter.

For further information, see page 13/40.

#### Overview Service Tool



The Service Tool can be used to input run commands, change run parameters and read out learned parameters, door states, input/output signals and service data.

You do not need to open the cover of the controller to do this.

For further information, see page 13/40.

## Products for specific requirements

Automatic door controls  
for industry applications

### Geared motors

#### Overview

SIDOOR geared motors are a combination of gear unit, motor and sensor. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning.

The maintenance-free, variable speed drive unit comprises a DC motor with non-self-locking gearing.

The geared motors must be selected according to the dynamic door weight. Two different versions are available for each of the SIDOOR MDG180, SIDOOR MDG400, SIDOOR M2 to SIDOOR M5 geared motors:

- SIDOOR MDG180 geared motors (max. door weight of 180 kg)
  - SIDOOR MDG180 L (pinion left) 6FB1103-0AT14-4MB0
  - SIDOOR MDG180 R (pinion right) 6FB1103-0AT13-4MB0
- SIDOOR MDG400 geared motors (max. door weight of 400 kg)
  - SIDOOR MDG400 L (pinion left) 6FB1103-0AT14-3MC0
  - SIDOOR MDG400 R (pinion right) 6FB1103-0AT13-3MC0
- SIDOOR M3 geared motors (max. door weight 180 kg)
  - SIDOOR M3 L (pinion left) 6FB1103-0AT10-4MB0
  - SIDOOR M3 R (pinion right) 6FB1103-0AT11-4MB0
- SIDOOR M4 geared motors (max. door weight 400 kg)
  - SIDOOR M4 L (pinion left) 6FB1103-0AT10-3MC0
  - SIDOOR M4 R (pinion right) 6FB1103-0AT11-3MC0
- SIDOOR M5 geared motors (max. door weight 600 kg)
  - SIDOOR M5 L (pinion left) 6FB1103-0AT10-3MD0
  - SIDOOR M5 R (pinion right) 6FB1103-0AT11-3MD0

The gear outlet direction is defined as left or right when viewing the gear unit from the front.



Geared motors (versions with pinion left) shown from bottom to top: SIDOOR MDG180 L, SIDOOR MDG400 L, SIDOOR M3 L, SIDOOR M4 L, SIDOOR M5 L

**Products for specific requirements**Automatic door controls  
for industry applications**Geared motors**

<b>Ordering data</b>	<b>Article No.</b>	<b>Ordering data</b>	<b>Article No.</b>
<b>SIDOOR MDG180 geared motors</b>		<b>SIDOOR M3 geared motors</b>	
• MDG180 L	6FB1103-0AT14-4MB0	• SIDOOR M3 L	6FB1103-0AT10-4MB0
• MDG180 R	6FB1103-0AT13-4MB0	• SIDOOR M3 R	6FB1103-0AT11-4MB0
<b>SIDOOR MDG400 geared motors</b>		<b>SIDOOR M4 geared motors</b>	
• MDG400 L	6FB1103-0AT14-3MC0	• SIDOOR M4 L	6FB1103-0AT10-3MC0
• MDG400 R	6FB1103-0AT13-3MC0	• SIDOOR M4 R	6FB1103-0AT11-3MC0
		<b>SIDOOR M5 geared motors</b>	
		• SIDOOR M5 L	6FB1103-0AT10-3MD0
		• SIDOOR M5 R	6FB1103-0AT11-3MD0

## Products for specific requirements

Automatic door controls  
for industry applications

### Accessories

#### Overview

An extensive range of accessories is available for the door control drives.

This is necessary to ensure low-noise operation of the door by the motor. The geared motors can be optimally integrated into the respective door drive system.

#### Accessories for all controllers for industrial applications

##### Rubber-metal anti-vibration mounts for geared motors

To ensure low-noise door operation, SIDOOR geared motors are integrated in the door system using rubber-metal anti-vibration mounts.

- Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for SIDOOR MDG180, SIDOOR M2 and SIDOOR M3 geared motors (door weights up to 180 kg)
- Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0 for SIDOOR MDG400 and SIDOOR M4 (door weights up to 400 kg), and SIDOOR M5 geared motors (door weights up to 600 kg)



Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for geared motors with door weights up to 180 kg



Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0 for geared motors with door weights up to 600 kg

#### Mounting bracket

Two different mounting brackets are available with elongated holes:

- Mounting bracket 6FB1104-0AT01-0AS0 for mounting SIDOOR geared motors, for flexible accommodation of the rubber-bonded metal
- Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit, this enables the toothed belt to be set to the required belt tension.



Mounting bracket 6FB1104-0AT01-0AS0 for mounting the geared motor



Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit

#### DIN rail holder

The standard DIN rail holder 6FB1144-0AT00-3SA0 is available for mounting controllers on the standard DIN rail TH 35 according to IEC 60715.

#### Door clutch holder

The door clutch holder serves to connect the respective door leaf by means of a toothed belt while also functioning as a toothed-belt lock. One door clutch holder per door leaf is required. The toothed-belt lock can accommodate both open ends of the toothed belt.

A door clutch holder is available for each toothed belt width:

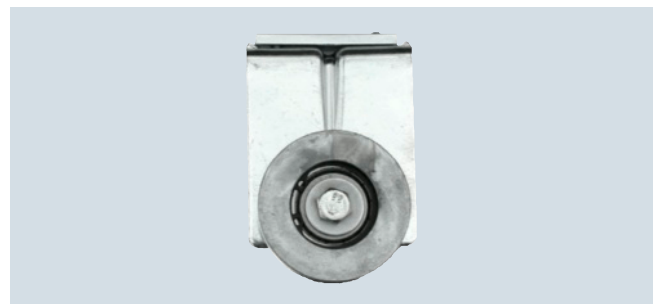
- Width 12 mm: 6FB1104-0AT01-0CP0
- Width 14 mm: 6FB1104-0AT02-0CP0



Door clutch holder 6FB1104-0AT01-0CP0  
(packaging size = 1 unit)

#### Deflector unit

The deflector unit 6FB1104-0AT03-0AS0 contains an embedded belt pulley which can be mounted on the door system. This unit deflects the STS toothed belt.

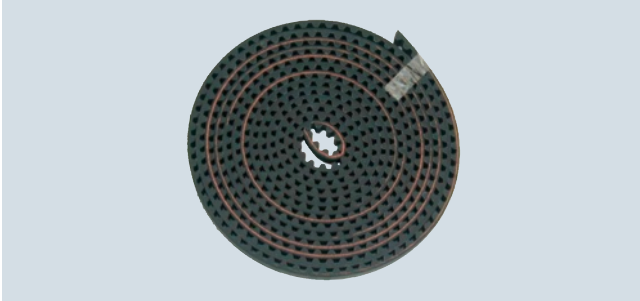


Deflector unit 6FB1104-0AT03-0AS0

**Overview** (continued)Toothed belt STS

The door system is moved between the end positions of the door using the STS toothed belts. Two different toothed belt lengths can be ordered for each toothed belt width.

- Toothed belt width 12 mm:
  - Length 4 m: 6FB1104-0AT01-0AB0
  - Length 45 m: 6FB1104-0AT02-0AB0
- Toothed belt width 14 mm:
  - Length 4 m: 6FB1104-0AT03-0AB0
  - Length 55 m: 6FB1104-0AT04-0AB0



Toothed belt 6FB1104-0AT01-0AB0 (width 12 mm, length 4 m)



Toothed belt 6FB1104-0AT02-0AB0 (width 12 mm, length 45 m)

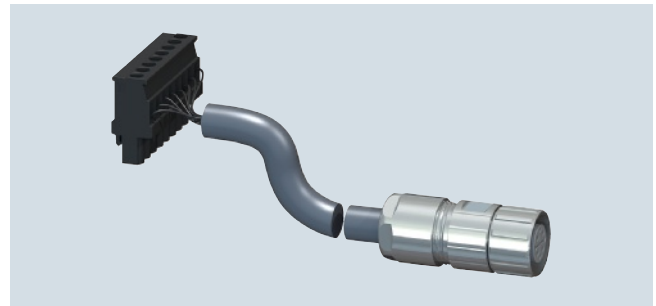
**Accessories for machine tool door drives only**Hybrid connecting cables CABLE-MDG

These connecting cables connect the SIDOOR ATD410W/ATD420W machine tool door drives to the SIDOOR MDG geared motor. Various lengths are available.

- Length 0.5 m: 6FB1104-0AT00-0CB5
- Length 1.5 m: 6FB1104-0AT01-0CB5
- Length 5 m: 6FB1104-0AT05-0CB0
- Length 7 m: 6FB1104-0AT07-0CB0
- Length 10 m: 6FB1104-0AT10-0CB0
- Length 15 m: 6FB1104-0AT15-0CB0

The SIDOOR ATD410W/ATD420W machine tool door drives are connected to a higher-level SIMATIC controller via the connector PB FC RS 485 PLUG 180 (6GK1500-0FC10) and the PB FC Standard Cable GP (6XV1830-0EH10), a standard bus cable with a special design for quick mounting.

A SIMATIC RS 485/USS communication module is required on the controller side, such as the ET 200S electronic module (6ES7138-4DF11-0AB0) for the SIMATIC ET 200.



SIDOOR CABLE MDG

Electronic module for ET 200S

1-channel module 6ES7138-4DF11-0AB0 for serial data exchange via point-to-point connection, for telegrams with a max. length of 224 bytes, RS 232C, RS 422, RS 485, 2 versions, ASCII and 3964(R) protocol, Modbus and USS protocol, parameter assignment via GSD file or STEP 7 (from V5.1)

Communication module CM PtP RS 422/485 BA

Basic communication module 6ES7540-1AB00-0AA0 with one RS 422/485 interface, Freeport, 3964(R) and USS protocols, 15-pin sub D socket, max. 19.2 kbit/s, for SIMATIC S7-1500

Communication module CM 1241

Communication module 6ES7241-1CH32-0XB0 for point-to-point connection with one RS 422/RS 485 interface, 9-pin, SUB D (pin) supports Freeport, for SIMATIC S7-1200



## Products for specific requirements

Automatic door controls  
for industry applications

### Accessories

Ordering data	Article No.		Article No.
<b>Rubber-metal anti-vibration mounts for geared motors</b> <ul style="list-style-type: none"> <li>SIDOOR rubber-metal anti-vibration mount for geared motors for door weights up to 300 kg</li> <li>SIDOOR rubber-metal anti-vibration mount for geared motors for door weights from 300 kg</li> </ul>	<b>6FB1104-0AT02-0AD0</b>  <b>6FB1104-0AT01-0AD0</b>	<b>For machine tool drives only</b>	
<b>Mounting bracket</b> <ul style="list-style-type: none"> <li>SIDOOR mounting bracket for geared motor</li> <li>SIDOOR mounting bracket with tensioning device for deflector pulley</li> </ul>	<b>6FB1104-0AT01-0AS0</b>  <b>6FB1104-0AT02-0AS0</b>	<b>CABLE-MDG hybrid connecting cables</b> <ul style="list-style-type: none"> <li>0.5 m</li> <li>1.5 m</li> <li>5 m</li> <li>7 m</li> <li>10 m</li> <li>15 m</li> </ul>	<b>6FB1104-0AT00-0CB5</b> <b>6FB1104-0AT01-0CB5</b> <b>6FB1104-0AT05-0CB0</b> <b>6FB1104-0AT07-0CB0</b> <b>6FB1104-0AT10-0CB0</b> <b>6FB1104-0AT15-0CB0</b>
<b>DIN rail holder</b> For mounting controllers on the standard DIN rail TH 35	<b>6FB1144-0AT00-3AS0</b>	<b>PB FC RS 485 PLUG 180</b>	<b>6GK1500-0FC10</b>
<b>Door clutch holder</b> SIDOOR door clutch holder	<b>6FB1104-0AT01-0CP0</b>	<b>PB FC Standard Cable GP</b>	<b>6XV1830-0EH10</b>
<b>Deflector unit</b> SIDOOR deflector unit	<b>6FB1104-0AT03-0AS0</b>	<b>Electronic module for ET 200S</b>	<b>6ES7138-4DF11-0AB0</b>
<b>SIDOOR toothed belt STS</b> <ul style="list-style-type: none"> <li>SIDOOR toothed belt STS 4 m</li> <li>SIDOOR toothed belt STS 45 m</li> </ul>	<b>6FB1104-0AT01-0AB0</b> <b>6FB1104-0AT02-0AB0</b>	<b>CM PtP RS 422/485 BA communication module</b>	<b>6ES7540-1AB00-0AA0</b>
		<b>CM 1241 communication module</b>	<b>6ES7241-1CH32-0XB0</b>

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**Overview**

The product-specific application/requirement lies in complying with the special railway requirements concerning functional safety.

Interior railway doors have a closing spring which must always bring the door into the "CLOSED" position. This applies to either side, even when a train car is inclined at 10°.

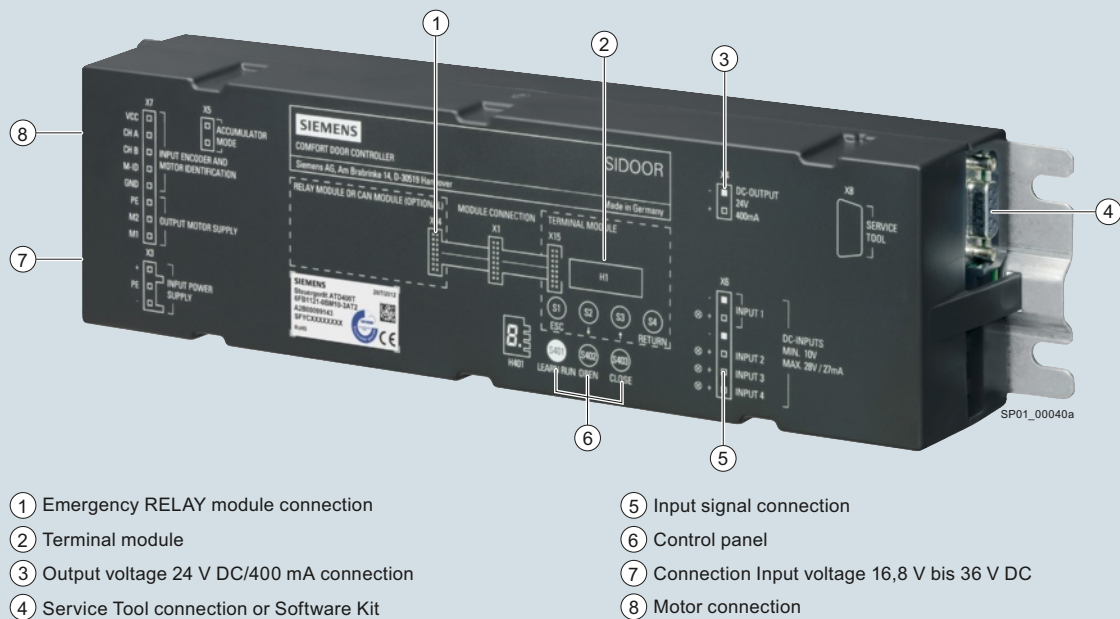
These specific operating states are handled by the door controller.

## Products for specific requirements

Automatic door controls  
for railway applications – Controllers

### SIDOOR ATD400T interior railway door drive

#### Overview



SIDOOR ATD400T interior railway door drive

The SIDOOR ATD400T interior railway door drive is an "intelligent" door drive which enables gangway doors to be opened and closed at adjustable speeds and accelerations.

- Relay module design
- For dynamic door weights up to 180 kg
- Automatic door weight detection
- Operating temperature -20 to +70 °C <sup>1)</sup>
- Flexible motor management (two different motor types), automatic detection
- Opening width 0.25 to 4 m
- Door can be operated with and without closing springs (60 to 80 N)
- With two identical door leaves, can be used up to a train inclination of 0 to 10%
- Forces and energies are limited in accordance with EN 14752
- EMC according to EN 50121-3-2
- Fulfills HL3 according to fire protection standard EN 45545-2 (Railway applications - Fire protection on rail vehicles)
- Vandal-proof

#### <sup>1)</sup> Note:

- Maximum output current at 24 V DC:
  - 0.4 A at ≤ 55 °C ambient temperature during operation
  - 0.1 A from 55 °C to 70 °C ambient temperature during operation, with restrictions at operating temperatures > 55 °C
- Maximum ambient temperature during operation:
  - 55 °C
  - 70 °C with restrictions at operating temperatures > 55 °C
- Restrictions at operating temperatures > 55 °C:
  - Only use the 24 V output voltage to operate control inputs (max. 0.1 A)
  - Use a sufficiently large (at least 350 x 350 mm), unpainted, metal mounting plate
  - The maximum drive parameters are restricted to the default values
  - If temperature class T3 according to EN 50155 is used, the maximum air temperature of 85 °C must not be exceeded near the printed-circuit board

#### Ordering data

#### Article No.

**SIDOOR ATD400T**  
interior railway door drive  
Door drive

**6FB1121-0BM13-3AT2**

**Overview Software Kit**

SIDOOR Software Kit

The scope of delivery of the SIDOOR Software Kit includes an installation CD.

**Note:**

Certain firmware updates are provided as free downloads in the Siemens Industry Online Support. For information on the availability of further firmware available at a charge, and on how to obtain this, please contact Technical Support.

The following functionalities can be selected on the CD:

SIDOOR User Software	The component that enables the door control system to be configured, parameters to be assigned, and analyzed.
Siemens HCS12 Firmware Loader	This component is used to update the firmware of the door controller.
SIDOOR USB to UART Bridge Driver	This driver is essential for operation of the USB adapter.

For further information, see page 13/40.

**Overview Service Tool**

The Service Tool can be used to input run commands, change run parameters and read out learned parameters, door states, input/output signals and service data.

You do not need to open the cover of the controller to do this.

For further information, see page 13/40.

## Products for specific requirements

Automatic door controls  
for railway applications

### Geared motors

#### Overview

Two different versions are available for the DC geared motors SIDOOR M3 and for the SIDOOR MDG180 DIN EN 45545-2.

#### DC technology:

- SIDOOR MDG180 geared motors (max. door weight 180 kg)
  - SIDOOR MDG180 L DIN EN 45545-2 (pinion left) 6FB1103-0AT16-4MB0
  - SIDOOR MDG180 R DIN EN 45545-2 (pinion right) 6FB1103-0AT15-4MB0
- SIDOOR M3 geared motors (max. door weight 180 kg)
  - SIDOOR M3 L (pinion left) 6FB1103-0AT10-4MB0
  - SIDOOR M3 R (pinion right) 6FB1103-0AT11-4MB0

The gear outlet direction is defined as left or right when viewing the gear unit from the front.



Center:  
SIDOOR M3 L DC geared motor 6FB1103-0AT10-4MB0 or  
SIDOOR MDG180 L 6FB1103-0AT16-4MB0 (version with pinion left)

#### Technical specifications

Article number	6FB1103-0AT16-4MB0	6FB1103-0AT15-4MB0	6FB1103-0AT10-4MB0	6FB1103-0AT11-4MB0
<b>Product designation</b>	Motor for door control			
<b>Design of the product</b>	MDG180 L DIN EN 45545-2	MDG180 R DIN EN 45545-2	M3 L	M3 R
<b>Supply voltage / for DC</b>	V	30		
<b>Active power consumption / Rated value</b>	W	80		
<b>Speed / maximum</b>	m/s	0.65		
<b>Protection class IP</b>				
• of gearbox	IP40			
• of the motor	IP54			
<b>Transmission ratio / of gearbox</b>		15		
<b>Torque / of the rotary actuator / Rated value</b>	N·m	3.5		
<b>Number of pulses / per revolution / maximum</b>		100		
<b>Operating current / Rated value</b>	A	4		
<b>Weight / of door / maximum</b>	kg	180		
<b>Ambient temperature</b>				
• during operation	°C	-20 ... +50		
• during storage	°C	-40 ... +85		
<b>Length / of the motor</b>	mm	236		
<b>Height / of the motor</b>	mm	98		
<b>Diameter / of the motor</b>	mm	63		
<b>Width / of gearbox / including drive pinion</b>	mm	85		

#### Ordering data

##### SIDOOR M3 geared motors

- SIDOOR M3 L
- SIDOOR M3 R

##### Article No.

6FB1103-0AT10-4MB0  
6FB1103-0AT11-4MB0

##### SIDOOR MDG180 geared motors

- SIDOOR MDG180 L
- SIDOOR MDG180 R

##### Article No.

6FB1103-0AT16-4MB0  
6FB1103-0AT15-4MB0

**Overview**

A comprehensive range of accessories is available for the SIDOOR elevator door systems.

This is necessary to ensure low-noise operation of the door by the controller. The geared motors can be optimally integrated into the respective door drive system.

Rubber-metal anti-vibration mounts for geared motors

To ensure low-noise door operation, the SIDOOR geared motors are integrated in the door system using rubber-metal anti-vibration mounts.

- Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for SIDOOR M3 DC geared motors, SIDOOR MDG180 DIN EN 45545-2 (door weights up to 180 kg)



Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for DC geared motors with door weights up to 250 kg

Mounting bracket

Two different mounting brackets are available with elongated holes:

- Mounting bracket 6FB1104-0AT01-0AS0 for SIDOOR M3 and SIDOOR MDG180 DIN EN 45545-2 DC geared motors for flexible accommodation of the rubber-bonded metal
- Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit, this enables the toothed belt to be set to the required belt tension.



Mounting bracket 6FB1104-0AT01-0AS0 for mounting the geared motor



Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit

Door clutch holder

The door clutch holder 6FB1104-0AT01-0CP0 serves to connect the respective door leaf by means of a toothed belt while also functioning as a toothed-belt lock. One door clutch holder per door leaf is required.

The toothed-belt lock can accommodate both open ends of the toothed belt.



Door clutch holder 6FB1104-0AT01-0CP0 (packaging size = 1 unit)

Deflector unit

The deflector unit 6FB1104-0AT03-0AS0 contains an embedded belt pulley which can be mounted on the door system.

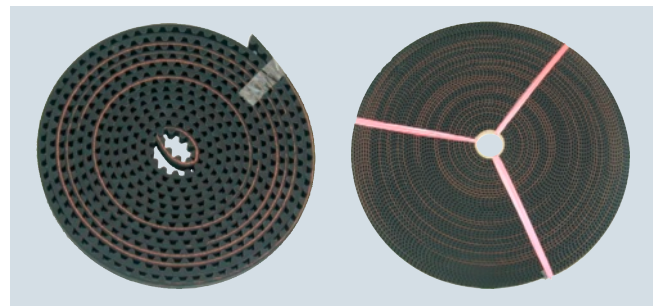
The toothed belt STS is redirected via this deflector unit.



Deflector unit 6FB1104-0AT03-0AS0

Toothed belt STS

The door system is moved between the end positions of the door using the toothed belt STS 6FB1104-0AT0.-0AB0. Two different toothed belt lengths are available.



Toothed belt 6FB1104-0AT01-0AB0, length 4 m (left)  
Toothed belt 6FB1104-0AT02-0AB0, length 45 m (right)

**Ordering data****Article No.****Rubber-metal anti-vibration mounts for geared motors**

- SIDOOR rubber-metal anti-vibration mount for geared motors for door weights up to 300 kg

**6FB1104-0AT02-0AD0****Mounting bracket**

- SIDOOR mounting bracket for geared motor
- SIDOOR mounting bracket with tensioning device for deflector pulley

**6FB1104-0AT01-0AS0****6FB1104-0AT02-0AS0****Door clutch holder**

SIDOOR door clutch holder

**6FB1104-0AT01-0CP0****Deflector unit**

SIDOOR deflector unit

**6FB1104-0AT03-0AS0****SIDOOR toothed belt STS**

- SIDOOR toothed belt STS 4 m
- SIDOOR toothed belt STS 45 m

**6FB1104-0AT01-0AB0****6FB1104-0AT02-0AB0**

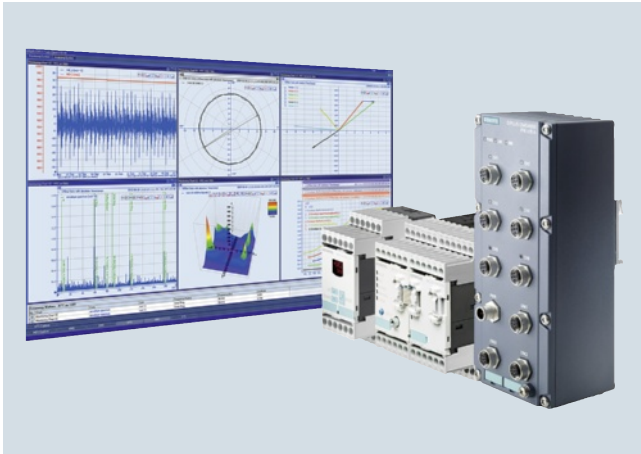
## Products for specific requirements

Condition monitoring systems

SIPLUS CMS1000 Condition Monitoring System

### Introduction, SIPLUS CMS1000

#### Overview



With the SIPLUS condition monitoring system from Siemens you can constantly monitor your machines and plants. Maintenance procedures can be planned better and only performed when they are actually necessary – predictive maintenance.

#### Overview SIPLUS CMS1000



SIPLUS CMS1000 offers an easy introduction to continuous monitoring without any expert knowledge required. The SIPLUS CMS1000 Condition Monitoring System works using characteristic values.

#### Other advantages at a glance:

- Permanent monitoring to protect the machines
- Effective monitoring of important processes and systems
- Energy efficiency support
- Early detection of damages
- Scheduled maintenance instead of spontaneous repair
- Reduction in maintenance costs
- Increase in plant availability
- Optimum utilization of service life of the units

## Overview



The compact SIPLUS CMS1000 Bearing Guard is the core component in the overall system.

It analyses the measured signals from the sensor:

- For analysis of the status of rolling-contact bearings in accordance with VDI 3832 (DKW)
- Machine monitoring RMS in accordance with DIN ISO 10816-3
- Signaling of limit violations via floating contacts

## Technical specifications

Type	<b>6AT8001-1AA00</b>	
<b>Product designation</b>	SIPLUS CMS1000 Bearing Guard	
<b>Product description</b>	Device for monitoring mechanical vibrations based on characteristic values	
<b>General data</b>		
<b>Protection class IP</b>	IP20	
<b>Ambient temperature</b>		
• during operating	°C	-25 ... +60
• during storage	°C	-25 ... +60
• during transport	°C	-25 ... +60
<b>Relative humidity without condensation during operating phase</b>	%	5 ... 95
<b>Consumed current at 24 V with DC typical</b>	A	0.21
<b>Active power loss total typical</b>	W	3.5
<b>Item designation</b>		
• according to DIN 40719 extendable after IEC 204-2 according to IEC 750	P	
• according to DIN EN 61346-2	P	
<b>Supply voltage</b>		
<b>Type of voltage of supply voltage</b>	AC/DC	
<b>Supply voltage 1</b>		
• for DC	V	24
• at 50 Hz - for AC	V	115 ... 240
• at 60 Hz - for AC	V	115 ... 240

Type	<b>6AT8001-1AA00</b>	
<b>Installation / fixing / dimensions</b>		
<b>mounting position</b>	vertical	
• recommended	vertical	
<b>Type of mounting</b>	standard rail	
<b>Width</b>	mm	45
<b>Height</b>	mm	106
<b>Depth</b>	mm	86
<b>Inputs / outputs</b>		
<b>Number of sensor inputs</b>		
• for IEPE sensors	0	
• for MEMS sensors	1	
<b>Number of disable inputs</b>	1	
<b>Number of rotational speed inputs</b>	1	
<b>Number of indicator outputs</b>	2	
<b>Design of input disable input DC 24 V</b>	Yes	
<b>Input voltage rotational speed input DC 24 V digital</b>	Yes	
<b>Range of input voltage rotational speed input -10 V ... + 10 V</b>	Yes	
<b>Range of input current rotational speed input</b>		
• 0 mA ... 20 mA	No	
• 4 mA ... 20 mA	Yes	
<b>Design of output indicator output</b>	Relay output	



## Products for specific requirements

Condition monitoring systems

SIPLUS CMS1000 Condition Monitoring System

### Bearing Guard

#### Technical specifications (continued)

Type	6AT8001-1AA00	
<b>Connections</b>		
<b>Design of the electrical connection</b>		
• of the inputs and outputs	screw terminal	
• for auxiliary and control current circuit	screw-type terminals	
<b>Terminals</b>		
<b>Product function</b>		
• removable terminal for main circuit	Yes	
• removable terminal for auxiliary and control circuit	Yes	
<b>Conductor cross-section that can be connected for auxiliary contact</b>		
• solid	mm <sup>2</sup>	0.5 ... 4
• finely stranded		
- with conductor end processing	mm <sup>2</sup>	0.5 ... 2.5
- without conductor final cutting	mm <sup>2</sup>	0.5 ... 2.5
<b>Communication</b>		
<b>Product function bus-communication</b>	No	

Type	6AT8001-1AA00	
<b>Construction</b>		
<b>Distance, to be maintained, to the ranks assembly</b>		
• upwards	mm	25
• forwards	mm	80
• sideways	mm	0
• downwards	mm	25
<b>Material of the enclosure</b>	plastic	
<b>Design of thread of connection screw</b>	M3	
<b>Dimension de la tête de tournevis</b>	Size 2 and Pozidriv 2	
<b>Tightening torque with screw-type terminals</b>	N-m	0.8 ... 1.2
<b>Weight</b>	kg	0.3
<b>Standards and approvals</b>		
<b>Standard</b>		
• for interference immunity	IEC 61326 - 1, IEC 61326 - 2 - 3	
• for security	IEC 61010-1	
<b>Verification of suitability</b>	CE, KC, EAC	

#### Ordering data

#### Article No.

#### SIPLUS CMS1000 Bearing Guard

6AT8001-1AA00

For analyzing the status of rolling-contact bearings in accordance with VDI 3832, and for signaling limit violations

## Products for specific requirements

### Condition monitoring systems

#### SIPLUS CMS1000 Condition Monitoring System

#### Accessories

#### Overview

The following accessories (to be ordered separately) are available for the SIPLUS CMS1000 Condition Monitoring System:

- Sensor for detecting the vibration acceleration of rolling-contact bearings
- Cables for connecting the bearing guard and sensor
  - 4 m long
  - 10 m long
  - 30 m long
- Adapter for connecting the sensor to different motors
  - M6/M6, M6/M8
  - M6/SPM

Ordering data	Article No.		Article No.
<b>SIPLUS CMS1000 SENSOR</b> Vibration acceleration sensor for the SIPLUS CMS1000 Bearing Guard	<b>6AT8001-1AA00-1XA0</b>	<b>SIPLUS CMS1000 CABLE-MEMS-44-0030</b> 4 x 0.34 mm <sup>2</sup> PUR shielded cable, M12, open end; cable length 30 m	<b>6AT8001-1AA00-1AB3</b>
<i>Cable</i> <b>SIPLUS CMS1000 CABLE-MEMS-44-0004</b> 4 x 0.34 mm <sup>2</sup> PUR shielded cable, M12, open end; cable length 4 m	<b>6AT8001-1AA00-1AA4</b>	<i>Adapter</i> <b>SIPLUS CMS1000 Adapter M6/M6, M6/M8</b> Thread adapter for mounting the SIPLUS CMS1000 Sensor	<b>6AT8001-2AA10-1AM0</b>
<b>SIPLUS CMS1000 CABLE-MEMS-44-0010</b> 4 x 0.34 mm <sup>2</sup> PUR shielded cable, M12, open end; cable length 10 m	<b>6AT8001-1AA00-1AB1</b>	<b>SIPLUS CMS1000 Adapter M6/SPM</b> SPM adapter for IEC squirrel-cage motors with the option for bearing monitoring Q01, G50	<b>6AT8001-2AA10-1SA0</b>

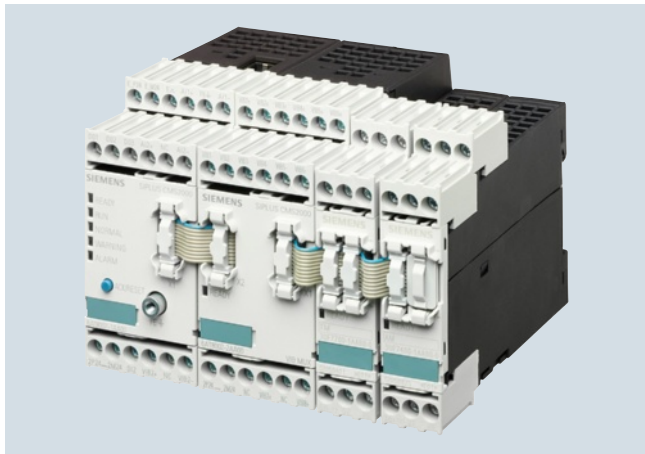
## Products for specific requirements

Condition monitoring systems

SIPLUS CMS2000 Condition Monitoring System

### Introduction

### Overview



The modular and parameterizable SIPLUS CMS2000 Condition Monitoring System is an easy to parameterize and web-based system.

It provides the following benefits:

- Analysis of the status of rolling-contact bearings in accordance with VDI 3832 (DKW)
- Machine monitoring RMS in accordance with DIN ISO 10816-3
- Detailed identification of damage with frequency-selective diagnostics
- Raw data recording and export for SIPLUS CMS X-Tools
- Trend recording and analysis
- Monitoring of process variables
- Signaling of limit violations
- Permanent monitoring to protect the machines
- Effective monitoring of important processes and systems
- Energy efficiency support
- Early detection of damage
- Scheduled maintenance instead of spontaneous repair
- Reduction in maintenance costs
- Increased system availability
- Optimum utilization of the service life of the units

The SIPLUS CMS2000 Condition Monitoring System is modularly expandable, e.g. with the

- SIPLUS CMS2000 VIB-MUX expansion module for expanding the IEPE vibration channels
- Temperature module for direct connection of temperature sensors (Pt100, Pt1000, ...)

#### Overview



The SIPLUS CMS2000 Basic Unit VIB is used for:

- Monitoring of motors, generators, pumps, fans, or other mechanical components
- Recording and analysis of vibrations, speed, and temperature

It is modularly expandable via the system interface, e.g. using SIPLUS CMS2000 VIB-MUX expansion modules and temperature modules.

#### Technical specifications

Type	<b>6AT8002-1AA00</b>	
Product designation	SIPLUS CMS2000 Basic Unit VIB	
Product description	Basic unit for monitoring vibrations in mechanical components based on characteristic values and frequency-selective analysis functions	
<b>General data</b>		
Protection class IP	IP20	
Ambient temperature		
• during operating	°C	-20 ... +65
• during storage	°C	-25 ... +85
• during transport	°C	-25 ... +85
Relative humidity without condensation during operating phase	%	5 ... 95
Active power loss total typical	W	2.6
physical measuring principal	Vibration acceleration	
Measuring range vibration frequency	Hz	2 ... 10 000
Scanning frequency maximum	Hz	46 875
Item designation		
• according to DIN 40719 extendable after IEC 204-2 according to IEC 750	P	
• according to DIN EN 61346-2	P	
Supply voltage		
Type of voltage of supply voltage	DC	
Supply voltage 1		
• for DC	V	24

Type	<b>6AT8002-1AA00</b>	
Product designation	SIPLUS CMS2000 Basic Unit VIB	
<b>Installation / fixing / dimensions</b>		
mounting position	vertical	
• recommended	vertical	
Type of mounting	standard rail	
Width	mm	45
Height	mm	106
Depth	mm	124
<b>Inputs / outputs</b>		
Number of analog inputs	2	
Number of disable inputs	1	
Number of rotational speed inputs	1	
Number of indicator outputs	3	
Number of sensor inputs		
• for IEPE sensors	2	
• for MEMS sensors	0	
Number of trigger inputs	1	
Product function monitoring of sensor inputs	Yes	
Input voltage		
• at disable input with DC 24 V	Yes	
• rotational speed input DC 24 V digital	Yes	
• at trigger input with DC 24 V	Yes	
Range of input voltage		
• at the analog input -10 V ... 10 V	Yes	
• rotational speed input -10 V ... + 10 V	No	

## Products for specific requirements

Condition monitoring systems

SIPLUS CMS2000 Condition Monitoring System

### Basic units

#### Technical specifications (continued)

Type	<b>6AT8002-1AA00</b>	
Product designation	SIPLUS CMS2000 Basic Unit VIB	
Range of input current	<ul style="list-style-type: none"> <li>at the analog input           <ul style="list-style-type: none"> <li>- 0 mA ... 20 mA No</li> <li>- 4 mA ... 20 mA Yes</li> </ul> </li> <li>rotational speed input           <ul style="list-style-type: none"> <li>- 0 mA ... 20 mA No</li> <li>- 4 mA ... 20 mA No</li> </ul> </li> </ul>	
Design of output indicator output	electronic	
Connections		
Design of the electrical connection	<ul style="list-style-type: none"> <li>of the inputs and outputs screw terminal</li> <li>for auxiliary and control current circuit screw-type terminals</li> </ul>	
Terminals		
Product function	<ul style="list-style-type: none"> <li>removable terminal for main circuit Yes</li> <li>removable terminal for auxiliary and control circuit Yes</li> </ul>	
Conductor cross-section that can be connected for auxiliary contact	<ul style="list-style-type: none"> <li>solid mm<sup>2</sup> 0.5 ... 4</li> <li>finely stranded           <ul style="list-style-type: none"> <li>- with conductor end processing mm<sup>2</sup> 0.5 ... 2.5</li> <li>- without conductor final cutting mm<sup>2</sup> 0.5 ... 2.5</li> </ul> </li> </ul>	
Communication		
Product function bus-communication	Yes	
Type of data transmission	Exporting of raw data as WAV file for further analyses (e.g. using CMS X-Tools) can be downloaded via browser	
Design of the interface	<ul style="list-style-type: none"> <li>Ethernet interface Yes</li> <li>SIMOCODE interface Yes</li> </ul>	

Type	<b>6AT8002-1AA00</b>	
Product designation	SIPLUS CMS2000 Basic Unit VIB	
Software / Services		
Browser software required	Web browser Firefox®, Google Chrome or Microsoft Internet Explorer	
Service	<ul style="list-style-type: none"> <li>as web server HTTP Yes</li> <li>for open IE communication TCP/IP Yes</li> </ul>	
Product function diagnosis via E-mail	Yes	
Configuration		
Type of hardware configuration	modular construction, basic unit can be expanded by means of expansion modules	
Material of the enclosure	plastic	
Memory capacity total	Gibyte	1
Weight	g	300
Standards		
Verification of suitability	CE, UL 508, CSA C22.2 Nr.142, RCM, EAC, KC	

#### Ordering data

#### Article No.

#### SIPLUS CMS2000 Basic Unit VIB

Basic unit for monitoring vibrations in mechanical components based on characteristic values and frequency-selective analysis functions

**6AT8002-1AA00**

## Overview

SIPLUS CMS2000 VIB-MUX expansion modules and temperature modules can be connected to the SIPLUS CMS2000 Basic Unit VIB via the SIMOCODE system interface.

### SIPLUS CMS2000 VIB-MUX expansion modules

Up to two SIPLUS CMS2000 VIB-MUX expansion modules can be connected to the SIPLUS CMS2000 Basic Unit VIB to expand the vibration channels. In this way, the number of vibration channels can be expanded modularly from 2 to a maximum of 16 channels.

The following configuration options are possible:

- Basic unit without expansion:  
2 time-synchronous, continuously sampled vibration channels
- Basic unit with one SIPLUS CMS2000 VIB-MUX:  
8 + 1: 8 channels via the SIPLUS CMS2000 VIB-MUX in multiplex mode, 1 channel continuous and independent of the channels connected on the SIPLUS CMS2000 VIB-MUX
- Basic unit with two SIPLUS CMS2000 VIB-MUX:  
16 vibration channels in multiplex mode

SIMOCODE connecting cable for connecting the SIPLUS CMS2000 Basic Unit VIB to the SIPLUS CMS2000 VIB-MUX, see "Accessories".



SIPLUS CMS2000 VIB-MUX expansion module 6AT8002-2AA00

### Temperature modules

Up to two temperature modules can be connected to the SIPLUS CMS2000 Basic Unit VIB.

Each temperature module has three inputs for the connection of up to three analog temperature sensors (sensor types: Pt100/ Pt1000, KTY83/KTY84 or NTC) available.

SIMOCODE connecting cable for connecting the SIPLUS CMS2000 Basic Unit VIB to the temperature modules, see "Accessories".



Temperature module 3UF7700-1AA00-0

## Ordering data

### SIPLUS CMS2000 VIB-MUX expansion module

Up to two SIPLUS CMS2000 VIB-MUX expansion modules can be connected to the SIPLUS CMS2000 Basic Unit VIB. Expansion modules can be connected to up to 8 IEPE vibration channels.

### Article No.

6AT8002-2AA00

### Article No.

### Temperature module

Up to two temperature modules can be connected to the SIPLUS CMS2000 Basic Unit VIB.

Three inputs are available for each temperature module for connecting up to three temperature sensors.

3UF7700-1AA00-0

## Products for specific requirements

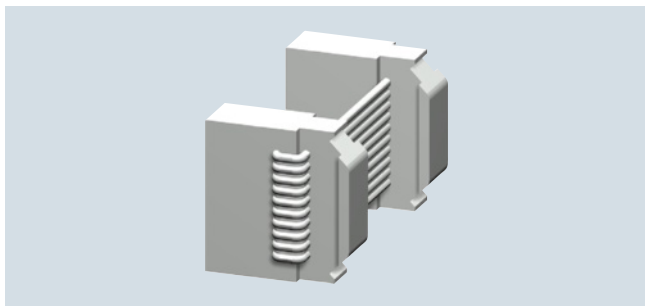
Condition monitoring systems

SIPLUS CMS2000 Condition Monitoring System

### Accessories

#### Overview

##### **SIMOCODE connecting cables**

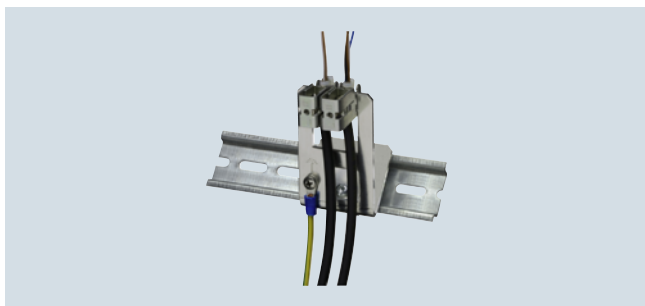


SIMOCODE connecting cable 3UF7930-0AA00-0

The connecting cable is used for connecting the SIPLUS CMS2000 Basic Unit VIB to the SIPLUS CMS2000 VIB-MUX expansion modules and the temperature modules via the SIMOCODE system bus interface.

The connecting cable with a length of 0.025 m must be used for side-by-side mounting of the basic unit and SIPLUS CMS2000 VIB-MUX expansion modules or temperature modules on a TH 35-15 standard mounting rail in accordance with IEC 60715.

##### **Shield support**



6AT8002-4AA00 shield support

A separate shield support must be ordered for the EMC-compliant connection of signal and encoder cables to the SIPLUS CMS2000 Basic Unit VIB and the SIPLUS CMS2000 VIB-MUX expansion module.

The shield support comprises two shield clamps and five terminal clamps. One shield clamp each is attached to the DIN rail above and below the basic unit. The sensor cable shields are connected to the shield clamps by means of the terminal clamps.

##### **VIB-SENSOR S01 vibration sensor**



VIB-SENSOR S01 vibration sensor 6AT8002-4AB00

The VIB-SENSOR S01 vibration sensor with IEPE (integrated electronics piezo-electric) interface can be directly connected to the SIPLUS CMS2000 Basic Unit VIB and the SIPLUS CMS2000 VIB-MUX expansion module.

The sensor detects vibration accelerations in the frequency range from 0.5 Hz to 15 kHz with a resolution of 100 mV/g.

A threaded screw with an M8 male thread for mounting to the measuring point is included in the scope of delivery. The connecting cable is connected to the vibration sensor via the MIL connector.

##### **CABLE-MIL connecting cables**



CABLE-MIL connecting cables 6AT8002-4AC03, 6AT8002-4AC10

The VIB-SENSOR S01 vibration sensor is connected to the SIPLUS CMS2000 Basic Unit VIB or the SIPLUS CMS2000 VIB-MUX expansion module by means of the CABLE-MIL connecting cable.

This high-quality industrial cable is made of black polyurethane and is assembled on one end with a MIL connector (MIL-C5015). The open cable end of the shielded two-wire cable is connected directly to the screw terminals of the basic unit.

The connecting cable is available in lengths of 3 and 10 m.

#### Technical specifications

Type	<b>3UF7930-0AA00-0</b>	
Product brand name	SIRIUS	
Product description	Connecting cables	
<b>General data</b>		
<b>Ambient temperature</b>		
• during operation	°C	-25 ... +60
• during storage	°C	-40 ... +80
• during transport	°C	-40 ... +80
<b>Relative humidity</b>		
• during operation	%	5 ... 95
Type	<b>6AT8002-4AA00</b>	
Product description	SIPLUS CMS2000 shield support	
Product description	Triple shield support for the EMC-compliant connection of signal and encoder cables	
<b>General data</b>		
Type of mounting	Standard mounting rail	
Number of signal cables connectable to shield support	3	
Type	<b>6AT8002-4AB00</b>	
Product brand name	SIPLUS CMS	
Product description	VIB-SENSOR S01	
<b>General data</b>		
physical measuring principle	Piezo-quartz recorder with integrated evaluation electronics	
<b>Frequency of operating range of sensor</b>		
• at +/- 3 dB	Hz	0.5 ... 15 000
<b>Sensitivity of vibration acceleration sensor typical</b>	mV/g	100
<b>Resolution of vibration acceleration measurement value of the sensor minimum</b>	g	0,002
<b>Vibration acceleration measurement range</b>	g	50
Full scale value		
<b>Resonance frequency</b>	Hz	23 000
<b>Signal voltage</b>		
• with DC	V	10 ... 14
<b>Type of power supply</b>	IEPE 2 to 10 mA	
<b>Type of connection</b>	MIL-C5015	
<b>Cable length Maximum</b>	m	80
<b>Ambient conditions</b>		
<b>IP degree of protection</b>	IP65	

Type	<b>6AT8002-4AB00</b>	
<b>Operating temperature</b>	°C	-50 ... +120
<b>Design</b>		
<b>Material of housing</b>	Stainless steel	
<b>Type of mounting other Note</b>	incl. mounting bolts UNF1/4-28 on M8	
Type	<b>6AT8002-4AC03</b>	<b>6AT8002-4AC10</b>
Product brand name	SIPLUS CMS	
Product description	CABLE-MIL-300 connecting cable	CABLE-MIL-1000 connecting cable
Product category	Industrial cable	
<b>General data</b>		
<b>Type of connection</b>	MIL-C5015 / open cable end	
<b>Type of insulation</b>	black polyurethane	
<b>Type of shielding</b>	Braided shielding with stranded drain wire	
<b>Operating temperature</b>	°C	-25 ... +122
<b>Cable length</b>	m	3                      10

#### Ordering data

#### Article No.

<b>SIMOCODE connecting cable</b>	<b>3UF7930-0AA00-0</b>
For side-by-side mounting of the SIPLUS CMS Basic Unit VIB basic unit and SIPLUS CMS2000 VIB-MUX expansion modules or temperature modules 3UF7700-1AA00-0	
<b>SIPLUS CMS2000 shield support</b>	<b>6AT8002-4AA00</b>
For EMC-compliant connection of signal and encoder cables to the SIPLUS CMS2000 Basic Unit VIB basic unit or the SIPLUS CMS2000 VIB-MUX expansion module	
<b>VIB-SENSOR S01 vibration sensor</b>	<b>6AT8002-4AB00</b>
Piezoelectric sensor for connection to the SIPLUS CMS2000 Basic Unit VIB basic unit or the SIPLUS CMS2000 VIB-MUX expansion module	
<b>CABLE-MIL connecting cable</b>	
For connection of VIB-SENSOR S01 vibration sensor to the SIPLUS CMS2000 Basic Unit VIB basic unit or the SIPLUS CMS2000 VIB-MUX expansion module	
• CABLE-MIL-300 connecting cable, Length 3 m	<b>6AT8002-4AC03</b>
• CABLE-MIL-1000 connecting cable, Length 10 m	<b>6AT8002-4AC10</b>



## Products for specific requirements

### Time synchronization

#### Introduction

#### Overview



SICLOCK time synchronization

In many applications it is becoming increasingly important to synchronize the time in plants and systems. Only if all network stations are supplied cyclically with a reliable time frame from a central location can optimum process operation be ensured. This results in benefits for the plant operator such as increased operational reliability, the possibility of tracing system faults in a targeted manner, increased economic efficiency due to fewer production outages, and increased productivity in manufacture.

For this purpose, the SICLOCK product family offers a comprehensive range of optimally matched components for setting up highly reliable time synchronization systems.

Typical industries and fields of application for time synchronization systems are:

- Factory/process automation
- Power supply
- Building automation
- Transportation systems
- Safety engineering
- IT systems

The SICLOCK product range comprises the following product groups:

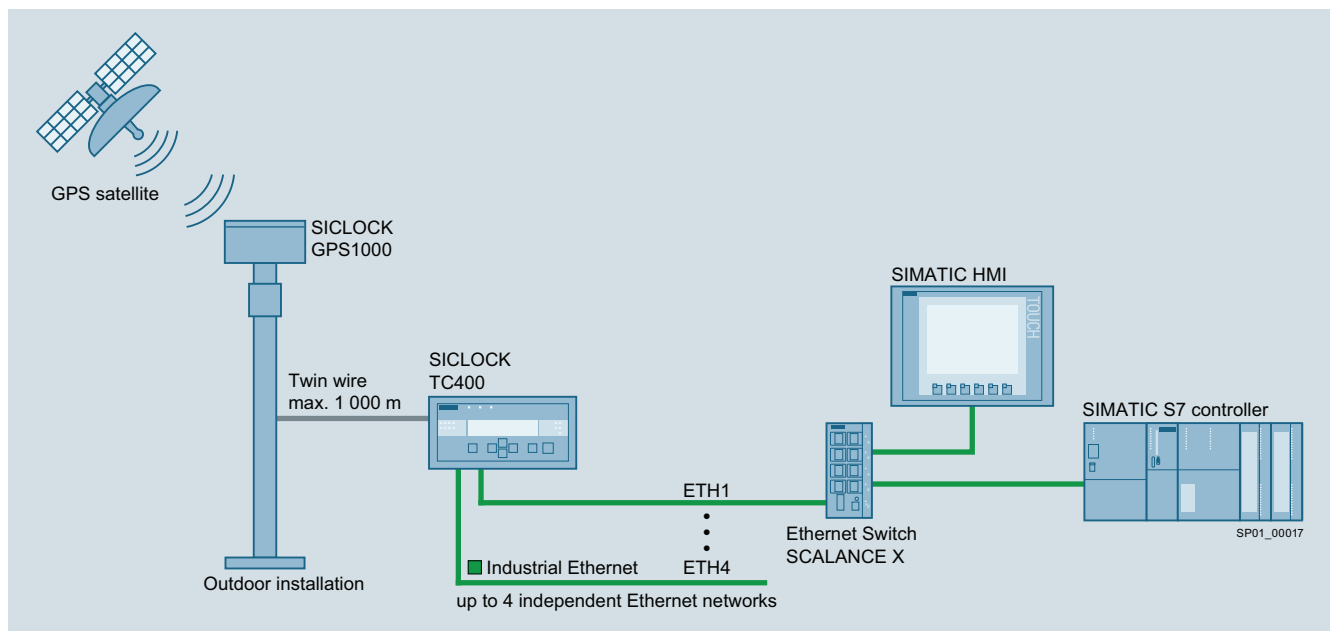
- Wireless receivers
- Central plant clocks
- Pulse converters
- Accessories

#### System description

Satellites or long-wave transmitters are used as primary time sources. The SICLOCK wireless receivers (e.g. SICLOCK GPS1000) receive these high-frequency signals and transmit the demodulated time signal to the central plant clock via a robust and interference-proof 2-wire connection.

The central plant clock converts the time signal into an Ethernet-based network frame (e.g. NTP, SIMATIC procedure) and thus provides all connected network stations with precise and uniform time information.

Furthermore, in the event of failure or loss of reception from the primary time source, the central plant clock ensures stable continuation of the clock time and tracking of the system time without time jumps as soon as reception is restored.



SICLOCK TC400 central plant clock with SICLOCK GPS1000 wireless receiver

#### Overview

The central plant clocks evaluate the clock time data that was transmitted from the wireless receiver and generate diverse output signals in order to synchronize the connected I/O devices.

If the wireless receiver fails or signal transmission is interrupted, the central plant clocks switch over to their internal high-precision quartz system and thus ensure reliable tracking of the clock time. When the input signal is available again, the central plant clock adjusts any time differences that may have occurred without time jumps by means of "microsteps".



SICLOCK TC100 and SICLOCK TC400 central plant clocks

#### Inputs and outputs

The high-precision SICLOCK TC100 and SICLOCK TC400 central plant clocks have one (SICLOCK TC100) or two (SICLOCK TC400) inputs for connection to wireless receivers.

The central plant clocks have one (SICLOCK TC100) or four (SICLOCK TC400) independent 10/100 Mbit Ethernet interfaces.

The network stations are synchronized using the proven SNTP standard and by means of the SIMATIC procedure.

The SICLOCK central plant clocks have two relay outputs for signaling alarms or warnings.

Alternatively and/or in addition, two point-to-point connections TTY (20 mA current interface) or one RS 422 (5 V level) connection can be set up for the SICLOCK TC400 central plant clock.

#### Operation

Parameterization of the interfaces, setting of the signal types, redundancy modes, and read-out of the status messages stored in the device are conveniently implemented via the integrated web interface.

LEDs and a display indicate operating states and show any error messages, which can also be read out via the web interface.

#### Ordering data

##### Central plant clock

A wireless receiver supplies the central plant clocks with time data; these then generate signals which are used to synchronize the connected I/O devices.

- SICLOCK TC400 central plant clock, single device
- SICLOCK TC100 central plant clock, single device

#### Article No.

**2XV9450-2AR01**

**2XV9450-2AR22**

## Products for specific requirements

Time synchronization

Wireless receivers

### GPS receiver

#### Overview



SICLOCK GPS1000 wireless receiver

The SICLOCK GPS1000 wireless receiver is designed to receive signals on the 1.575 GHz frequency from the GPS satellite system. The wireless receiver generates the time information (UTC – coordinated universal time) from this high frequency signal and converts it on the output side into the DCF77 time signal. The wireless receiver can be used all over the world.

The SICLOCK GPS1000 wireless receiver is designed for direct connection to SICLOCK TC100 and SICLOCK TC400 central plant clocks. The line current method used permits a distance of up to one kilometer between the wireless receiver and the central plant clock.

The antenna has to be installed outdoors for optimum reception of the satellite signals. The wireless receiver needs no parameter assignment or maintenance and, when used with SICLOCK TC100 or SICLOCK TC400 central plant clocks, is supplied by them with its operational energy.

The 2XV9450-1AR82 package is available for the direct synchronization of PCs. This package also includes the SICLOCK GPS1000 PS pulse converter for level conversion and the receiving software, which runs on PCs.

#### Ordering data

#### Article No.

##### SICLOCK GPS1000 package

2XV9450-1AR82

GPS radio clock for the time synchronization of PCs as well as programmable controllers via RS 232 interface; in industrial environments with high levels of interference; with distances up to 1000 m between the antenna and the device, package comprises:

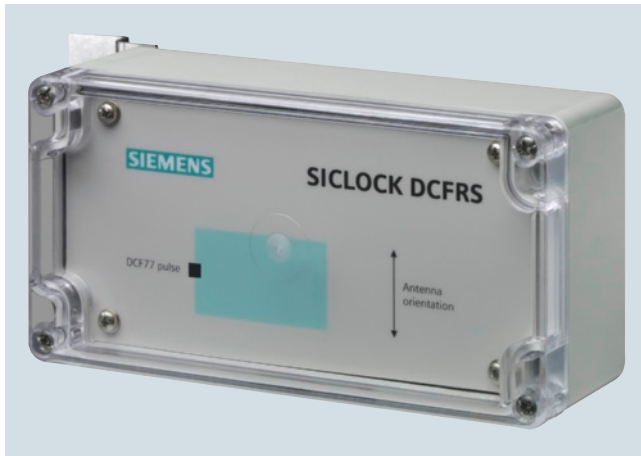
- GPS1000 antenna head with antenna frame
- GPS1000 power supply
- Distribution socket
- 5 m RS 232 connecting cable
- DCF77 receiving service for Windows

##### SICLOCK GPS1000

2XV9450-1AR84

GPS radio clock for the time synchronization of PCs, programmable controllers, as well as the SICLOCK TC100 and SICLOCK TC400 central plant clocks; Single device incl. installation material

## Overview



SICLOCK DCFRS wireless receiver (without antenna base)

SICLOCK DCFRS wireless receivers receive signals from the DCF77 time signal transmitter. The DCF77 transmitter is located in Mainflingen near Frankfurt am Main and transmits long-wave signals at a frequency of 77.5 kHz. Under good reception conditions, signals can be received within a radius of up to 1 500 km of the transmitter location.

Unlike devices that receive signals from satellites, the SICLOCK DCFRS can also be used inside buildings. SICLOCK DCF77 wireless receivers output the demodulated DCF77 time signal.

SICLOCK DCF77 wireless receivers are available in two versions:

- SICLOCK DCFRS with TTY interface (20 mA current interface) for direct connection to central plant clocks
- SICLOCK DCFRS with RS 232 signal level for connection to PCs

Note:

We recommend the software DCF77 receiving service (Article No. 2XV9450-1AR28) if the RS 232 version is used, see "Accessories". Parameter assignment is not necessary for both receiver versions.

## Ordering data

## Article No.

**SICLOCK DCFRS****2XV9450-1AR16**

DCF radio clock for the time synchronization of PCs and programmable controllers

- Active DCF77 antenna with TTY output (20 mA line current) spare part

**SICLOCK DCFRS****2XV9450-1AR06**

DCF radio clock for the time synchronization of individual PCs over short distances, the package comprises

- Active DCF77 antenna with RS 232 interface and mounting bracket
- 20 m connecting cable, mounted

**SICLOCK DCFRS****2XV9450-1AR14**

DCF radio clock for the time synchronization of individual PCs over short distances, the package comprises

- Active DCF77 antenna with RS 232 interface and mounting bracket
- 20 m connecting cable, mounted
- DCF77 receiving service for Windows

**SICLOCK DCFRS****2XV9450-1AR21**

DCF radio clock for the time synchronization of PCs and programmable controllers package comprises

- Active DCF77 antenna with TTY output (20 mA line current) and antenna frame
- TTY/RS 232 converter
- Plug-in power supply
- Two distribution sockets
- 1 m connecting cable mounted, extendable to 1000 m
- DCF77 receiving service for Windows

## Products for specific requirements

### Time synchronization

#### Pulse converters

##### Overview

The pulse converter is available in three versions:

- SICLOCK PCON
- SICLOCK EOPC
- SICLOCK GPS1000 PS



SICLOCK GPS1000 PS, SICLOCK PCON and SICLOCK EOPC pulse converters

##### **SICLOCK PCON pulse converter**

The SICLOCK PCON is a single-channel, electrical-optical pulse converter. It enables electrical and optical time frames and pulses to be distributed.

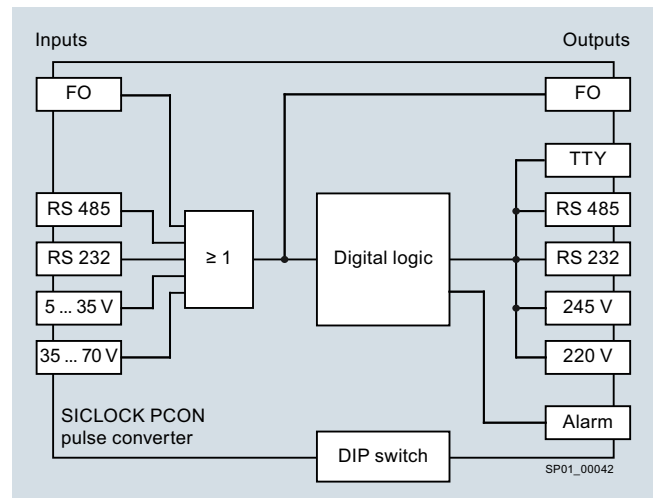
The device has three inputs for electrical signals (RS 422, RS 232, etc.), one optical input, as well as five electrical outputs and one optical output. By using fiber-optic cables, longer distances can be bridged with very high interference immunity.

The SICLOCK PCON pulse converter can be operated in two modes:

- In transparent mode, the input signal is output at all outputs without any change.
- In pulse mode, an edge change at the input triggers a pulse with parameterizable length at all outputs.

The device is easily parameterized by means of DIP switches located directly on the device.

Inputs X1	Outputs X2
RS 422 (non-isolated)	RS 422 (non-isolated)
RS 232 (non-isolated)	RS 232 (non-isolated)
Pulse input 5 ... 35 V or 5 ... 70 V	Pulse output 24 V (non-isolated)
	Pulse output 24 ... 220 V (isolated)
FOC	FOC
BFOC connection system	BFOC connection system
	TTY 20 mA current interface



SICLOCK PCON pulse converter (functional diagram)

**Overview** (continued)**SICLOCK EOPC pulse converter**

The SICLOCK EOPC is an electrical-optical converter and hub. It features two electrical inputs, which can be alternatively used, and transfers these signals at its 32 fiber-optic outputs. This pulse converter is therefore the ideal choice for applications with numerous nodes with optical pulse interface which have to be synchronized.

Inputs X1	Outputs
TTY 20 mA current interface	32 x BFOC 62.5/125 µm
Pulse input 10 ... 65 V	

**SICLOCK GPS1000 PS pulse converter**

The SICLOCK GPS1000 PS pulse converter is always used when a SICLOCK wireless receiver is used as stand-alone unit, i.e. without a central plant clock. It fulfills two main functions:

- On the one hand, the pulse converter is used as an energy source for SICLOCK wireless receivers.
- On the other hand, the device is used as a level converter.

The time signal received at input 11/12 is output as RS 232 level at the Sub-D interface X3.

Inputs	Outputs
TTY 20 mA current interface to the wireless receiver	9-pole Sub-D RS 232 level
	TTY 20 mA current interface
	TTY-inverted 20 mA current interface

**Ordering data****Article No.**

<b>SICLOCK PCON</b> Single-channel, electrical-optical pulse converter for industrial applications, 820 nm, 24 ... 230 V AC/DC, with multimode fiber optic connection	<b>2XV9450-1AR63-1SA3</b>
<b>SICLOCK EOPC</b> Electrical-optical pulse converter for industrial applications with 32 fiber-optic cable outlets for transparent operation and pulse mode, 24 ... 110 V DC	<b>2XV9450-1AR72</b>
<b>SICLOCK GPS1000 power supply 230 V</b>	<b>2XV9450-1AR85-0AA2</b>

## Products for specific requirements

### Time synchronization

#### Accessories

##### Overview

###### Software

For less complex applications, the wireless receivers can even be operated without central plant clocks.

Two software packages are available for such applications to process the time information on Windows computers or in a SIMATIC PLC.

- 2XV9450-1AR28: SICLOCK DCF77 receiving service software for Windows XP, Windows Vista, Windows 7, Windows Server 2003/2008/2008 R2
- 2XV9450-1AR32: SICLOCK DCF77 receiving service software for SIMATIC S7-300 and S7-400

###### Lightning protection

The 2XV9450-1AR83 lightning protection element is integrated by default into the connecting cable downstream of the wireless receiver and protects the components connected to it against overvoltage caused by lightning strikes.

###### Mounting hardware

For easy installation in 19" rack units, a 2XV9450-2AR81 mounting frame for two SICLOCK TC100 and/or SICLOCK TC400 central plant clocks each is available.

##### Ordering data

##### Article No.

###### Software

Receiving service software for Windows

2XV9450-1AR28

###### Lightning protection for antenna cable

Lightning protection for TTY connection cable for SICLOCK GPS1000 or SICLOCK DCFRS wireless receivers

2XV9450-1AR83

###### Mounting frame for SICLOCK TC100 and SICLOCK TC400 central plant clocks

2XV9450-2AR81

### Overview

The SICLOCK TC100 and SICLOCK TC400 central plant clocks can be operated with the SICLOCK GPS1000 or SICLOCK DCFRS wireless receivers.

With the bundles you order the complete unit comprising:  
The central plant clock, the antennas/wireless receivers and the accessories required.

### Ordering data

### Article No.

#### SICLOCK Bundle TC400

2XV9450-2AR10

Complete solution, e.g. for use in PCS 7, the package comprises

- SICLOCK TC400
- SICLOCK GPS1000 antenna with 1 m connecting cable mounted, extendable to 1000 m
- Antenna frame
- Distribution socket
- Lightning protection

#### SICLOCK Bundle TC400

2XV9450-2AR20

SICLOCK TC400 central plant clock with Ethernet interface + DCFRS radio clock, industrial version, the package comprises

- SICLOCK TC400
- Active DCF77 antenna with TTY output (20 mA line current), 1 m connecting cable fitted, can be extended to 1000 m
- Distribution socket

#### SICLOCK Bundle TC100

2XV9450-2AR26

SICLOCK TC100 central plant clock with Ethernet interface + DCFRS radio clock, the package comprises

- SICLOCK TC100
- Active DCF77 antenna with TTY output (20 mA line current) and antenna frame, 1 m connecting cable fitted, can be extended to 1000 m
- Antenna frame
- Distribution socket

#### SICLOCK Bundle TC100

2XV9450-2AR50

Complete solution, e.g. for use in PCS 7, the package comprises

- SICLOCK TC100
- SICLOCK GPS1000 antenna with 1 m connecting cable mounted, extendable to 1000 m
- Antenna frame
- Distribution socket
- Lightning protection



## Products for specific requirements

### Notes

## Overviews



14/2	SIMATIC HMI
14/5	SIMATIC PCS 7
14/8	SIMATIC NET
14/9	SIMATIC Ident

**Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

[www.siemens.com/simatic/  
printmaterial](http://www.siemens.com/simatic/printmaterial)

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## Overviews

### SIMATIC HMI

#### Introduction

#### Overview

##### **SIMATIC HMI - High-luminance and rugged HMI devices**

###### HMI devices

SIMATIC HMI Key Panels – Pre-assembled and ready for installation, for conventional operator panels.

<http://www.siemens.com/key-panels>

SIMATIC HMI Basic Panels – The entry level series for simple HMI applications.

<http://www.siemens.com/basic-panels>

SIMATIC HMI Comfort Panels – High-end functionality for demanding HMI applications.

<http://www.siemens.com/comfort-panels>

SIMATIC HMI Mobile Panels – Portable HMI devices for mobile deployment on site.

<http://www.siemens.com/mobile-panels>

###### HMI devices for special requirements and application areas

Fully enclosed HMI devices for SIMATIC

The fully-enclosed SIMATIC HMI devices (PRO devices) are ideal for industrial applications in harsh environments due to their extremely rugged design. They are, for example, specially designed for mounting on a support arm/stand.

<http://www.siemens.com/ip65-hmi-devices>

###### Devices with stainless steel fronts

SIMATIC HMI offers industry-specific versions for smooth use in accordance with regulations – with modified standard devices. For the food and beverages industry we supply, for example, devices with stainless steel fronts, and for industries facing particularly harsh environmental conditions, we offer fully enclosed devices with dust and splashwater protection in a rugged aluminum enclosure with high degree of protection IP65. Panels and Panel PCs with touch screens and stainless steel fronts are designed for machine-level operator control and monitoring in the food, beverages and tobacco industry.

<http://www.siemens.com/inox-hmi-devices>

###### HMI devices for hazardous areas

Intrinsically safe Panel PCs and Thin Clients that were specifically developed for hazardous areas.

<http://www.siemens.com/simatic-hmi-ex>

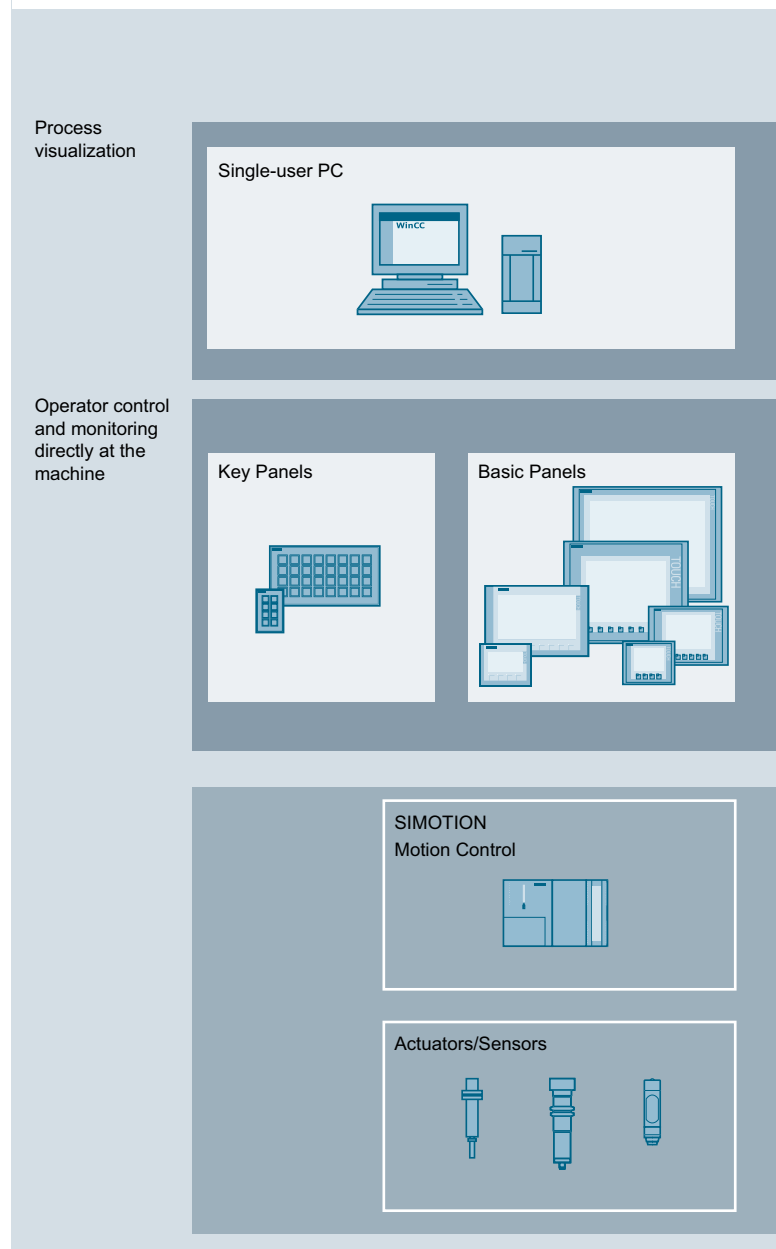
###### Individual HMI devices in customized versions

<http://www.siemens.com/customized-automation>

##### **SIMATIC SCADA systems – Efficient to a new level**

Siemens SCADA systems redefine efficiency – in factory automation as well as in infrastructure applications

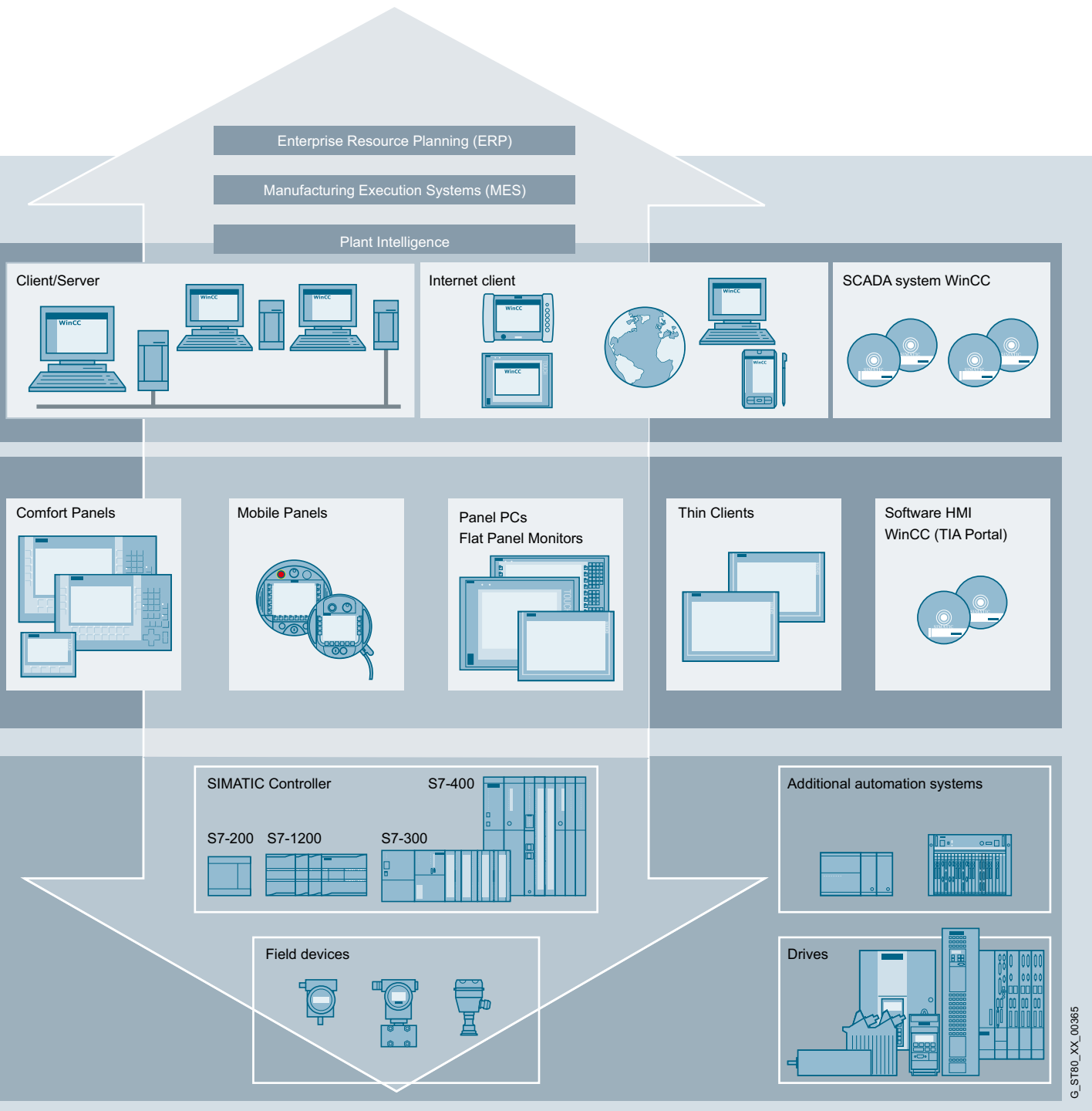
- **Efficiency:**  
As a key to greater productivity, SIMATIC SCADA systems combine efficient engineering with high-performance archiving and maximum data security. These features provide the basis for efficient operations management and intelligent production analyses.
- **Scalability:**  
We offer stationary and mobile solutions to cover increasing demands – security guaranteed. To this end we have applied more than 15 years of SCADA know-how from all industry sectors. No matter how large or small your request is – we have the right answer.



SIMATIC HMI – The whole world of human-machine interfacing

- **Innovation:**  
Stay informed with mobile SCADA solutions anywhere and at any time – including with existing tablet and smartphone hardware. The use of multi-touch gestures in the industrial environment opens the door for modern operating concepts. Openness: Since international standards and system-internal script and programming interfaces are supported, special requests can also be easily implemented.

[www.siemens.com/scada](http://www.siemens.com/scada)

**Overview** (continued)


G-ST80\_XX\_00365

SIMATIC WinCC V7 is available for highly complex applications with Plant Intelligence solutions, integrated archive servers, or redundant architectures.

<http://www.siemens.com/wincc>

WinCC Open Architecture addresses applications with high customer-specific demand for adaptation – even on non-Windows platforms.

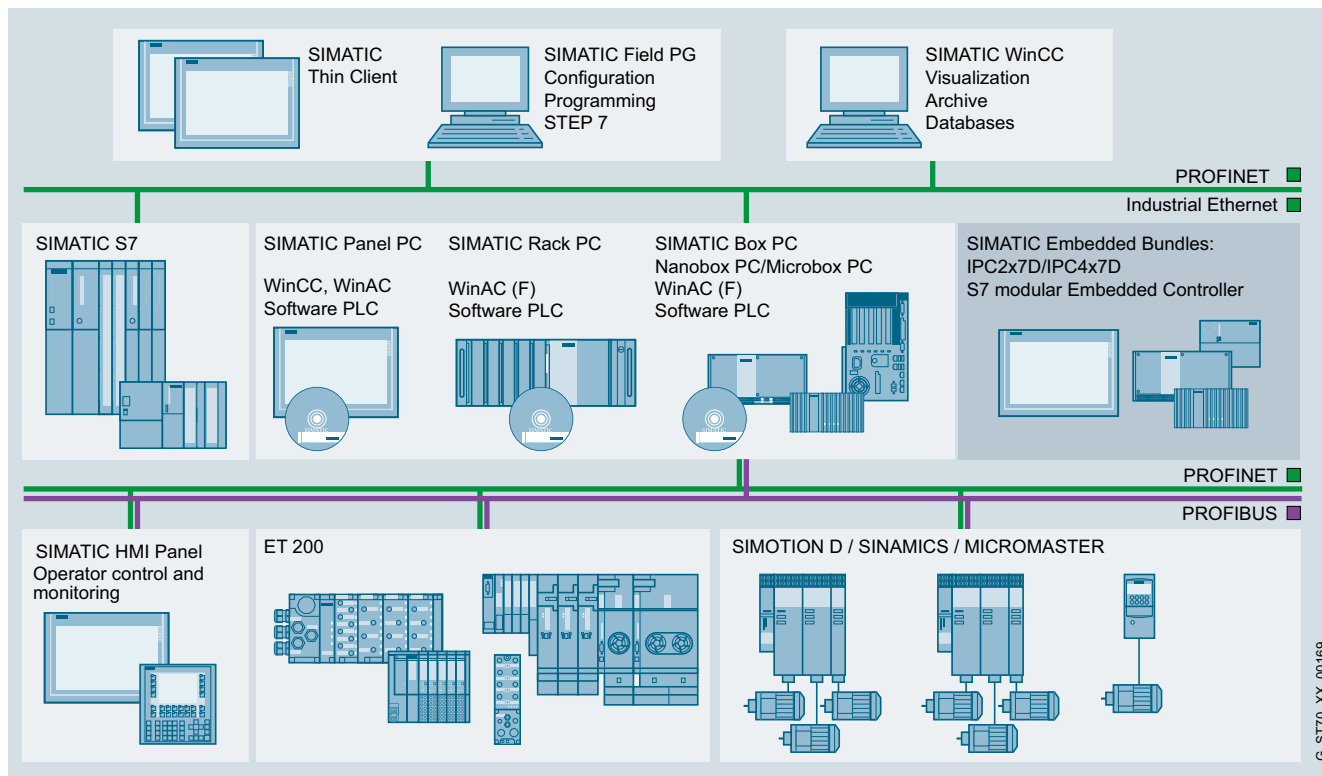
<http://www.siemens.com/wincc-open-architecture>

## Overviews

### PC-based Automation

#### Introduction

#### Overview



Embedded and PC-based Automation in the system environment

#### Industrial PCs

Our reliable and innovative SIMATIC IPC industrial PCs constitute the optimum PC hardware platform for PC-based Automation from Siemens.

<http://www.siemens.com/simatic-ipc>

#### PC-based controllers

Siemens has developed a wide range of coordinated hardware and software components for PC-based Automation. Focal point: SIMATIC PC-based Control with SIMATIC WinAC, the open, flexible and reliable software controller for your PC-based automation solution, also approved by the German Technical Inspectorate, and fail-safe.

<http://www.siemens.com/winac>

#### Embedded controllers

SIMATIC S7-mEC is a modular controller in S7-300 design with the latest embedded PC technology. It comprises the EC31 (CPU) and optionally available expansion modules.

<http://www.siemens.com/simatic-s7-mec>

#### Embedded bundles with industrial PCs

Embedded bundles based on the embedded industrial PCs are extremely compact, rugged, and maintenance-free systems for use at machine level. The functions of PC-based Control (also fail-safe) and/or visualization are already pre-installed and ready to use.

<http://www.siemens.com/simatic-embedded-bundles>

#### Software packages for SIMATIC IPC

SIMATIC industrial PCs are offered with low-cost software packages. For runtime versions with SIMATIC WinCC V7, WinCC Runtime Professional or WinCC Runtime Advanced visualization software products, as well as the SIMATIC WinAC RTX (F) software controller. The simultaneous purchase of industrial PC and software package results in a price advantage.

<http://www.siemens.com/simatic-ipc-packages>

#### Industrial monitors and thin clients

Flexible distributed operating concepts can be implemented via Flat Panel monitors and thin clients. They are industry-standard LCD monitors with high-luminance displays that can be placed up to 30 m away from the PC, or high-performance industrial thin clients. SIMATIC ITC, for one or even several operator stations, can be placed as far away as required via Industrial Ethernet.

<http://www.siemens.com/simatic-ifp>

<http://www.siemens.com/simatic-itc>

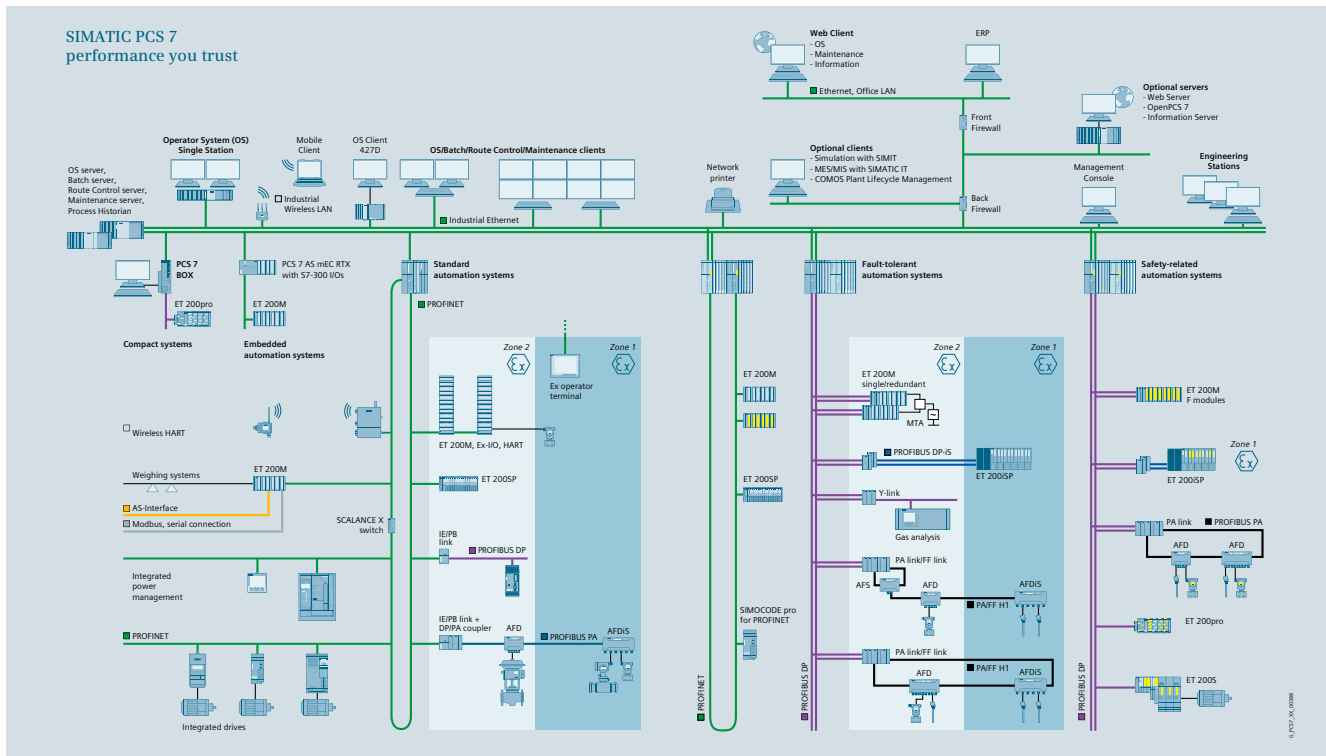
#### Customized Automation

With Customized Automation, field-proven SIMATIC, SIMATIC IPC and SIMATIC HMI standards are transferred to individual products and systems – tailored precisely to the customer's requirements. The portfolio covers the hardware and software range, as well as support and logistics.

<http://www.siemens.com/customized-automation>

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### Overview



SIMATIC PCS 7 system architecture

### Performance you trust

In process engineering plants, the process control system is the starting point for optimal value added: All procedures and processes can be operated, monitored and influenced with the process control system.

The more powerful the process control system, the more effectively this potential can be used. For this reason, performance is in the foreground with SIMATIC PCS 7, alongside scalability, flexibility, and integration. Starting with planning and engineering, the process control system offers powerful tools, functions and features for cost-effective and efficient plant operation through all phases of the plant life cycle.

### Performance through integration

Integration is one of the special strengths of SIMATIC PCS 7. This has many aspects:

- Horizontal integration into TIA
- Vertical integration into hierarchical communication
- System-integrated tools for engineering tasks
- Integration of the field level, including drives, switchgear, etc.
- Integrated functions, e.g. for batch process automation, route control, process safety, energy management, telecontrol tasks, etc.

### Horizontal integration

A system for integrated automation of the entire process chain, from incoming raw materials to outgoing goods – this is one of the decisive advantages resulting from the seamless integration of SIMATIC PCS 7 into Totally Integrated Automation.

The process control system is mainly responsible for automating the primary processes here, but it can do much more: All auxiliary facilities, as well as the electrical infrastructure in the form of low-voltage or medium-voltage switchgear and the building management system, can also be integrated into the system.

Integration of selected SIMATIC standard components – automation systems, industrial PCs, network components, or distributed process I/O – into the process control system guarantees optimum interaction of individual components, and secures economic benefits such as simple selection, reduced stock keeping, and global support.

### Vertical integration

The hierarchal communication of a company encompasses the field level, the control level, and the process level, up to management and enterprise resource planning (ERP). Thanks to standardized interfaces – based on international industry standards as well as internal interfaces – SIMATIC PCS 7 is able to provide process data for analysis, planning, coordination, and optimization of plant sequences or production and business processes – in real time, and at any location in the company.

## Overviews

### SIMATIC PCS 7

#### Introduction

#### Overview (continued)

##### Central engineering

SIMATIC PCS 7 convinces with graded functional diversity, consistent operator control philosophy, and uniformly structured engineering and management tools. A central engineering system with a coordinated range of tools for integrated system engineering and configuring of batch automation, safety functions, material transport or telecontrol systems creates value added over the entire life cycle. Reductions in configuring and training costs result in minimization of total cost of ownership (TCO) over the entire plant life cycle.

##### Functional diversity

Depending on the typical process automation or customer-specific requirements, SIMATIC PCS 7 can be functionally expanded for the following, for example:

- Batch process automation (SIMATIC BATCH)
- Functional safety and protection functions (Safety Integrated for Process Automation)
- Route control for material transport (SIMATIC Route Control)
- Telecontrol of remote units (SIMATIC PCS 7 TeleControl)
- Automation of electrical switchgear (SIMATIC PCS 7 PowerControl)

Further additional functions that are also integrated, or can be integrated, seamlessly into the control system make optimization of processes and reductions in operating costs possible. SIMATIC PCS 7 has, for example, tools for energy and asset management, and it offers higher quality closed-loop control functions, as well as industry-specific automation solutions and libraries.

##### **Customized performance**

Thanks to a unique scalable system architecture, SIMATIC PCS 7 creates the ideal basis for cost-effective implementation of individual automation solutions and economic operation of process plants.

SIMATIC PCS 7 users derive sustained profit from a modular system platform based on standard SIMATIC components. Its uniformity enables flexible scaling of hardware and software, as well as perfect interaction both within the system and beyond system limits. The architecture of the SIMATIC PCS 7 Process Control System is designed in such a manner that instrumentation and control can be configured in accordance with customer requirements and optimally matched to the dimensions of the plant. The control system can be subsequently expanded or reconfigured at any time if there is an increase in capacity or a technological modification. When the plant grows, SIMATIC PCS 7 simply grows along with it – without the provision of expensive reserve capacities.

##### **Performance in engineering**

With regard to planning and engineering, performance can be equated with minimizing time and costs. In conjunction with COMOS, SIMATIC PCS 7 offers a unique approach here: Integrated planning workflow from the description of the process to the automation program.

A standardized system interface, strictly object-oriented working, and centralized data management mean data consistency across all planning steps, including automatically updated system documentation.

Engineering using other planning tools is also mastered extremely efficiently by SIMATIC PCS 7 by means of the Advanced Engineering System (AdvES). This can be used to import plant data from CAD/CAE tools without problems. It additionally allows automatic generation of the AS configuration thanks to simple multiplication of process tag types and model solutions, as well as parameter processing.

##### **Performance in operation**

Process control also becomes more complex due to the multi-layer nature of automation engineering and the increased merging with information technology. Intuitive and fault free operation is therefore more important than ever with regard to efficient working and the minimization of downtimes and servicing requirements. Using effective Advanced Process Control (APC) functions and an excellent operator system, SIMATIC PCS 7 supports optimization as well as user-friendly and safe control of the process. Monitoring of product quality and performance indicators additionally allows the process to be operated more economically. At the same time, SIMATIC PCS 7 convinces with high flexibility, plant availability, and investment security.

##### Process control and maintenance

SIMATIC PCS 7's operator system is used to monitor process operation using various views, and permits interventions when necessary. Its architecture is flexible and scalable – from single-user systems up to multi-user systems with a redundant client/server architecture. The operator interface takes account of the current specifications of NAMUR (user association of automation technology in the process industries) and PI (Profibus International) and offers a high level of user-friendliness for simple, intuitive interaction with the plant. Ergonomic symbols, task-oriented faceplates, uniform representation of status information, and optimized alarm functions allow safe process control.

The alarm management function integrated in SIMATIC PCS 7 is able to focus on essential alarms and to specifically guide the operator in exceptional circumstances. In this way, it systematically reduces the workload of operating staff.

Preventive and predictive maintenance strategies reduce total cost of ownership. With the SIMATIC PCS 7 Maintenance Station, maintenance personnel always have a watchful eye on critical production equipment such as pumps, valves, distillation columns or motors, and can carry out the relevant maintenance measures in good time before servicing is required – independent of the maintenance plan and without the risk of an unplanned plant standstill.

### Overview (continued)

#### Process optimization

SIMATIC PCS 7 supports process optimization in many different manners, including:

- Control Performance Monitoring
- Advanced Process Control
- Process Historian

The Control Performance Monitoring function monitors and signals the control quality of the closed-loop control block. If the performance declines, the controller can be optimized in good time or specific maintenance measures can be initiated.

The integrated I&C libraries of SIMATIC PCS 7 also provide higher quality closed-loop control functions with which cost-effective Advanced Process Control applications can be implemented: multi-variable control, predictive control, or override control. It is thus possible to effectively improve profitability, product quality, safety, and environmental protection in small and medium-sized plants.

Current and historic process data form the basis of all optimization. Secure and user-friendly real-time data storage and analysis is handled using the Process Historian. The process values, messages, and batch data managed in the database of the Process Historian can be called extremely rapidly. User-specific processing and visualization of this historic data are supported by the information server, which is a reporting system based on the Microsoft Reporting Services.

#### **SIMATIC PCS 7 system and technology components**

With the rugged, high-performance SIMATIC PCS 7 system components from Catalog ST PCS 7, you already have a versatile platform for cost-effective implementation and economical operation of your process control systems. Perfect interplay of these system components makes it possible for you to sustain high-quality production and to establish new products significantly faster on the market.

With SIMATIC PCS 7 technology components from Catalog ST PCS 7 T that can be seamlessly integrated into the process control system, you can expand the functional scope of the system components in a carefully targeted manner for specific automation tasks.

This covers a wide spectrum, for example:

- Telecontrol for monitoring and controlling remote plant units
- Automation technology for electrical low-voltage or medium-voltage switchgear
- Industry-specific automation systems for the cement and mining industries, as well as for laboratory and training facilities
- Graphical objects for task-oriented optimization of process visualization
- Block libraries for technological functions, package unit and panel integration, monitoring and analyzing mechanical assets, as well as for building automation systems (heating, ventilation, air-conditioning – FMCS/HVAC)

- Editors and function blocks for the efficient configuration of small or medium-sized automation systems with simple parameter control and materials management
- Process analytical technology for quality assurance through optimization of development and production processes based on up-to-date measurements, and critical quality and performance attributes
- Simulation system for testing and commissioning of plant-specific application software
- Flexible, high-performance Manufacturing Execution System (MES)
- System expansion for operator systems for the integration of third-party controllers, programmable logic controllers and package units
- Products for migration of the process control systems TELEPERM M, APACS+/QUADLOG or Bailey INFI 90/NET 90 with SIMATIC PCS 7

SIMATIC PCS 7 technology components have been released for all versions and service packs of SIMATIC PCS 7 system components. Development and testing of SIMATIC PCS 7 technology components are dependent on the corresponding SIMATIC PCS 7 system components, so versioning and release is normally performed asynchronously, that is following a delay of between 3 and 6 months.

#### **Additional functionality can be integrated using add-on products**

Modularity, flexibility, scalability, and the openness of SIMATIC PCS 7 offer optimal prerequisites for integrating supplementary components and solutions in the process control system in an applicative manner and thus extend and round off its functionality.

Many supplementary add-on products for SIMATIC PCS 7 have been developed by Siemens as well as by external partners (see Catalog ST PCS 7 AO, Add-ons for the SIMATIC PCS 7 Process Control System). These software packages and hardware components authorized by the system manufacturer enable cost-effective implementation of SIMATIC PCS 7 for special automation tasks.



# Overviews

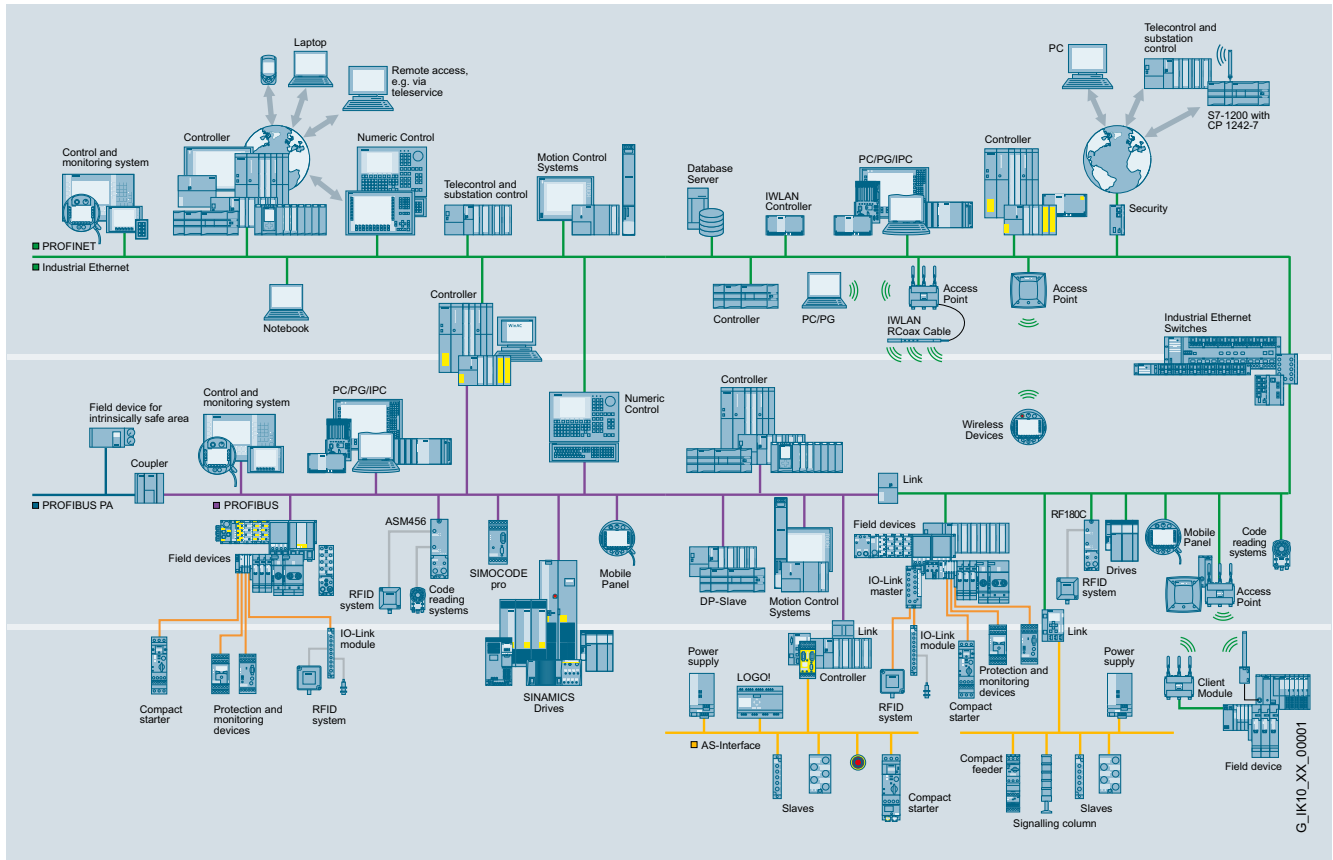
## SIMATIC NET

### Introduction

### Overview

#### SIMATIC NET

Industrial communication – the backbone of automation



Powerful and open communication systems ensure trouble-free communication for automation systems, covering

- data communication or
- process or field communication.

Openness and flexibility of the individual communication systems in different topologies enable linking of a wide variety of systems and their subsequent expansions. By using standardized communication systems, it is possible to connect standardized components from different suppliers without any problems. This ensures maximum protection of investment, as existing networks can be extended without any adverse effects

SIMATIC NET provides components for an integrated overall solution beyond network boundaries.

These include:

- Passive network components, e.g. FastConnect cabling systems
- Active network components, e.g. SCALANCE X Industrial Ethernet switches
- Interfaces for connecting programmable controllers to the communication systems:
  - Integrated interfaces
  - Communications processors
- Components for wireless networks, e.g. Industrial Wireless LAN, SCALANCE W Access Points, and Client Modules
- Components for industrial security
- Components for Industrial Remote Communication, worldwide access to outlying plants, distant machines, and for mobile applications such as TeleControl.
- Components for the connection to remote networks, e.g. SCALANCE M
- Routers, e.g. IE/PB Link PN IO
- Software for configuration, monitoring and diagnosis of the network, e.g. SINEMA Server

#### More information

- Catalog IK PI
- Catalog CA 01 on DVD
- Internet: [www.siemens.com/industrial-communication](http://www.siemens.com/industrial-communication)

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G\_IK10\_XX\_10290

Overview

*SIMATIC Ident – for more cost-effective production and logistics processes*

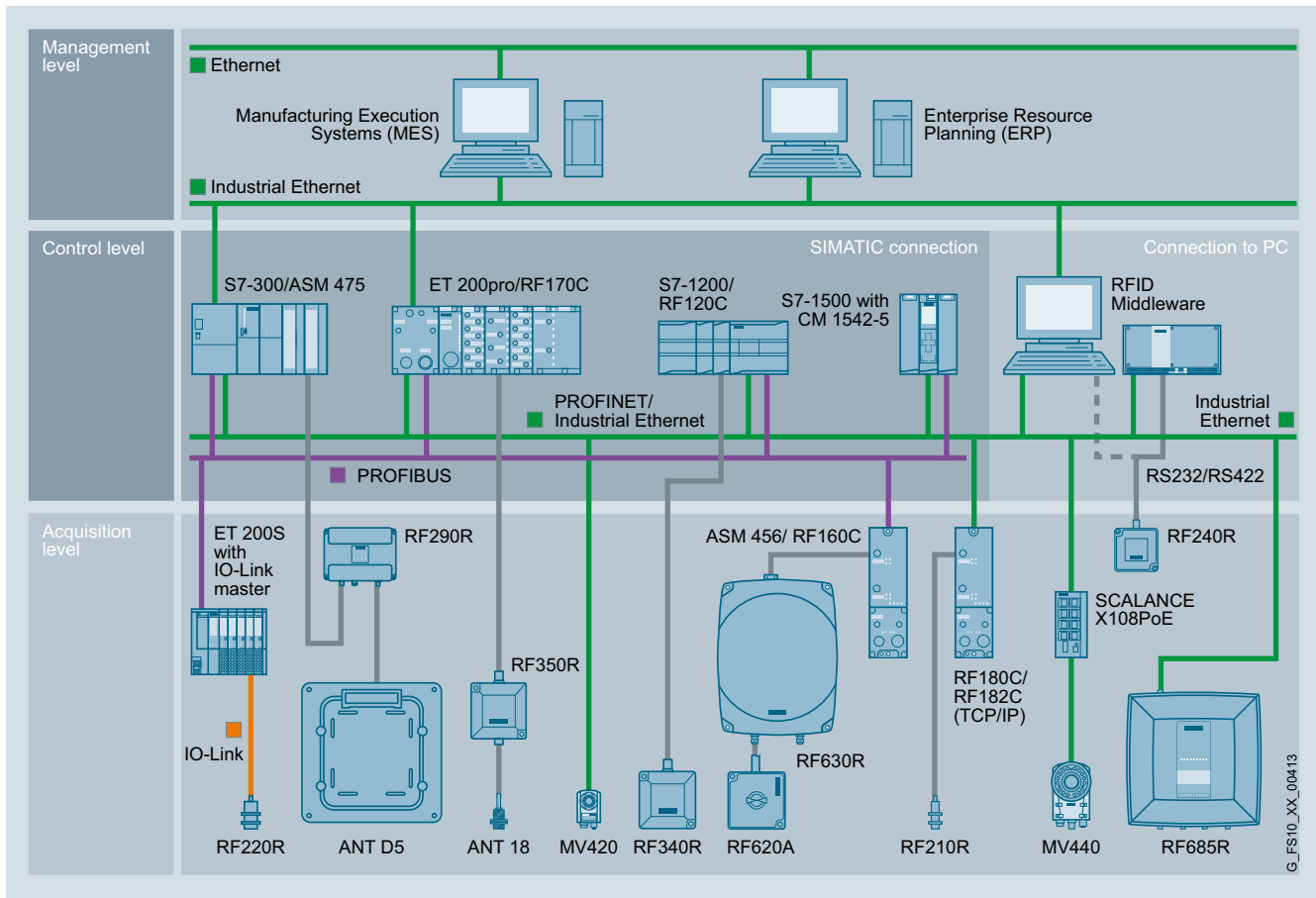
Fiercer competition, stricter standards and legal regulations, shorter product lifecycles, more individual customer requirements, and the increasing globalization of the value-added chain: to stay ahead in ever more dynamic markets, companies must increase the efficiency of their value-added chain. And this applies to production control, asset management, tracking & tracing, as well as supply chain management. Through the use of innovative identification technology, companies can gain an important competitive edge.

But should RFID or optical code reading systems be used? Which technology is the right one for the respective application? Is an alternative or joint application appropriate, and how flexibly can you react to changing requirements? Siemens can help you to make the right decision. We offer SIMATIC Ident, a unique portfolio for industrial identification which can provide the perfect solution for your requirements while keeping your options flexible for the future.

The two technologies constitute a single system

The appropriate identification technology depends on factors such as recording distance, light conditions, single or repeated identification, and environmental influences such as temperature and contamination. Depending on the application, optical and RFID systems can also be used together as a hybrid solution in the same production line, e.g. DMC for direct marking on the product and RFID for pallets or workpiece holders.

In this case, seamless connection of the two technologies is essential. Our SIMATIC Ident portfolio can offer you the appropriate solution: using joint communication modules or function blocks, connection of optical and RFID systems to the SIMATIC PLC is simple. This ensures an integrated software architecture for you and saves considerable time and money on engineering, commissioning and maintenance.



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## Overviews

### SIMATIC Ident

#### Introduction

#### Overview (continued)

##### *Identification systems: RFID and optical codes*

Whether barcode, DMC, RFID or OCR: each technology has its specific strengths. Optical character recognition, for example, is used wherever information must also be read by people, such as the use-by dates on food products. 2D codes and RFID are renowned for their high level of data security and have proven their worth, even in the toughest industrial environments.

The decisive criterion for an identification system: your individual application.

##### Verification, identification: code reading systems



If increased performance is required, 2D codes are recommended as an alternative to a barcode, since they offer a higher storage capacity and a better read rate. They can be applied cheaply to products, e.g. together with dispatch labels. In addition, they enable direct part marking (DPM) of the products by means of lasers, printing or dot-peening, making them especially good at withstanding external influences. The recording of 2D codes is absolutely reliable even from acute viewing angles or under poor lighting conditions.

Our SIMATIC code reading systems provide the ideal solution for reading and verification of 1D and 2D codes and for optical character recognition (OCR), ensuring reliable traceability of production batches and object recognition (Pat-Genius) beyond the production plant.

##### Identification, mobile data storage:



If a line of sight does not exist between the recording unit and the code, if large data quantities or long distances are necessary, or if saved information has to be changed, this is a job for RFID. With this technology, the product or object is fitted with a memory chip that can be programmed and read wirelessly. With low-cost smart labels for the logistics, robust data memories for assembly lines and long-range transponders, RFID is ideal for a wide variety of applications.

Our intelligent SIMATIC RF system family offers you transparency without gaps. This makes data available at all times along the complete production and distribution route - thus allowing perfect control and optimization of material flows and logistics.

##### **More information**

- Catalog ID 10
- Catalog CA 01 on DVD
- Internet: [www.siemens.com/simatic-ident](http://www.siemens.com/simatic-ident)

## Supplementary components



<b>15/2</b>	<b>Drive systems</b>
15/2	SINAMICS drive systems
<b>15/10</b>	<b>Overvoltage protection</b>
15/10	SICROWBAR overvoltage protection
<b>15/11</b>	<b>Timing, coupling and monitoring relays</b>
15/11	SIRIUS relays
<b>15/13</b>	<b>Measuring systems</b>
<b>15/13</b>	<b>Automation systems</b>
15/13	SIMOTION Motion Control System
15/15	SINUMERIK 828D/ SINUMERIK 828D BASIC with SINAMICS S120 Combi
15/15	SINUMERIK 840D sl
<b>15/16</b>	<b>System cabling</b>
15/16	MOTION-CONNECT connection system

**Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

[www.siemens.com/simatic/printmaterial](http://www.siemens.com/simatic/printmaterial)

## Supplementary components

### Drive systems

#### SINAMICS drive systems

##### Overview

##### The SINAMICS range



- Totally integrated range of drives for any application and every industry
- Wide range of power ratings from 0.12 kW to 120 MW
- Broad functional scope from simple V/f control through to highly dynamic servo control
- Designed for problem-free interaction with other Siemens automation components
- Shared platform concept with uniform functionality, engineering, commissioning, operation as well as a uniform diagnostics concept and communication mechanisms

##### SINAMICS V20 – the perfect solution for basic applications



- Power range from 0.12 kW to 30 kW
- Voltage:
  - 230 V 1 AC: 200 V to 240 V 1 AC (-10 % to +10 %)
  - 400 V 3 AC: 380 V to 480 V 3 AC (-15 % to +10 %)
- Integrated USS and Modbus RTU interfaces
- Integrated braking module for 7.5 kW to 30 kW
- Parameter readout and cloning without power supply
- Integrated connection and application macros
- ECO mode for V/f, V<sup>2</sup>/f
- Integrated hibernation mode in the idle state

##### More information

- Brochure SINAMICS V20
- Interactive Catalog CA 01
- Internet:
  - [www.siemens.com/sinamics-v20](http://www.siemens.com/sinamics-v20)
  - [www.siemens.com/industrymall](http://www.siemens.com/industrymall)

##### SINAMICS V90 basic servo drive system – the performance-optimized and easy-to-use servo drive system



- SINAMICS V90 is the new member of the SINAMICS family of drives, and SIMOTICS S-1FL6 is the new member of the SIMOTICS family of motors. Together they form an optimized servo drive system for positioning, as well as speed and torque control. Thanks to the optimized design, the system permits high servo performance with a high level of ruggedness in a simple, low-cost way.
- SINAMICS V90 is designed for all-purpose servo applications while taking into consideration the challenges for machine builders and system integrators in terms of costs and time-to-market.
- The SINAMICS V90 system can essentially be commissioned effortlessly by means of a simple plug-and-play procedure. The SINAMICS V90 drive offers optimum servo-performance, can be integrated quickly into SIMATIC PLC control systems and offers a high level of reliability. The connection is made, for example, by means of a pulse-direction interface or via analog inputs/outputs. A seamless drive system can be created by combining the SINAMICS V90 servo drive with our SIMOTICS S-1FL6 servomotor.
- SINAMICS V90 offers internal positioning, positioning with pulse sequence, and speed and torque control.
- With integral auto-tuning in real time and automatic suppression of machine resonances, the system automatically optimizes itself to achieve a highly dynamic performance and smooth operation. In addition, the pulse train input makes it easier to achieve high positioning accuracy due to its high frequency limit of up to 1 MHz.

##### More information

- Brochure SINAMICS V90
- Interactive Catalog CA 01
- Internet:
  - [www.siemens.com/sinamics-v90](http://www.siemens.com/sinamics-v90)
  - [www.siemens.com/industrymall](http://www.siemens.com/industrymall)

**Overview** (continued)**SINAMICS G120P – the specialist for pumps, fans, and compressors**

- Automatic switchover to mains-fed operation at rated speed
- Numerous functions for pumps, fans and compressors, for example energy-saving mode, auto ramping, Pt1000/LG-Ni1000 temperature sensor interface, cascade connection, real time clock, bypass, multi-zone control
- Communication: RS 485, USS, Modbus RTU, BACnet MS/TP, PROFINET, EtherNet/IP, PROFIBUS DP, CANopen
- Integrated in the TIA Portal with SINAMICS Startdrive
- Energy efficient through minimal apparent power losses, automatic adaptation of the motor current to the actual load conditions with ECO mode

More information

- Catalog D 35
- Interactive Catalog CA 01
- Internet:  
[www.siemens.com/sinamics-g120p](http://www.siemens.com/sinamics-g120p)  
[www.siemens.com/industrymall](http://www.siemens.com/industrymall)

**SINAMICS G120D – the distributed single-motor drive for high-performance solutions**

- Positioning capability
- Power range from 0.75 kW to 7.5 kW
- Energy efficient thanks to regenerative feedback and low line harmonic distortion
- Safety Integrated: STO, SS1, SDI, SSM and SLS encoderless
- Thanks to the modular design, electronics stocks are minimal
- Interchangeable memory card
- Communication via PROFIBUS DP, PROFINET, EtherNet/IP
- Integrated in the TIA Portal with SINAMICS Startdrive

More information

- Catalog D 31
- Interactive Catalog CA 01
- Internet:  
[www.siemens.com/sinamics-g120d](http://www.siemens.com/sinamics-g120d)  
[www.siemens.com/industrymall](http://www.siemens.com/industrymall)

## Supplementary components

### Drive systems

#### SINAMICS drive systems

##### Overview (continued)

##### **SINAMICS G120C – the compact and versatile inverter with optimum functionality**



- Compact unit
- Highest power density in its class
- Power range from 0.55 kW to 18.5 kW
- Easy commissioning and maintenance
- With BOP-2 or IOP operator panel
- Safety Integrated: STO
- Available communication: PROFIBUS DP, CANopen, USS, Modbus RTU, PROFINET, EtherNet/IP
- Integrated in the TIA Portal with SINAMICS Startdrive

##### More information

- Catalog D 31
- Interactive Catalog CA 01
- Internet:  
[www.siemens.com/sinamics-g120c](http://www.siemens.com/sinamics-g120c)  
[www.siemens.com/industrymall](http://www.siemens.com/industrymall)

##### **SINAMICS G120 – the modular single-motor drive for low to medium power ratings**



- Power range from 0.37 kW to 250 kW
- Safety Integrated: STO, SS1, SBC, SLS, SDI and SSM encoderless
- Communication via PROFIBUS, PROFINET, EtherNet/IP, RS 485, USS, Modbus RTU, CANopen, BACnet MS/TP
- Energy efficient thanks to regenerative feedback and low line harmonic distortion
- Parameter copy function for standard commissioning
- Integrated in the TIA Portal with SINAMICS Startdrive

##### More information

- Catalog D 31
- Interactive Catalog CA 01
- Internet:  
[www.siemens.com/sinamics-g120](http://www.siemens.com/sinamics-g120)  
[www.siemens.com/industrymall](http://www.siemens.com/industrymall)



**Overview** (continued)**SINAMICS G110D – the distributed single-motor drive for simple solutions**

- Continuous speed control of three-phase induction motors
- Meets all the requirements of conveyor applications with frequency control
- Distributed configuration – ideal for applications covering large areas
- Integrated into TIA via AS-Interface
- Wide power range from 0.75 kW to 7.5 kW

More information

- Catalog D 31
- Interactive Catalog CA 01
- Internet:  
[www.siemens.com/sinamics-g110d](http://www.siemens.com/sinamics-g110d)  
[www.siemens.com/industrymall](http://www.siemens.com/industrymall)

**SINAMICS G110M – the distributed inverter integrated in the motor**

- Power range from 0.37 kW to 4 kW
- Integrated safety functions (STO locally via F-DI or via PROFIsafe)
- Integrated communication: USS, Modbus RTU, PROFIBUS, PROFINET, EtherNet/IP
- Basic PLC functions and additional conveyor technology functions
- Local commissioning via DIP switch and potentiometer, memory card, USB interface or Intelligent Operator Panel (IOP)
- Integrated in the TIA Portal with SINAMICS Startdrive

More information

- Catalog D 31
- Interactive Catalog CA 01
- Internet:  
[www.siemens.com/sinamics-g110m](http://www.siemens.com/sinamics-g110m)  
[www.siemens.com/industrymall](http://www.siemens.com/industrymall)



## Supplementary components

### Drive systems

#### SINAMICS drive systems

##### Overview (continued)

**SINAMICS G130/SINAMICS G150 – the universal drive-converter solution for single-motor drives with a high power rating**



- Available as a standardized control cabinet or chassis unit
- Output range from 110 kW to 800 kW or 2700 kW with parallel switching
- Specifically tuned for drives with quadratic and constant load characteristics with medium performance requirements without regenerative feedback
- Service-friendly thanks to easy access to all modules
- Communication via PROFIBUS DP, PROFINET, Ethernet/IP, CANopen
- Energy-efficient due to variable-speed operation
- Sensorless vector control
- Safety Integrated: STO, SBC, SS1 with SBR/SAM; SLS, SSM, SDI, SBT
- Easy commissioning and parameterization by means of user-friendly AOP30 control panel or PC-controlled via the STARTER commissioning tool

##### More information

- Catalog D 11
- Interactive Catalog CA 01
- Internet:  
[www.siemens.com/sinamics-g130](http://www.siemens.com/sinamics-g130)  
[www.siemens.com/sinamics-g150](http://www.siemens.com/sinamics-g150)  
[www.siemens.com/industrymall](http://www.siemens.com/industrymall)

**SINAMICS S110 – the specialist for simple positioning tasks**



- Servo control
- Power range from 0.12 kW to 90 kW
- Safety Integrated
- Integrated positioning functions
- Straightforward system interface with higher-level controllers (e.g. PLC) with PROFIBUS DP, PROFINET, CANopen

##### More information

- Catalog D 31
- Interactive Catalog CA 01
- Internet:  
[www.siemens.com/sinamics-s110](http://www.siemens.com/sinamics-s110)  
[www.siemens.com/industrymall](http://www.siemens.com/industrymall)

**Overview** (continued)

**SINAMICS S120 – the flexible, modular drive system for demanding single-axis and multi-axis applications from the low-end to the high-end performance range**



- Specially for motion control and vector control in single-axis and multi-axis applications in all areas of machine and plant manufacturing
- Servo/vector control, V/f control
- Power range from 0.12 kW to 1200 kW, as Cabinet Modules up to 4500 kW
- Various types of construction for different application areas
- Highly flexible due to, for example, modular system architecture, different cooling methods, support for a wide range of motors/encoders, easy expansion
- High degree of scalability with regard to performance, number of axes, functionality
- Integrated safety functions
- Comprehensive motion control functionality
- High availability and efficiency, even in unstable networks
- Automatic parameterization and easy drive commissioning/optimization.

More information

- Catalog PM 21, NC 61, NC 62, D 21.3
- Interactive Catalog CA 01
- Internet:  
[www.siemens.com/sinamics-s120](http://www.siemens.com/sinamics-s120)  
[www.siemens.com/industrymall](http://www.siemens.com/industrymall)

**SINAMICS S150 – the sophisticated drive solution for mid to high-performance single-motor drives**



- Particularly suitable for applications with high requirements regarding precision and dynamic response in the mid to high-performance range, as well as for frequent braking cycles with high braking energies and four-quadrant operation
- Ready-to-operate control cabinet
- Power range from 75 kW to 1200 kW
- Straightforward configuring and commissioning provided by the SIZER for Siemens Drives and STARTER
- High availability and efficiency, even in unstable networks
- Economic operation due to standard regenerative feedback
- Line-friendly operation thanks to Clean Power Filter (line feedback < 1 %)
- Reactive power compensation possible
- Fitted as standard with PROFIBUS DP interface for connection to higher-level controls

More information

- Catalog D 21.3
- Internet:  
[www.siemens.com/sinamics-s150](http://www.siemens.com/sinamics-s150)  
[www.siemens.com/industrymall](http://www.siemens.com/industrymall)

## Supplementary components

### Drive systems

#### SINAMICS drive systems

##### Overview (continued)

#### **SINAMICS GM150 – the universal drive solution for single-motor drives in the medium-voltage range**



- Single-motor drive for applications with quadratic and constant load characteristics without regenerative feedback
- Space-saving, simple and fast commissioning
- Ready-to-connect cabinet unit
- Ideally suited to the economical deployment of pumps, fans, extruders, mixers etc.
- Power section in HV-IGBT technology for outputs up to 13 MVA, output voltage 2.3 kV to 4.16 kV, with choice of air or water-cooling
- Power section in IGCT technology for outputs from 10 MVA to 24 MVA, output voltage 3.3 kV, water-cooled
- Optimum interaction with SIMATIC

##### More information

- Catalog D 12
- Internet:  
[www.siemens.com/sinamics-gm150](http://www.siemens.com/sinamics-gm150)

#### **SINAMICS SM150 – the sophisticated drive solution for single and multi-motor drives in the medium-voltage range**



- Single or multi-motor drive for regenerative, highly dynamic applications
- Roller drives (cold, hot), shaft conveyor drives, test benches, belt systems
- Power section in HV-IGBT technology for outputs from 3.4 MVA to 5.8 MVA, output voltage 3.3 kV and 4.16 kV, with choice of air or water-cooling
- Power section in IGCT technology for outputs from about 5 MVA to 31.5 MVA, output voltage 3.3 kV, water-cooled
- Ideal for direct power exchange via the common DC bus for multi-motor drives involving both regenerative and motor operation
- Optimum interaction with SIMATIC

##### More information

- Catalog D 12
- Internet:  
[www.siemens.com/sinamics-sm150](http://www.siemens.com/sinamics-sm150)

**Overview** (continued)***SINAMICS DCM – the scalable drive system for basic and demanding DC applications***

- In the power range from 6 kW to 30 MW for machines and plants in the industrial environment (steel/aluminum, plastics, printing, paper, cranes, mining, oil and gas, excitation equipment) in the new plant and retrofit businesses
- PROFIBUS DP as standard, PROFINET optional
- Control Unit variance
- Field power supply to suit requirements
- Electronics power supply for connection to 24 V DC
- Power section isolated with respect to ground (floating voltage sensing)
- Free function blocks and Drive Control Chart (DCC)
- Expandable functionality using SINAMICS components
- Single-phase operation possible
- Painted modules and nickel-plated copper rails
- Wide temperature range

More information

- Catalogs D 23.1, D 23.2
- Internet:  
[www.siemens.com/sinamics-dcm](http://www.siemens.com/sinamics-dcm)

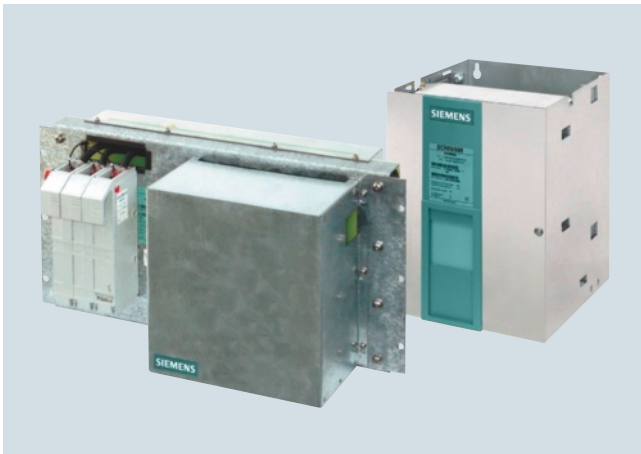
## Supplementary components

### Overvoltage protection

#### SICROWBAR overvoltage protection

##### Overview

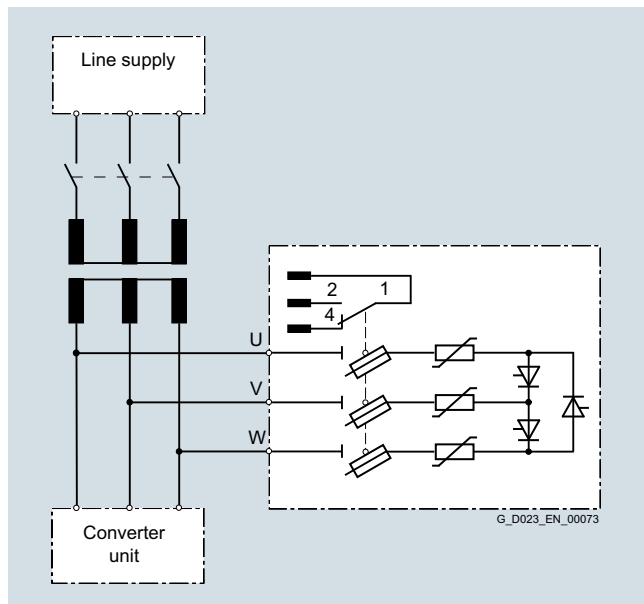
##### SICROWBAR AC



**SICROWBAR AC** is used to protect power semiconductors in converters (thyristors and diodes) against overvoltage that occurs between the phases of a three-phase network. The range of applications is not restricted to protecting DC drive converters, but also comprises infeed/regenerative feedback units of the AC drive technology that are equipped with thyristors.

Overvoltage that occurs on the AC side of converters is mainly caused by switching operations when disconnecting from the line supply at the transformer's primary side. This applies both to operational switching operations (shutdown at no-load) as well as in the case of a fault (shutdown under load).

The overvoltage protection is mainly used in the following configuration:



##### More information

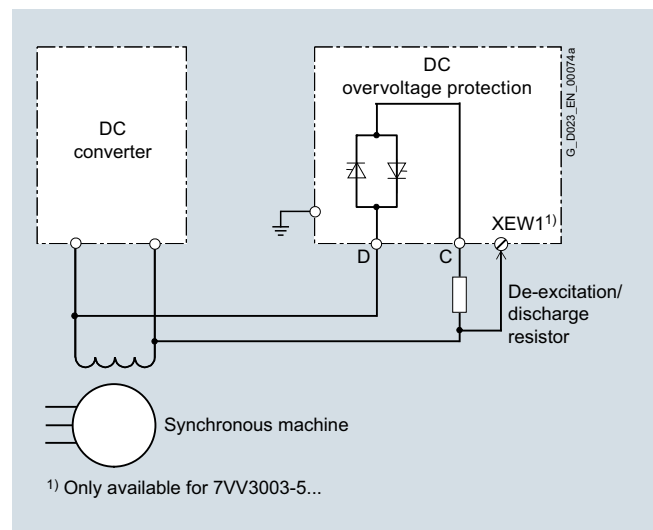
- Catalog D 23.1
- Internet:  
[www.siemens.com/sinamics-dcm](http://www.siemens.com/sinamics-dcm)

##### SICROWBAR DC



**SICROWBAR DC** protects coils and converters against overvoltage conditions when they are used to supply large inductances, for instance, the excitation coils of synchronous machine motors, DC machine motors or hoisting solenoids.

As an option, it is additionally possible for the 7VV3003-5... devices to initiate high-speed de-excitation, triggered by a superimposed signal. A corresponding de-excitation/discharge resistor must be provided.



##### More information

- Catalog D 23.1
- Internet:  
[www.siemens.com/sinamics-dcm](http://www.siemens.com/sinamics-dcm)

#### Overview



#### SIRIUS relays – one range for every application

Our range of SIRIUS relays offers you everything you need for a motor feeder application. Easy and convenient – and all from one source. Whether you require compact timing relays or reliable monitoring relays, particularly narrow coupling relays, plug-in relays, low-noise power relays or interface converters – it will not be easy to find a more complete and comprehensive range of relays anywhere. Quite simply, there is one for every possible need. What is more: all SIRIUS relays are particularly easy to use. So take a closer look at our range and convince yourself – you will be surprised.

#### SIRIUS 3UG, 3RR, 3RN, 3RS monitoring relays Reliable monitoring and protection

SIRIUS relays from Siemens offer maximum protection for machines and plants, and they now also communicate with the control level thanks to IO-Link. The new SIRIUS relays for IO-Link reliably monitor network quality, power values, voltages, speeds and temperatures and at the same time they open up an even wider field of applications for you.

**3RS temperature monitoring relays** operate autonomously or in parallel with a closed temperature control loop and serve to monitor a defined limit temperature in solid, liquid or gaseous media.

**3UG monitoring relays** are used to monitor electric and non-electric variables which cannot (or should not) be directly recorded by an automation system.

- Monitoring of networks for overvoltage or undervoltage, direction of rotation, or asymmetry.
- Monitoring of loads using Cos-phi or current measurement.
- Monitoring for insulation faults and fault currents.
- Monitoring of levels or speeds of rotation.

**The 3RR current monitoring relays** are suitable not only for monitoring motors or other loads, but are also well suited to monitoring multiphase currents of the entire plant or the driven process. In this way, for example, an idling pump or an overload is promptly detected and reported in good time. The 3RR2 monitoring relays can be set up individually or integrated directly into the load feeder.

**3RN thermistor motor protection devices** monitor the winding temperature of motors fitted with a PTC sensor.

- Compliance with the ATEX directive 94/9/EC through conformity with EN 60079-14 and EN 60947-8 standards.
- Fast fault diagnostics through display of open-circuit and short-circuit.
- Solid-state compatible output due to hard gold-plated contacts.

#### SIRIUS speaks IO-Link

With the SIRIUS monitoring relay for IO-Link you are opting for maximum flexibility: As well as the autonomous monitoring function that is still available, measured values and data can also be transferred directly to the controller via IO-Link. Parameters can also be assigned locally or via IO-Link. This means that the SIRIUS relays for IO-Link are fully integrated into Totally Integrated Automation, our open system architecture for integrated automation. You also profit from significantly simplified device replacement – thanks to data matching and automatic re-parameterization via a parameter server.

#### SIRIUS 3RP, 7PV timing relays

Electronic timing relays are used for all delayed switching operations in open-loop control, starting, protection and closed-loop control circuits.

Thanks to their sophisticated and compact design, the 3RP timing relays are ideal timer modules for control cabinet, switchgear and controller manufacturers from the industry. Due to their narrower design, the 7PV timing relays are particularly suitable for use in heating, ventilation and air-conditioning systems and compressors.

#### SIRIUS 3RA function modules and time-delayed auxiliary switches

The function modules permit the construction of starters and contactor combinations for direct and star-delta starting. They include the essential control functions that are needed for the respective feeder – for example, timing and electrical interlocking functions. Function modules that function as timing relays can easily and quickly be fitted to SIRIUS contactors – without any significant wiring effort. They permit both ON-delay and OFF-delay switching of contactors.

The electronically delayed auxiliary switches that can be connected to contactors are designed for contactor coil voltages in the 24 to 240 V AC/DC range. Auxiliary switches for control and alarm signals are used specially for switching the smallest signals for electronics applications. They are used, for example, for allowing a pump or fan to run on, in a similar way to an OFF-delay relay or for the delayed activation of a gate drive. Simply by snapping and locking it into place, both the electrical and mechanical connection is made. To attenuate switching overvoltages of the contactor coil, a varistor is integrated in the time-delayed auxiliary switch.



## Supplementary components

### Timing, coupling and monitoring relays

#### SIRIUS relays

##### Overview (continued)

##### **SIRIUS 3RQ3, 3RS18, 3TG10 and LZS coupling relays**

As the successors to the familiar 3TX7 coupling relays, the **3RQ3 coupling relays** are now available in a new uniform enclosure design. With their narrow width of 6.2 mm and low installation depth/height, they are ideal for space-optimized use in control cabinets with short gaps between tiers, and in flat control boxes. All versions are available for screw-type terminals and spring-loaded terminals with push-in technology. Wiring time is reduced because conductors are inserted and clamped from the front.

3RQ3 coupling relays are available as:

- Relay couplers (not plug-in).
- Plug-in relay couplers with replaceable relay.
- Optocouplers with semiconductor output (not plug-in).

The **3RS18 coupling relays** set new standards: With a wide voltage range from 24 V to 240 V AC/DC they are the star attraction on the coupler market. In this series, we offer you devices in the field-proven 22.5 mm industrial enclosure with one, two or three changeover contacts – using screw-type or spring-loaded connections and for combination and wide-range voltage with hard gold-plated contacts for an especially high contact reliability – even at low current levels. Thanks to the well-proven industrial enclosure, you can enjoy the benefits of user-friendly connection systems with permanent wiring, just the same as with our timing relays. Two conductors can be connected at each terminal point.

**3TG10 power relays** prove their worth wherever small, low-noise relays or contactors are required at a reasonable price. This makes them ideal for simple controllers, especially for use in large-series manufactured devices and controllers. For applications that do not require an overload relay and need only one auxiliary switch – and which therefore need more switching power, higher switching voltage, and a longer service life.

**LZS plug-in coupling relays** are available as complete devices or as individual modules for self-assembly or spare parts requirements. This series is divided into three designs: RT, PT, and MT.

- Can be used for contact multiplication, adaptation of potential, or for switching small loads.
- Max. 4 changeover contacts in one device:
  - Wide-voltage versions with or without hard gold-plated contacts.
  - With screw-type or push-in spring-loaded terminals.

##### **SIRIUS 3RS70 signal converters**

The 3RS70 (previously 3RS17) signal converters (also innovated), share the enclosure concept with the 3RQ3 coupling relays. They are used mainly for the electrical isolation and conversion of analog signals. Sensors/actuators and controllers usually have different potentials and therefore require electrical isolation in the signal circuit. This is done either in the controller or by means of signal converters.

The conversion of one signal into another is required if, for example, a voltage signal has to be converted into a current signal for transmission over a longer distance, or if the output of a sensor and the input of a controller do not match.

The implemented frequency outputs offer another application. The input signal is converted to a proportional frequency here. This means that analog signals can be processed with digital inputs.

This is important if a controller offers no possibility for an analog input, or if all analog inputs are already occupied, for example, in the case of retrofits.

##### More information

- Catalog IC 10
- Product documentation for SIRIUS relays
- Internet: [www.siemens.com/relays](http://www.siemens.com/relays)

#### Overview



- Measuring systems are encoders for recording distances, angles of rotation, and velocities.
- Can be used on machines in various sectors, e.g. production machines, manipulators, machine tools, and special machines.
- Can be connected to SIMATIC, SINAMICS, SINUMERIK and SIMOTION.
- Accessories available for measuring systems: couplings, mounting material, connectors, and completely pre-assembled signal cables.

- External encoders are available as incremental or absolute-value encoders.
- Incremental encoders:
  - Interfaces RS 422 (TTL), 1 V<sub>pp</sub> and HTL.
  - Operating voltage 5 V DC or 10 V to 30 V DC.
- Absolute-value encoders:
  - All absolute-value encoders are available in singleturn and multiturn versions.
  - Interface SSI (synchronous serial interface) or connection for EnDat, PROFIBUS DP, PROFINET IO with RT/IRT and DRIVE-CLiQ.
  - Encoders with PROFIBUS DP support Class 1 ... 3 profiles as well as isochronous mode, internode communication, and application-specific supplementary functions. They are parameterizable.
  - Encoders with PROFINET IO support Class 1 ... 4 profiles.
- All measuring systems are available in synchro flange and supported flange joint versions. The absolute encoders are available in a hollow shaft version.

#### More information

- Catalogs NC 62, NC 82, PM 21, D 31
- Interactive Catalog CA 01
- Internet:
  - [www.siemens.com/sensor-systems](http://www.siemens.com/sensor-systems)
  - [www.siemens.com/industrymall](http://www.siemens.com/industrymall)

## SIMOTION Motion Control System

#### Overview



#### SIMOTION system

- The SIMOTION system is used predominantly in machines in which motion control with servo or hydraulic axes plays a key role. The main fields of application are packaging, printing and plastics machines, as well as the automation of machines for textiles, molding, wood, glass, ceramics and stone.
- The system approach: Merging of motion control with logic and technology functions. In this way, all movements, motion-related logic functions and technology functions such as temperature, hydraulic controls or cams are executed in the same system.
- Advantages:
  - No time-critical interfaces between the components
  - No programming effort required for these interfaces
  - Standardized and transparent programming and diagnostics, as is familiar from PLC systems
  - Free choice of hardware platform: controller, PC or directly integrated in the drive
  - Simple graphical sequence programming using Motion Control Chart
  - Integrated PLC functionality



## Supplementary components

### Automation systems

#### SIMOTION Motion Control System

##### Overview (continued)

- Components of the SIMOTION system:
  - SCOUT engineering system:  
The engineering system for complete machine automation, including: MCC (Motion Control Chart) for easy graphical sequence programming; LAD and FBD for programming PLC tasks, ST as text language for simple generation of functions and extensive calculations.
  - Runtime software modules:  
Various motion control and technology functions for implementing simple axis-positioning by means of synchronous operation and cams disks, up to 3D-path interpolation with transformations for various handling kinematics. By careful selection, the system can be flexibly adapted to the machine.
- Components of the SIMOTION system:
  - Hardware platforms: Various platforms permit adaptation to the respective machine. You can choose between the compact versions directly in the drive, the modular versions in S7-300 design, and the open versions as pure software solutions on industrial PCs

##### **SIMOTION D – compact and integrated in the drive**

- The complete machine automation with drive control, PLC, motion control and technology functionality in one compact unit of SINAMICS S120 design
- Particularly fast response
- Versatile networking options via PROFIBUS, PROFINET or Ethernet
- Scalable since multiple performance versions are available
- SIMOTION D is available in two configurations:
  - As a single-axis system SIMOTION D410-2 with multi-axis option (blocksize format). The Control Units are available in D410-2 DP and D410-2 DP/PN versions and are snapped onto the SINAMICS S120 PM340 Power Modules in blocksize format.
  - As a multi-axis system SIMOTION D4x5-2 in four performance variants for as many as 128 axes (booksize format)
- Ideal for:
  - Compact machines
  - Distributed automation concepts, e.g. on machines with a large number of axes
  - Modular machines
  - Time-critical demands on the axis couplings

##### **SIMOTION C – modularity and flexibility**

- Controller in S7-300 design
- 2 versions, optionally with integrated drive interfaces for analog and stepper drives or with a PROFINET interface
- Onboard inputs/outputs expandable with SIMATIC S7-300 I/O and function modules
- With integrated isochronous PROFIBUS interfaces for distributed connection of drives or communication with operator panels and higher level controllers
- Ideal for:
  - Highest possible level of freedom for drive selection
  - Broad range of process signals
  - Retrofit applications by means of integrated analog interfaces

##### **SIMOTION P – open for other tasks**

- This PC-based, open Motion Control System is available in two versions:
  - SIMOTION P320-3 for embedded PC solutions running on Windows Embedded Standard 2009
  - SIMOTION P350-3 for high-performance applications running on Windows XP
- Control, motion control, and HMI functions are executed together with standard PC applications on one platform. The advantage for the user: Using the PC platform and the Microsoft Windows operating system – with a real-time expansion for SIMOTION – the advantages of both worlds are combined in SIMOTION P:
- Openness thanks to the Windows operating system
- Real-time capability thanks to the SIMOTION operating system
- Ideal for:
  - Applications requiring an open PC world
  - Applications with particularly high performance requirements, e.g. hydraulics applications
  - Applications requiring control and visualization on one hardware system
  - Extensive data storage, evaluation and logging

##### More information

- Catalog PM 21
- Catalog CA 01
- Internet:
  - [www.siemens.com/simotion](http://www.siemens.com/simotion)
  - [www.siemens.com/industrymall](http://www.siemens.com/industrymall)

### Overview



#### SINUMERIK 828 – optimum scalability in the compact class

Alongside two high-performance CNC variants of SINUMERIK 828D, SINUMERIK 828D BASIC is a low-cost starter model in the compact class. SINUMERIK 828 therefore fits the performance requirements of standard machine concepts perfectly.

#### Compact, strong, simple – simply ingenious

The compact, operator-panel-based SINUMERIK 828 CNC systems are extremely rugged and very easy to maintain.

An operator panel front of die-cast magnesium, the panel-based CNC design with minimal interfaces and the high degree of protection make the SINUMERIK 828 CNC systems reliable partners even in harsh environments. Designed without a fan or hard disk, with NVRAM memory technology and no back-up battery, SINUMERIK 828 is a completely maintenance-free CNC.

Powerful CNC functions coupled with a unique 80-bit NANO<sup>FP</sup> accuracy permit excellent workpiece precision to be achieved in very short machining times. Thanks to a flexible CNC programming language as well as the unique machining step programming ShopTurn/ShopMill package, it is possible to program and machine both mass-production parts or single workpieces with the highest efficiency. Preconfigured technology-specific system software and unique service functions reduce the commissioning and servicing costs to an absolute minimum.

#### Technology tailor-made for use in standard turning and milling machines

SINUMERIK 828D is perfectly adapted for use in standard machines and provides optimum support for turning and milling technology. With two preconfigured system software variants for machining technology, the SINUMERIK 828 CNC systems are ready for use in turning and milling machines on dispatch from the factory.

#### More information

- Catalog NC 82
- Interactive Catalog CA 01
- Internet:  
[www.siemens.com/sinumerik](http://www.siemens.com/sinumerik)  
[www.siemens.com/industrymall](http://www.siemens.com/industrymall)

### Overview



SINUMERIK 840D sl offers modularity, openness, flexibility and uniform structures for operation, programming, and visualization. It provides a system platform with trend-setting functions for almost all technologies.

Integrated into the SINAMICS S120 drive system and complemented by the SIMATIC S7-300 automation system, the SINUMERIK 840D sl forms a complete digital system that is optimally suited to the mid and upper performance range.

SINUMERIK 840D sl is characterized by:

- A high level of flexibility
- Maximum dynamics and precision
- Optimum integration into networks

#### **Benefits**

- Maximum performance and flexibility for medium to complex multi-axis systems, thanks to scalable hardware and software
- Consistent openness in the area of the user interface, the PLC, and the NC core for the integration of your specific know-how
- Integrated safety functions for man and machine: SINUMERIK Safety Integrated
- Comprehensive range of functions for the integration of machine tools into communication, engineering and production processes: SINUMERIK Integrate

## Supplementary components

Automation systems, system cabling

### SINUMERIK 840D sl

#### Overview (continued)

##### Application

The SINUMERIK 840D sl can be used globally in the following technologies:

- Turning
- Drilling
- Milling
- Grinding
- Laser cutting
- Nibbling
- Punching
- Toolmaking and moldmaking
- High-speed cutting applications
- Woodworking and glass processing
- Handling

- Transfer lines
- Rotary indexing machines
- Mass series production
- JobShop production

For use in countries requiring approval, there is the export version SINUMERIK 840DE sl.

##### More information

- Catalog NC 62
- Interactive Catalog CA 01
- Internet:  
[www.siemens.com/sinumerik](http://www.siemens.com/sinumerik)  
[www.siemens.com/industrymall](http://www.siemens.com/industrymall)

### MOTION-CONNECT connection system

#### Overview

MOTION-CONNECT includes connection systems and components which are optimally tailored to individual areas of application. MOTION-CONNECT cables feature state-of-the-art connection systems to ensure fast, reliable connection of different components, and offer maximum quality as well as system-tested reliability.



MOTION-CONNECT power cable and signal cable

MOTION-CONNECT cables are available as fully-assembled power and signal cables or sold by the meter. The pre-assembled cables can be ordered in length units of 10 cm (3.94 in) and can be extended, if necessary.

Whatever your machine requirements, MOTION-CONNECT offers the solution.

- **Robust, high-performance and easy to use**  
thanks to pre-assembled cables with a rugged metal connector in degree of protection IP67 and reliable SPEED-CONNECT quick-release lock
- **Outstanding and proven quality**  
achieved by consistent quality management and system-tested cables

Cables are available in two different qualities – MOTION-CONNECT 500 and MOTION-CONNECT 800PLUS.

MOTION-CONNECT 500	MOTION-CONNECT 800PLUS
<ul style="list-style-type: none"> <li>• Cost-effective solution for predominantly fixed installation</li> <li>• Tested for travel distances up to 5 m (16.4 ft)</li> </ul>	<ul style="list-style-type: none"> <li>• Meets requirements for use in cable carriers</li> <li>• Oil-resistant</li> <li>• Tested for travel distances of up to 50 m (164 ft)</li> </ul>

##### More information

- Catalogs NC 62, NC 82, PM 21
- Interactive Catalog CA 01
- Internet:  
<http://www.siemens.com/motion-connect>  
<http://www.siemens.com/industrymall>

## Appendix



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<b>16/3</b>	<b>Additional documentation</b>
16/3	SIMATIC Manual Collection
<b>16/4</b>	<b>Standards and approbations</b>
16/4	CE marking
16/5	Certificates
<b>16/5</b>	<b>Qualitätsmanagement</b>
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<b>16/17</b>	<b>Software Licenses</b>
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<b>16/24</b>	<b>Article No. index</b>
<b>16/30</b>	<b>Conditions of sale and delivery</b>

## Appendix

### SITRAIN – Training for Industry

#### You benefit from practical training provided directly by the manufacturer

SITRAIN – Training for Industry – provides you with comprehensive support in solving your tasks.

Training directly from the manufacturer enables you to make better choices with more confidence in your decision-making processes.

#### **SITRAIN Training means:**

- Shorter times for commissioning, maintenance and servicing
- Optimized production operations
- Reliable configuration and startup
- Shorter start-up times, reduced downtimes and faster fault clearance
- Swift elimination of deficits in existing plants
- Avoidance of costly planning errors right from the start
- Flexible plant adaptation to market requirements
- Compliance with quality standards in production
- Increased employee satisfaction and motivation
- Shorter familiarization times following changes in technology and staff



#### Contact

Visit our site on the Internet at:

[www.siemens.com/sitrain](http://www.siemens.com/sitrain)

or let us advise you personally. You can request our latest training catalog from:

#### **SITRAIN – Training for Industry Customer Support Germany:**

Phone: +49 911 895-7575

Fax: +49 911 895-7576

E-mail: [info@sitrain.com](mailto:info@sitrain.com)

#### Important key data

##### **Top trainers**

Our trainers are skilled specialists with direct and extensive practical experience. Course developers have close contact with product development, and directly pass on their knowledge to the trainers, who can then in turn teach more effectively.

##### **Practical experience**

Practice makes perfect – that's why we attach the greatest importance to hands-on learning. Practical exercises can comprise up to half of the course time. You can therefore immediately implement your new knowledge in your day-to-day work situations.

##### **300 courses in 62 countries**

We offer a total of about 300 local attendance courses. You can find us at more than 50 locations in Germany, and in 62 countries worldwide. To find out which course is held at which location, go to:

[www.siemens.com/sitrain](http://www.siemens.com/sitrain)

##### **Customized training**

Would you prefer individual training instead? Our solution: We will provide a program tailored exactly to suit your personal requirements. Training can be carried out in our Training Centers or onsite at your company.

We instruct you using state-of-the-art training equipment which has been especially designed by our developers for the SITRAIN courses. This training approach will give you all the assurance you need.

##### **The right mixture: Blended learning**

Blended learning involves a combination of various training media. For example, a face-to-face course in a training center can be optimally supplemented by teach-yourself Web-based training (WBT) courses as preparation or follow-up.

The add-on effect: Reduced traveling costs and periods of absence.





#### Overview

The SIMATIC manual collection brings together the manuals of Totally Integrated Automation in the smallest possible package. It is eminently suitable for startup and service, replaces the space-consuming paper version in the office and provides fast access to the information.

The manual collection contains manuals in 5 languages for

- LOGO!
- SIMADYN
- SIMATIC bus components
- SIMATIC C7
- SIMATIC Distributed I/O
- SIMATIC HMI
- SIMATIC Sensors
- SIMATIC NET
- SIMATIC PC Based Automation
- SIMATIC PCS 7
- SIMATIC PG/PC
- SIMATIC S7
- SIMATIC Software
- SIMATIC TDC

Manuals that are not yet available in all 5 languages will at least be included in English and German.

There is an update contract for the SIMATIC Manual Collection that encompasses supply of the up-to-date collection and three subsequent updates which is valid for one year. If the update contract is not cancelled, it is automatically extended and the list price will be charged to the customer.

Ordering data	Article No.
<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed IO, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	<b>6ES7998-8XC01-8YE0</b>
<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	<b>6ES7998-8XC01-8YE2</b>

## Appendix

### Standards and approbations

#### CE marking

##### Overview

The electronic products described in this catalog comply with the requirements and protection objectives of the following EC-directives insofar as they relate to the product concerned. They also comply with the corresponding harmonized European standards (EN) published for these products in the Official Journals of the European Community.

- Directive 2004/108/EC of the European Parliament and Council on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive)
- Directive 2006/95/EC of the European Parliament and of the Council on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (Low Voltage Directive)
- Directive 94/9/EC of the European Parliament and the Council on approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres (ATEX Directive).
- Directive 1999/5/EC of the European Parliament and of the Council on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (RTTE Directive)

The originals of the declarations of conformity are kept available by us for the responsible supervisory authorities.

##### **Note on the EMC Directive:**

In terms of their interference emissions, SIMATIC products are designed for industrial applications.

If individual products deviate from this specification, it is noted in the catalog with the products.

The installation instructions in the manuals must be adhered to when installing and operating the products described in this catalog. These contain, for example, important information on installation in cabinets and on the use of shielded cables.

##### Notes for machine manufacturers

The SIMATIC automation system is not a machine within the context of the EU machine guidelines. Therefore a declaration of conformity with regard to the EU machine directive 89/392/EEC or 2006/42/EU (new edition, applicable from end of 2009) may not be provided for SIMATIC.

The EU machine directive regulates the requirements placed on a machine or a part thereof. A machine is understood for the purposes of this guideline to be a combination of interconnected parts or mechanisms (see also EN 292-1, Paragraph 3.1).

SIMATIC is part of the electrical equipment of a machine, and must therefore be integrated into the evaluation of the complete machine by the machine manufacturer.

As electrical equipment, SIMATIC is subject to the low-voltage directive which, as a "total safety directive", covers all dangers just like the machine directive.

The EN 60204-1 standard (safety of machines, general requirements for the electrical equipment of machines) is applicable to the electrical equipment of machines.

The following table will help you in the provision of your declaration of conformity, and shows which criteria according to EN 60204-1 (2006-06) apply to SIMATIC. You can obtain further information from the enclosed declaration of conformity according to the low-voltage and EMC directives (with list of included standards).

EN 60204-1	Topic/criterion	Notes
Paragraph 4	General requirements	The requirements are met when the equipment is assembled/installed in accordance with the installation guidelines. Please note the relevant information in the manuals.
Paragraph 11.2	Digital input/output interfaces	The requirements are met
Paragraph 12.3	Programmable equipment	The requirements are met when the equipment is installed in lockable cabinets to protect against alteration of the memory contents by unauthorized persons
Paragraph 20.4	Voltage tests	The requirements are met

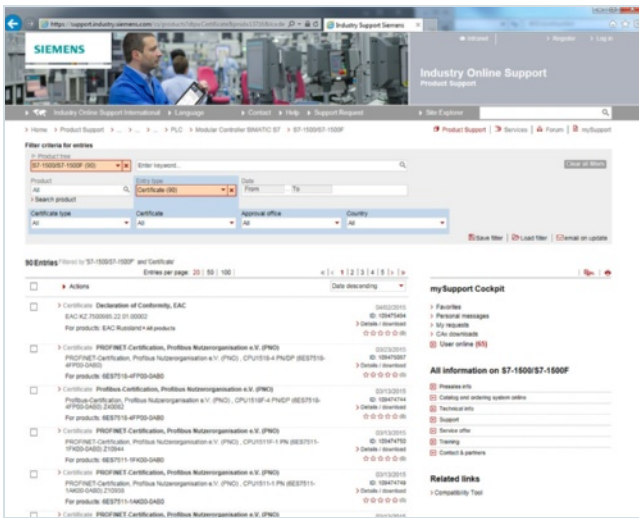
**Certificates, authorizations, approbations, declarations of conformity**

An overview of the certificates available for SIMATIC products (CE, UL, CSA, FM, shipping authorizations) can be found in the internet at

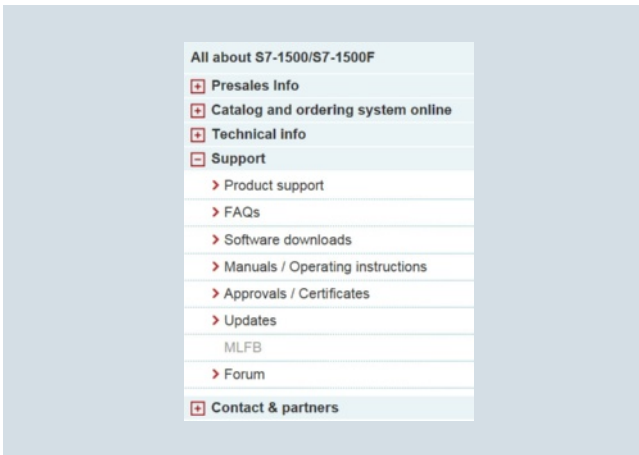
<http://www.siemens.com/simatic/certificates>

The lists are continuously updated. The data for products which have not yet been included in the overview is continuously collected and prepared for the subsequent edition.

You can also find certificates, approbations, verification certificates or characteristic curves under Product support "Entry list"



or by going directly to the Link Box:



**Quality management**

The quality management system of the Industry Sector, Industry Automation Division, complies with the international standard ISO 9001.

The products and systems described in this catalog are sold under application of a quality management system certified by DQS in accordance with DIN EN ISO 9001.

The DQS certificate is recognized in all IQ Net countries.

**DQS Registered Certificate No.:**

Siemens AG

- I IA AS Industrial Automation Systems  
Reg. No.: 001323 QM08

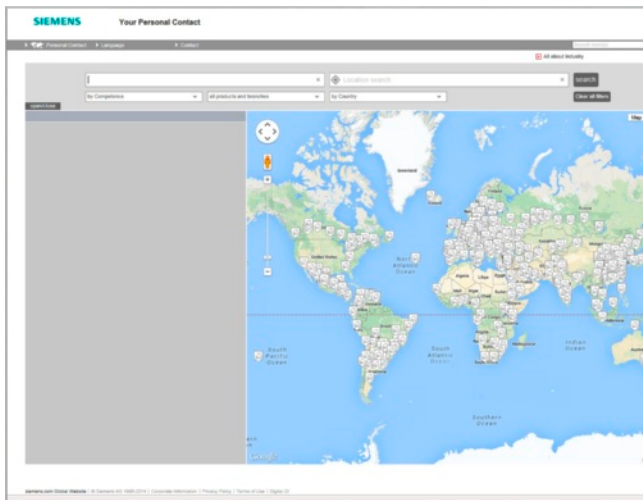


## Appendix

### Partner at Siemens

#### Contacts worldwide

#### Overview



At Siemens Industry we are resolutely pursuing the same goal: long-term improvement of your competitive ability. We are committed to this goal. Thanks to our commitment, we continue to set new standards in automation and drive technology. In all industries – worldwide.

At your service locally, around the globe for consulting, sales, training, service, support, spare parts ... on the entire Industry Automation and Drive Technologies range.

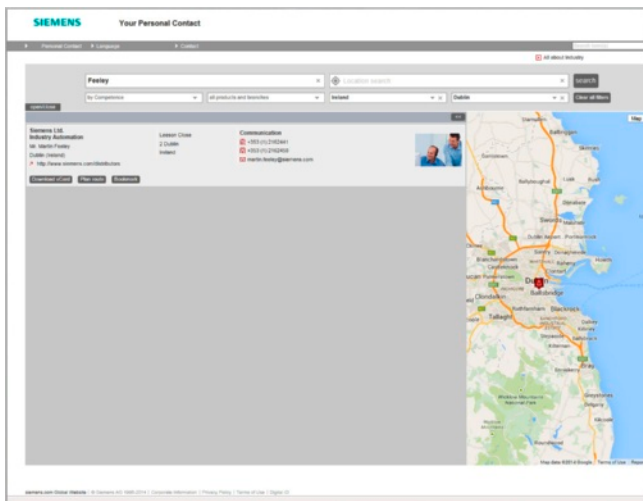
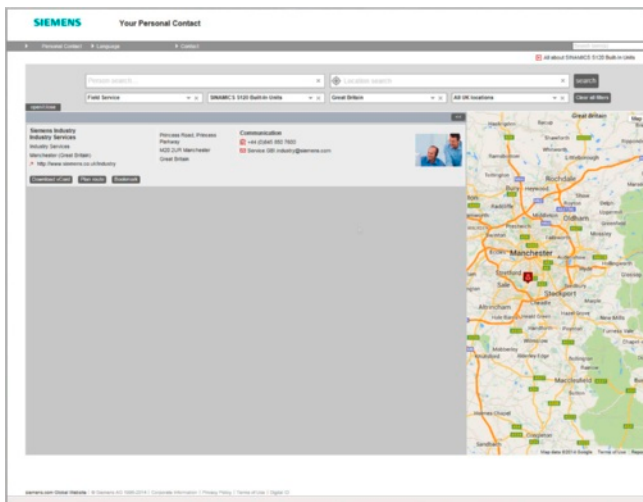
Your personal contact can be found in our Contacts Database at: [www.siemens.com/automation/partner](http://www.siemens.com/automation/partner)

You start by selecting

- the required competence,
- products and branches,
- a country,
- a city

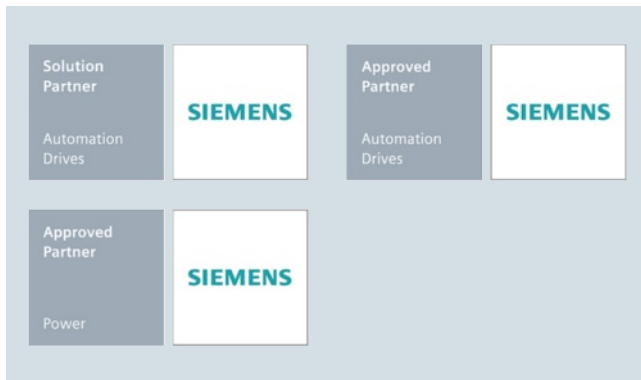
or by a

- location search or
- person search.



### Overview

#### Siemens Solution und Approved Partners



#### Highest competence in automation and drive technology as well as power distribution

Siemens works closely together with selected partner companies around the world in order to ensure that customer requirements for all aspects of automation and drives, as well as power distribution, are fulfilled as best as possible – wherever you are, and whatever the time. It is for this reason that we systematically train and keep our partners well prepared, in addition to certifying them in specific technologies. It is our declared intention and goal to train and prepare our partners to the same standards as our own employees.

This approach is based on contractually agreed quality criteria as well as optimum support for our partners by providing clearly defined processes. This ensures that they possess all the qualities to meet customer requirements optimally. The partner emblem is the guarantee and indicator of proven quality.

#### Solution Partners and Approved Partners

The Siemens Partner Program distinguishes between Solution Partners and Approved Partners.

At present we are working with more than 1,400 Solution Partners worldwide. They represent countless tailored and future-proof automation and drive solutions in the most diverse industries.

With their extensive technical product knowledge, Siemens Approved Partners offer a combination of goods and services that include specialist technologies, customized modifications and the provision of high-quality system and product packages. They also provide qualified technical support and assistance

#### Partner Finder

The screenshot shows the Siemens Partner Finder web application. The header includes the Siemens logo and navigation links for 'Partner Finder', 'Language', and 'Contact'. The main content area is titled 'Partner Finder' and contains a search form. The form includes a 'Partner search' tab, a 'Reference search' tab, and an 'Industry events' tab. The search form has several dropdown menus for 'Technology', 'Specialist', 'Industry', 'Service', 'Country', and 'Region/State', along with text input fields for 'Company/ZIP code' and 'Zip code'. A 'Find' button is located at the bottom right of the search form. A note on the right side of the form states: 'Please note that some technologies are only available as specialist and that the search criteria entered are linked with and'. The footer of the page contains the text: '© Siemens AG 1996-2015 | Corporate Information | Data Privacy | Terms of Use | Digital ID | V.13.1'.

In the Siemens global Solution Partner program, customers are certain to find the optimum partner for their specific requirements - with no great effort. The Partner Finder is basically a comprehensive database that showcases the profiles of all our solution partners.

#### Easy selection:

Set filters in the search screen form according to the criteria that are relevant to you. You can also directly enter the name of an existing partner.

#### Skills at a glance:

Gain a quick insight into the specific competencies of any particular partner with the reference reports.

#### Direct contact option:

Use our electronic query form:

[www.siemens.com/automation/partnerfinder](http://www.siemens.com/automation/partnerfinder)

Additional information on the Siemens Solution Partner Program is available online at:

[www.siemens.com/partner-program](http://www.siemens.com/partner-program)

## Appendix

### Siemens Automation Cooperates with Education

#### Simplify your education in automation

#### Unique support for educators and students in educational institutions

Cooperates  
with Education

Automation

SIEMENS

#### Siemens Automation Cooperates with Education (SCE)

offers a global system for sustained support of technical skills. SCE supports educational institutions in their teaching assignment in the industrial automation sector and offers added value in the form of partnerships, technical expertise, and know-how. As the technological leader, our comprehensive range of services can support you in the knowledge transfer for Industry 4.0.

#### Our services at a glance

- Training curriculums for your lessons
- Trainer packages for hands-on learning
- Courses convey up-to-date, specialist knowledge
- Support for your projects/textbooks
- Complete didactic solutions from our partners
- Personal contact for individual support

#### Training curriculums for your lessons



Use our profound industrial know-how for practice-oriented and individual design of your course. We offer you more than 100 didactically prepared training curriculums on the topics of automation and drives technology free of charge. These materials are perfectly matched to your curricula and syllabuses, and optimally suited for use with our trainer packages. This takes into account all aspects of a modern industrial solution: installation, configuration, programming, and commissioning. All documents, including projects, can be individually matched to your specific requirements.

#### Particular highlights:

- With the new SIMATIC PCS 7 curriculums and trainer packages, you can pass on basic, practice-oriented PCS 7 knowledge at universities within about 60 hours (= 1 semester), using plant simulation.

- The new TIA Portal training materials for SIMATIC S7-1200 are available in English, German, French, Italian, Spanish and Chinese for download.

[www.siemens.com/sce/documents](http://www.siemens.com/sce/documents)

#### Trainer packages for hands-on learning



Our SCE trainer packages offer a specific combination of original industrial components which are perfectly matched to your requirements and can be conveniently used in your course. These price reduced bundles available exclusively to schools include innovative and flexible hardware and software packages. SCE can currently offer more than 90 SCE trainer packages including related equipment. These cover both the factory and process automation sectors. You can use them to impart the complete course contents on industrial automation at a very low cost.

#### Trainer packages are available for:

- Introduction to automation technology with LOGO! logic module and SIMATIC S7-1200 compact controller
- PLC engineering with SIMATIC S7 hardware and STEP 7 software (S7-300, S7-1500 and TIA Portal)
- Operator control and monitoring with SIMATIC HMI
- Industrial networking over bus systems with SIMATIC NET (PROFINET, PROFIBUS, IO-Link)
- Sensor systems with VISION, RFID and SIWAREX
- Process automation with SIMATIC PCS 7
- Power Monitoring Devices SENTRON PAC 4200
- Motor Management SIMOCODE
- Networked drive and motion technologies with SINAMICS/SIMOTION
- CNC programming with SinuTrain

#### Important ordering notes:

Only the following institutions are authorized to obtain trainer packages: vocational schools, Colleges and Universities, in-house vocational training departments, non commercial research institutions and non commercial training departments.

To purchase a trainer package, you require a specific end-use certificate, which you can obtain from your regional sales office.

[www.siemens.com/sce/tp](http://www.siemens.com/sce/tp)



**Unique support for educators and students in educational institutions** (continued)**Courses convey up-to-date specialist knowledge**

Profit from our excellent know-how as the leader in industrial technologies. We offer you specific courses for automation and drive technology worldwide. These support you in the practice-oriented transferring of product and system know-how, are in conformance with curriculums, and derived from the training fields. Compact technical courses especially for use at universities are also available.

Our range of courses comprises a wide variety of training modules based on the principle of Totally Integrated Automation (TIA). The focus is on the same subject areas as with the SCE trainer packages.

Every PLC and drive course is oriented on state-of-the-art technology. Your graduates can thus be prepared optimally for their future professional life.

In some countries we are offering classes based on our training curriculums. Please inquire with your SCE contact partner.

[www.siemens.com/sce/contact](http://www.siemens.com/sce/contact)

**Support for your projects/textbooks**

Automation and drive technology is characterized by continuous and rapid developments. Service and Support therefore play an important role.

We can provide you with consulting for selected projects and support from your personal SCE contact as well as our web based and regional Customer Support.

As a particular service, SCE supports technical authors with our know-how as well as with intensive technical consulting. Siemens library of special textbooks covering the industrial automation sector provides an additional resource for you and your students. These can be found at the SCE web site.

[www.siemens.com/sce/contact](http://www.siemens.com/sce/contact)  
[www.siemens.com/sce/books](http://www.siemens.com/sce/books)

**Complete didactic solutions**

Our partners for learning systems offer a wide range of training systems and solutions for use in your courses or laboratory.

These models have been designed based on our trainer packages and thus save you the time and cost of self-construction of individual components. The Partner systems provide you with simple and effective help in the fulfillment of your teaching assignment.

[www.siemens.com/sce/partner](http://www.siemens.com/sce/partner)

**Contact for individual support**

You can find your personal SCE contact on our Internet site. Your local SCE Promoter will answer all your questions concerning the complete SCE offering, and provide you with timely and competent information about innovations. When you encounter challenges, you can profit from our global team of excellence.

If a direct SCE contact is not listed for your country, please contact your local Siemens office.

[www.siemens.com/sce/contact](http://www.siemens.com/sce/contact)

**SCE Support Finder for your Internet request**

You are an educator and need support on the topic of industry automation? Send us your request:

[www.siemens.com/sce/supportfinder](http://www.siemens.com/sce/supportfinder)

Scan the QR  
code for further  
information  
(SCE homepage)

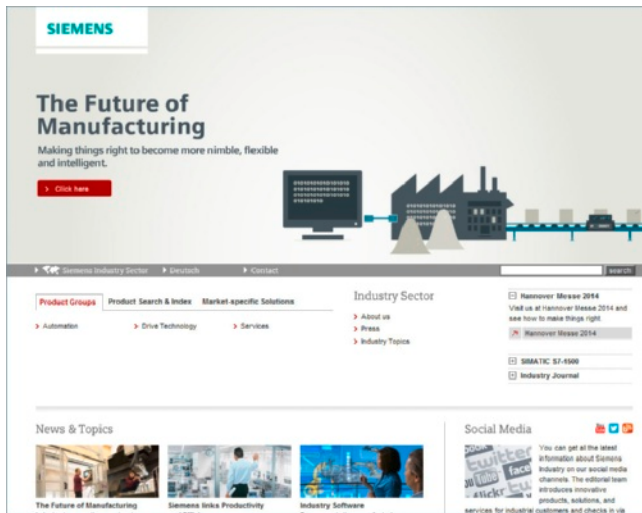


## Appendix

### Online Services

#### Information and Ordering in the Internet and on DVD

##### Siemens Industry Automation and Drive Technologies in the WWW



A detailed knowledge of the range of products and services available is essential when planning and configuring automation systems. It goes without saying that this information must always be fully up-to-date.

Siemens Industry Automation and Drive Technologies has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address

[www.siemens.com/industry](http://www.siemens.com/industry)

you will find everything you need to know about products, systems and services.

##### Product Selection Using the Interactive Catalog CA 01 of Industry



Detailed information together with convenient interactive functions:

The interactive catalog CA 01 covers more than 80 000 products and thus provides a full summary of the Siemens Industry Automation and Drive Technologies product base.

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives. All information is linked into a user interface which is easy to work with and intuitive.

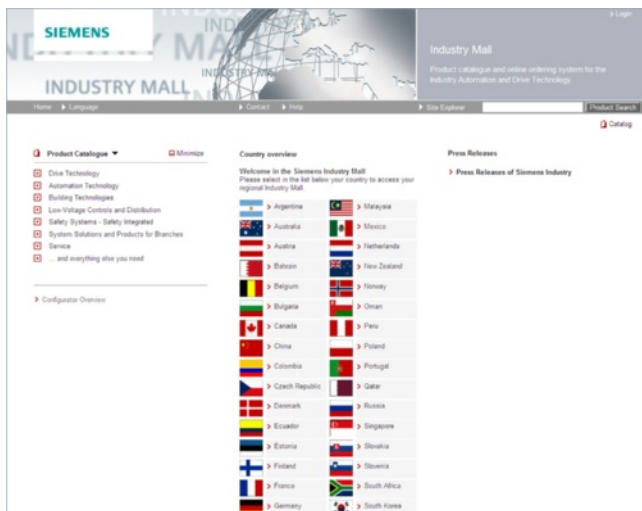
After selecting the product of your choice you can order at the press of a button, by fax or by online link.

Information on the interactive catalog CA 01 can be found in the Internet under

[www.siemens.com/automation/ca01](http://www.siemens.com/automation/ca01)

or on DVD.

##### Easy Shopping with the Industry Mall



The Industry Mall is the electronic ordering platform of Siemens AG on the Internet. Here you have online access to a huge range of products presented in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking and tracing of the order to be carried out. Availability checks, customer-specific discounts and preparation of quotes are also possible.

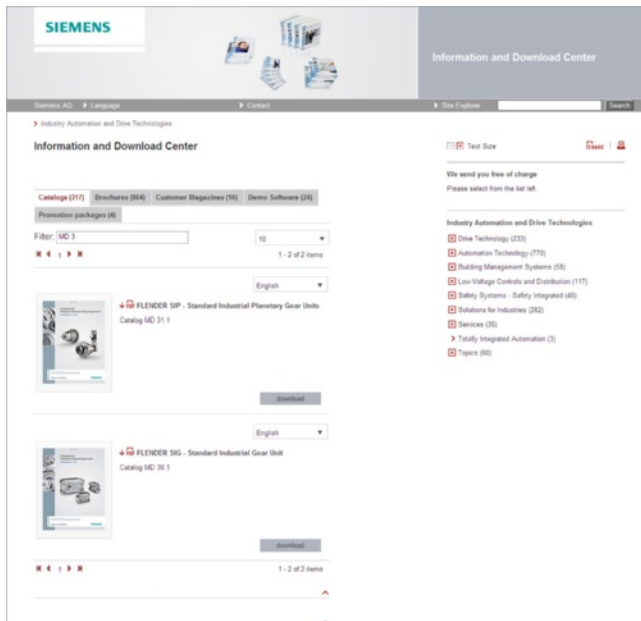
Numerous additional functions are available to support you.

For example, powerful search functions make it easy to select the required products. Configurators enable you to configure complex product and system components quickly and easily. CAx data types are also provided here.

Please visit the Industry Mall on the Internet under:

[www.siemens.com/industrymall](http://www.siemens.com/industrymall)

#### Downloading Catalogs



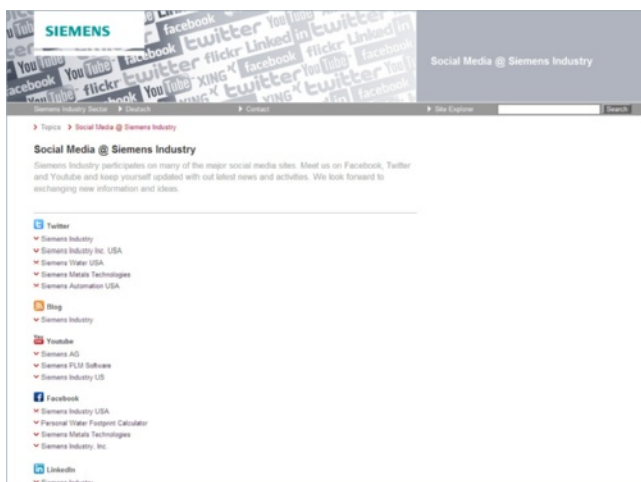
In addition to numerous other useful documents, you can also find the catalogs listed on the back inside cover of this catalog in the Information and Download Center. Without having to register, you can download these catalogs in PDF format or increasingly as digital page-turning e-books.

The filter dialog box above the first catalog displayed makes it possible to carry out targeted searches. If you enter "MD 3" for example, you will find both the MD 30.1 and MD 31.1 catalogs. If you enter "ST 70" both the ST 70 catalog and the associated news or add-ons are displayed.

Visit us on the web at:

[www.siemens.com/industry/infocenter](http://www.siemens.com/industry/infocenter)

#### Social Media



Connect with Siemens through social media: visit our social networking sites for a wealth of useful information, demos on products and services, the opportunity to provide feedback, to exchange information and ideas with customers and other Siemens employees, and much, much more. Stay in the know and follow us on the ever-expanding global network of social media.

Connect with Siemens Industry at our central access point:

[www.siemens.com/industry/socialmedia](http://www.siemens.com/industry/socialmedia)

Or via our product pages at:

[www.siemens.com/automation](http://www.siemens.com/automation)

or

[www.siemens.com/drives](http://www.siemens.com/drives)

To find out more about Siemens' current social media activities visit us at:

[www.siemens.com/socialmedia](http://www.siemens.com/socialmedia)

#### Mobile Media



Discover the world of Siemens.

We are also constantly expanding our offering of cross-platform apps for smartphones and tablets. You will find the current Siemens apps at the app store (iOS) or at Google Play (Android).

The Siemens app, for example, tells you all about the history, latest developments and future plans of the company – with informative pictures, fascinating reports and the most recent press releases.



## Appendix Industry Services

Your machines and plant can do more – with Industry Services.

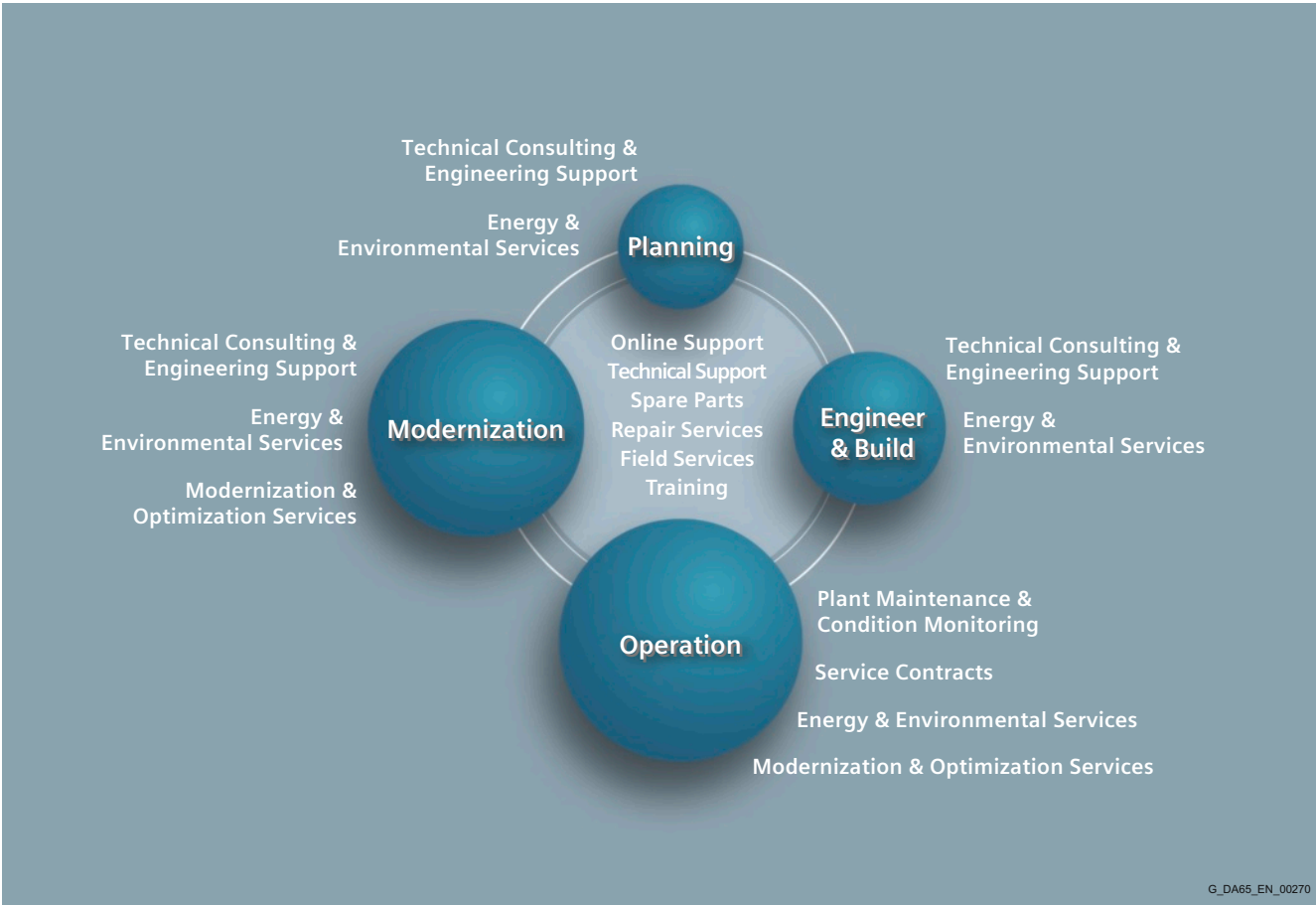


Whether it is production or process industry - in view of rising cost pressure, growing energy costs, and increasingly stringent environmental regulations, services for industry are a crucial competitive factor in manufacturing as well as in process industries.

All over the world Siemens supports its customers with product, system, and application-related services throughout the entire life cycle of a plant. Right from the earliest stages of planning, engineering, and building, all the way to operation and modernization. These services enable customers to benefit from the Siemens experts' unique technological and product knowledge and industry expertise.

Thus downtimes are reduced and the utilization of resources is optimized. The bottom line: increased plant productivity, flexibility, and efficiency, plus reduced overall costs.

Discover all advantages of our service portfolio:  
[www.siemens.com/industry-services](http://www.siemens.com/industry-services)



G\_DA65\_EN\_00270

Siemens supports its clients with technology based Services across a plants entire life cycle.

#### Online Support

Online support is a comprehensive information system for all questions relating to products, systems, and solutions that Siemens has developed for industry over time. With more than 300,000 documents, examples and tools, it offers users of automation and drive technology a way to quickly find up-to-date information. The 24-hour service enables direct, central access to detailed product information as well as numerous solution examples for programming, configuration and application.

The content, in six languages, is increasingly multimediated – and now also available as a mobile app. Online support's "Technical Forum" offers users the opportunity to share information with each other. The "Support Request" option can be used to contact Siemens' technical support experts. The latest content, software updates, and news via newsletters and Twitter ensure that industry users are always up to date.



[www.siemens.com/industry/onlinesupport](http://www.siemens.com/industry/onlinesupport)

#### Online Support App



Using the Online Support app, you can access over 300,000 documents covering all Siemens industrial products - anywhere, any time. Regardless of whether you need help implementing your project, fault-finding, expanding your system or are planning a new machine.

You have access to FAQs, manuals, certificates, characteristics curves, application examples, product notices (e.g. announcements of new products) and information on successor products in the event that a product is discontinued.

Just scan the product code printed on the product directly using the camera of your mobile device to immediately see all technical information available on this product at a glance. The graphical CAx information (3D model, circuit diagrams or EPLAN macros) is also displayed. You can forward this information to your workplace using the e-mail function.

The search function retrieves product information and articles and supports you with a personalized suggestion list. You can find your favorite pages – articles you need frequently – under

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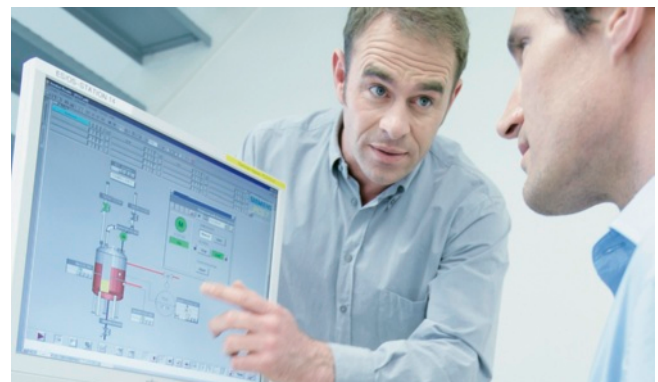


The app is available free of charge from the Apple App Store (iOS) or from Google Play (Android).

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#### Technical Support

The ability to quickly analyze system and error messages and take appropriate action are key factors in ensuring that plants run safely and efficiently. Questions can arise at any time and in any industry, whether it's an individual product or a complete automation solution. Siemens technical support offers individual technical assistance in matters related to functionality, how to operate, applications, and fault clearance in industrial products and systems – at any time and globally, over the phone, by e-mail, or via remote access. Experienced experts from Siemens answer incoming questions promptly. Depending on the requirements, they first consult specialists in the areas of development, on-site services, and sales. Technical support is also available for discontinued products that are no longer available. Using the support request number, any inquiry can be clearly identified and systematically tracked.





## Appendix

### Industry Services

#### Industry Services for the entire life cycle

##### **Spare Parts**

Drive and automation systems must be available at all times. Even a single missing spare part can bring the entire plant to a standstill – and result in substantial financial losses for the operator. The spare parts services from Siemens protect against such losses – with the aid of quickly available, original spare parts that ensure smooth interaction with all other system components. Spare parts are kept on hand for up to ten years; defective parts can be returned. For many products and solutions, individual spare parts packages ensure a preventive stock of spare parts on-site. The spare parts service is available around the world and around the clock. Optimum supply chain logistics ensure that replacement components reach their destination as quickly as possible. Siemens' logistics experts take care of planning and management as well as procurement, transportation, customs handling, warehousing, and complete order management for spare parts.



##### **Repair Services**

Reliable electrical and electronic equipment is crucial for operating continuous processes. That is why it is essential that motors and converters always undergo highly specialized repair and maintenance. Siemens offers complete customer and repair services – on site and in repair centers – as well as technical emergency services worldwide. The repair services include all measures necessary to quickly restore the functionality of defective units. In addition, services such as spare parts logistics, spare parts storage and rapid manufacturing are available to plant operators in all verticals. With a global network of certified repair shops operated by Siemens as well as third parties, Siemens handles the maintenance and overhaul of motors, converters, and other devices as an authorized service partner.



##### **Field Services**

It's a top priority in all industries: the availability of plants and equipment. Siemens offers specialized maintenance services such as inspection and upkeep as well as rapid fault clearance in industrial plants – worldwide, continuously, and even with emergency services as needed. The services include startup as well as maintenance and fault clearance during operation. The startup service includes checking the installation, function tests, parameterization, integration tests for machines and plants, trial operation, final acceptance, and employee training. All services, including remote maintenance of drives, are also available as elements of customized service contracts.



#### **Training**

Increasingly, up-to-date knowledge is becoming a determining factor in success. One of the key resources of any company is well-trained staff that can make the right decision at the right moment and take full advantage of the potential. With SITRAIN – Training for Industry, Siemens offers comprehensive advanced training programs. The technical training courses convey expertise and practical knowledge directly from the manufacturer. SITRAIN covers Siemens' entire product and system portfolio in the field of automation and drives. Together with the customer, Siemens determines the company's individual training needs and then develops an advanced training program tailored to the desired requirements. Additional services guarantee that the knowledge of all Siemens partners and their employees is always up-to-date.



#### **Technical Consulting & Engineering Support**

The efficiency of plants and processes leads to sustainable economic success. Individual services from Siemens help save substantial time and money while also guaranteeing maximum safety. Technical consulting covers the selection of products and systems for efficient industrial plants. The services include planning, consulting, and conceptual design as well as product training, application support, and configuration verification – in all phases of a plant's lifecycle and in all questions related to product safety. Engineering support offers competent assistance throughout the entire project, from developing a precise structure for startup to product-specific preparation for implementation as well as support services in areas such as prototype development, testing and acceptance.



#### **Energy & Environmental Services**

Efficient energy use and resource conservation – these top sustainability concerns pay off – both for the environment and for companies. Siemens offers integrated solutions that unlock all technical and organizational potential for successful environmental management. Customized consulting services are aimed at sustainably lowering the cost of energy and environmental protection and thus increasing plant efficiency and availability. The experts provide support in the conceptual design and implementation of systematic solutions in energy and environmental management, enabling maximum energy efficiency and optimized water consumption throughout the entire company. Improved data transparency makes it possible to identify savings potential, reduce emissions, optimize production processes, and thereby noticeably cut costs.





## Appendix

### Industry Services

#### Industry Services for the entire life cycle

##### **Modernization & Optimization Services**

High machine availability, expanded functionality and selective energy savings – in all industries, these are decisive factors for increasing productivity and lowering costs. Whether a company wants to modernize individual machines, optimize drive systems, or upgrade entire plants, Siemens' experts support the projects from planning to commissioning.

Expert consulting and project management with solution responsibility lead to security and make it possible to specifically identify savings potential in production. This secures investments over the long term and increases economic efficiency in operation.



##### **Plant Maintenance & Condition Monitoring**

Modern industrial plants are complex and highly automated. They must operate efficiently in order to ensure the company's competitive strength. In addition, the steadily increasing networking of machines and plants require consistent security concepts. Maintenance and status monitoring as well as the implementation of integrated security concepts by Siemens' experts support optimum plant use and avoid downtime. The services include maintenance management as well as consulting on maintenance concepts, including the complete handling and execution of the necessary measures. Complete solutions also cover remote services, including analysis, remote diagnosis, and remote monitoring. These are based on the Siemens Remote Services platform with certified IT security.



##### **Service Contracts**

Making maintenance costs calculable, reducing interfaces, speeding up response times, and unburdening the company's resources – the reduced downtimes that these measures achieve increase the productivity of a plant. Service contracts from Siemens make maintenance and repairs more cost-effective and efficient. The service packages include local and remote maintenance for a system or product group in automation and drive technology. Whether you need extended service periods, defined response times, or special maintenance intervals, the services are compiled individually and according to need. They can be adjusted flexibly at any time and used independently of each other. The expertise of Siemens' specialists and the capabilities of remote maintenance thus ensure reliable and fast maintenance processes throughout a plant's entire lifecycle.



### Overview

#### Software types

Software requiring a license is categorized into types. The following software types have been defined:

- Engineering software
- Runtime software

#### Engineering software

This includes all software products for creating (engineering) user software, e.g. for configuring, programming, parameterizing, testing, commissioning or servicing.

Data generated with engineering software and executable programs can be duplicated for your own use or for use by third parties free-of-charge.

#### Runtime software

This includes all software products required for plant/machine operation, e.g. operating system, basic system, system expansions, drivers, etc.

The duplication of the runtime software and executable programs created with the runtime software for your own use or for use by third-parties is subject to a charge.

You can find information about license fees according to use in the ordering data (e.g. in the catalog). Examples of categories of use include per CPU, per installation, per channel, per instance, per axis, per control loop, per variable, etc.

Information about extended rights of use for parameterization/configuration tools supplied as integral components of the scope of delivery can be found in the readme file supplied with the relevant product(s).

#### License types

Siemens Industry Automation & Drive Technologies offers various types of software license:

- Floating license
- Single license
- Rental license
- Rental floating license
- Trial license
- Demo license
- Demo floating license

#### Floating license

The software may be installed for internal use on any number of devices by the licensee. Only the concurrent user is licensed. The concurrent user is the person using the program. Use begins when the software is started. A license is required for each concurrent user.

#### Single license

Unlike the floating license, a single license permits only one installation of the software per license.

The type of use licensed is specified in the ordering data and in the Certificate of License (CoL). Types of use include for example per instance, per axis, per channel, etc.

One single license is required for each type of use defined.

#### Rental license

A rental license supports the "sporadic use" of engineering software. Once the license key has been installed, the software can be used for a specific period of time (the operating hours do not have to be consecutive).

One license is required for each installation of the software.

#### Rental floating license

The rental floating license corresponds to the rental license, except that a license is not required for each installation of the software. Rather, one license is required per object (for example, user or device).

#### Trial license

A trial license supports "short-term use" of the software in a non-productive context, e.g. for testing and evaluation purposes. It can be transferred to another license.

#### Demo license

The demo license support the "sporadic use" of engineering software in a non-productive context, for example, use for testing and evaluation purposes. It can be transferred to another license. After the installation of the license key, the software can be operated for a specific period of time, whereby usage can be interrupted as often as required.

One license is required per installation of the software.

#### Demo floating license

The demo floating license corresponds to the demo license, except that a license is not required for each installation of the software. Rather, one license is required per object (for example, user or device).

#### Certificate of license (CoL)

The CoL is the licensee's proof that the use of the software has been licensed by Siemens. A CoL is required for every type of use and must be kept in a safe place.

#### Downgrading

The licensee is permitted to use the software or an earlier version/release of the software, provided that the licensee owns such a version/release and its use is technically feasible.

#### Delivery versions

Software is constantly being updated. The following delivery versions

- PowerPack
- Upgrade

can be used to access updates.

Existing bug fixes are supplied with the ServicePack version.

#### PowerPack

PowerPacks can be used to upgrade to more powerful software. The licensee receives a new license agreement and CoL (Certificate of License) with the PowerPack. This CoL, together with the CoL for the original product, proves that the new software is licensed.

A separate PowerPack must be purchased for each original license of the software to be replaced.

#### Upgrade

An upgrade permits the use of a new version of the software on the condition that a license for a previous version of the product is already held.

The licensee receives a new license agreement and CoL with the upgrade. This CoL, together with the CoL for the previous product, proves that the new version is licensed.

A separate upgrade must be purchased for each original license of the software to be upgraded.

## Appendix

### Software Licenses

#### Overview

##### **ServicePack**

ServicePacks are used to debug existing products. ServicePacks may be duplicated for use as prescribed according to the number of existing original licenses.

##### **License key**

Siemens Industry Automation & Drive Technologies supplies software products with and without license keys.

The license key serves as an electronic license stamp and is also the "switch" for activating the software (floating license, rental license, etc.).

The complete installation of software products requiring license keys includes the program to be licensed (the software) and the license key (which represents the license).

##### **Software Update Service (SUS)**

As part of the SUS contract, all software updates for the respective product are made available to you free of charge for a period of one year from the invoice date. The contract will automatically be extended for one year if it is not canceled three months before it expires.

The possession of the current version of the respective software is a basic condition for entering into an SUS contract.

You can download explanations concerning license conditions from [www.siemens.com/automation/salesmaterial-as/catalog/en/terms\\_of\\_trade\\_en.pdf](http://www.siemens.com/automation/salesmaterial-as/catalog/en/terms_of_trade_en.pdf)

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## Appendix

### Notes





## Appendix

### Conditions of sale and delivery

#### 1. General Provisions

By using this catalog you can acquire hardware and software products described therein from Siemens AG subject to the following Terms and Conditions of Sale and Delivery (hereinafter referred to as "T&C"). Please note that the scope, the quality and the conditions for supplies and services, including software products, by any Siemens entity having a registered office outside Germany, shall be subject exclusively to the General Terms and Conditions of the respective Siemens entity. The following T&C apply exclusively for orders placed with Siemens Aktiengesellschaft, Germany.

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- the "General Terms of Payment"<sup>1)</sup> and,
- for software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or Registered Office in Germany"<sup>1)</sup> and,
- for other supplies and services, the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry"<sup>1)</sup>.

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- the "General Terms of Payment"<sup>1)</sup> and,
- for software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or Registered Office outside of Germany"<sup>1)</sup> and
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[www.siemens.com/automation/salesmaterial-as/catalog/en/terms\\_of\\_trade\\_en.pdf](http://www.siemens.com/automation/salesmaterial-as/catalog/en/terms_of_trade_en.pdf)

To calculate the surcharge (except in the cases of dysprosium and neodym), the official price from the day prior to that on which the order was received or the release order was effected is used.

To calculate the surcharge applicable to dysprosium and neodym ("rare earths"), the corresponding three-month basic average price in the quarter prior to that in which the order was received or the release order was effected is used with a one-month buffer (details on the calculation can be found in the explanation of the metal factor).

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