Network transitions

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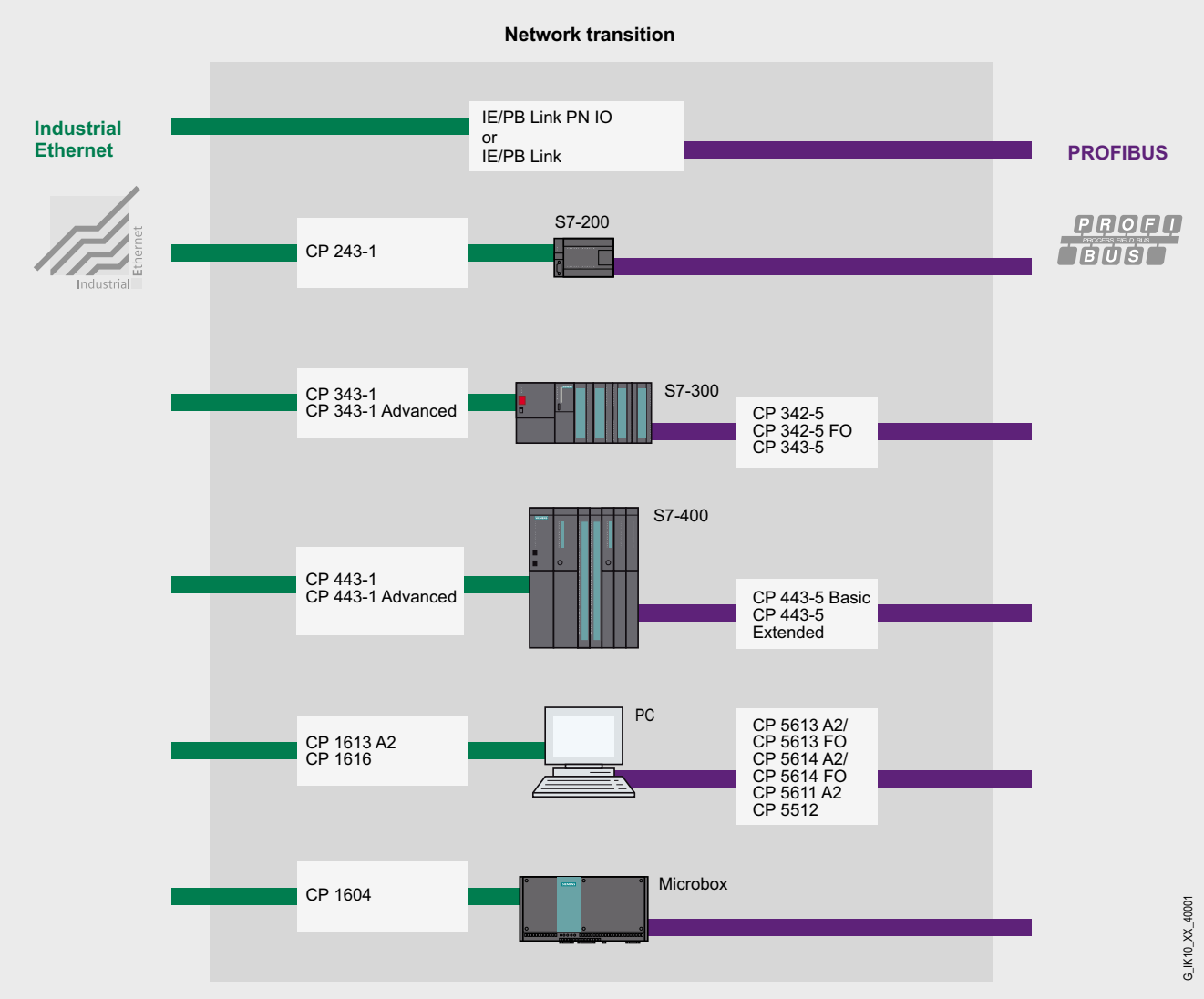
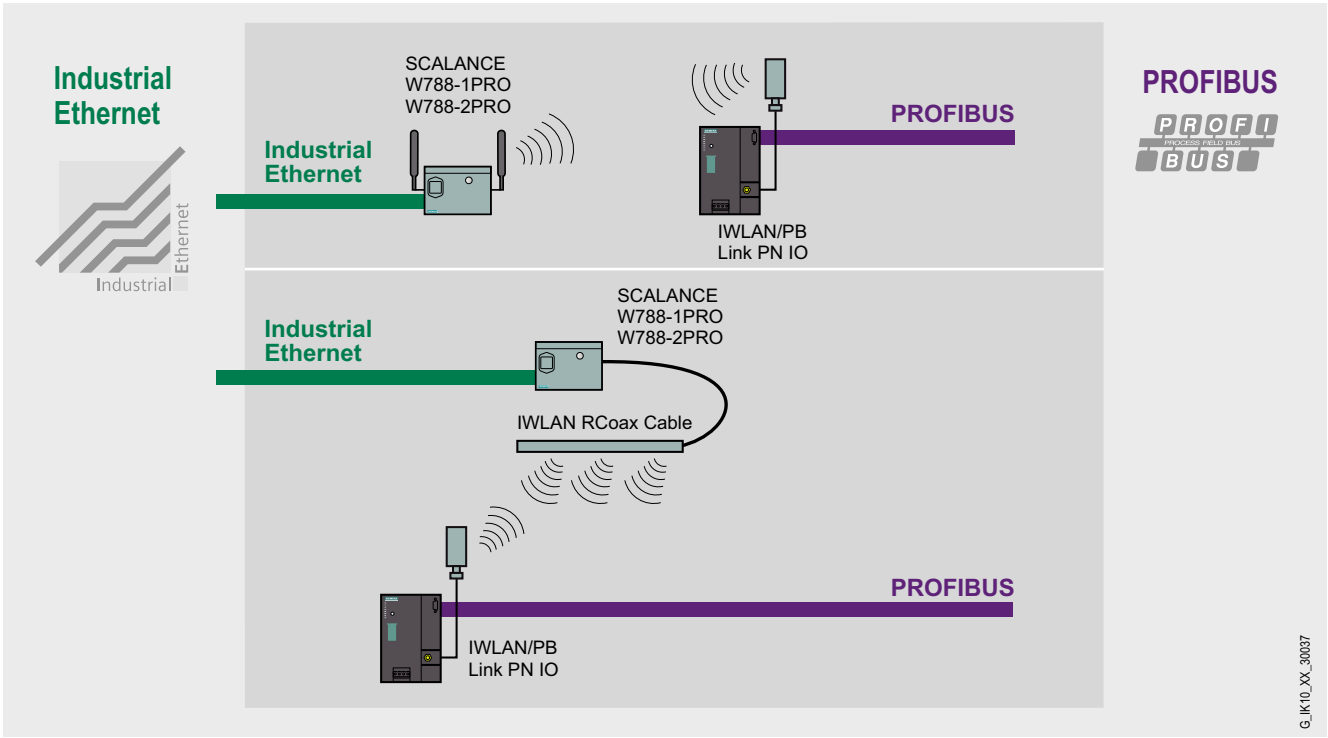
Introduction

Overview

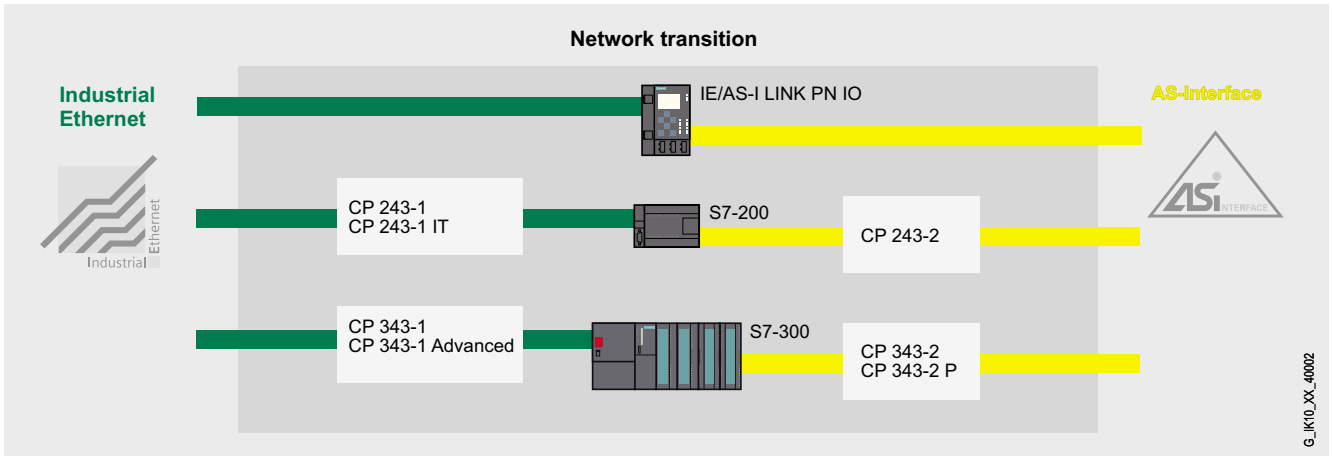


Industrial Ethernet – PROFIBUS network transitions

Overview (continued)



IWLAN – PROFIBUS network transitions



Industrial Ethernet – AS-Interface network transitions

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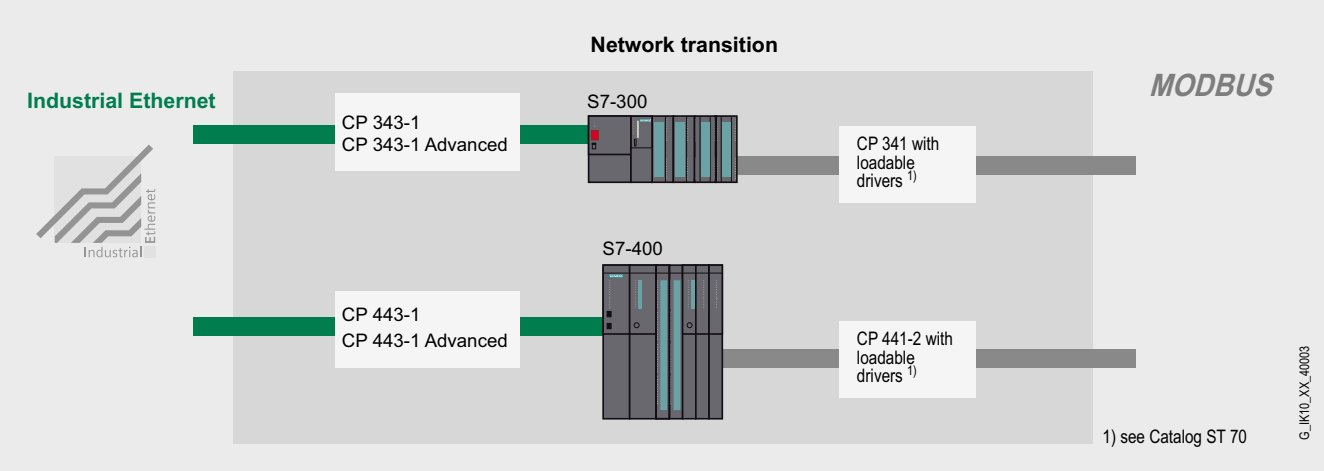
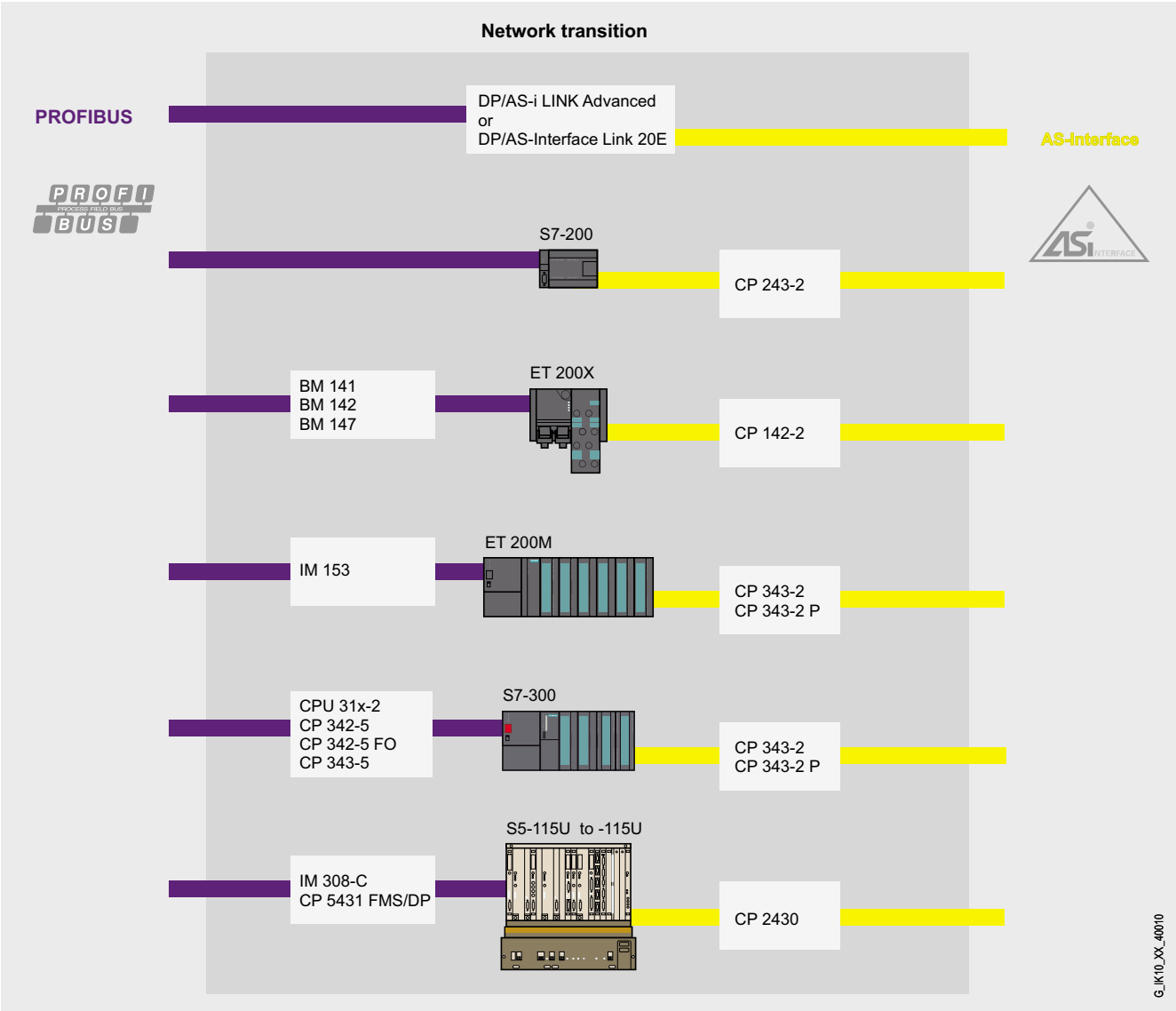
Introduction

Overview (continued)

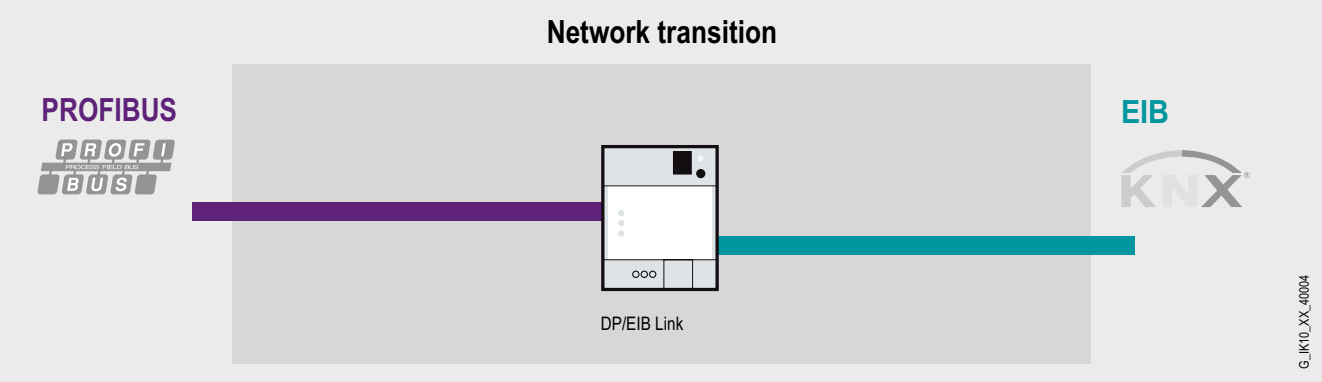


Industrial Ethernet – MODBUS network transitions

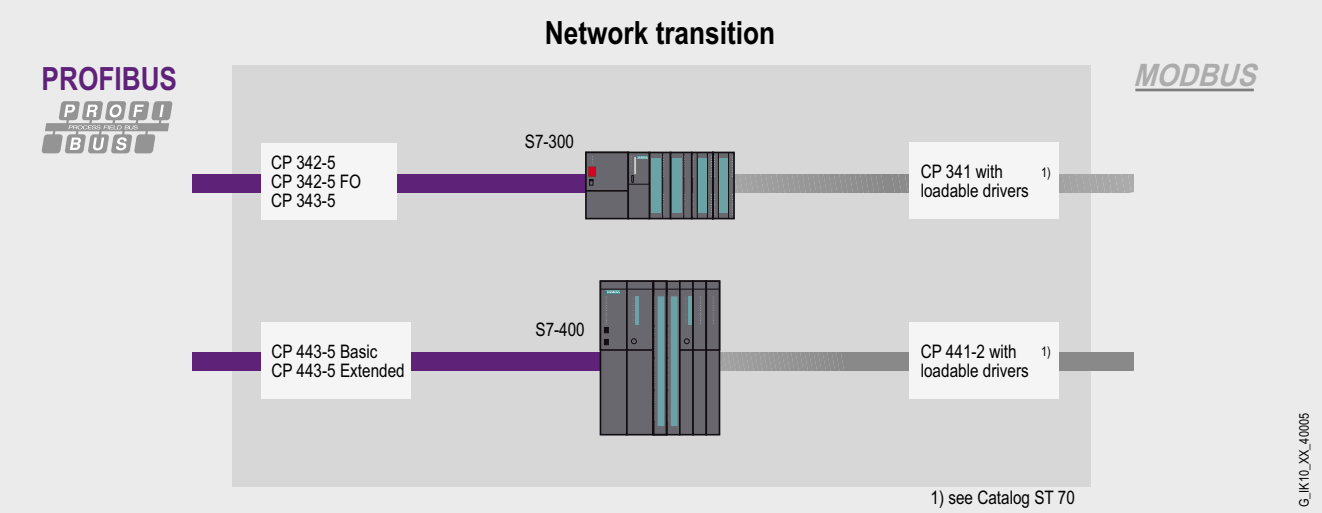


PROFIBUS – AS-Interface network transitions

Overview (continued)



PROFIBUS – EIB network transitions

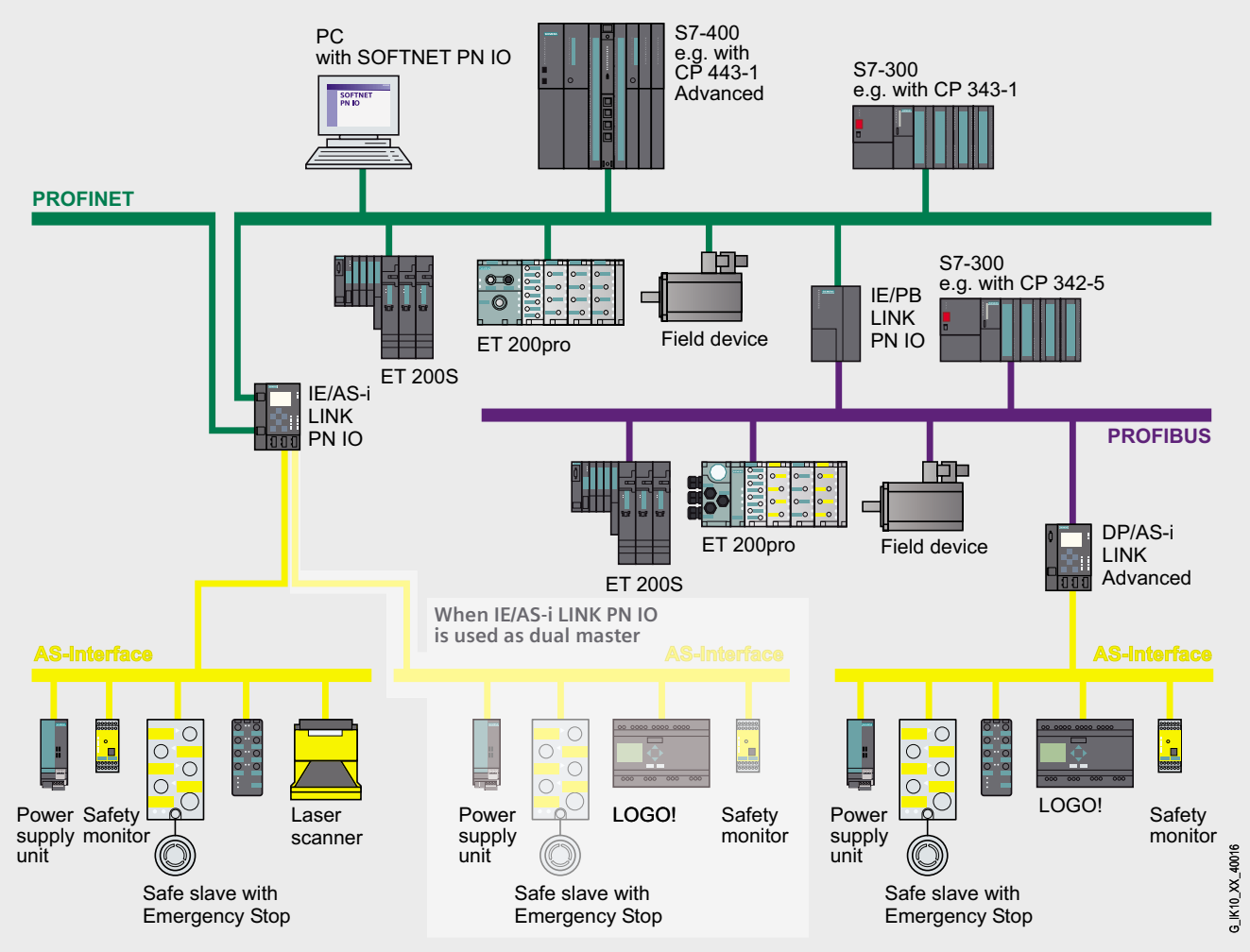


PROFIBUS – MODBUS network transitions

Introduction

Application

The advantages of Industrial Ethernet, PROFIBUS, EIB and AS-Interface can be utilized in a common bus system by means of special links.



Network transitions from one bus system to another are implemented using links, PLCs or PCs. In the case of PLCs or PCs, this can take place via integrated interfaces and communications processors (CPs). Links pass on the data autonomously from one network to the other.

The following links are available:

- IE/PB Link and IE/PB Link PN IO for the transition from Industrial Ethernet to PROFIBUS (also for fail-safe communication)
- IE/AS-i LINK PN IO for the transition from Industrial Ethernet to AS-Interface
- IWLAN/PB Link PN IO for the transition from IWLAN to PROFIBUS
- DP/AS-i LINK Advanced and DP/AS-Interface Link 20E for the transition from PROFIBUS to AS-Interface
- DP/EIB Link for the transition from PROFIBUS to KNX/EIB

In the case of PLCs such as e.g. SIMATIC S7-200, S7-300, S7-400, SINUMERIK or SIMOTION C, data is exchanged between the individual networks by means of communications processors or integrated interfaces. The data is linked by means of a PLC, and therefore passed on to the other network already preprocessed.

PROFINET network transition with proxy functionality

PROFIBUS segments can be connected to Industrial Ethernet via PROFINET proxys. This connection can be implemented using a solution with the SIMATIC WinAC PN optional package, SIMATIC S7-300/400-CPUs with DP and PN interface, IE/PB Link or via the IE/PB Link PN IO.

For a wireless network transition, a SCALANCE W-700 Access Point with the IWLAN/PB Link PN IO can be used. This allows all PROFIBUS standard slaves to be used unchanged for PROFINET.

Application (continued)

PROFINET

Based on Industrial Ethernet, PROFINET enables direct communication of field devices (IO devices) with controllers (IO controllers) as well as the solution of isochronous drive controls for motion control applications. PROFINET also supports distributed automation with the help of component engineering (Component Based Automation).

PROFIBUS DP device types

PROFIBUS DP distinguishes between two different master classes and different DP functions:

DP Master Class 1

The DP Master Class 1 is the central component on PROFIBUS DP. The central controller or PC exchanges information with distributed stations (DP slaves) in a fixed, repeated message cycle.

DP Master Class 2

Devices of this type are used (programming, configuration or control devices) during start-up, for configuring the DP system or for controlling the plant during normal operation (diagnostics). A DP Master Class 2 can be used, for example, to read the input, output, diagnostics and configuration data of the slaves.

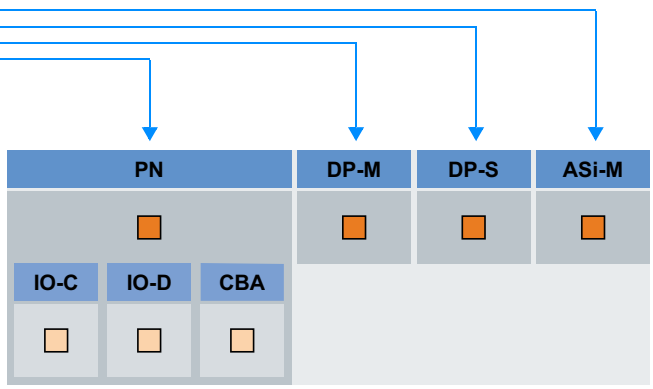
DP slave

A DP slave is an I/O station that reads in input data and transfers output data to the I/O. The volume of input and output data depends on the device and can be up to 244 byte.

The functional scope can differ between DP Master Class 1 and 2 or DP slaves. This determines the performance and availability of a communications processor.

AS-Interface master

AS-Interface is a single-master system and consists of a master, an AS-Interface power supply and the stations, referred to as slaves. The masters, e.g. communications processors or links, handle data exchange with the slaves.



More information

Important note:
It is important to note the restrictions for use of the specified SIMATIC Net products (Order Nos. 6GK..., 6XV1...) which you can view in the Internet:.

Additional information is available in the Internet:

http://www.siemens.com/simatic-net/ik-info

IWLAN/PB Link PN IO

Overview

PN			DP-M	DP-S	ASi-M
■			■		
IO-C	IO-D	CBA			
	□				

- Compact router between Industrial Wireless LAN and PROFIBUS
- Flexible integration of field level systems into an IWLAN radio infrastructure according to IEEE 802.11b/g and IEEE 802.11a with up to 54 Mbit/s at 2.4 GHz or 5 GHz with SCALANCE W Access Points
- PROFINET IO proxy;
  connection of PROFIBUS DP slaves to PROFINET IO controller according to PROFINET standard:
  - from the viewpoint of the IO-controller, all DP slaves are handled like I/O devices with Ethernet interface, i.e. the IWLAN/PB Link PN IO is their proxy.
  - from the viewpoint of the DP slaves, the IWLAN/PB Link PN IO is the DP master
- Connection of a WLAN antenna or alternatively an antenna for operation with an RCoax cable (radiating cable)
- Communication with programmable controllers in mobile applications such as automated guided vehicles, storage and retrieval systems or monorail overhead conveyors
- Direct substitution of solutions with Power Rail Booster for PROFIBUS with non-contact data transmission technology; Advantages: No wear of sliding contacts
- For installation in the casing of the Power Rail Booster (common with overhead conveyor and automated guided vehicles) to degree of protection IP20
- High, reliable data throughput together with rapid roaming
- High degree of protection against unauthorized access thanks to 128-bit encoding (AES)
- Module replacement without the need for a programming device, using the C-PLUG swap media for backing up the configuration data
- Integration in STEP 7

Benefits

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- High mobility;
  increased plant availability through wireless data transmission to mobile communication partners, e.g. to control an automated guided vehicle system (AGVS)
- Wear-free;
  contact-free technology with RCoax as a substitute for contact wires, e.g. in monorail overhead conveyors
- Integration of PROFIBUS field devices into an IWLAN radio network (investment protection)
- Designed for compatibility with Power Rail Booster;
  optimized for installation in overhead conveyors with ET 200S
- Flexible implementation by connecting an IWLAN antenna or an alternative antenna for RCoax cable
- Module replacement without the need for a programming device, using the C-PLUG swap media for backing up the configuration data

Application

The IWLAN Link PN IO supports the use of an IWLAN with RCoax and WLAN antennas for wireless or contact-free data transmission e.g. in monorail overhead conveyors or storage and retrieval systems. With the support of PROFINET the numerous different PROFIBUS system functions, such as diagnosis over the bus, remain available.

- Monorail overhead conveyors;
  vehicle controllers for monorail overhead conveyors can be implemented at low cost on the basis of SIMATIC components. High availability, short response times and easy expansion can be achieved by using distributed controllers, such as SIMATIC ET 200S IM 151/CPU. The IWLAN/PB Link PN IO allows the vehicle control systems to be used unchanged. The user can also program them remotely with STEP 7 over IWLAN.
- Storage and retrieval systems;
  with these systems, data light barriers requiring intensive maintenance can be replaced by an IWLAN solution. This enhances plant availability.

Design

The IWLAN/PB Link PN IO is snapped onto a standard rail, and the outer dimensions correspond to the housing of the Power Rail Booster. Using a connector, either an antenna for RCoax or an antenna for an IWLAN radio field can be connected. The degree of protection IP20 ensures that the IWLAN/PB Link PN IO is suitable for installation in the control cabinet.

- Compact design;
  the rugged plastic casing features on the front:
  - an R-SMA interface for connecting antennae
  - one 9-pin Sub-D socket for connection to PROFIBUS
  - one 4-pin terminal strip for connecting the external supply voltage of 24 V DC.
  - Diagnostic LEDs
- Can be operated without a fan
- Fast device replacement in the event of a fault by using the optional C-PLUG swap medium (not included in scope of supply)

Function

PROFINET

- PROFINET IO proxy;
  wireless connection of PROFIBUS DP slaves to PROFINET IO controller according to PROFINET standard

Diagnostics

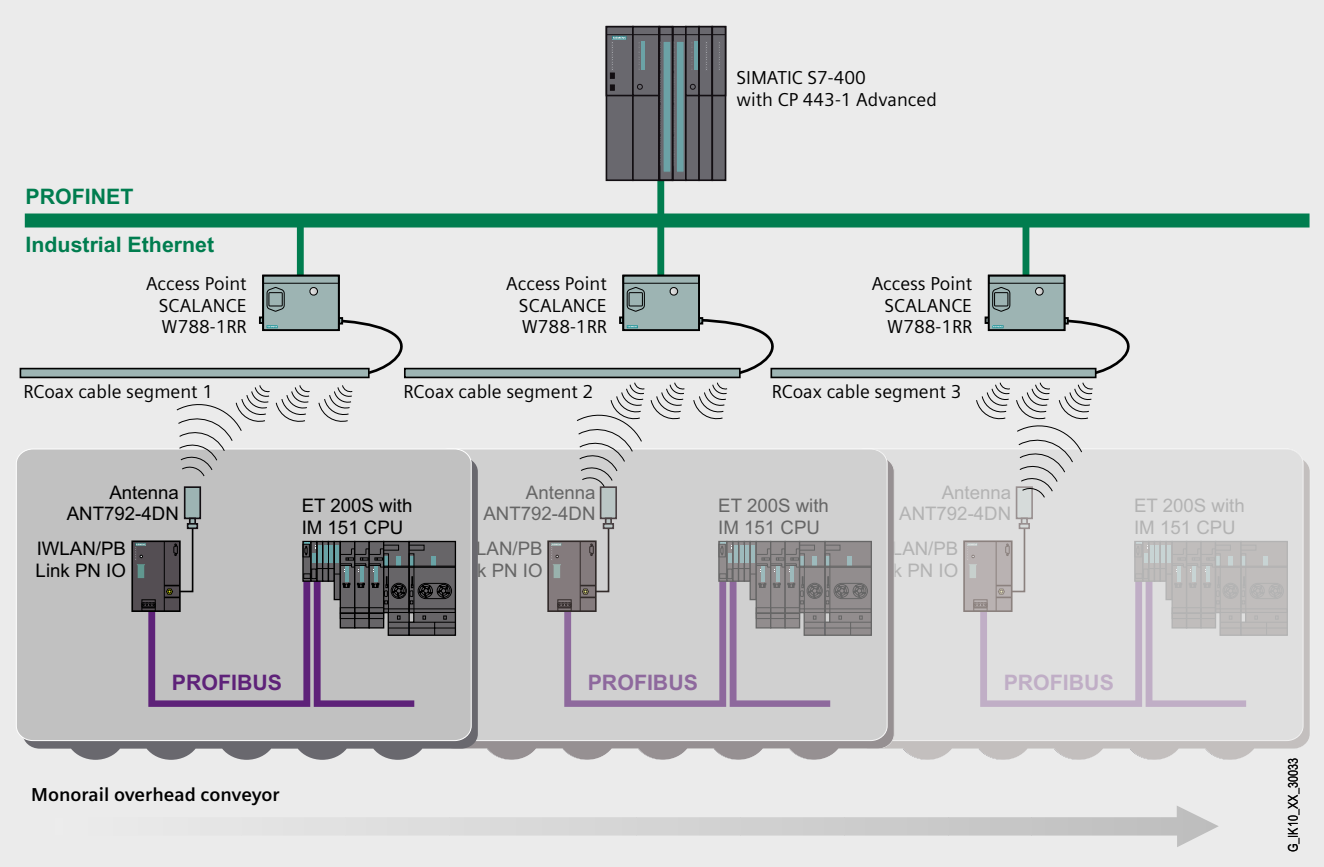
Extensive diagnostic options are available via STEP 7 or SNMP, including:

- Diagnosis of the assigned PROFINET field devices;
  using the IWLAN/PB Link PN IO as a proxy, the connected DP slaves can be diagnosed in the same manner as PROFINET IO devices (also in the user program of the PROFINET IO controller)
- General diagnostics and statistics functions
- Connection diagnostics
- LAN controller statistics
- Diagnostics Buffer
- Integration into network management systems through the support of SNMP V1 MIB-II

Configuring

With STEP 7 V 5.3 SP2 or higher (HSP IWLAN/PB Link PN IO necessary), the parameters required for the IWLAN/PB Link PN IO, e.g. the addresses, are assigned and all the necessary routing information is automatically generated.

Integration



System solution with IWLAN/PB Link PN IO using example of monorail overhead conveyor

IWLAN – PROFIBUS network transition

IWLAN/PB Link PN IO

Technical specifications

Data transmission rates	
• Radio	1 … 54 Mbit/s
- standards supported	802.11a, 802.11b, 802.11g
• PROFIBUS	9.6 kbit/s … 12 Mbit/s incl. 45.45 kbit/s (PROFIBUS PA)
Interfaces	
• Connection to Industrial Wireless LAN	RSMA antenna socket
• Connection to PROFIBUS	9-pin Sub-D socket
- maximum segment length for PROFIBUS [1]	20 m
- maximum current consumption at the PROFIBUS interface with connection of network components (for example, optical network components)	100 mA at 5 V
• Connection for power supply	4-pin terminal block
Power supply [2]	2 supplies for 20.4 … 28.8 V DC
Current consumption (at rated voltage)	
• External from 24 V DC, max.	300 mA
Power loss	approx. 6.5 W
Perm. ambient conditions	
• Operating temperature	0 °C … + 60 °C
• Transport/storage temperature	- 40 °C … + 70 °C
• Relative humidity, max.	95 % at +25 °C
Construction	
• Module format	Power Rail Booster enclosure
• Dimensions (W x H x D) in mm	90 x 132 x 75
• Weight	approx. 300 g
Degree of protection	IP20
Configuration	
Configuration software	STEP 7/NCM S7 with V5.3 SP2 or later plus Hardware Support Package for IWLAN/PB Link PN IO
Performance data	
PROFINET communication	
• Number of DP slaves on the IWLAN/PB Link PN IO (PROFINET IO-Devices for PROFINET IO)	max. 8
• Number of DP inputs.	max. 256 byte
• Number of DP outputs.	max. 256 byte
Additional functionality	
• Number of S7 connections	max. 8
• Number of DSGW connections	max. 8

1) A repeater is required if the specified length is exceeded

2) The power supply is electrically isolated; a high-impedance connection (>700 kΩ) exists to the contact spring for mounting of the enclosure on the DIN rail).

Ordering data

	Order No.
IWLAN/PB Link PN IO Network transition between Industrial Wireless LAN and PROFIBUS with PROFINET IO functionality, TCP/IP, S7-Routing, IEEE 802.11 b/g/a at 2.4/5 GHz to 54 Mbit/s, 9.6 kbit/s to 12 Mbit/s PROFIBUS; including electronic manual on CD-ROM German, English, French, Spanish, Italian	
• National approvals for operation outside the U.S.A. and Canada	**6GK1 417-5AB00**
• National approvals for operation inside the U.S.A. and Canada	**6GK1 417-5AB01**
C-PLUG 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	**6GK1 900-0AB00**
NCM S7 configuration software for Industrial Ethernet	Delivered with STEP 7 V5.3
Documentation S7-CPs/NCM Paper version for Industrial Ethernet and PROFIBUS; manual package for configuring S7-CPs, IE/PB Link and PC-Station (STEP 7 V5.3)	
• German	**6GK7 080-0AA01-8AA0**
• English	**6GK7 080-0AA01-8BA0**
S7-300 power supply PS 307 24 V DC	**6ES7 307-1BA00-0AA0**
IWLAN RCoax cables Radiating cables for complex radio environments as special antenna for SCALANCE W Access Points; for enhanced temperature range (-40 °C … + 85 °C); sold by the meter	**6XV1 875-2A**
• 2.4 GHz	**6XV1 875-2A**
• 5 GHz	**6XV1 875-2D**
IWLAN RCoax N-Connect Female Antenna ANT792-4DN RCoax helical antenna with circular polarization for RCoax systems; 2.4 GHz; N-Connect female connection; antenna gain 1 dB at 2.4 GHz; degree of protection IP67; ambient temperature -20 °C … +60 °C	**6GK5 792-4DN00-0AA6**
IWLAN RCoax N-Connect Female Antenna ANT793-4MN RCoax 5/8 antenna, vertical polarization for RCoax systems; 5 GHz; N-Connect female connection; degree of protection IP67; ambient temperature -20 °C … +60 °C	**6GK5 793-4MN00-0AA6**

Ordering data	Order No.
SCALANCE W788-1PRO	
IWLAN Access Point with built-in radio interface; radio networks IEEE 802.11b/g/a at 2.4/5 GHz to 54 Mbit/s; national approvals; WPA/AES; Power over Ethernet (PoE), degree of protection IP65 (-20 °C … +60 °C); scope of supply: 2 antennas ANT795-4MR, IP67 hybrid plug-in connector, assembly material, manual on CD-ROM; German/English	
• National approvals for operation outside the U.S.A. and Canada	**6GK5 788-1ST00-2AA6**
• National approvals for operation inside the U.S.A. and Canada	**6GK5 788-1ST00-2AB6**
SCALANCE W788-2PRO	
IWLAN Dual Access Point with two built-in radio interfaces; radio networks IEEE 802.11b/g/a at 2.4/5 GHz to 54 Mbit/s; national approvals; WPA/AES; Power over Ethernet (PoE), degree of protection IP65 (-20 °C … +60 °C); scope of supply: 2 antennas ANT795-4MR, IP67 hybrid plug-in connector, assembly material, manual on CD-ROM; German/English	
• National approvals for operation outside the U.S.A. and Canada	**6GK5 788-2ST00-2AA6**
• National approvals for operation inside the U.S.A. and Canada	**6GK5 788-2ST00-2AB6**
SCALANCE W788-1RR	
IWLAN Access Point with built-in radio interface; Industrial Wireless LAN Rapid Roaming (IWLAN RR) or Industrial Wireless LAN (IWLAN); radio networks IEEE 802.11b/g/a at 2.4/5 GHz to 54 Mbit/s; national approvals; WPA/AES; Power over Ethernet (PoE), degree of protection IP65 (-20 °C … +60 °C); scope of supply: 2 antennas ANT795-4MR, IP67 hybrid plug-in connector, assembly material, manual on CD-ROM; German/English	
• National approvals for operation outside the U.S.A. and Canada	**6GK5 788-1SR00-2AA6**
• National approvals for operation inside the U.S.A. and Canada	**6GK5 788-1SR00-2AB6**
SCALANCE W788-2RR	
IWLAN Dual Access Point with two built-in radio interfaces; Industrial Wireless LAN Rapid Roaming (IWLAN RR) or Industrial Wireless LAN (IWLAN); radio networks IEEE 802.11b/g/a at 2.4/5 GHz to 54 Mbit/s; national approvals; WPA/AES; Power over Ethernet (PoE), degree of protection IP65 (-20 °C … +60 °C); scope of supply: 2 antennas ANT795-4MR, P67 hybrid plug-in connector, assembly material, manual on CD-ROM; German/English	
• National approvals for operation outside the U.S.A. and Canada	**6GK5 788-2SR00-2AA6**
• National approvals for operation inside the U.S.A. and Canada	**6GK5 788-2SR00-2AB6**

	Order No.
RCoax N-Connect Male Termination Impedance	**6GK5 795-1TN00-1AA0**
Terminating resistor, 50 Ohm	
RCoax N-Connect Female N-Connector	**6GK5 798-0CN00-0AA0**
Plug-in connector for assembly in the field	
RCoax N-Connect male/male	
Flexible connecting cable e.g. between two RCoax segments	
• 1 m	**6XV1 875-5AH10**
• 5 m	**6XV1 875-5AH50**
RCoax N-Connect/R-SMA male/male	
Flexible connecting cable for components with R-SMA connection and RCoax N-Connect	
• 1 m	**6XV1 875-5CH10**
• 5 m	**6XV1 875-5CH50**
RCoax R-SMA/SMA Male/Male Flexible Connection Cable	
Flexible cable for connecting an IWLAN/PB Link PN IO to components with R-SMA and SMA connections, e.g. cabinet feedthrough; assembled with two R-SMA to N-male connectors	
• 0.3 m	**6XV1 875-5DE30**
RCoax N-Connect/R-SMA female/female panel feedthrough	**6GK5 798-0PT00-2AA0**
Panel feedthrough for wall thicknesses up to 5.5 mm, R-SMA female and N-female connections	
Preset-PLUG	**6GK5 798-8AB00**
Swap medium for simple initial startup of IWLAN clients, e.g. SCALANCE W-740 client modules or IWLAN/PB Link PN IO	

IE/PB Link PN IO

Overview

PN			DP-M	DP-S	ASi-M
			■		
IO-C	IO-D	CBA			
	□				

- Compact network transition between Industrial Ethernet and PROFIBUS
- Connection to Industrial Ethernet
  with 10/100 Mbit/s full/half duplex connection with auto-sensing for automatic switchover
- Connection to PROFIBUS
  with 9.6 kbit/s to 12 Mbit/s incl. 45.45 kbit/s for PROFIBUS PA
- PROFINET IO proxy;
  connection of PROFIBUS DP slaves to PROFINET IO controller via real-time communication (RT) according to PROFINET standard:
  - from the viewpoint of the IO-controller, all DP slaves are handled like I/O devices of the Ethernet interface, i.e. the IE/PB Link PN IO is its proxy.
- Cross-network programming device/operator panel communication by S7 routing,
  i.e. all S7 stations can be remotely programmed by the programming device on the Industrial Ethernet or PROFIBUS.
- Cross-network access to data of S7 stations for visualization by means of S7 OPC server and S7 routing;
  - via the IE/PB Link PN IO access can be made from the PC on the Industrial Ethernet (e.g. for HMI applications with OPC Client interface) by means of S7 OPC server, to all data of the S7 stations on the PROFIBUS.
- Module replacement without the need for a PG, using the C-PLUG swap media for backing up the configuration data

Benefits

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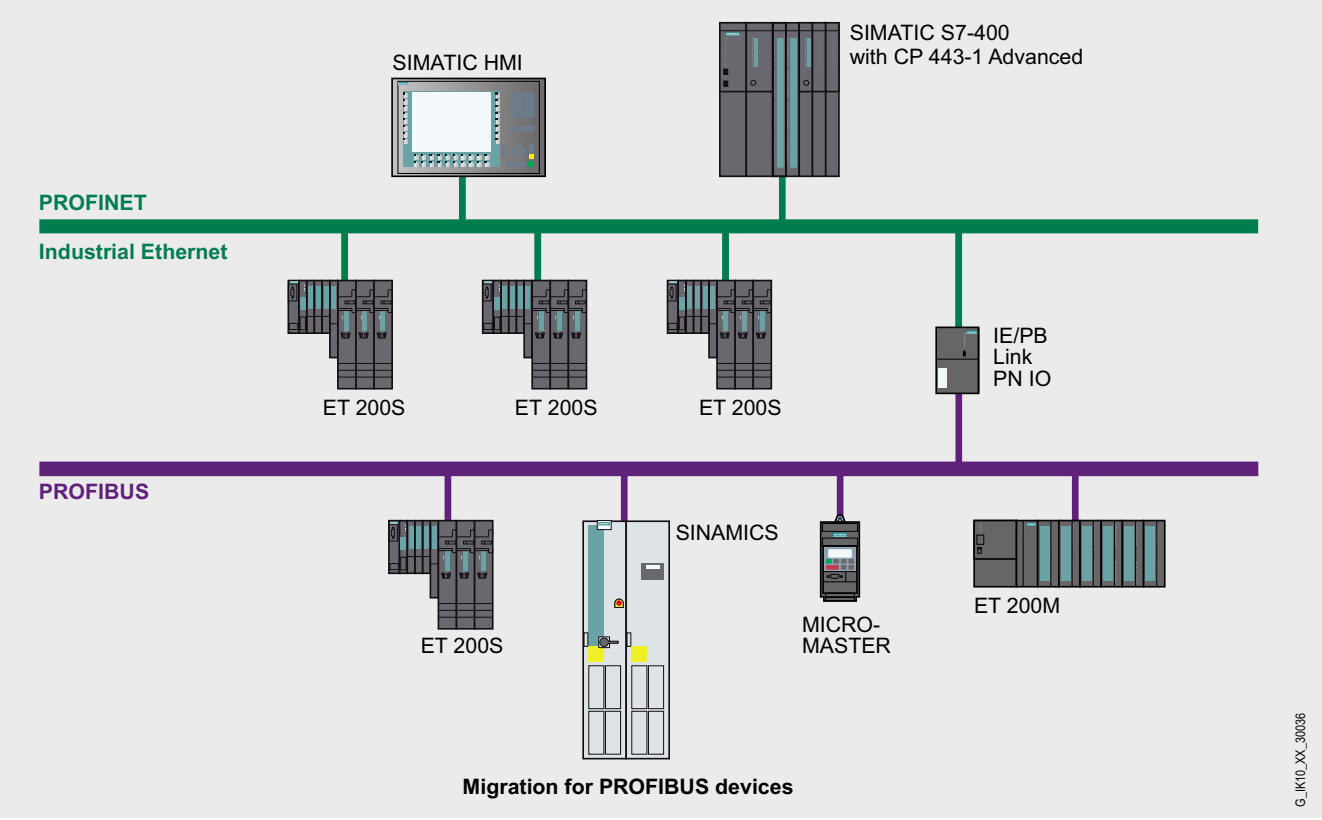
PROFINET applications

- Protection of investment due to simple connection of PROFIBUS DP slaves to PROFINET IO controller
- Access to process data from all plant management levels
- Worldwide access to data of the PROFIBUS nodes via Industrial Ethernet and Internet for vertical integration
- Optimization of a plant from a central location
- Loading of STEP 7 programs from a central location
- Independence from manufacturers thanks to support of the PROFINET standard for distributed field devices
- Module replacement without the need for a PG, using the C-PLUG swap media for backing up the configuration data



Migration for PROFIBUS devices

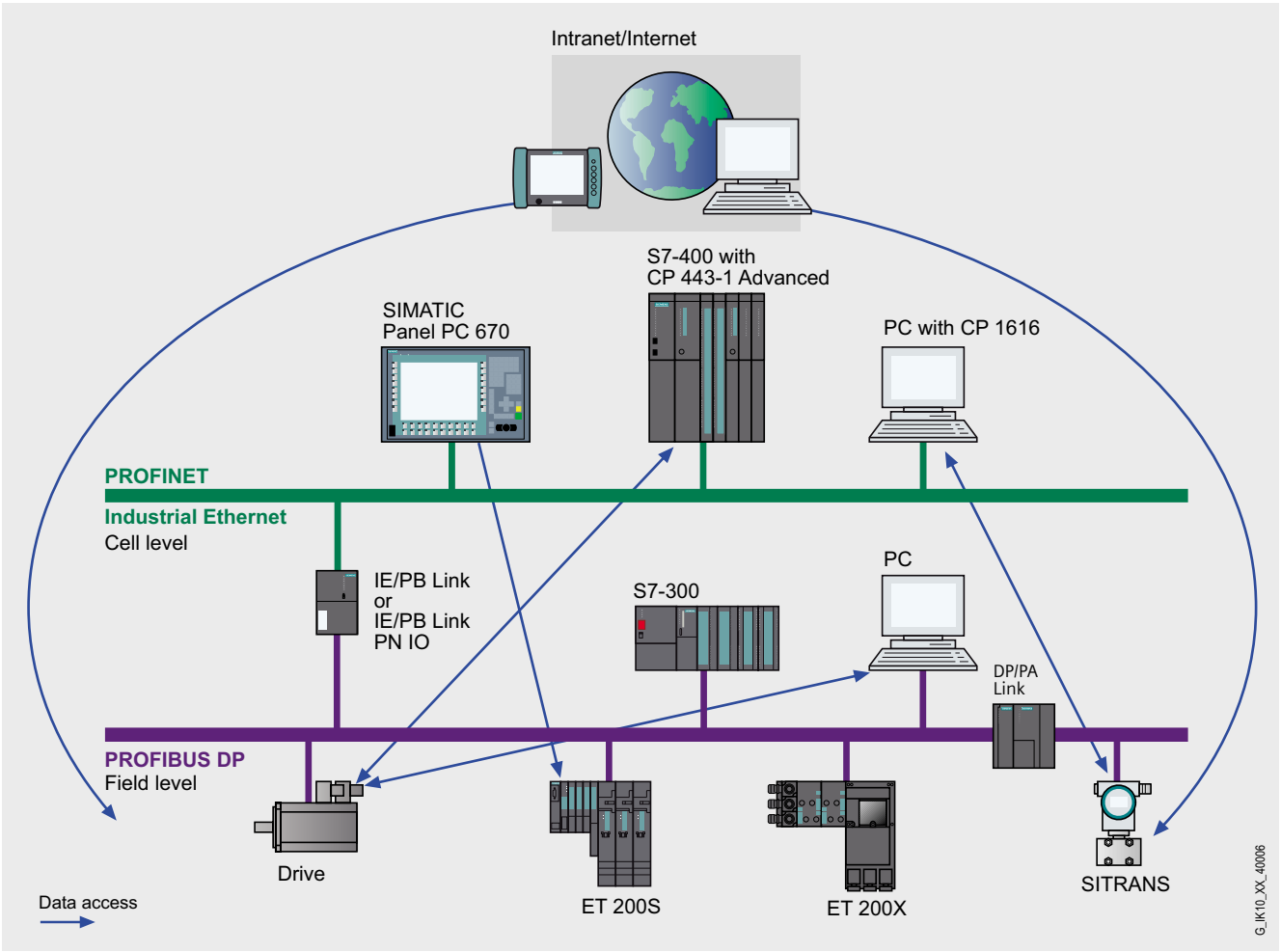
Sample configuration of PROFINET with Industrial Ethernet and PROFIBUS. Via the IE/PB Link PN IO as proxy, PROFIBUS devices can be seamlessly incorporated in the PROFINET.

IE/PB Link PN IO

Benefits (continued)

Applications in the case of vertical integration

- Worldwide access to data of the PROFIBUS nodes via Industrial Ethernet and Internet for vertical integration
- Optimization of a plant from a central location
- Access to process data from all plant management levels
- Loading of STEP 7 programs from a central location



Sample configuration of IE/PB Link PN IO as router from Industrial Ethernet to PROFIBUS for vertical integration

Application

As an independent component, the IE/PB Link PN IO forms the seamless transition between Industrial Ethernet and PROFIBUS.

By means of the IE/PB Link PN IO as proxy, the existing PROFIBUS devices can continue to be used and integrated into a PROFINET application.

The IE/PB Link PN IO also offers the following functions:

- S7 routing
  - cross-network programming device/operator panel communication, i.e. all S7 stations can be remotely programmed by the programming device on the Industrial Ethernet or PROFIBUS.
  - from the HMI stations on the Industrial Ethernet, access can be made to visualization data of the S7 stations on the PROFIBUS.
- Data record routing (PROFIBUS DP)
  - this makes it possible, for example to parametrize and diagnose a PROFIBUS field device using SIMATIC PDM (on the PC) on the Industrial Ethernet via the IE/PB Link PN IO.

Design

The IE/PB Link PN IO exhibits all the advantages of the SIMATIC design:

- Compact design;
  the rugged plastic casing features on the front:
  - one RJ45 port for connection to Industrial Ethernet.
  - one 9-pin Sub-D socket for connection to PROFIBUS
  - one 2-pin terminal strip for connecting the external supply voltage of 24 V DC.
  - diagnostic LEDs
- Connection is by means of the IE FC RJ45 Plug 180 with 180° cable exit or by means of a standard patch cable
- Simple mounting;
  the IE/PB Link PN IO is mounted on an S7-300 DIN rail.
- Can be operated without a fan
- Fast device replacement in the event of a fault by using the optional C-PLUG swap medium (not included in scope of supply)

Function

PROFINET

- PROFINET IO proxy;
  connection of PROFIBUS DP slaves to PROFINET IO controller via real-time communication (RT) according to PROFINET standard

Additional functions for vertical integration

- S7 routing
  - cross-network programming device communication, i.e. all S7 stations on Industrial Ethernet or PROFIBUS can be remotely programmed by the programming device.
  - from the HMI stations on the Industrial Ethernet, access can be made to visualization data from the S7 stations on the PROFIBUS.
- Data record routing (PROFIBUS DP)
  - with this option, the IE/PB Link PN IO can be used as a router for data sets that have to be sent to field devices (DP slaves). SIMATIC PDM (Process Device Manager) is a tool that creates data sets of this type for parameterizing and diagnosing field devices.
    Application:
    This makes it possible, for example to parameterize and diagnose a PROFIBUS PA field device using SIMATIC PDM (on the PC) on Industrial Ethernet via the IE/PB Link PN IO and DP/PA coupler.

The additional functions for vertical integration can also be used in an existing PROFIBUS application without PROFINET for interfacing to a higher-level Industrial Ethernet.

The IE/PB Link PN IO can be used as an additional DP master Class 2 on a PROFIBUS segment for coupling to Industrial Ethernet and offers the above-mentioned functions.

Diagnostics

Extensive diagnostic options are available via STEP S7 or SNMP, including:

- Diagnosis of the assigned PROFINET field devices;
  using the IE/PB Link PN IO as a proxy, the connected DP slaves can be diagnosed in the same manner as PROFINET IO devices (also in the user program of the PROFINET IO controller)
- General diagnostics and statistics functions
- Connection diagnostics
- LAN controller statistics
- Diagnostics buffer
- Integration into network management systems through the support of SNMP V1 MIB-II

Configuring

The IE/PB Link PN IO is configured with STEP 7, V 5.3 SP1 and higher.

The parameters required for IE/PB Link PN IO, e.g. the addresses, are assigned using STEP 7 and all the necessary routing information is automatically generated.

The configuration data for PROFINET IO created using STEP 7 are saved on the IO Controller. The maximum volume of data that can be stored must be taken into account. The initialization data for the Ethernet interface are backed up on the C-PLUG (Configuration Plug) swap medium. The IE/PB Link PN IO can be replaced without the need for a programming device in the event of failure because the relevant configuration data are backed up on the IO-Controller or on the C- PLUG.

Technical specifications

Data transmission rates	
• Industrial Ethernet	10/100 Mbit/s autosensing
• PROFIBUS	9.6 kbit/s to 12 Mbit/s incl. 45.45 kbit/s (PROFIBUS PA)
Interfaces	
• Connection to Industrial Ethernet	
- 10BaseT/100BaseT	RJ45
• Connection to PROFIBUS	9-pin Sub D socket
• Connection for power supply	2-pin terminal block
Power supply	24 V DC (+/-5%)
Current consumption (at rated voltage)	
• external from 24 V DC, max.	600 mA
Power loss	approx. 10 W
Perm. ambient conditions	
• Operating temperature	0 °C ... + 60 °C
• Transport/storage temperature	- 40 °C ... + 70 °C
• Relative humidity, max.	95 % at +25 °C
Construction	
• Module format	S7-300 construction
• Dimensions (W x H x D) in mm	80 x 125 x 120
• Weight	approx. 600 g
Degree of protection	IP20
Configuring	
Configuration software for PROFINET and additional functions	STEP 7/NCM S7, V5.3 SP1 or higher
Performance data	
PROFINET communication	
PROFINET IO performance data	
• Number of DP slaves on the IE/PB Link PN IO (PROFINET IO-Devices for PROFINET IO)	64
• Number of DP inputs, max.	2.048 byte
• Number of DP outputs, max.	2.048 byte
Additional functionality	
• Number of S7 connections	Max. 32
• Number of DSGW connections	Max. 32

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IE/PB Link PN IO

Ordering data	Order No.
IE/PB Link PN IO Network transition between Industrial Ethernet and PROFIBUS; with PROFINET IO functionality, TCP/IP, S7 routing and dataset routing, 10/100 Mbit/s Fast Ethernet, 9.6 to 12 Mbit/s PROFIBUS; including electronic manual on CD-ROM German, English, French, Spanish, Italian	**6GK1 411-5AB00**
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/CPUs with Industrial Ethernet interface	
• 1 pack = 1 item	**6GK1 901-1BB10-2AA0**
• 1 pack = 10 items	**6GK1 901-1BB10-2AB0**
• 1 pack = 50 items	**6GK1 901-1BB10-2AE0**
C-PLUG 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	**6GK1 900-0AB00**
S7-300 DIN rail	**6ES7 390-1AB60-0AA0**
S7-300 power supply PS 307 24 V DC	**6ES7 307-1BA00-0AA0**
NCM S7 configuration software for Industrial Ethernet	Included in STEP 7 V5 scope of supply
Documentation S7-CPs/NCM Paper version for Industrial Ethernet and PROFIBUS; manual package for configuring S7-CPs, IE/PB Link and PC-Station (STEP 7 V5.3)	
• German	**6GK7 080-0AA01-8AA0**
• English	**6GK7 080-0AA01-8BA0**
Manual for twisted pair and fiber optic networks Paper version network architecture, components, configurations, mounting guidelines	
• German	**6GK1 970-1BA10-0AA0**
• English	**6GK1 970-1BA10-0AA1**
Manual for PROFIBUS networks Paper version Network architecture, project management, network components, mounting	
• German	**6GK1 970-5CA20-0AA0**
• English	**6GK1 970-5CA20-0AA1**

More information

Additional information is available in the Internet:

http://www.siemens.com/profinet

8

Overview

PN			DP-M	DP-S	ASi-M
■			■		
IO-C	IO-D	CBA			
		■			

- Compact network transition between Industrial Ethernet and PROFIBUS
- Connection to Industrial Ethernet with 10/100 Mbit/s full/half duplex connection with autosensing for automatic switchover
- Connection to PROFIBUS with data transmission rates of 9.6 kbit/s to 12 Mbit/s incl. 45.45 kbit/s for PROFIBUS PA
- PROFINET Standard Version V1.0.
- IE/PB Link supports the PROFINET communication services for data communication between the PROFINET devices and is a proxy for PROFIBUS field devices.
- PROFINET defines an engineering model for distributed automation solutions and a model for integrated communication over PROFIBUS and Industrial Ethernet with IT standards.
- Cross-network programming device/operator panel communication by S7 routing, i.e. all S7 stations can be remotely programmed using the programming device on the Industrial Ethernet or PROFIBUS.

Benefits

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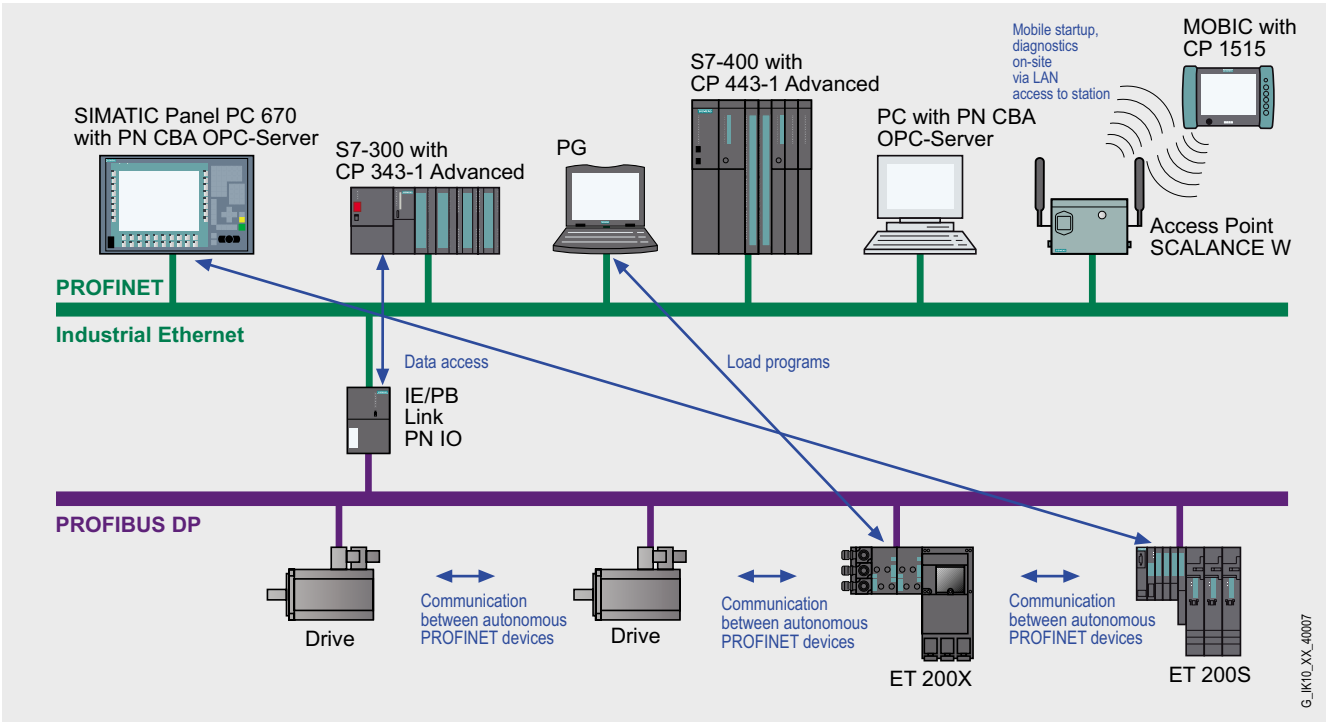
Applications in Component Based Automation

- Support for the PROFINET standard V1.0
- Consistent modularization of plants and machines through easy handling of distributed intelligence

- Access to process data from all plant management levels
- Worldwide access to data of the PROFIBUS nodes via Industrial Ethernet and Internet for vertical integration
- Optimization of a plant from a central location
- Loading of STEP 7 programs from a central location



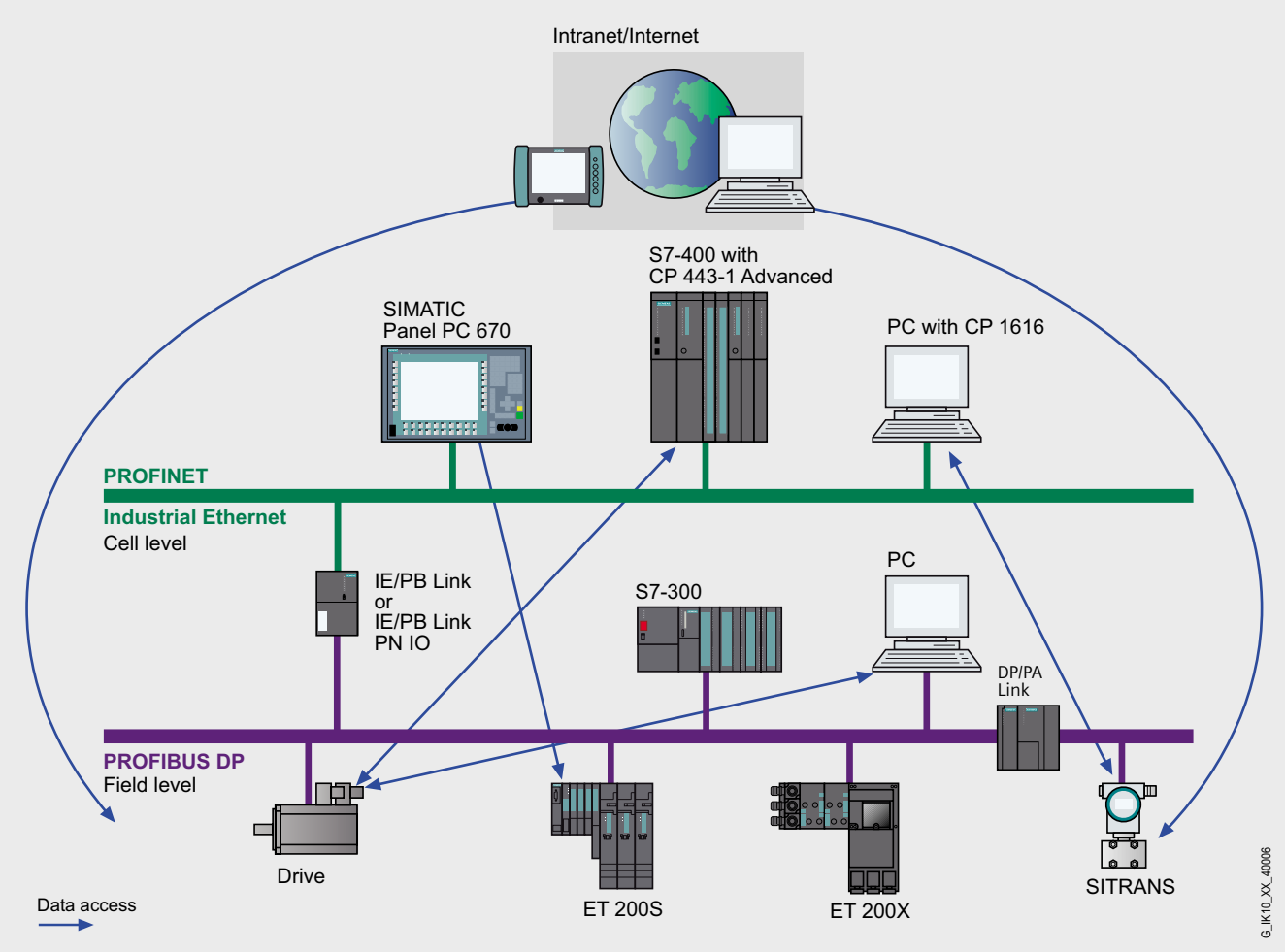
Sample configuration of PROFINET with Industrial Ethernet and PROFIBUS. Over the IE/PB Link as proxy, PROFIBUS devices can be seamlessly incorporated in the PROFINET.

IE/PB link

Benefits (continued)

Applications in the case of vertical integration

- Worldwide access to data of the PROFIBUS nodes via Industrial Ethernet and Internet for vertical integration
- Optimization of a plant from a central location
- Loading of STEP 7 programs from a central locations



Sample configuration of IE/PB Link as network transition from Industrial Ethernet to PROFIBUS for vertical integration

Application

As an independent component, the IE/PB Link enables the seamless transition between Industrial Ethernet and PROFIBUS.

PROFINET defines an engineering model for distributed automation solutions and a model for integrated communication over PROFIBUS and Industrial Ethernet with IT standards.

PROFINET facilitates communication relationships between PROFIBUS devices as well as between PROFIBUS devices and Ethernet devices. IE/PB Link supports the connection of DP slaves as well as the connection of PROFIBUS devices with loadable functionality in the form of a program, e.g. an ET 200 S with CPU.

This allows vertical integration from the management level down to the field level.

- Support for Component Based Automation based on the new PROFINET standard of PROFIBUS International.
  This standard supports:
  - component technology in automation engineering
  - graphical configuration of communication between intelligent devices instead of complex programming
  - manufacturer-independent, plant-wide engineering
  - component Based Automation provides access to the variables of the PROFINET components from all standard PC applications with an OPC client interface, e.g. visualization systems. The objects can be directly selected from a list of variables from the selected PROFINET component through OPC servers.

The IE/PB Link also offers the following functions:

- S7 routing
  - enables cross-network PG/OP communication, i.e. all S7 stations can be remotely programmed using the programming device on the Industrial Ethernet or PROFIBUS.
  - HMI stations on the Industrial Ethernet can access visualization data from the S7 stations on the PROFIBUS.
- Data record routing (PROFIBUS DP)
  - this makes it possible, for example, to parameterize and diagnose a PROFIBUS field device using SIMATIC PDM (on the PC) on the Industrial Ethernet via the IE/PB Link.

Design

The IE/PB link has all the advantages of the SIMATIC design

- Compact design;
  the rugged plastic casing features on the front
  - 15-pin Sub-D connector for interfacing to Industrial Ethernet (automatic switching between AUI and industrial twisted pair).
  - RJ45 interface for connection to twisted pair
  - 9-pin Sub-D connector for connection to PROFIBUS
  - 4-pin terminal block for connecting the external supply voltage of 24 V DC
- Automatic transmission rate detection through autosensing.
- The IE/PB link is operated without fans.
- Simple mounting; the IE/PB link is mounted on an S7-300 sectional rail.

Function

The IE/PB Link module supports the following communication services:

- PROFINET communication services in accordance with the PROFINET standard Version V1.0
- Network transition as DP Master Class 2/vertical integration
  - S7 Routing
  - data record routing (PROFIBUS DP)

PROFINET

IE/PB Link supports the communication services specified in PROFINET for data communication between the PROFINET devices and is a proxy for PROFIBUS field devices.

It facilitates communication relationships between PROFIBUS devices as well as between PROFIBUS devices and Ethernet devices. IE/PB Link supports the connection of simple DP slaves as well as the connection of PROFIBUS devices with loadable functionality in the form of a program, e.g. for an ET200 S with its own CPU.

Network transition as DP Master Class 2/vertical integration

- The IE/PB Link can be used as an additional DP Master Class 2 on a PROFIBUS segment for coupling to Industrial Ethernet and offers the following functions.
- S7 Routing
  - enables cross-network PG communication, i.e. all S7 stations can be remotely programmed using the programming device on the Industrial Ethernet or PROFIBUS.
- Data record routing (PROFIBUS DP)
  - with this option, the IE/PB Link can be used as a router for data sets that have to be sent to field devices (DP slaves). SIMATIC PDM (Process Device Manager) is a tool that creates data sets of this type for parameterizing and diagnosing field devices.
    Application:
    This makes it possible, for example, to parameterize and diagnose a PROFIBUS PA field device using SIMATIC PDM (on the PC) on Industrial Ethernet via the IE/PB Link and DP/PA coupler/link.

Diagnostics data

Extensive diagnostic options are available via NCM S7, including:

- Operating status
- General diagnostics and statistics functions
- Connection diagnostics
- LAN controller statistics
- Message buffer

Configuration

For configuring the additional functions of IE/PB Link, STEP 7 Version V5.1 SP2 and higher is necessary.

The parameters required for IE/PB Link, such as the addresses, are assigned using STEP 7 and all the necessary routing information is automatically generated.

For configuring the PROFINET communication, the separate engineering tool SIMATIC iMap to the PROFINET standard is required. The tool is offered as an option package with STEP 7.

The SIMATIC iMap engineering software, which operates system-wide and manufacturer-independently, replaces the otherwise complex programming of the communication relationships between intelligent devices with easy graphical configuration.

IE/PB link

Technical specifications

Data transmission rates	
• Industrial Ethernet	10/100 Mbit/s autosensing
• PROFIBUS	9.6 kbit/s ... 12 Mbit/s incl. 45.45 kbit/s (PROFIBUS PA)
Interfaces	
• Connection to Industrial Ethernet	
- AUI (10 Mbit/s)	15-pin Sub-D socket
- 10BaseT/100BaseT	RJ45
• Connection to PROFIBUS	9-pin Sub-D socket
• Connection for supply voltage	4-pin terminal block
Supply voltage	24 V DC (+/-5%)
Current consumption (at rated voltage)	
• External from 24 V DC, max.	600 mA
Power loss	approx. 10 W
Perm. ambient conditions	
• Operating temperature	0 °C ... + 60 °C
• Transport/storage temperature	- 40 °C ... + 70 °C
• Relative humidity, max.	95 % at +25 °C
Construction	
• Module format	S7-300 construction
• Dimensions (W x H x D) in mm	80 x 125 x 120
• Weight	approx. 600 g
Degree of protection	IP20
Configuration	
Configuration software for PROFINET	Option package SIMATIC iMAP V1.2 and higher
Configuring software for additional functions	NCM S7 in STEP 7, V5.1 SP2 or higher
Performance data	
PROFINET communication	
• Number of DP slaves on the IWLAN/PB Link PN IO (PROFINET IO-Devices for PROFINET IO)	max. 64 [1]
• Number of DP inputs	max. 2048 byte
• Number of DP outputs	max. 2048 byte
Additional functionality	
• Number of S7 connections	max. 32
• Number of DSGW connections	max. 32

1) All PROFINET IO Devices (DP slaves) to be connected to the IE/PB Link PN IO must be generated as PROFIBUS-DPV0 (standard slaves) using STEP 7.

Ordering data

Ordering data	Order No.
IE/PB link Network transition between Industrial Ethernet and PROFIBUS, including electronic manual on CD-ROM, German, English, French, Spanish, Italian	**6GK1 411-5AA00**
S7-300 DIN rail	**6ES7 390-1AB60-0AA0**
S7-300 power supply PS 307 24 V DC	**6ES7 307-1BA00-0AA0**
NCM S7 configuration software for Industrial Ethernet	Shipped with STEP 7 V5
Manual for TP and fiber-optic networks Paper version Network architecture, components, configurations, installation guidelines	
• German	**6GK1 970-1BA10-0AA0**
• English	**6GK1 970-1BA10-0AA1**
Manual for PROFIBUS networks Paper version Network architecture, project management, network components, installation	
• German	**6GK1 970-5CA20-0AA0**
• English	**6GK1 970-5CA20-0AA1**
SIMATIC iMap V3.0 for configuring PROFINET CBA *Prerequisite:* Windows 2000 Prof. with Service Pack 4 or higher or Windows XP Prof. with Service Pack 1 or Windows 2003 Server with Service Pack 1 or higher; 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; *Delivery form:* German, English, with electronic documentation	
• Single license	**6ES7 820-0CC04-0YA5**
• Software Update Service	**6ES7 820-0CC01-0YX2**
• Upgrade to V3.0, single license	**6ES7 820-0CC04-0YE5**

More information

Additional information is available in the Internet:
http://www.siemens.com/automation/cba

IE/AS-i LINK PN IO

Overview

PN			DP-M	DP-S	ASi-M
	IO-C	IO-D	CBA		
■		■			■

- Compact network transition between Industrial Ethernet (PROFINET IO device) and AS-Interface
- Single and dual AS-Interface master (according to AS-Interface specification V3.0) for connecting 62 AS-Interface slaves
- High-performance, integrated analog value transmission
- Integral earth-fault monitoring for the AS-Interface cable
- Simple diagnostics and startup on site using a pixel-graphics display and operator keys or Web interface with standard browser
- Optimum TIA integration through STEP 7, integration in engineering tools from other vendors through PROFINET type file (GSDML)
- Vertical integration (standard Web interface) through Industrial Ethernet
- Power supply from the AS-Interface cable or alternatively with 24 V DC (optional)
- Module replacement without PG by using C-PLUG (optional)

Benefits

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- Short startup time due to simple configuration by pressing a button and testing of the AS-Interface segment on display or through Web interface
- Reduction in downtimes and servicing times on failure of slave due to convenient diagnostics on display or through Web interface
- Reduction of installation costs because the power can be supplied entirely from the AS-Interface cable, so an additional power supply is not required
- Reduced engineering overhead thanks to convenient configuration of Siemens slaves by means of Drag&Drop in HW-Config (STEP 7)

Application

The IE/AS-i LINK PN IO is a PROFINET IO-Device (according to IEC 61158) and AS-Interface master (according to AS-Interface specification V3.0 to EN 50 295), and enables transparent data access to the AS-Interface from Industrial Ethernet.

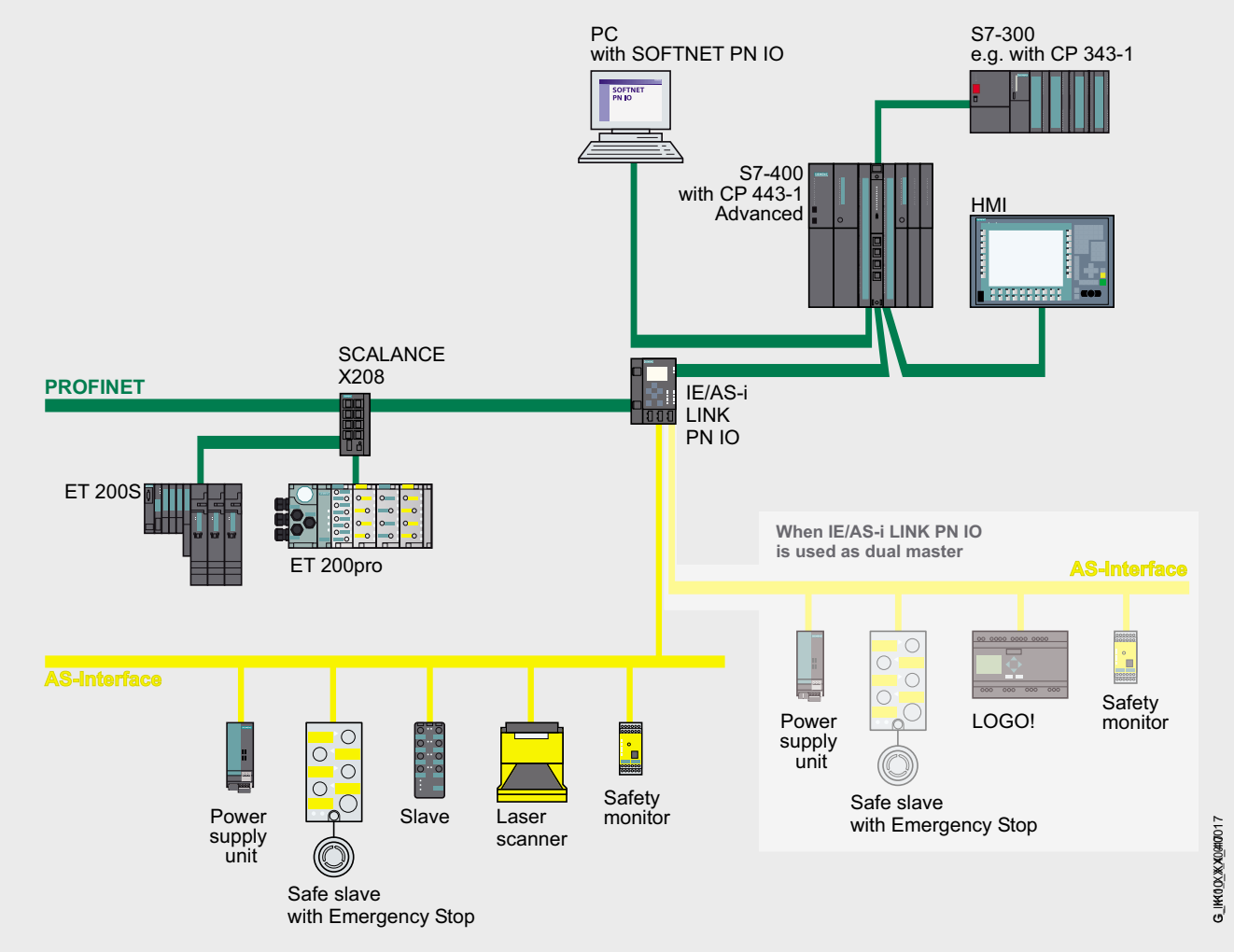
PROFINET IO-Controllers can exchange I/O data cyclically with the AS-Interface; with acyclic services AS-i master calls can also be carried out. The IE/AS-i LINK PN IO is thus ideally suitable for distributed configuration and for linking an underlying AS-Interface network.

The IE/AS-i LINK PN IO in the version as AS-i single master is sufficient for applications with typical quantity frameworks.

The IE/AS-i LINK PN IO in the version as AS-i dual master is used for applications with high quantity frameworks. In this case, twice the quantity frameworks can be used on two AS-i segments running independently of each other.

IE/AS-i LINK PN IO

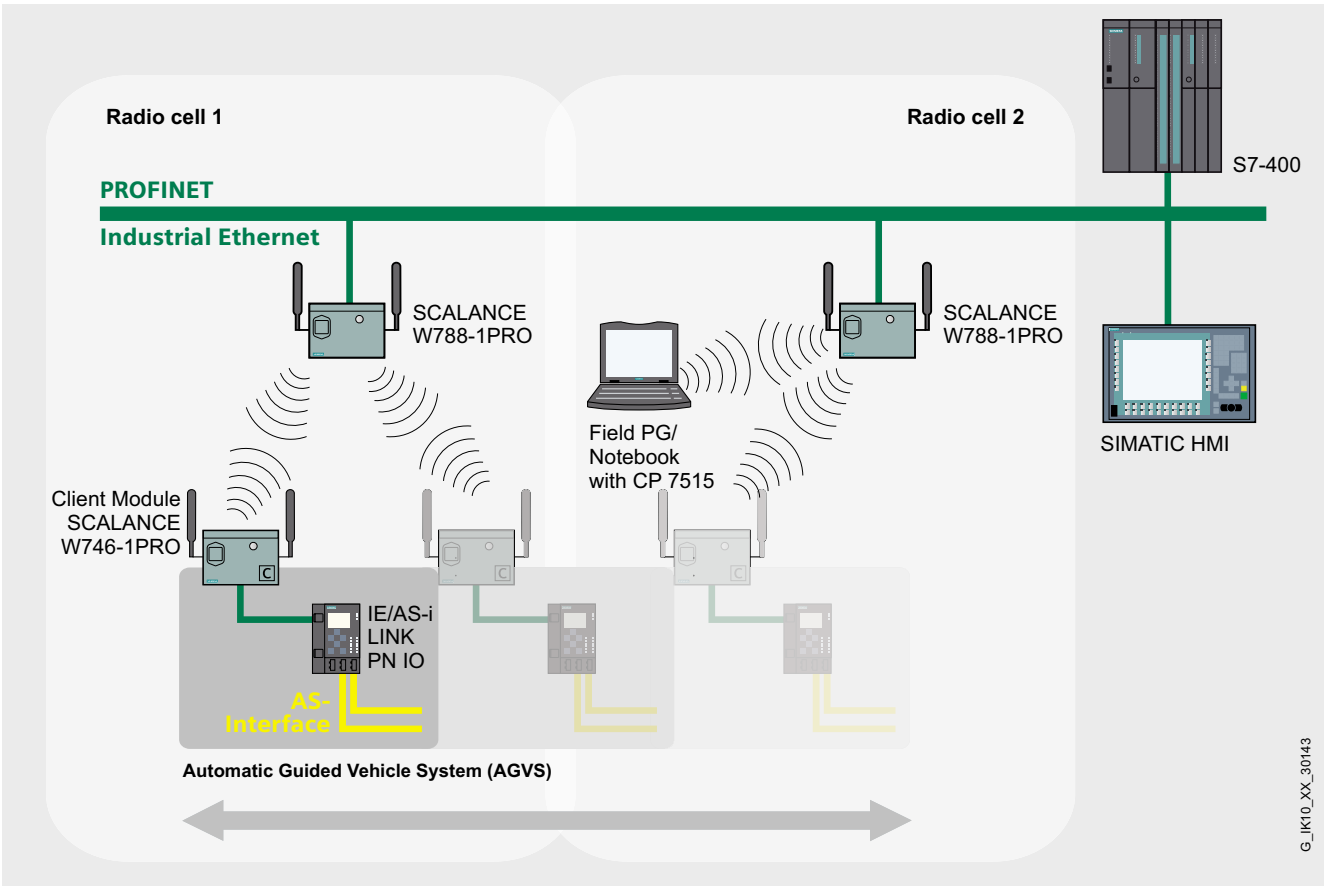
Application (continued)



Linking of AS-Interface to PROFINET via IE/AS-i LINK PN IO as single/dual master

Application (continued)

With an upstream IWLAN client module, e.g. SCALANCE W746-1PRO, an AS-Interface segment can be integrated wirelessly into the PROFINET world. Typical applications here are those solved with fault-prone festoon cables or contact conductor technology; maintenance costs are thus reduced.



Wireless communication between Industrial Ethernet and AS-Interface components

IE/AS-i LINK PN IO

Design

- Sturdy plastic enclosure with degree of protection IP20 for DIN rail mounting
- Compact design;
  - display in front panel for exactly detailed indication of operating state and functional readiness of all connected and activated AS-Interface slaves
  - keys for startup and testing of the AS-Interface segment directly on the IE/AS-i LINK PN IO
  - LED display of operating state of PROFINET IO and AS-Interface
  - integral 2-port switch (RJ45 socket) for connection to Industrial Ethernet supports the linear topology without external switch
  - convenient startup, diagnostics and testing of the IE/AS-i LINK PN IO over a Web interface with standard browser
  - power supply from the AS-Interface shaped cable or alternatively with 24 V DC
  - low mounting depth through recessed connector assembly
- Simple assembly on standard DIN rail
- Operation without fans or batteries
- Fast device replacement in the event of a fault by using the optional C-PLUG swap medium (not included in scope of supply)

Function

The IE/AS-i LINK PN IO allows a PROFINET IO master to cyclically access the I/O data of all slaves of a subordinate AS-Interface segment. In line with the enhanced AS-Interface specification (V3.0), a maximum of 62 slaves – each with 4 inputs and 4 outputs – as well as analog slaves can be connected per AS-Interface segment.

The IE/AS-i LINK PN IO occupies 62 input byte and 62 output byte in the IO controller as standard, in which the I/O data of the connected AS-Interface slaves are saved. The input/output buffer can be compressed so that only the actual I/O memory space required is occupied in the system of the IO controller. Integral evaluation of analog signals is just as simple as the accessing of digital values.

PROFINET IO controllers are also able to trigger AS-Interface master calls (e.g. write parameters, modify addresses, read diagnostics values) by means of the acyclic PROFINET services.

The subordinate AS-i segment can be completely started up using an input display in the AS-Interface link. The IE/AS-i LINK PN IO is equipped with two switched Ethernet ports which additionally permit use of the integral Web server, making the input display already described even easier to use. Firmware updates are also available.

The optional C-PLUG supports module replacement without a programming device, ensuring that downtimes in the event of a fault are reduced to a minimum.

Diagnostics data

Extensive diagnostics options are available via the display and input keys, Web interface or STEP 7, including

- Operating status of the link
- Status of the link as PROFINET IO device
- Diagnostics of the AS-Interface network
- Frame statistics
- Standard diagnostics sites for rapid diagnostics access using standard browser

Configuration

The IE/AS-i LINK PN IO can be configured using STEP 7 from Version V5.4 SP2 or simply by importing the actual configuration on the display.

Alternatively, the IE/AS-i LINK IO can be integrated in the engineering tool by means of the PROFINET type file (GSD):

- STEP 7 versions lower than V5.5 SP2
- Engineering tools from other manufacturers

With STEP 7 configuring, uploading of the AS-Interface configuration is possible in STEP 7 from V5.4 SP2 onwards. In addition, AS-Interface Slaves from Siemens can be conveniently configured in HW-Config (slave catalog).

Technical specifications

Data transmission rates per AS-i segment	
• AS-Interface bus cycle time	5 ms for 31 slaves; 10 ms for 62 slaves
• Ethernet data transmission rate	10/100 Mbit/s, autosensing
Interfaces	
• AS-Interface connection	1 x 4-pin terminal block (plug-in)
- with single master	1 x 4-pin terminal block (plug-in)
- with dual master (2 AS-i segments)	2 x 4-pin terminal block (plug-in)
• Connection to Ethernet	2 x RJ45 sockets (switch ports)
• Optional: 24 V DC supply voltage	3-pole terminal contacts (plug-in) incl. functional ground for integral ground fault monitoring
• Slot for the swap medium	C-PLUG
Display	128 x 64 pixels with backlighting
Keys	Membrane keyboard (6 keys)
Supply voltage	
• From the AS-Interface shaped cable (segment 1)	According to AS-Interface specification EN 50 295
• Optional	24 V DC
Current consumption	
• From the AS-Interface shaped cable	max. 250 mA
Loading capacity	
• Power loss	7.5 W
Degree of protection	IP20
Perm. ambient conditions	
• Operating temperature	
- horizontal mounting	0 °C … +60 °C
- vertical mounting	0 °C … +45 °C
• Transport/storage temperature	-30 °C … +70 °C
• Relative humidity	max. 95% at +25 °C
• Operating altitude	3000 m above mean sea level
Construction	
• Assembly	On standard DIN rail
• Dimensions (W x H x D) in mm	90 x 132 x 88.5
• Weight	approx. 380 g
Supported AS-Interface master profiles	M1, M2, M3, M4 (corresponding to AS-Interface specification V3.0)
Configuration of AS-Interface	by means of keys on front panel, with STEP 7 Version V5.4 SP2, through Web interface

Ordering data

	Order No.
IE/AS-i LINK PN IO	
Network transition between Industrial Ethernet and AS-Interface; master profiles M3 and M4, enhanced AS-Interface specification V3.0; degree of protection IP20; manual on CD-ROM German, English, French, Spanish, Italian	
• Single master with display	**6GK1 411-2AB10**
• Dual master with display	**6GK1 411-2AB20**
Accessories	
C-PLUG	**6GK1 900-0AB00**
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	
IE FC RJ45 Plug 90	
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; e.g. for ET 200S	
• 1 pack = 1 item	**6GK1 901-1BB20-2AA0**
• 1 pack = 10 items	**6GK1 901-1BB20-2AB0**
• 1 pack = 50 items	**6GK1 901-1BB20-2AE0**

DP/AS-i LINK Advanced

Overview

PN	DP-M	DP-S	ASi-M
		■	■

- Compact network transition between PROFIBUS (DP slave) and AS-Interface
- Single and dual AS-Interface master (according to AS-Interface specification V3.0) for connecting 62 AS-Interface slaves
- High-performance, integrated analog value transmission
- High-performance, integral earth-fault monitoring for the AS-Interface cable
- Simple diagnostics and startup on site using a pixel-graphics display and operator keys or Web interface with standard browser
- Optimum TIA integration through STEP 7, integration into engineering tools of other vendors through PROFIBUS type file (GSD)
- Vertical integration (standard Web interface) through Industrial Ethernet
- Power supply from the AS-Interface cable or alternatively with 24 V DC (optional)
- Module replacement without PG by using C-PLUG (optional)

Benefits

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- Short startup time through simple configuration by pressing a button and testing the AS-Interface segment via display or Web interface
- Reduction in downtimes and servicing times on failure of slave through convenient diagnostics on display or Web interface and by simple replacement of module with the C-PLUG swap medium
- Reduction of installation costs because the power can be supplied entirely from the AS-Interface cable, so an additional power supply is not required
- Reduced engineering overhead through convenient configuration of Siemens slaves per slave catalog in HW-Config (STEP 7)
- Lower costs for high quantity frameworks as result of the dual AS-Interface master

Application

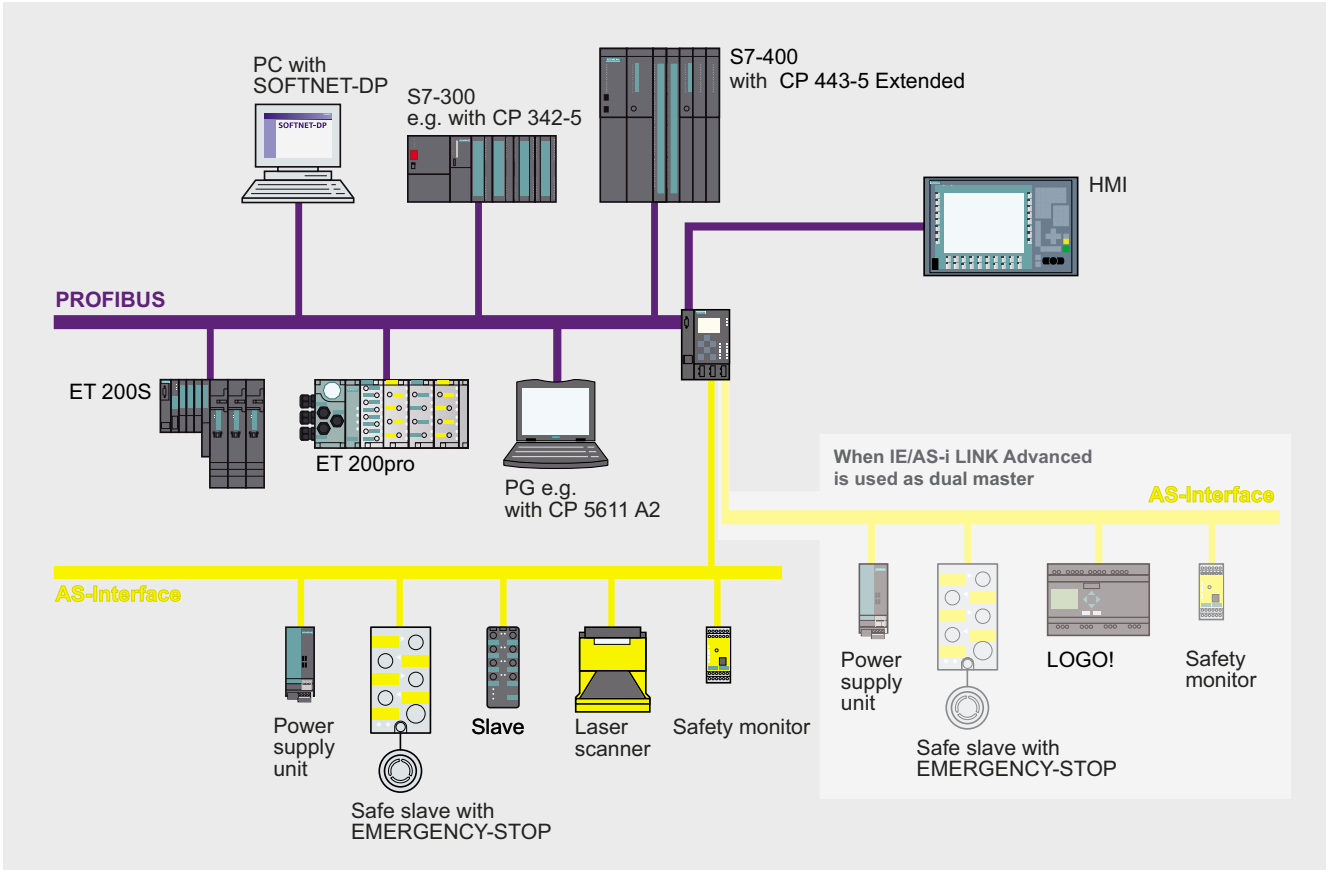
The DP/AS-i LINK Advanced is PROFIBUS DPV1 slave (according to EN 50 170) and AS-Interface master (according to AS-Interface specification V3.0 to EN 50 295) and enables transparent data access to the AS-Interface from PROFIBUS DP.

PROFIBUS DP masters can exchange I/O data cyclically with the AS-Interface; DP masters with acyclic services can additionally carry out AS-Interface master calls. The DP/AS-i LINK Advanced is thus particularly suitable for distributed configuration and for linking a subordinate AS-Interface network.

The DP/AS-i LINK Advanced in the version as AS-Interface single master is sufficient for applications with typical quantity frameworks.

The DP/AS-i LINK Advanced in the AS-Interface dual master version is used for applications with high quantity frameworks. In this case, twice the quantity frameworks can be used on two AS-Interface segments running independently of each other.

Application (continued)



Linking of AS-Interface to PROFIBUS via DP/AS-i LINK Advanced as single/dual master

8

DP/AS-i LINK Advanced

Design

- Stable plastic enclosure with degree of protection IP20 for DIN rail mounting
- Compact design;
  - display in front panel for exactly detailed indication of operating state and functional readiness of all connected and activated AS-Interface slaves
  - 6 keys for startup and testing of the AS-Interface segment directly on the DP/AS-i LINK Advanced
  - LED display of operating state of PROFIBUS DP and AS-Interface
  - integral Ethernet port (RJ45 socket) for convenient startup, diagnostics and testing of DP/AS-i LINK Advanced through a Web interface with standard browser
  - power supply from the AS-Interface shaped cable or alternatively with 24 V DC
  - low mounting depth due to recessed connector assembly
- Simple assembly on standard DIN rail
- Operation without fans or batteries
- Fast device replacement in the event of a fault by using the optional C-PLUG swap medium (not included in scope of supply)

Function

The DP/AS-i LINK Advanced allows a PROFIBUS DP master to cyclically access the I/O data of all slaves of a subordinate AS-Interface segment. In line with the enhanced AS-Interface specification (V3.0), a maximum of 62 slaves – each with 4 inputs and 4 outputs – as well as analog slaves can be connected per AS-Interface segment.

The DP/AS-i LINK Advanced occupies 62 input byte and 62 output byte in the DP master as standard, in which the I/O data of the connected digital AS-Interface slaves are saved. The input/output buffer can be compressed so that only the I/O memory space actually required is occupied in the system of the DP master. Integral evaluation of analog signals is just as simple as the access to digital values; it is unnecessary to call communications blocks.

PROFIBUS DP V1 masters are also able to trigger AS-Interface master calls (e.g. write parameters, modify addresses, read diagnostics values) by means of the acyclic PROFIBUS services.

The subordinate AS-Interface segment can be completely started up using an input display in the AS-i link. The DP/AS-i LINK Advanced is equipped with an additional Ethernet port which permits use of the integral Web server and therefore additionally increases the convenience of the input display already described. Firmware updates are also available free of charge.

The optional C-PLUG supports module replacement without a programming device, ensuring that downtimes in the event of a fault are reduced to a minimum.

Diagnostics data

Extensive diagnostics options are available via LEDs, the display and input keys, Web interface or STEP 7, including

- Operating status of the link
- Status of the link as PROFIBUS DP slave
- Diagnostics of the AS-Interface network
- Frame statistics
- Standard diagnostics sites for rapid diagnostics access using standard browser

Configuration

The DP/AS-i LINK Advanced can be configured using STEP 7 from Version V5.4 or simply by importing the actual configuration on the display.

Alternatively, the DP/AS-i LINK Advanced can be integrated in the engineering tool by means of the PROFIBUS type file (GSD):

- COM PROFIBUS
- Older STEP 7 versions lower than V5.4
- Engineering tools from other vendors

With STEP 7 configuring, uploading of the AS-Interface configuration is possible in STEP 7 from V5.4 onwards. In addition, AS-Interface Slaves from Siemens can be conveniently configured in HW-Config (slave catalog).

Technical specifications

Data transmission rates per AS-Interface segment	
• AS-Interface bus cycle time	5 ms for 31 slaves; 10 ms for 62 slaves
• PROFIBUS data transmission rate	Up to 12 Mbit/s
• Ethernet data transmission rate	10/100 Mbit/s, autosensing
Interfaces	
• AS-Interface connection	1 x 4-pin terminal block (plug-in)
- with single master	1 x 4-pin terminal block (plug-in)
- with dual master (2 AS-i segments)	2 x 4-pin terminal block (plug-in)
• Connection to PROFIBUS	1 x 9-pin Sub-D socket
• Connection to Ethernet	1 x RJ45 socket
• Optional: 24 V DC supply voltage	3-pole terminal contacts (plug-in) incl. functional ground for integral ground fault monitoring
• Slot for the swap medium	C-PLUG
Display	128 x 64 pixels with backlighting
Keys	Membrane keyboard (6 keys)
Supply voltage	
• From the AS-Interface shaped cable (segment 1)	According to AS-Interface specification EN 50 295
• Optional: 24 V DC	24 V DC, PE conductor
Current consumption	
• From the AS-Interface shaped cable	max. 250 mA
Loading capacity	
• 5 V DC on PROFIBUS connection	max. 70 mA
• Power loss	7.5 W
Degree of protection	IP20
Perm. ambient conditions	
• Operating temperature	
- horizontal mounting	0 °C … +60 °C
- vertical mounting	0 °C … +45 °C
• Transport/storage temperature	-30 °C … +70 °C
• Relative humidity	max. 95% at +25 °C
• Operating altitude	3000 m above mean sea level
Construction	
• Assembly	On standard DIN rail
• Dimensions (W x H x D) in mm	90 x 132 x 88.5
• Weight	approx. 380 g
Supported AS-Interface master profiles	M1, M2, M3, M4 (corresponding to complete AS-Interface specification V3.0)
Configuration of AS-Interface	by means of keys on front panel, with STEP 7 Version V5.4 and later, through Web interface

Ordering data

	Order No.
DP/AS-i LINK Advanced	
Network transition between PROFIBUS DP and AS-Interface; master profiles M3 and M4, enhanced AS-Interface specification V3.0; degree of protection IP20; manual on CD-ROM, German, English, French, Spanish, Italian	
• Single master with display	**6GK1 415-2BA10**
• Dual master with display	**6GK1 415-2BA20**
Accessories	
C-PLUG	**6GK1 900-0AB00**
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	
IE FC RJ45 Plug 90	
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; e.g. for ET 200S	
• 1 pack = 1 item	**6GK1 901-1BB20-2AA0**
• 1 pack = 10 items	**6GK1 901-1BB20-2AB0**
• 1 pack = 50 items	**6GK1 901-1BB20-2AE0**
Bus connector RS 485 with angled cable outlet (35°)	
With screw-type terminals, max. data transmission rate 12 Mbit/s	
• Without PG interface	**6ES7 972-0BA60-0XA0**

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PROFIBUS DP – AS-Interface network transition

DP/AS-Interface Link 20E

Overview

PN	DP-M	DP-S	ASi-M
		■	■

The DP/AS-Interface link 20E connects PROFIBUS DP with AS-Interface. It provides the following functions:

- PROFIBUS DP slave and AS-Interface master
- Up to 62 AS-Interface slaves can be connected and integrated analog value transfer (according to the extended AS-Interface specification V2.1).
- Supports all AS-Interface master functions in accordance with the extended AS-Interface specification V2.1, i.e. Master Class M3.
- Supplied from the AS-Interface cable, so no additional power supply is necessary.
- Supports uploading of the AS-Interface configuration in STEP 7 from V5.2.

Benefits

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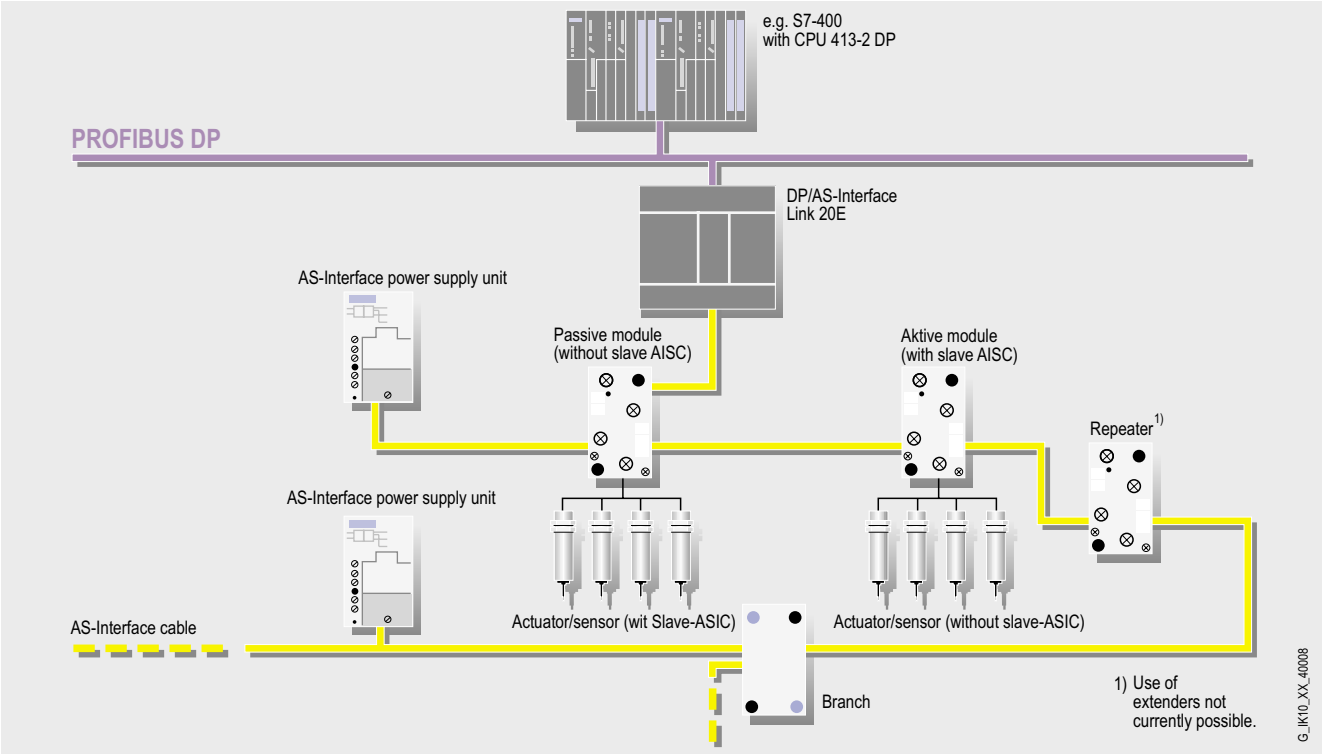
- Reduction of installation costs because the power is supplied entirely from the AS-Interface cable, so an additional power supply is not required.
- Shorter start-up time thanks to easy configuration at the press of a button
- Reduction of downtimes or service times due to failure of a slave thanks to the LEDs
- Quick and easy start-up thanks to readout of the AS-Interface configuration (ES03 and higher)



Transition from PROFIBUS DP to AS-Interface over DP/AS-Interface Link 20E

DP/AS-Interface Link 20E

Application

The DP/AS-Interface Link 20E is a PROFIBUS DP slave (according to EN 50 170) and AS-Interface master (according to EN 50 295) and enables the AS-Interface to be operated on PROFIBUS DP.

Simple PROFIBUS masters can exchange I/O data cyclically with AS-Interface; masters with acyclic services can exchange I/O data and perform master calls. DP/AS-Interface Link 20E cannot be used in conjunction with the extender.

Design

- Compact housing with degree of protection IP20 for DIN rail mounting
- LEDs in the frontplate for displaying the operating status and operational readiness of all connected and activated slaves
- The PROFIBUS DP address can be set by the simple push of a button
- LED display of PROFIBUS DP slave address, DP bus fault and diagnostics
- Two pushbuttons for switching the operating mode and for setting the existing ACTUAL configuration as SETPOINT configuration
- Power is supplied from the AS-Interface shaped cable

Function

The DP/AS-Interface Link 20E allows a DP master to access all slaves of an AS-Interface segment. According to the expanded specifications (V2.1) a maximum of 62 slaves each with 4 inputs and 3 outputs can now be connected.

By default, the DP/AS-Interface Link 20E occupies 32 byte input and 32 byte output data in the DP master in which the I/O data of the AS-Interface slaves connected are stored. The size of the input/output buffer can be compressed, so that only the memory space of the DP master actually required is occupied.

PROFIBUS DP masters are also able to invoke the AS-Interface master calls through the acyclic PROFIBUS utilities menu (e.g. parametric control, change addresses, read diagnostic values).

Configuration

The DP/AS-Interface Link 20E can be configured at the PROFIBUS with STEP 7 or COM PROFIBUS.

Enclosed with the manual are also the type and GSD files, so that it is also possible to carry out configuration with versions that do not yet contain the DP/AS-Interface Link 20E as standard.

Configuration of the AS-Interface segment can be preset either by means of STEP 7 or simply by adopting the ACTUAL configuration. Startup is also possible without PROFIBUS.

For STEP 7 configuration, uploading of the AS-Interface configuration is possible in STEP 7 V5.2 and newer.

Technical specifications

AS-Interface bus cycle time	5 ms for 31 slaves 10 ms for 62 slaves
PROFIBUS transmission rate	max. 12 Mbit
Supported AS-Interface master profile	M3 (corresponding to Complete AS-Interface Specification V2.1)
Configuring AS-Interface	by means of pushbutton on the frontplate or with STEP 7 V5.1 SP2
Interfaces	
• AS-Interface connection	Clip contacts
• Connection to PROFIBUS	9-pin Sub-D socket
Supply voltage	
• From the AS-Interface cable	According to AS-Interface specification EN 50 295
Current consumption	
• From the AS-Interface cable	max. 200 mA
Loading capacity	
5 V DC on PROFIBUS connection	max. 90 mA
Power loss	3.7 W
Mounting	DIN rail or direct mounting
Degree of protection	IP20
Perm. ambient conditions	
• Operating temperature	
- horizontal mounting	0 °C ... +60 °C
- vertical mounting	0 °C ... +45 °C
• Transport/storage temperature	-40 °C ... +70 °C
• Relative humidity	max. 95% at +25 °C
Construction	
• Module format	S7-200 construction
• Dimensions (W x H x D) in mm	90 x 80 x 60
• Weight	approx. 200 g

Ordering data

Ordering data	Order No.
DP/AS-Interface Link 20E Network transition between PROFIBUS DP and AS-Interface in degree of protection IP20	**6GK1 415-2AA01**
DP/AS-Interface Link 20E manual Paper version including type and GSD files	
• German	**6GK1 971-2DS01-0AA0**
• English	**6GK1 971-2DS01-0AA1**
• French	**6GK1 971-2DS01-0AA2**
• Spanish	**6GK1 971-2DS01-0AA3**
• Italian	**6GK1 971-2DS01-0AA4**

DP/EIB Link

Overview

PN	DP-M	DP-S	ASi-M
		■	

The DP/EIB Link connects manufacturing and process automation with building automation

Data is exchanged between PROFIBUS DP and EIB (European Installation Bus)

Compact enclosure with degree of protection IP20 in control cabinets as well as in subdistribution boards

Configurable with STEP 7 standard tools or COM PROFIBUS as a DP slave and with the EIB configuration software ETS 2

Benefits

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- New applications by linking production and process automation (PROFIBUS) to building automation (EIB) for optimized, all-encompassing energy management
- High-performance open-loop control, closed-loop control and visualization systems from automation engineering, e.g. SIMATIC, are now available for EIB
- Flexible installation thanks to mounting in control cabinets and subdistribution boards
- Low start-up and maintenance costs thanks to:
  - easy mounting on standard rails
  - LED to display PROFIBUS status
  - the DP address can be set directly using a DIP switch
  - EIB programming button and status display on the device

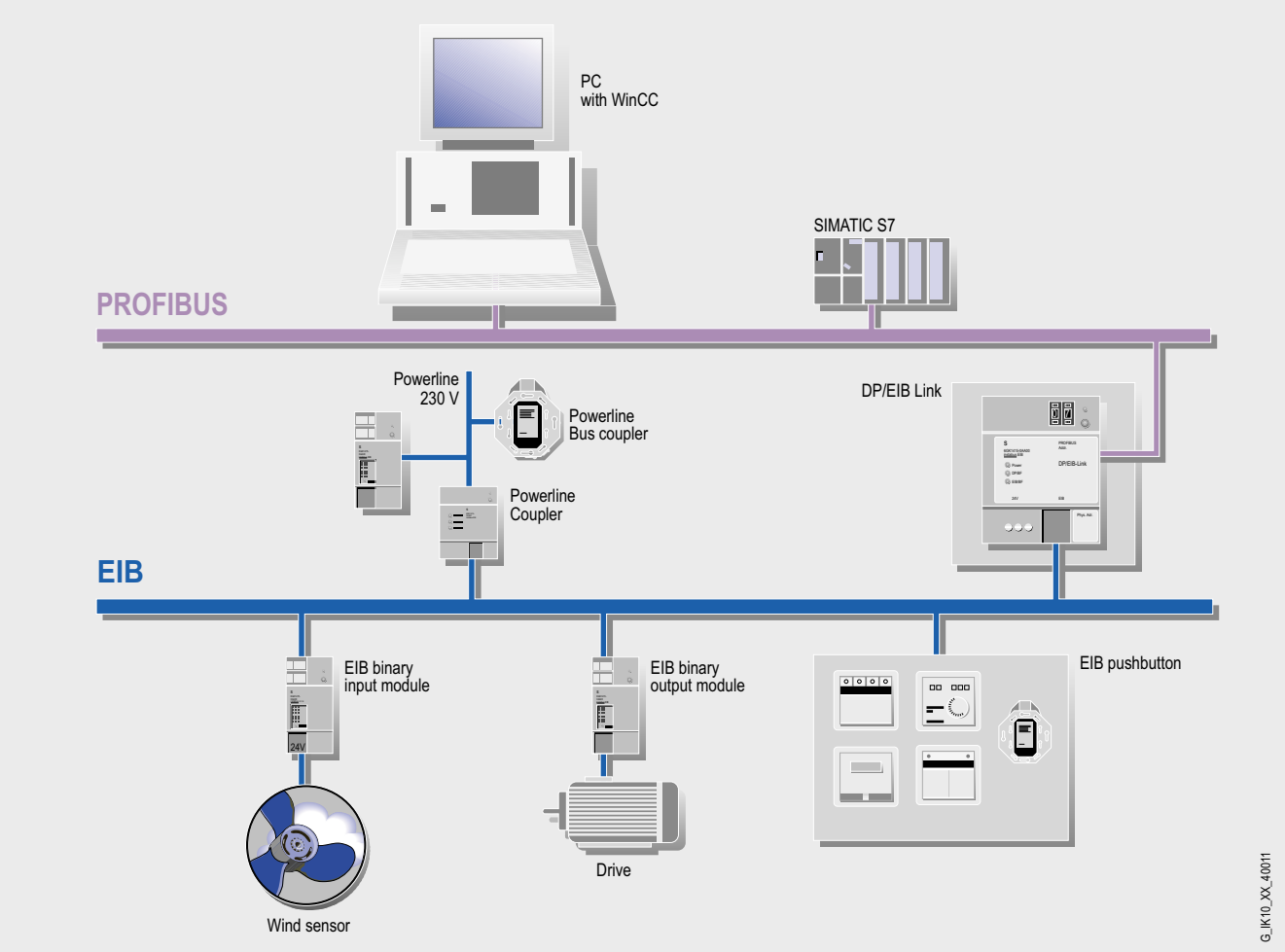
Application

The DP/EIB Link is used to connect the two open standard communication systems for manufacturing and process automation PROFIBUS DP and for building automation EIB. EIB for building automation can now be connected to PROFIBUS DP.

The DP/EIB Link is predestined for energy management tasks, since monitoring, open-loop control, closed-loop control and visualization of all energy consumers in the electrical installation and in the industrial application can be performed by one integrated system.

It is designed for installation in control cabinets as well as in subdistribution boards.

Application (continued)



Network transition from PROFIBUS DP to EIB/KNX with DP/EIB Link

Design

The DP/EIB Link has a standard enclosure to N dimensions with 4 width modules (WM) in the subdistribution board

- The PROFIBUS DP cable is connected on the side with a 9-pole Sub-D female connector through a bus connector (6ES7 972-0BA50-0XA0) and PROFIBUS bus cable
- The EIB bus is connected using bus terminals
- Connector for external power supply

Displays and command elements:

- LED for EIB functions (programming, test, diagnostics, etc.)
- LED for PROFIBUS status
- Coding switch for the PROFIBUS address
- Programming button for EIB

Function

The DP/EIB Link is a DP slave and maps data objects of the event-driven EIB in the process image of the DP master. The EIB data objects that are connected to PROFIBUS are specified using the EIB configuration software ETS 2. The DP/EIB Link provides various profiles for this purpose, each of which comprise different numbers of the various data objects.

Status changes in these data objects are transferred to the DP/EIB Link, or it can change these so that the PROFIBUS master is able to read and write to data objects.

The DP slave address is set using a coding switch on the Link; STEP 7 or COM PROFIBUS can be used for configuration and to specify the size of the PROFIBUS I/O area.

With the DP/EIB Link, the number and type of EIB data points to be transferred to PROFIBUS can be set as required. This means that the Link can be matched to each application and optimal utilization of the memory resources is possible. A range of different profiles are available for configuration that each cover all EIB data types.

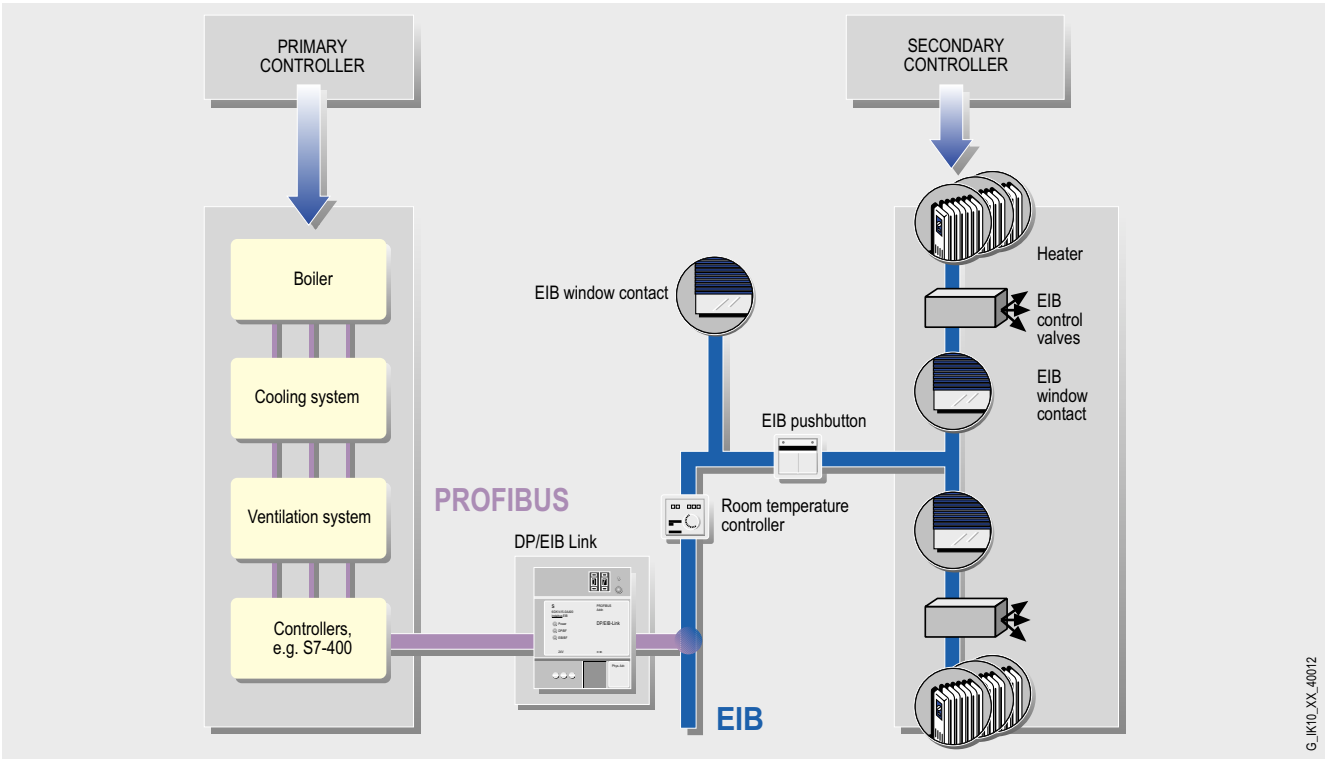
Configuring

- PROFIBUS DP:
  A GSD file is enclosed with the manual. The DP slave address is set using a coding switch on the DP/EIB Link. The data objects are accessed over DP-V1 (read/write data set).
- EIB:
  the database entry of the DP/EIB Link for the EIB configuration software ETS 2 is included with the manual.

Note:
for further details on building engineering with instabus EIB technology, see Catalog "I 2.1 2000 N-System" Order No. E86060-K8210-A101-A3.
Contact your nearest Siemens branch office for further information.

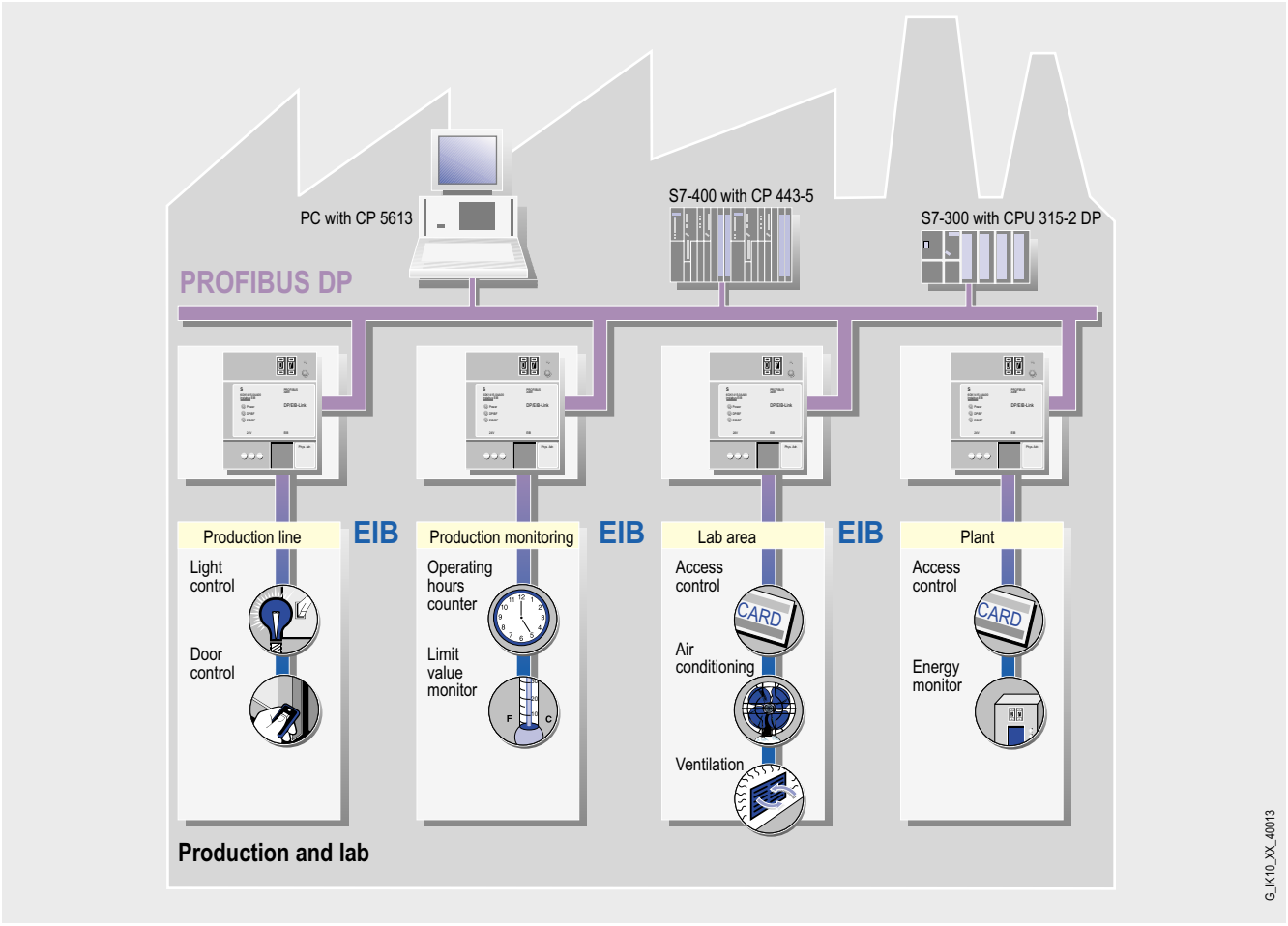
DP/EIB Link

Integration



DP/EIB Link as a link for HVAC systems (heating, lighting, air conditioning) between the primary and secondary control systems

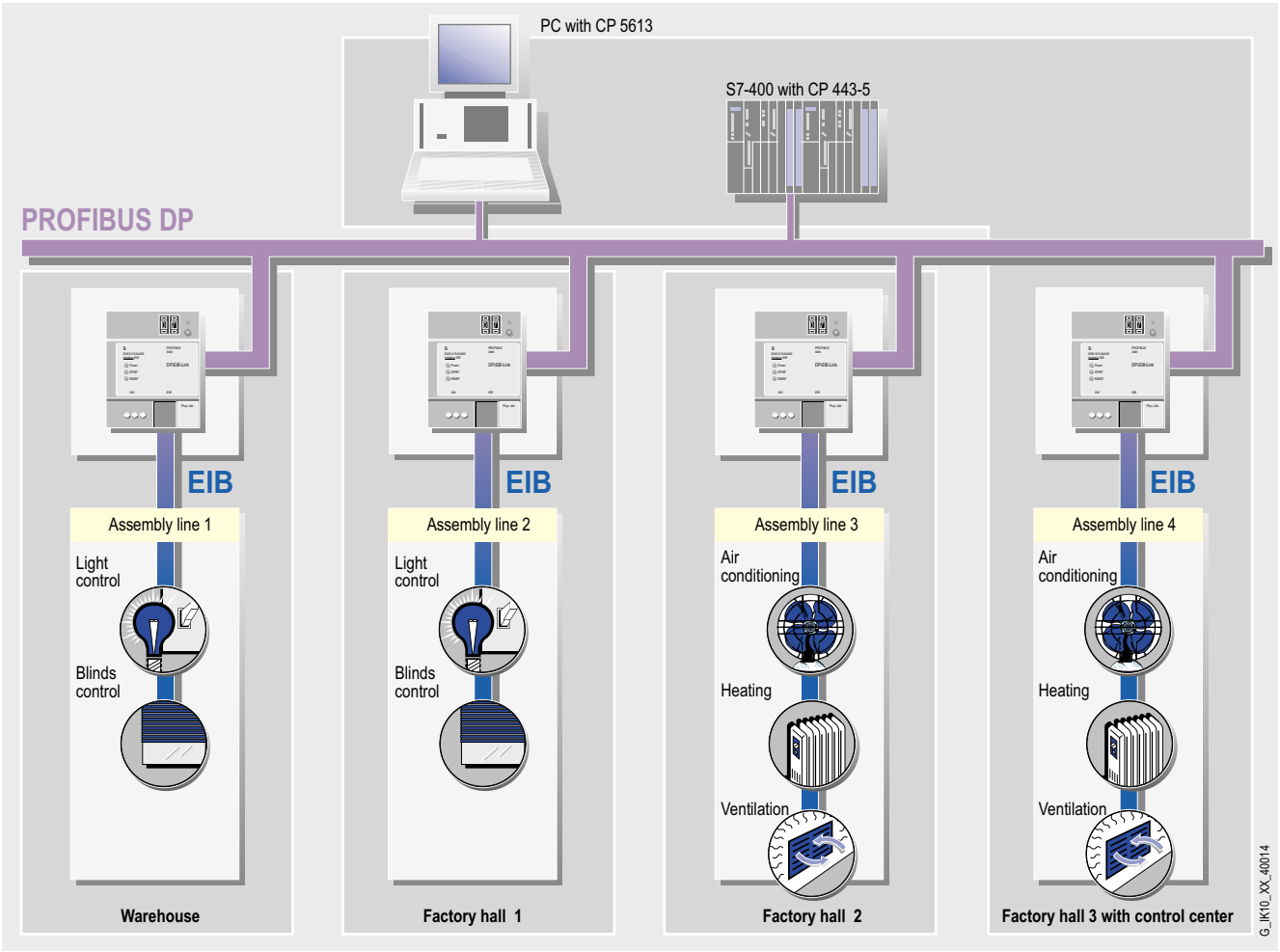
Integration (continued)



Use of DP/EIB Link in production and the laboratory

DP/EIB Link

Integration (continued)



Connection of EIB applications to a PROFIBUS network that spans buildings

Technical specifications

Data transmission rate	
• PROFIBUS DP	max. 12 Mbit/s
• EIB	9.6 kbit/s
Interfaces	
• Connection to PROFIBUS	9-pin Sub-D socket
• Connection to EIB	Terminals
Power supply	24 V DC (20.4 ... 30 V)
Current input at 24 V DC	120 ... 150 mA
Power consumption	
• PROFIBUS section	approx. 3.3 W
• EIB section	approx. 300 mW
Perm. ambient conditions	
• Operating temperature	-5 °C ... +60 °C
• Transport/storage temperature	-25 °C ... +70 °C
• Relative humidity	5% ... 93%
Construction	
• Dimensions (W x H x D) in mm	72 x 90 x 55
• Weight	approx. 300 g

Ordering data

Ordering data	Order No.
DP/EIB Link Network transition for transferring data between PROFIBUS DP and EIB	**6GK1 415-0AA01**
Manual Paper version incl. GSD file and ETS data base entry	
• German	**6GK1 971-3DA00-0AA0**
• English	**6GK1 971-3DA00-0AA1**
SIMATIC NET Manual Collection Electronic manuals for communication systems, communication protocols and communication products on CD-ROM, German/English	**6GK1 975-1AA00-3AA0**