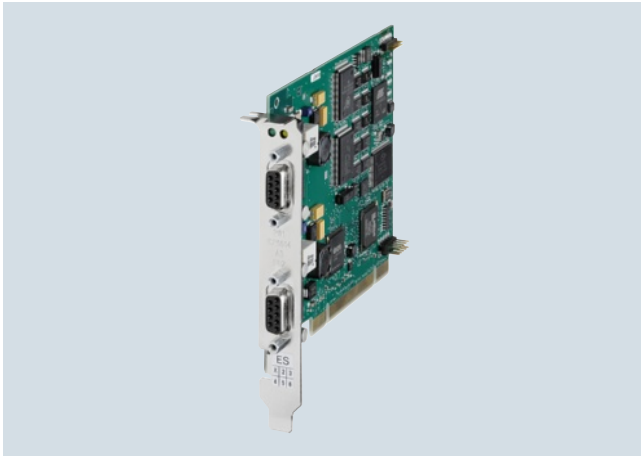


Overview



DP-M	DP-S	FMS	OPC	PG/OP	S7/S5
•	•		•	•	•

- PCI card (universal keyed 5 V/3.3 V) with own microprocessor for connection of PCs and SIMATIC PG/PC to PROFIBUS at up to 12 Mbit/s
- Communication services:
 - PROFIBUS DP master and slave interface according to IEC 61158/61784 on one PCI card
 - 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
- Comprehensive diagnostics possibilities for installation, commissioning and operation of the module
- High performance over direct dual-port RAM access
- Event and filter mechanisms to reduce the loading on the host CPU
- Multiprotocol operation and parallel operation of up to four CPs
- Implementation of Motion Control applications is possible because a constant bus cycle time is supported
- The appropriate OPC servers and configuration tools are included in the scope of supply of the respective communications software.

Benefits

get

Designed for Industry

- Fast access to process data by means of direct access to the dual port RAM of the hardware
- High computing performance in the PG/PC; reduces workload of host CPU by preprocessing the communication on the hardware
- Use of different operating system environments; driver as source code for porting to different operating system environments
- Reduced number of slots; through parallel operation as DP master and DP slave
- Can also be used in typical motion control applications
- Real-time capable data exchange in constant bus cycle time mode

Application



The CP 5614 A3 supports the connection of a SIMATIC PG/PC and PCs with PCI slot to PROFIBUS. It can be either a DP master or a DP slave.

Two different PROFIBUS networks can then be connected in a hierarchic structure on a PC with a PROFIBUS card and data can be transferred between the two.

The CP 5614 A3 provides high-performance support for control tasks on the PC (PC based Control, Numeric Control, Robot Control).

Design

- Short PCI card
- Operation possible in 3.3 V and 5 V PCI slots (universal keyed)
- 33 MHz or 66 MHz PCI clock
- Operation possible as 32-bit card in a 64-bit PCI X-slot
- 2 x 9-pin sub-D socket for connection to PROFIBUS
- Diagnostics LEDs
- Parallel operation of up to four CPs

The module is installed by means of PCI standard mechanisms (Plug&Play).

If the CP 5614 A3 is used as DP master, DP slave, or in a PG/OP on a PROFIBUS DP, the connection is made:

- **to the electrical PROFIBUS** via
 - Bus connector and PROFIBUS bus cable or
 - bus terminal (e.g. bus terminal 12M) and PROFIBUS bus cable
- **to the optical PROFIBUS with OLM** via
 - bus cable with two bus connectors or
 - PROFIBUS plug-in cable 830-1T
- **to the optical PROFIBUS with OBT and integrated interface** via
 - bus cable with two bus connectors or
 - PROFIBUS plug-in cable 830-1T

PROFIBUS

Communication for PC-based systems

CP 5614 A3

Function

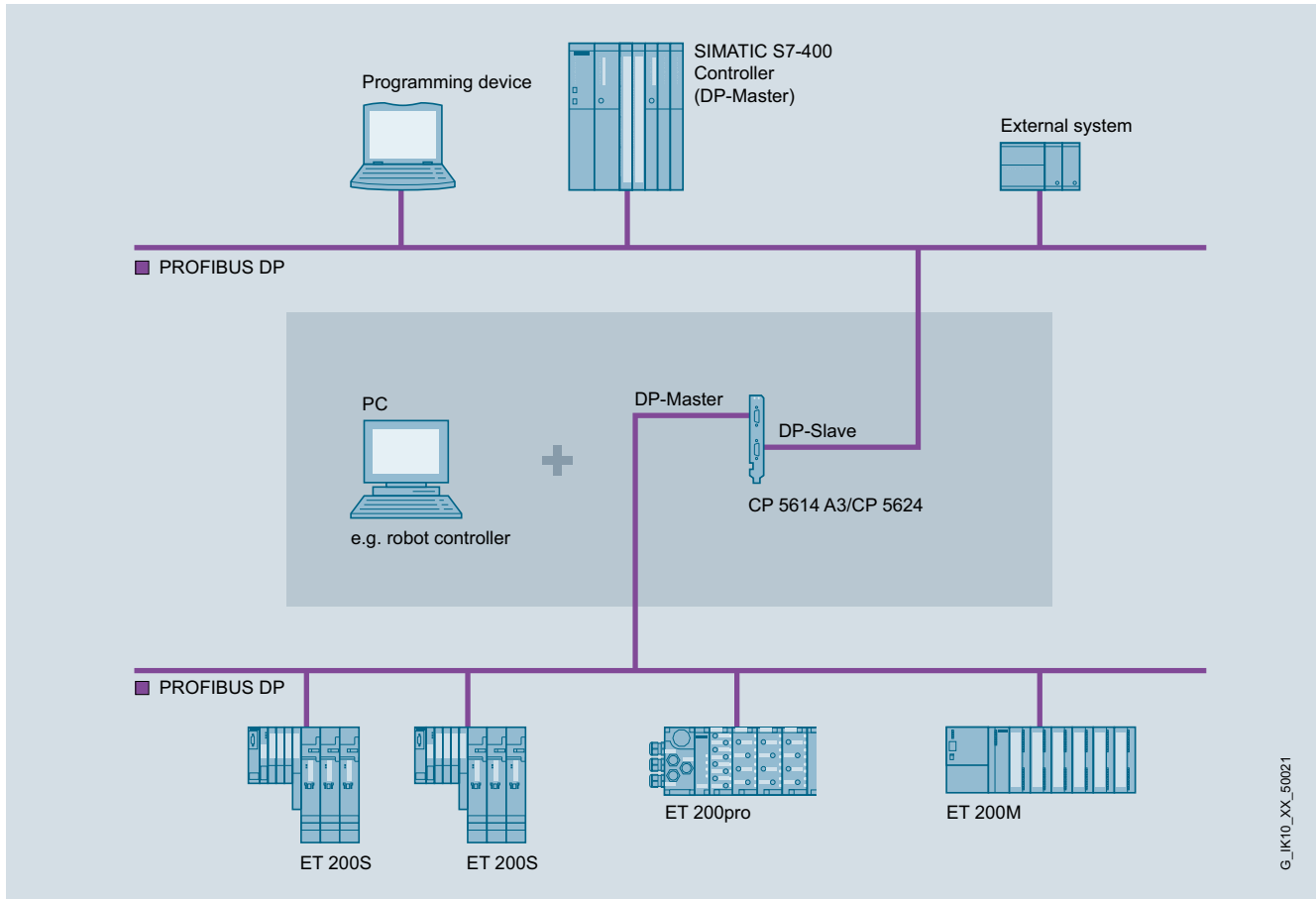
PROFIBUS DP

Access to process data

The CP 5614 A3 is operated as a PROFIBUS DP master and DP slave module that stores the process image (input/output and diagnostic data) in the dual-port RAM. High-performance data transfer to and from the PROFIBUS slaves is performed autonomously by the hardware of the CP 5614 A3. The user accesses the dual-port RAM directly.

The process data of the slaves is always consistent, i.e. the user receives the data of a slave from one and the same DP cycle.

Parallel operation of the HARDNET-PB DP software (DP master) and DP-Base software (DP master, DP slave) is not possible.



Example configuration of CP 5614 A3 as DP master and DP slave

Event filter mechanism

The user receives up-to-date data over two access mechanisms:

- Cyclic polling of the DP slaves (high loading for host CPU)
- Notification through event/filter mode on changing the input data of a slave (minimal loading for host CPU)

Both alternatives can be combined. This allows users to optimize use of the PC for their applications.

The event/filter mechanism can be used additionally for

- Notification by means of an interrupt of the diagnostic alarms from slaves
- During operation with constant bus cycle time, signaling by means of interrupt:
 - Start DP cycle
 - End cyclic data communication with DP slaves

FastLogic

FastLogic means that the CP 5614 A3 can react autonomously to 4 plant statuses. This results in a short response time and independence from the host application, e.g. fast shutdown of devices.

DP programming interface

The DP master programming interfaces of the CP 5613 A3 and CP 5614 A3 are identical.

The DP programming interface of the CP 5614 A3 features the following functions:

- DP slave
- DP master Class 1 including acyclic DP expansions
- DP master Class 2 including acyclic DP expansions

The process data is accessed directly through the dual-port RAM. The DP RAM interface not only offers fast access as DP master/slave but also a basis for porting to other operating system environments (e.g. VXWorks, QNX, RMOS, RTX).

Function (continued)

Administrative function calls (initialization and management services as well as diagnostic functions) are provided through a DP master and DP slave library (DP_BASE.DLL and DPS_BASE.DLL).

A transfer mechanism (PC application) can be activated in the software as a linking component for data transfer between the master and slave interface.

Defined I/O data can be transferred in this manner between the master interface and the slave interface.

The two connected PROFIBUS networks can be operated with different PROFIBUS bus parameters because they are independent of each other.

HARDNET-PB DP Development Kit

The HARDNET-PB DP Development Kit provides access to the functions DP master Class 1 and DP slave (incl. acyclic DP expansions)

The HARDNET-PB DP Development Kit is used to integrate the CP 5613 A3 and CP 5614 A3 communications processors into any operating system environment. The kit contains the necessary source code, including the descriptions in PDF format, and can be downloaded free of charge from the Internet.

Access to process data with HARDNET-PB DP

HARDNET-PB DP is available to permit compatibility with older applications that were created with the DP-Lib interface.

Parallel operation of the DP-Base and HARDNET-PB DP software is not possible.

Software for PG/OP communication

This software supports programming of the SIMATIC S7 controllers over PROFIBUS in combination with STEP 7. PG/OP communication is already available after the CP 5614 A3 (DP-Base) has been installed. No additional software packages are required.

Open communication (SEND/RECEIVE) based on the FDL interface

SEND/RECEIVE (FDL interface) is already available following installation of the CP 5614 A3 (DP-Base) and provides services for data transfer, diagnostics and management. No additional software packages are required.

Software for S7 communication (HARDNET-PB S7)

SIMATIC S7 system components communicate with each other using S7 communication functions. The S7 programming interface provides programming device/PC user programs with access to SIMATIC S7 system components. This provides easy, flexible access to the data of the SIMATIC S7 controller.

The following services are available with S7 communication:

Administrative services

- Connection management
- Mini database
- Trace

Data transfer services

- Read/write variables
- BSEND/BRECEIVE (up to 64 KB per task)

User interfaces

- **OPC interface**

The OPC server included in the respective software package can be used as the standard programming interface for the PROFIBUS DP (DP master and DP slave), open communication, S7 communication and PROFIBUS FMS protocols for linking automation technology applications to OPC-capable Windows applications (Office, HMI systems, etc.).

Configuration

- The S7 communication, open communication, DP protocol (DP-V0/DP-V1/DP-V2) protocols are configured in STEP 7 or NCM PC.
- A configuration tool is included in the scope of delivery of the PROFIBUS software packages.

Diagnostics

Comprehensive diagnostic tools are available (for installation, start-up and operation) for the module itself and for the PROFIBUS DP network. These tools can be used for quick and easy start-up of a PROFIBUS DP network with a CP 5614 A3.

Technical specifications (continued)

Article No.	6GK1561-4AA02
Product-type designation	CP 5614 A3
<u>Performance data</u> <u>PROFIBUS DP</u>	
Software for DP master function required	No
Service as DP master	
• DPV0	Yes
• DPV1	Yes
• DPV2	Yes
Number of DP slaves on DP master usable	124
Amount of data	
• of the address area of the inputs as DP master overall	30 256 byte
• of the address area of the outputs as DP master overall	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 overall	244 byte
• of the address area of the outputs as DP slave overall	244 byte
<u>Performance data</u> <u>S7 communication</u>	
Software for S7 communication required	Yes, HARDNET-PB S7 (S7-5613)
Number of possible connections for S7/PG communication maximum	50
<u>Performance data</u> <u>multi-protocol mode</u>	
Number of active connections with multiprotocol mode	50
Number of configurable connections per PC station	207
Product functions management, configuration	
Configuration software required	included in scope of delivery
Product functions Diagnosis	
Product function Port diagnostics	Yes
Standards, specifications, approvals	
Standard	
• for EMC	89/336/EEC
• for safety of CSA and UL	CAN/CSA C22.2 & UL 60950-1, UL 1950
• for emitted interference	EN 61000-6-3
• for interference immunity	EN 61000-6-2
Verification of suitability	
• CE mark	Yes
• C-Tick	Yes

Ordering data

Article No.

CP 5614 A3 communications processor

PCI card (32-bit; 3.3 V/5 V) master and slave 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; German/English

6GK1561-4AA02

Accessories

PROFIBUS FastConnect bus connector RS 485 Plug 180

with 180° cable outlet, insulation displacement

6GK1500-0FC10

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 FastConnect Stripping Tool

Preset stripping tool for fast stripping of PROFIBUS FastConnect bus cables

6GK1905-6AA00

PROFIBUS bus terminal 12M

Bus terminal for connection of PROFIBUS stations up to 12 Mbit/s with plug-in cable 1.5 m long

6GK1500-0AA10

Note:

For software ordering data, see page 3/227

More information

You can find the HARDNET-PB DP Development Kit on the Internet at:

<http://www.siemens.com/simatic-net/dk5613>

The CP 5614 A3 module can also be used under the LINUX and UNIX operating systems. Information on the available LINUX distributors and UNIX operating systems can be found at:

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

PROFIBUS

**3/4 Introduction**

- 3/5 Process or field communication
- 3/9 Data communication
- 3/11 Communication overview
- 3/13 Topologies

3/15 Network components

- 3/15 Overview of network components
- 3/17 Network selection criteria
- 3/20 Connection examples

3/22 Electrical networks (RS 485)

- 3/22 PROFIBUS FastConnect
- 3/24 PROFIBUS bus cables
- 3/35 ECOFAST bus cables
- 3/40 Hybrid fieldbus connections
- 3/42 Energy cables
- 3/47 RS485 bus connector
- 3/52 830-1T connecting cable
- 3/53 830-2 connecting cable
- 3/54 PROFIBUS M12 and 7/8" connecting cable/connector
- 3/61 Bus terminals
- 3/64 Active RS 485 terminating element
- 3/65 Repeater RS 485 for PROFIBUS
- 3/67 Diagnostics repeater for PROFIBUS DP

3/70 Electrical networks (PROFIBUS PA)

- 3/70 Introduction
- 3/73 SpliTConnect
- 3/77 Bus cables
- 3/80 Active field distributors

3/85 Electrical networks (FOUNDATION Fieldbus)

- 3/85 Bus cables

3/88**Optical networks with OLM**

- 3/88 Overview of FC-FOCs
- 3/90 FC glass fiber-optic cables
- 3/95 FC FO termination kit
- 3/96 Glass fiber-optic cable
- 3/111 Plastic and PCF fiber-optic cable
- 3/118 PCF-FOC termination kit
- 3/121 OLM Optical Link Module

3/134 Optical networks with OBT and integrated interface

- 3/134 Plastic and PCF fiber-optic cable
- 3/140 PCF-FOC termination kit
- 3/143 Optical bus terminal OBT

3/146 System interfaces for SIMATIC S7

- 3/146 Introduction
- 3/148 Communication for SIMATIC S7-1200
- 3/148 CM 1242-5
- 3/152 CM 1243-5
- 3/156 Communication for SIMATIC S7-1500
- 3/156 CM 1542-5
- 3/161 CP 1542-5
- 3/165 Communication for SIMATIC S7-300
- 3/165 CP 342-5
- 3/169 CP 342-5 FO
- 3/173 Communication for SIMATIC S7-400
- 3/173 CP 443-5 Extended
- 3/178 Communication for SIMATIC S7 – software

PROFIBUS

3/179 System interfaces for PG/PC/IPC

3/179	Overview
3/180	<u>Communication for PC-based systems</u>
3/180	Performance data
3/181	Connection options to SIMATIC PCs
3/182	CP 5603
3/187	CP 5613 A3
3/191	CP 5614 A3
3/196	CP 5623
3/201	CP 5624
3/206	CP 5612
3/210	CP 5622
3/214	CP 5711
3/219	SOFTNET for PROFIBUS
3/222	OPC server for PROFIBUS
3/225	S7 OPC Redundancy for PROFIBUS
3/227	Software
3/229	PC adapter USB A2

3/231 System interfaces for SIMATIC HMI

3/231	<u>System interfaces with WinCC (TIA Portal)</u>
3/232	SIMATIC S7
3/234	<u>SIMATIC WinCC (TIA Portal) Runtime</u>
3/235	WinCC Runtime Communication
3/238	<u>System interfaces with WinCC flexible</u>
3/238	SIMATIC WinCC flexible RT
3/243	<u>System interfaces with WinCC</u>
3/243	SIMATIC WinCC

3/255 Network transitions

Ch. 2	IE/PB Link PN IO
3/255	DP/DP coupler
3/256	PA routers
Ch. 4	DP/AS-i LINK Advanced
Ch. 4	DP/AS-Interface Link 20E
Ch. 4	DP/AS-i F-Link

3/261 Industrial Controls

3/261	<u>Soft Starters</u>
3/261	3RW44 soft starters for High-Feature applications
3/263	Software
3/263	– Soft Starter ES
3/267	– SIRIUS 3RW44 Soft Starter block library for SIMATIC PCS 7
3/270	<u>Motor starters for use in the field, high degree of protection</u>
3/270	M200D motor starters for PROFIBUS
3/273	– Communication module, motor starter modules
3/274	– Accessories
3/276	Software
3/276	– Motor Starter ES
3/280	– SIRIUS motor starter block library for SIMATIC PCS 7
3/282	<u>SIMOCODE 3UF Motor Management and Control Devices</u>
3/282	SIMOCODE pro 3UF
3/282	– General data
3/288	– Basic units
3/290	– Expansion modules
3/292	– Fail-safe expansion modules
3/293	– Accessories
3/300	3UF18 current transformers for overload protection
3/301	<u>SIRIUS 3RK3 Modular Safety System</u>
3/301	General data
3/306	3RK31 central units
3/307	3RK32/33 expansion modules, 3RK35 interface modules, 3RK36 operating and monitoring modules
3/308	Accessories