

SIEMENS

SIMATIC NET

PG/PC - PROFIBUS CP 5613 A2 / CP 5614 A2

Operating Instructions

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12/2012

C79000-G8976-C301-02

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

 DANGER
indicates that death or severe personal injury will result if proper precautions are not taken.
 WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.
 CAUTION
indicates that minor personal injury can result if proper precautions are not taken.
NOTICE
indicates that property damage can result if proper precautions are not taken.


If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

 WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Preface

1.1 Components of the product

What the consignment contains

The following components are supplied with the CP 5613 A2 / CP 5614 A2:

- CP 5613 A2 / CP 5614 A2 communications processor
- SIMATIC NET CD
- Certificate of license

Please check that the consignment you have received is complete. If the consignment is incomplete, contact your supplier or your local Siemens office.

Validity of this documentation

These operating instructions are valid for the following products:

- CP 5613 A2
order number: 6GK1 561-3AA01
- CP 5614 A2
order number: 6GK1 561-4AA01

Content of this documentation

These operating instructions contain information about the installation and configuration of the CP 5613 A2 and CP 5614 A2 communications processors.

Updated operating instructions on the Internet

You will find the current version of these operating instructions on the Product Support pages under the following entry ID: 62612014

(<http://support.automation.siemens.com/WW/view/en/62612014>)

Further documentation

The documents listed below contain more detailed information on commissioning and using the communications processor. You will find this documentation on the Product Support pages on the Internet under the following entry link:

Support (<http://support.automation.siemens.com/WW/view/en>)

Enter the entry ID shown below of the relevant manual as the search item.

- **Configuration manual Commissioning PC Stations**

This provides you with detailed information on commissioning and configuring SIMATIC NET PC communications modules.

Entry ID:

13542666 (<http://support.automation.siemens.com/WW/view/en/13542666>)

- **System manual SIMATIC NET Industrial Communication with PG/PC**

- **Volume 1– Basics**

Entry ID:

42783968 (<http://support.automation.siemens.com/WW/view/en/42783968>)

- **Volume 2– Interfaces**

Entry ID:

42783660 (<http://support.automation.siemens.com/WW/view/en/42783660>)

The system manuals introduce the topic of industrial communication and explain the communications protocols used. There is also a description of the OPC interface as user programming interface.

- **Installation manual SIMATIC NET PC Software**

This document contains detailed information on installing the SIMATIC NET PC software.

Entry ID:

42784913 (<http://support.automation.siemens.com/WW/view/en/42784913>)

- **System manual PROFIBUS Network Manual**

In this document you will find detailed information about setting up a PROFIBUS network.

Entry ID:

35222591 (<http://support.automation.siemens.com/WW/view/en/35222591>)

SIMATIC NET documentation

You will find the entire SIMATIC NET documentation on the pages of Product Support:

10805878 (<http://support.automation.siemens.com/WW/view/en/10805878>)

Go to the required product group and make the following settings:

→ Entry list → Entry type "Manuals / Operating Instructions"

Service & Support

In addition to the product documentation, the comprehensive online information platform of Siemens Automation Customer Support supports at any time and at any location in the world. You will find the Service & Support pages on the Internet at the following address:

(<http://support.automation.siemens.com/WW/llisapi.dll?func=cslib.csinfo2&aktprim=99&lang=en>)

Apart from news, you will also find the following information there:

- Product information, Product Support, Applications & Tools
- Technical Forum
- Technical Support - Ask the Siemens experts
- Our service offer:
 - Technical Consulting, Engineering support
 - Field Service
 - Spare parts and repairs
 - Maintenance, optimization, modernization and more

You will find contact data on the Internet at the following address:

(<http://www.automation.siemens.com/partner/guiwelcome.asp?lang=en>)

See also

(<https://support.automation.siemens.com/WW/llisapi.dll?func=cslib.csinfo&lang=en&objid=38718979&caller=view>)

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You will find detailed information on the training curriculum and how to contact our customer consultants at the following Internet address:

(www.siemens.com/sitrain)

SIMATIC NET glossary

Explanations of the specialist terms used in this documentation can be found in the SIMATIC NET glossary.

You will find the SIMATIC NET glossary here:

- SIMATIC NET Manual Collection

The DVD ships with certain SIMATIC NET products.

- On the Internet under the following entry ID:

50305045 (<http://support.automation.siemens.com/WW/view/en/50305045>)

Description of the device

2.1 CP 5613 A2 product characteristics

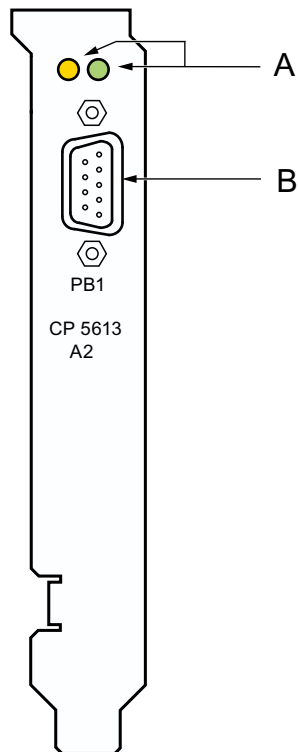
CP 5613 A2 characteristics

The CP 5613 A2 is a communications processor for connecting PCs to PROFIBUS. The essential characteristics are as follows:

- The CP 5613 A2 is equipped with a PROFIBUS interface allowing up to 12 Mbps. It is intended for operation in PGs and PCs with a PCI bus interface according to the PCI standard V2.2.
- With the CP 5613 A2, up to 32 devices (PC, PG, SIMATIC S7 or ET 200) can be linked to form a network segment. By linking several segments with repeaters, a maximum of 64 nodes can be connected.
- Optimized for fast DP master operation (DP Base) with up to 124 DP slaves with full data consistency
- As an alternative, can also be used as a DP slave
- Relieves the PC due to event mechanisms (automatic detection of data changes)
- Fast logic support regardless of the user program (automatic linking of input and output data can be set by the user program).
- Plug and play support during installation of the hardware
- Support of all data transmission speeds from 9.6 kbps to 12 Mbps
- Floating RS-485 connector
- Support of PCI 3.3 V/5 V, 33 MHz/66 MHz, 32 bit/64 bit and PCI-X 66 MHz, 32 bit/64 bit

CP 5613 A2 appearance

The following figure shows the CP 5613 A2 communications processor:



- A Yellow and green status LED
B PROFIBUS interface 1 (master or slave)

2.2 CP 5614 A2 product characteristics

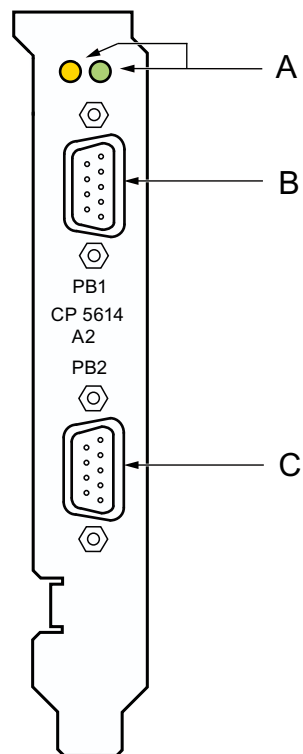
CP 5614 A2 characteristics

The CP 5614 A2 is a communications processor for connecting PCs to PROFIBUS. It has the same characteristics as the CP 5613 A2, as well as:

- Second RS-485 connector for additional connection of the CP as a DP slave to a second DP network.
- Program-controlled transfer of data between master and slave module to allow for setting up of hierarchical PROFIBUS networks.
- DP master and DP slave can be operated at the same time.

CP 5614 A2 appearance

The following figure shows the CP 5614 A2 communications processor:



- A Yellow and green status LED
- B PROFIBUS interface 1 (master)
- C PROFIBUS interface 2 (slave)

2.3 PROFIBUS interface

PROFIBUS network

The physical link between the PROFIBUS interface and the PROFIBUS network is via a floating RS-485 interface that is part of the module. Depending on the network configuration, data rates of 9.6 Kbps up to a maximum of 12 Mbps are possible in the PROFIBUS network.

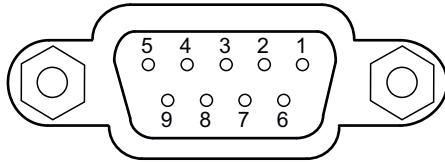
Note

You will find information about the structure of a PROFIBUS network in the system manual "PROFIBUS Network Manual". The document is part of the Manual Collection. You will also find this on the Product Support pages under the following entry ID:

35222591 (<http://support.automation.siemens.com/WW/view/en/35222591>)

PIN assignment

The D-sub female connector has the following pin assignment:



PIN	Short name	Meaning	Input/output
1	NC	Socket pin 1 is not connected.	-
2	NC (M24)	Socket pin 2 is not connected. With other MPI/DP components, the return line of the floating 24 V power supply may be via this pin.	-
3	LTG_B	Signal line B of the PROFIBUS connector.	Input/output
4	RTSAS	RTSAS, input signal for direct MPI link. The control signal is "1" active when the automation system connected over a special MPI cable is sending.	Input
5	M5EXT	M5EXT return line (GND) of the 5 V power supply. The current load of an external consumer connected between P5EXT and M5EXT must not exceed a maximum of 90 mA.	Output
6	P5EXT	P5EXT supply (+5 V) of the 5 V power supply. The current load of an external consumer connected between P5EXT and M5EXT must not exceed a maximum of 90 mA (short-circuit proof).	Output
7	NC (P24V)	Socket pin 7 is not connected. With other MPI/DP components, the P24V supply of the floating 24 V power supply may be via this pin.	-
8	LTG_A	Signal line A of the PROFIBUS connector.	Input/output
9	RTS	RTS output signal of the CP module. The control signal is "1" active when the device (PG or PC) is sending.	Output
Shield		The shield is connected to components of the connector housing.	

2.4 Meaning of the LED display

LED display

The meaning of the LED display is as follows:

Green and yellow LED	Function
green lit	DP master: Shows the token rotation (in other words, normal operation).
green off	DP master: Incorrect bus parameters, defective bus or CP not in operation
green flashing at one second intervals	DP master: Bad database
green and yellow flashing alternately	Module is being addressed by diagnostics tool to check installation.
yellow lit	DP slave: Shows polling by the higher-level DP master: (in other words, normal operation).
yellow off	DP slave: DP slave connector is not addressed.
red flashing fast	Module not started (normal status following reset).
green and yellow flashing synchronized	Exception status (error in firmware)

Software installation

3.1 Installing the driver

installation of the CP 5613 A2 / CP 5614 A2 driver

The driver is installed automatically when you install the "SIMATIC NET, PC Software, Edition 11/2003" (or higher) or the Developer Kit (version 3.1).

Note

For the STEP 7 version approved for the communications processor, refer to the readme file of STEP 7.

3.2 Uninstalling the driver

Uninstalling after using the communications processor (with SIMATIC NET PC software)

NOTICE
Uninstalling the driver The procedure recommended here deletes the entire SIMATIC NET PC software on the PC not only the driver for the communications processor.

- **Initial situation:** The "SIMATIC NET PC Software" DVD is installed on the computer.
- Uninstall the SIMATIC NET PC software as described in the Installation Instructions of the "SIMATIC NET, PC Software" DVD.

Uninstalling the CP 5613 A2 / CP 5614 A2 driver

The driver is uninstalled automatically when you uninstall the "SIMATIC NET, PC Software" DVD.

3.3 Installing the SIMATIC NET PC software

SIMATIC NET PC software

The SIMATIC NET PC software is one of several software packages with which you can operate the CP in your PG/PC. You will find information on alternatives in the section "Alternative software packets (Page 17)".

To configure the CP, you require additional configuration software. You will find information on the configuration software in the section "Configuration (Page 23)".

Condition

The plug and play function is activated in the BIOS of your PG/PC.

Prior to hardware installation

Install the software as described in the installation manual "SIMATIC NET PC Software". You will find this installation manual on the Product Support pages under the entry ID: Auto-Hotspot (<http://support.automation.siemens.com/WW/view/en/61630923>)

You should also note the current information on the SIMATIC NET PC software on the Product Support pages:
Support (<http://support.automation.siemens.com/WW/view/en/10805995/133400>)

After the hardware installation

After installing the CP, your PG/PC automatically searches for a suitable driver.

1. Follow the instructions of the Hardware Wizard of Windows.
2. Do not activate the search for drivers on the Internet.

3.4 Uninstalling the SIMATIC NET PC software

Condition

The SIMATIC NET PC software is installed on the PG/PC.

Procedure

Note

The procedure recommended here deletes the entire SIMATIC NET PC software on the PG/PC not only the driver for the communications processor.

Uninstall the entire software package as described and recommended in the installation manual "SIMATIC NET PC Software".

You will find the installation manual on the SIMATIC NET DVD or on the Product Support pages under the following entry ID:

61630923 (<http://support.automation.siemens.com/WW/view/en/61630923>)

3.5 Alternative software packets

Alternatives to SIMATIC NET PC software

To operate the CP, alternative software packages such as STEP 7 V5.5 or STEP 7 Professional V11 are also available. You will find current information on this on the Product Support pages under the following entry ID:

47071380 (<http://support.automation.siemens.com/WW/view/en/47071380>)

Hardware installation

4.1 Safety notices

 WARNING**Electric shock possible - work only when the power supply is off**

Opening the PG/PC and plugging or pulling the communications processor is permitted only when the power is off.

Turn off your PG/PC and pull the power cable connector before you start the hardware installation.

NOTICE**Note the EC directives**

Components can be damaged or destroyed by electrostatic discharge. When installing, keep to the rules for electrostatically sensitive devices (ESD).

- Pick up components and modules only by their edges. Do not touch the pins or conductors.
- Before opening the PG/PC, make sure that you discharge any electrostatic charge from your body. You can do this by touching metal parts on the back panel of the PG/PC pulling the power plug.
- Make sure that you also discharge any electrostatic charge from tools you intend to use for the work on the PG/PC.
- Do not operate the PG/PC with the housing open.

NOTICE**Firm mounting**

The CP must sit firmly and uniformly in the slot. Check that the module sits firmly in the slot as described in the manual accompanying your PG/PC.

Note**Oblique installation position is permitted**

Some PG/PC designs require oblique installation of the CP. This is permitted.

4.2 Installing hardware

Permitted number of communications processors in the PG/PC

The driver software supports a maximum of 4 CPs per PG/PC, of which a maximum of 2 CPs may be in configured mode.

4.2.1 Automatic adaptation of the bus clock speed

Automatic adaptation of the bus clock speed

The CP is designed for a bus clock speed of 66 MHz. If the CP is inserted in a PCI slot with a higher bus clock speed, the bus clock speed is adapted to the highest possible bus rate of the CP. Examples:

- The PCI slot is automatically reduced to a bus clock speed of 66 MHz.
- The bus clock speed of the CP is automatically reduced to 33 MHz if a module with a 33 MHz bus clock speed is connected.

4.2.2 Installing hardware_PCI

Procedure

Note

- **First install the software**
First install the software before you insert the CP in the slot.
 - **Activated plug and play function**
The plug and play function must be activated in the BIOS of your PG/PC.
-

Follow the steps outlined below when inserting the CP:

1. Turn off your PG/PC and pull the power cable connector.
2. Open the computer housing as described in the manual accompanying your PG/PC.
3. Remove the cover of a free PCI slot.
4. Remove the CP from its packaging.
5. Insert the CP in the PCI slot and secure it.
Make sure that the CP is correctly inserted and secured.
6. Close the computer housing as described in the manual accompanying your PG/PC.

7. Insert the power plug into the socket again and turn your PG/PC on.
The plug and play function of Windows automatically searches for a driver.
8. Follow the instructions of the Hardware Wizard of Windows.
Do *not* activate the search for drivers on the Internet.

4.3 Hardware compatibility

4.3.1 Compatibility with other CPs

Compatibility with other CPs

The communications processors CP 5613 A2 and CP 5614 A2 can replace the following CPs:

- CP 5613
- CP 5614

4.3.2 Replacement

Note

If the previous CP has been removed from the PG/PC, no configuration changes need to be made

You can adopt the configuration of the previous CP. To do this, you simply need to reload the configuration.

Note the following: When loading the previous configuration, the previous CP has priority over the new CP. As long as the previous CP is connected, its configuration cannot be adopted by the new CP. You should therefore remove the previous CP from your PC/PG.

Procedure for replacement

When replacing a module, follow the steps described in the section "Hardware installation (Page 19)".

Configuration

Configuring with STEP 7 or NCM PC

Create a suitable configuration for the CP in STEP 7 or NCM PC.

the procedure is described in detail in the configuration manual "Commissioning PC Stations". You will find this document on the Product Support pages under the following entry ID:

13542666 (<http://support.automation.siemens.com/WW/view/en/13542666>)

NOTICE
No downloading of a CP 5613 A2 configuration to a CP 5614 A2 A DP slave configuration for a CP 5613 A2 must not be downloaded to a CP 5614 A2 because the DP slave will not work with this configuration.

Technical specifications

Technical specifications for CP 5613 A2 / CP 5614 A2

Construction	Values
Module format	PC card, short PCI format
Dimensions (H x W x D) in mm	107 x 18 x 168
Weight	CP 5613 A2: 105 g CP 5614 A2: 120 g
Bus interface	PCI V2.2, plug and play
Voltage	
Operating voltage	Safety extra low voltage (SELV) to EN 60950
Rated voltage (limit values)	5 VDC (4.75 to 5.25 V)
Current consumption	
Current consumption from PCI slot	CP 5613 A2: typical: 0.8 A CP 5614 A2: typical: 0.9 A
Interfaces	
Connection to PG/PC	PCI/PCI-X slot , 3.3 V/5 V, 32 bit, 33/66 MHz bus clock
Connector to PROFIBUS	9-pin D-sub female connector with screw locking mechanism The CP 5614 A2 has two interfaces. If both interfaces of the CP 5614 A2 are used, straight bus connectors must be used. The following network components are recommended for connection to PROFIBUS: <ul style="list-style-type: none"> RS-485 bus connector, order number 6GK1500-0EA01 12M bus terminal, order number 6GK1500-0AA10
Type of transmission	RS-485 floating within the SELV limits

Interfaces

Mode of the PROFIBUS interface	Floating (interface signals), non-floating (cable shield)
PROFIBUS controller used	<ul style="list-style-type: none"> • CP 5613 A2 / CP 5614 A2 Master: ASPC2R ST E2a • CP 5614 A2 Slave: DPC31

Data transfer

Transmission speed	9.6 kbps to 12 Mbps
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Electromagnetic compatibility (EMC)

Emission	Class B to EN 55022 FCC class B
Noise immunity on signal lines	+/- 2 kV to EN 61000-4-5, surge
Immunity to discharges of static electricity	+/- 6 kV, contact discharge to IEC 61000-4-2
Immunity to RF interference	10 V/m at 80 MHz to 2 GHz to EN 61000-4-3 10 V/m 50 % ON period at 900 MHz and 1.89 GHz to EN 61000-4-3 10 V/m with 80 % amplitude modulation with 1 kHz, 9 kHz - 80 MHz to EN 61000-4-6

Climatic Conditions

Temperature	Tested to: DIN EN 60068-2-1, DIN EN 60068-2-2, DIN EN 60068-2-14
Operation	Temperature change max. 10 K/h
Transportation/storage temperature	-40 °C through +70 °C Temperature change max. 20 K/h
Relative humidity	<ul style="list-style-type: none"> • tested to DIN IEC 60068-2-78 in operation 85% at 30°C (no condensation) • tested to DIN IEC 60068-2-30: storage/transportation: 5% at 25 - 55 °C (no condensation)

Mechanical environmental conditions

Vibration during operation	tested to DIN EN 60068-2-6 during operation 10 to 58 Hz, amplitude 0.0375 mm; 58 to 500 Hz, acceleration 4.9 m/s ² 3 axes
Shock during operation	Tested to DIN EN 60068-2-27 during operation half sine: 50 m/s ² (5 g), 30 ms 3 axes

Certification

A

Note

The specified approvals apply only when the corresponding mark is printed on the communications processor.

Electromagnetic compatibility - EMC directive

The communications processor meets the requirements of the EC Directive:2004/108/EEC (EMC directive).

The communications processor is designed for use in the following areas:

Area of application	Requirements	
	Emission	Immunity
Residential areas, business and commercial operations, and small businesses	EN 61000-6-3	EN 61000-6-1
Industrial environment	EN 61000-6-4	EN 61000-6-2

EC declaration of conformity

You will find the EC declaration of conformity for this communications processor on the Product Support pages under the following entry ID:

63367995 (<http://support.automation.siemens.com/WW/view/en/63367995>)

Machinery directive

This communications processor is not a machine in the sense of the EC directive 2006/42/EEC (Machinery Directive). There is therefore no declaration of conformity relating to this EC Directive for the communications processor.

If the communications processor is part of the equipment of a machine, it must be included in the procedure for obtaining the declaration of conformity by the manufacturer of the machine.

C-TICK approval

The communications processor meets the requirements of the Australian AS/NZS 3548 standard.

CSA approval

The communications processor has an approval in accordance with the Canadian CAN/CSA C22.2 No. 60950-1 standard.

ICES conformity

The communications processor meets the requirements of the Canadian standard ICES-003. It is rated as a digital device of Class B ("Class B digital apparatus").

FCC approval

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Siemens AG is not responsible for any radio television interference caused by unauthorized modifications of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Siemens AG. The correction of interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user. The use of shielded I/O cables is required when connecting this equipment to any and all optional peripheral or host devices. Failure to do so may violate FCC and ICES rules.

UL approval

The communications processor has an approval in accordance with the US standard UL 60950-1.

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