

SIEMENS

SIMATIC NET

PG/PC - PROFIBUS CP 5623/CP 5624

Operating Instructions

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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

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

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.

Preface

What the consignment contains

The following components are supplied with the CP 5623 / CP 5624:

- Communications processor CP 5623 or communications processor CP 5624
- SIMATIC NET DVD including
 - SIMATIC NET PC software
 - Manual Collection
- Certificate of license

Please check that the consignment you have received is complete. If it is not complete, please contact your supplier or your local Siemens office.

Validity of this documentation

These operating instructions are valid for the following products:

- CP 5623
order number: 6GK 1562-3AA00
- CP 5624
order number: 6GK1 562-4AA00

Content of this documentation

These operating instructions contain information about the installation and configuration of the CP 5623 and CP 5624 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:

38549256 (<http://support.automation.siemens.com/WW/view/en/38549256>)

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>)

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Description of the device

1.1 Properties of the CP 5623

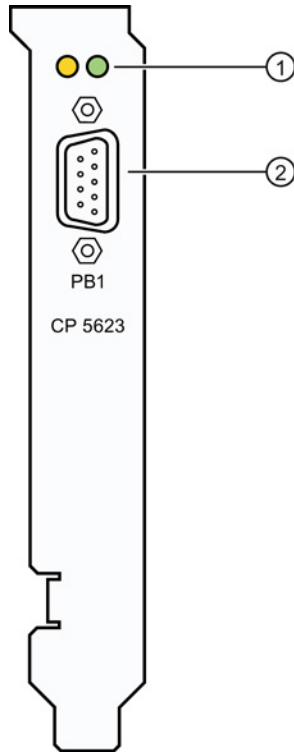
Properties

The CP 5623 is a communications processor for connecting PCs (personal computers) or PGs (programming devices) to PROFIBUS and MPI networks. The essential properties are as follows:

- Transmission speeds up to 12 Mbps.
- Floating RS-485 connector.
- Linking of up to 32 devices (PC, PG, SIMATIC S7 or ET 200) to form a network segment.
 - By linking several segments with repeaters, up to 124 nodes can be connected.
- The additional interface signals for a direct link to a PLC (Programmable Logic Controller) are supported up to 187.5 Kbps.
- Installation in PGs and PCs with a PCI Express slot. The following is supported:
 - PCI Express x1
 - Can also be operated in x4, x8 and x16 slots
 - Plug and play
- Optimized for fast DP master operation (DP Base) with up to 124 DP slaves with full data consistency.
- Relief of the PC/PG with 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.
- Measurement of own operating temperature with temperature sensor.
- Display of the total operating hours with operating hours counter.

Appearance

The following graphic shows the CP 5623 communications processor:



- 1 LEDs
- 2 PROFIBUS interface PB1 (master or slave)

1.2 Properties of the CP 5624

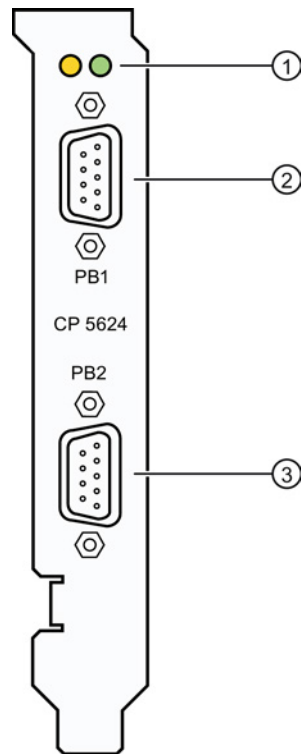
Properties

The CP 5624 is a communications processor for connecting PCs (personal computers) or PGs (programming devices) to PROFIBUS and MPI networks. In addition to the properties of the CP 5623, the CP 5624 also has the following features:

- Additional PROFIBUS connection as DP slave to a second DP network.
- DP master and DP slave can be operated at the same time.
- Program-controlled data transfer between master and slave module for setting up hierarchical PROFIBUS networks.

Appearance

The following graphic shows the CP 5624 communications processor:



- 1 LEDs
- 2 PROFIBUS interface PB1 (master only)
- 3 PROFIBUS interface PB2 (slave only)

1.3 PROFIBUS interface

Note

Connector with 180° cable outlet

Use the bus connector with a 180° cable outlet if you want to use the lower PROFIBUS connector (PB2, slave only) or both PROFIBUS connectors at the same time. You can obtain these connectors, for example, under the following order numbers:

- 6GK1 500-0FC10
- 6GK1 500-0EA02

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.

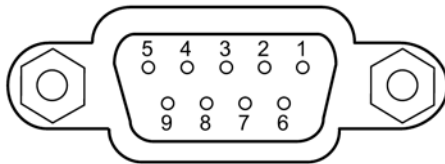
Note

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.	

1.4 Meaning of the LED display

LED display

The meaning of the LED display is as follows:

Green and yellow LED		Meaning
Green on:		Shows the token rotation, in other words, normal operation.
Green off:		Incorrect bus parameters, defective bus or CP not in operation.
Green flashes at one second intervals:		Bad database.
Green flashes fast, yellow is off:		Module not started; normal status following reset.
Green and yellow flashing alternately:		When using more than one module in a PG/PC: Identification of the module by a diagnostics tool.
Green and yellow flashing synchronized:		Exception status; error in firmware.
One of the two LEDs is on, the second flashes quickly:		Error initializing the module.
Applies only to DP slave operation with the CP 5624	Yellow on:	Shows polling by the higher-level DP master.
	Yellow off:	DP slave connector is not addressed.

Software installation

2.1 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 16)".

To configure the CP, you require additional configuration software. You will find information on the configuration software in the section "Configuration (Page 21)".

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: 61630923 (<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.

2.2 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>)

2.3 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 (TIA Portal) are 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

3.1 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).
<ul style="list-style-type: none">• 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.

3.2 Installing hardware

Permitted number of communications processors in the PG/PC

The driver software supports a maximum of 4 CPs per PG/PC.

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 from a free PCI Express slot.
4. Remove the CP from its packaging.
5. Insert the CP in the PCI Express 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.

3.3 Hardware compatibility

Compatibility with predecessor versions

The CP 5623 can replace the following predecessor versions:

- CP 5613 A3
- CP 5613 A2
- CP 5613

The CP 5624 can replace the following predecessor versions:

- CP 5613 A3 and CP 5614 A3
- CP 5613 A2 and CP 5614 A2
- CP 5613 and CP 5614

Note

PCI Express

Please note: The CPs of the 5613 / 5614 series are PCI cards. The CP 5623 and CP 5624 communications processors are PCI Express cards. This means that you can only replace previous versions with a CP 5623 / CP 5624 if there is a free PCI Express slot available in the PG/PC.

Note

No configuration changes necessary

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

Procedure for replacement

When replacing a module, follow the steps described in the section "Hardware installation (Page 17)".

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>)

Compatibility during configuration

If there is not yet a CP 5623 / CP 5624 available in the hardware catalog of your STEP 7 version or NCM PC version, you can also select a previous version for configuration.

- For the CP 5623, select a configuration of:
 - CP 5613 A3,
 - CP 5613 A2 or
 - CP 5613
- For the CP 5624, select a configuration of:
 - CP 5614 A3,
 - CP 5614 A2 or
 - CP 5614

The CP 5623 / CP 5624 is downwards compatible with the configurations of the previous versions.

NOTICE
The DP slave configuration of a CP of the 56x3 series is not compatible with the DP slave configuration of a CP from the 56x4 series. This means, for example, that the DP slave configuration of a CP 5623 cannot be loaded on a CP 5624 - and vice versa - because the slave will not work with this configuration.

Technical specifications

Technical specifications of the CP 5623 / CP 5624

Connection to PROFIBUS

Amount	
• For CP 5623	1
• For CP 5624	2
Transmission speeds	9.6 kbps, 19.2 kbps, 45.45 kbps, 93.75 kbps, 187.5 kbps, 500 kbps, 1.5 Mbps, 3 Mbps, 6 Mbps, 12 Mbps
Design	9-pin D-sub female connector with screw locking mechanism RS-485 (ungrounded within the SELV limits)
Properties	Grounded cable shield Floating interface signals

Connection to PG/PC

PCI Express x1
V 1.0a plug and play
Can also be operated in x4, x8 or x16.

Electrical specifications of the PCI plug-in connector

Operating voltage	Rated voltage	3.3 VDC and 12 VDC
	Permitted range	DC 3.0 to 3.6 V for 3.3 VDC 11.0...13.0 VDC for 12 VDC
	Properties	Safety extra low voltage (SELV) to EN 60950
Current consumption	Typical	
	• CP 5623	720 mA at 3.3 V and 250 mA at 12 V
	• CP 5624	750 mA at 3.3 V and 300 mA at 12 V
Effective power loss	Typical	
	• CP 5623	5.4 W
	• CP 5624	6.1 W

Permitted ambient conditions

Operating conditions	Temperature (EN 60068-2-1+2)	+5...+60 °C
	Temperature change max.	≤10 K/h
	Rel. humidity (EN 60068-2-78)	≤ 85% at 30 °C no condensation

Technical specifications of the CP 5623 / CP 5624

	Vibration (EN 60068-2-6)	10 to 58 Hz amplitude 0.075 mm 58 to 500 Hz, acceleration 10 m/s ²
	Shock (EN 60068-2-27)	Half-sine: 50 m/s ² (5 g), 30 ms
Storage and transportation conditions	Temperature (EN 60068-2-1+2)	-20...+60 °C
	Temperature change max.	≤20 K/h
	Rel. humidity (EN 60068-2-30)	≤ 95% at +25...+55 °C no condensation
	Vibration (EN 60068-2-6)	8.51 to 500 Hz acceleration 10 m/s ² 5 to 8.51 Hz, amplitude 3.5 mm
	Shock (EN 60068-2-29)	Half-sine: 250 m/s ² (25 g), 6 ms
Design, dimensions and weight		
Module format	Flat module	Short PCI card
Weight	• For CP 5623	102 g
	• For CP 5624	117 g
Dimensions (W x H x D)	• For CP 5623	21.6 x 126.3 x 180.5
	• For CP 5624	21.6 x 126.3 x 180.5
Electromagnetic compatibility		
Emission	• to EN 55022	Class B
	• to FCC	Class B
Immunity	On signal cables	
	• Surge to EN 610004-5	±2 kV
	• Burst to EN 61000-4-3	±2 kV
	to discharge of static electricity	
	• Contact discharge to IEC 61000-4-2	±6 kV
to radiated radio frequencies		
• to EN 61000-4-3	3 V/m with 80% amplitude modulation with 1 kHz, at 2 MHz – 2.7 GHz 10 V/m with 80% amplitude modulation with 1 kHz, at 80 MHz to 2 GHz	
• to EN 61000-4-6	10 V/m 80% amplitude modulation with 1 kHz, at 10 kHz to 80 MHz	

Approvals

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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