SIEMENS

SIMATIC NET

PG/PC - Industrial Ethernet CP 1628

Operating Instructions

06/2021
C79000-G8976-C280-09

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

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.

Table of contents

Preface

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What the consignment contains

The following components are supplied with the CP 1628:

- CP 1628 communications processor
- DVD "Security Configuration Tool" (or driver/software CD for the CP 1628)
- Safety notices for the CP 1628
- "SIMATIC NET PC Software" DVD
- "SIMATIC STEP 7 Professional" DVD

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 product:

- CP 1628
  Article number: 6GK1162-8AA00

Content of this documentation

These operating instructions contain information about the installation and configuration of the CP 1628 communications processor.

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:
62611659 (https://support.industry.siemens.com/cs/ww/en/view/62611659)

Further documentation

The documents listed below contain more detailed information on commissioning and using the communications processor.

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:
  77377601 (https://support.industry.siemens.com/cs/ww/en/view/77377601)

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

  – **Volume 1 – Basics (system manual)**

    Entry ID:
    77376110 (https://support.industry.siemens.com/cs/ww/en/view/77376110)

  – **Volume 2 – Interfaces (programming manual)**

    Entry ID:
    77378184 (https://support.industry.siemens.com/cs/ww/en/view/77378184)

    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:
   77377602 (https://support.industry.siemens.com/cs/ww/en/view/77377602)

- **System manual Industrial Ethernet Network Manual**

  In this document you will find detailed information about setting up an Industrial Ethernet network.

  Entry ID:
  27069465 (https://support.industry.siemens.com/cs/ww/en/view/27069465)

SIMATIC NET documentation

You will find the entire SIMATIC NET documentation on the Product Support pages:
 15247 (https://support.industry.siemens.com/cs/ww/en/ps/15247)

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

→ Filter criteria for entries → entry type "Manual"

See also

Support (https://support.industry.siemens.com/cs/ww/en/ps)

Trademarks

The following and possibly other names not identified by the registered trademark sign ® are registered trademarks of Siemens AG:

HARDNET, SOFTNET, CP 1612, CP 1613, CP 5612, CP 5613, CP 5614, CP 5622

Industry Online Support

In addition to the product documentation, you are supported by the comprehensive online information platform of Siemens Industry Online Support at the following Internet address:
Link: (https://support.industry.siemens.com/cs/de/en/)

Apart from news, there you will also find:

- Project information: Manuals, FAQs, downloads, application examples etc.

- Contacts, Technical Forum

- The option submitting a support query:
  Link: (https://support.industry.siemens.com/My/ww/en/requests)

- Our service offer:

  Right across our products and systems, we provide numerous services that support you in every phase of the life of your machine or system - from planning and implementation to commissioning, through to maintenance and modernization.

You will find contact data on the Internet at the following address:
Link: (https://www.automation.siemens.com/aspa_app/?ci=yes&lang=en)

SITRAIN - Training for Industry

The training offer includes more than 300 courses on basic topics, extended knowledge and special knowledge as well as advanced training for individual sectors - available at more than 130 locations. Courses can also be organized individually and held locally at your location.

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

Link: (https://sitrain.automation.siemens.com/DE/sitrain/default.aspx?AppLang=en)

Industrial Networks Education

Training and certification for Industrial Networks

In our Industrial Networks Education courses you'll learn to design and implement wired and wireless data networks and connect them to a corporate network. You will also receive instruction on how to secure, diagnose and optimize communication networks. Certification can also be offered to supplement almost all training courses.

Link: (https://www.siemens.com/industrial-networks-education)

Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines, and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions form one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. These systems, machines and components should only be connected to the enterprise network or the Internet if and only to the extent necessary and with appropriate security measures (firewalls and/or network segmentation) in place.

You can find more information on protective measures in the area of industrial security by visiting: (https://www.siemens.com/industrialsecurity).

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends performing product updates as soon as they are available and using only the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under (https://www.siemens.com/industrialsecurity).

SIMATIC NET glossary

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

You will find the SIMATIC NET glossary on the Internet at the following address:

Link: (https://support.automation.siemens.com/WW/view/en/50305045)

Recycling and disposal

The products are low in harmful substances, can be recycled and meet the requirements of the Directive 2012/19/EU for disposal of waste electrical and electronic equipment (WEEE).

Do not dispose of the products at public disposal sites.

For environmentally compliant recycling and disposal of your electronic waste, please contact a company certified for the disposal of electronic waste or your Siemens representative.

Note the different national regulations.

Description of the device

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Product features

NOTICE
Important information relating to the product
Some parts of the CP 1628 firmware are supplied by a third party. This third-party supplier has informed us that they will no longer offer maintenance for the supplied software components. This means that there is no monitoring regarding any future critical vulnerabilities that may be exhibited by these software components. Siemens, therefore, can no longer ensure that the firmware does not contain security-critical vulnerabilities for all CP 1628 purchased after May 2021. Plus, any future security vulnerabilities can no longer be published in a Security Advisory – due to the fact the Siemens no longer has any knowledge of such vulnerabilities – and such vulnerabilities also are no longer removed.
However, the basic functionalities of the CP 1628 are not affected by these vulnerabilities. The only difference is that there is no longer the full guarantee that the secure networks used with the CP 1628 are fully protected. We therefore recommend that you implement a state-of-the-art security concept for the entire plant (for more information, see the notes under https://www.siemens.com/industrialsecurity). We especially recommend that you do not secure the Internet access of the CP 1628 via the functions integrated into the product but by using an additional security appliance, such as the SCALANCE SC. In this case, the plant would be adequately protected even if there was a security-critical vulnerability in the CP 1628.

The CP 1628 is a PCIe module for connecting PGs/PCs to Industrial Ethernet. The essential properties are as follows:

- Two RJ-45 ports for Industrial Ethernet for connecting twisted-pair cables
- Can be used as a 2-port switch (both RJ45 connectors lead to the integrated switch)
- The following data rates are supported:
    - 10/100 Mbps (half/full duplex)
    - 1000 Mbps (full duplex)
- Own processor on the CP 1628 reduces the load on the PG/PC CPU.
- Autosensing, autocrossover, autonegotiation
- ISO and TCP/IP transport protocol onboard

- Encrypted firmware that is signed and transferred to the CP 1628
- Integrated security (firewall, VPN)

Note

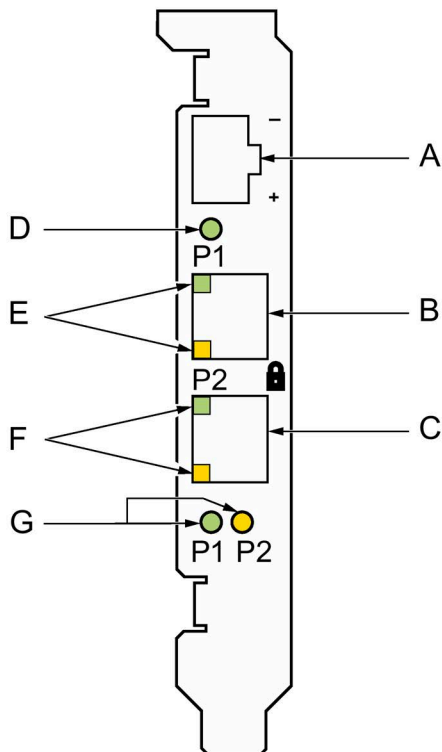All CP 1613 and CP 1623 software products can be operated with the CP 1628.

Hardware requirements

The CP 1628 requires a PCIe slot (PCI express x1; can also be operated in x4, x8 or x16 slots).

LED display

The following graphic shows the front panel of the CP 1628 communications processor:

A	Connecting socket for optional external power supply
B	Port 1
C	Port 2
D	Power/fault LED
E	2 port LEDs for Port 1
F	2 port LEDs for Port 2
G	LEDs for displaying the transmission speed of Port 1 and Port 2

The table describes the LED displays that indicate the operating states:

LED	LED	Description
Power/fault LED	Off	No external power supply connected, no fault
	Green	External power supply connected
	Red (flashing)	Module fault/error
2 port LEDs in each port (green and yellow)	• Green, off • Yellow, off	No cable connected
	• Green, on continuously • Yellow, off	Link exists, no data traffic
	• Green, on continuously • Yellow, flashing	• Link exists, sending/receiving data
LEDs for displaying data transmission speed P1 and P2 ports	Off	• 10 Mbps or • no cable connected
	Green, on continuously	100 Mbps
	Yellow, on continuously	1000 Mbps
LEDs P1 and P2 flash alternately	• Yellow, flashing • Green, flashing	Identification of the communications processor

External power supply

Via the external power supply socket (12 to 24 V DC), the CP 1628 can be operated as a 2-port switch even if the PC is turned off.

Software installation

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3.1 Installing the driver

Installation

After the PC has booted, the Windows plug-and-play mechanism searches for a driver for the communications processor. This can be found on the supplied "SIMATIC NET PC Software" DVD.

3.2 Installing the "SIMATIC NET PC Software"

"SIMATIC NET PC Software"

The "SIMATIC NET PC Software" is the software package with which you can operate the communications processor in your PG/PC.

To configure the communications processor, you require additional configuration software. You will find information on the configuration software in the section "Configuration (Page 17)".

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 following entry ID: 77377602 (https://support.industry.siemens.com/cs/ww/en/view/77377602)

You should also note the current information on the "SIMATIC NET PC Software" on the Product Support pages in:
 (https://support.industry.siemens.com/cs/ww/en/ps/15362/pm)

After the hardware installation

After installing the communications processor, 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.

3.3 Uninstalling the "SIMATIC NET PC Software"

Condition

The "SIMATIC NET PC Software" is installed on the PG/PC.

Procedure

Note

The recommended procedure removes 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 PC Software" DVD or on the Product Support pages under the following entry ID:

77377602 (https://support.industry.siemens.com/cs/ww/en/view/77377602)

Hardware installation

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Note on lightning protection

> **Note**
>
> The requirements of EN61000-4-5, surge immunity tests on power supply lines, are met only when a Blitzductor is used with 12 to 24 VDC:
>
> 12 - 24 VDC: VT AD 24V Art. No. 918 402
>
> Vendor: DEHN+SÖHNE GmbH+Co.KG, Hans Dehn Str. 1, Postfach 1640, D - 92306 Neumarkt, Germany

Number of permitted communications processors

> **Note**
>
> A maximum of four CP 1628 modules can be installed in one PG/PC. Take into account the technical specifications of the power supply for the PCI slots of the PG/PC.
>
> Make sure that there is adequate ventilation, especially when using the maximum number of modules, so that the operating temperature does not exceed 55 °C.
>
> If you have installed the SIMATIC NET PC software, you can check the operating temperature of the module with the "Communication Settings" tool on the "Operating data" properties page.

Notes on passive network components

You will find important notes on the use of passive network components in the document "Industrial Ethernet / PROFINET Passive network components" (https://support.industry.siemens.com/cs/ww/en/view/84922825).

Procedure

To install and connect up the CP 1628 follow the steps outlined below:

Note

When handling the communications processor, make sure that you do not touch the connectors or the electronic components.

1. Turn off your PC and pull out the power cable connector from the socket.
2. Open the PC housing as described in the manual for your PG/PC and remove the cover of a free PCIe slot in your PC.
3. Insert the CP 1628 in the PCIe slot.
   Make sure that the CP 1628 is inserted and secured correctly.
4. Close the PC housing as described in the manual accompanying your PG/PC.
5. Plug the connecting cable (twisted pair) into one of the two jacks on the front panel of the CP 1628.
6. Plug the power supply connector into the socket again and turn on your PC.

Optional: If required, connect the external power supply with the supplied or a compatible plug-in connector.

Configuration

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The following engineering or configuration tools are available to allow you to configure the communications processor:

- STEP 7 V5.5 (not included in the scope of delivery)

- STEP 7 Professional (TIA Portal)

- Communication Settings (COML S7)

- "SCT" (Security Configuration Tool) as additional package for STEP 7 as of V5.5.3 (part of the DVD "Security Configuration Tool" or driver/software CD for the CP 1628)

The steps involved are described in the "Commissioning PC Stations" manual or in the relevant online help files.

Note

The CP 1613- / CP 1623 configuration can be downloaded to the CP 1628.

Note

The CP 1628 has four consecutive MAC addresses:

- The base address printed on the module is the Windows NDIS MAC address that cannot be modified.

- The second MAC address can be changed during configuration (Industrial Ethernet MAC address).

- The third and fourth MAC addresses are reserved for future functions and cannot be modified.

5.1 Configuring Security

Security

Security settings are made either in "STEP 7 Professional (TIA Portal)" or, when using the SIMATIC NET software product "S7 REDCONNECT", in the "SCT" software product (Security Configuration Tool) that can be called up in STEP 7 as of V5.5.3. You will find further information in the configuration manual "Industrial Ethernet Security – Basics and Application". You will find this document on the Internet under the following entry ID: 109738463 (https://support.industry.siemens.com/cs/ww/en/view/109738463)

Technical specifications

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CP 1628

The following technical specifications apply to the CP 1628 communications processor:

Data transfer	
Transmission speed	• 10/100 Mbps (half/full duplex) • 1000 Mbps (full duplex)

Interfaces	
Connection to 10BaseT/100BaseTx/ 1000BaseT	RJ-45 ports (two)
Connector for PG/PC	PCI Express x1; can also be operated in x4, x8 or x16 slots

Power	
PCIe power supply	3.3 VDC and 12 VDC

External power supply	
Rated voltage	12 to 24 VDC
Limit voltages	Min. 10.5 VDC Max. 32 VDC

Current consumption	
PCIe power at 3.3 VDC	max. 0.85 A
PCIe power at 12 VDC	max. 0.4 A

Permitted ambient conditions	
Operating temperature	+5 to +55 °C
Transportation/storage temperature	-20 to +60 °C

Construction	
Module format	• Standard height • half length
Dimensions (H x W x D) in mm	126.3 x 21.6 x 180.5
Weight	124 g
Space required	PCIe slot

External power supply

The following technical specifications refer to the external power supply:

Requirements of the external power supply	
Electrical isolation	required
Rated voltage range	12 to 24 VDC
CP 1628 current consumption	• at 12 VDC: 0.55 A • at 24 VDC: 0.3 A

Connection of external power supply	
Socket strip, 2-pin	Use the supplied connector.

Note

If supplied from a separate source, this must meet the requirements to comply with NEC Class 2.

Approvals

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Note

The specified approvals apply only when the corresponding mark is printed on the product. You can check which of the following approvals have been granted for your product by the markings on the type plate.

Electromagnetic compatibility - EMC directive

The communications processor meets the requirements of the EU Directive 2014/30/EU (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

RoHS Directive

The product meets the requirements of the EC directive 2011/65/EU (RoHS Directive) on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Applied standard: EU L174, 01/07/2011

Declaration of conformity

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

58826997 (https://support.industry.siemens.com/cs/ww/en/view/58826997)

C-TICK approval

The communications processor meets the requirements of the Australian AS/NZS 3548 standard according to EN 61000-6-3.

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.

Marking for the customs union

EAC (Eurasian Conformity)

Eurasian Economic Union of Russia, Belarus, Armenia, Kazakhstan and Kyrgyzstan

Declaration of conformity according to the technical regulations of the customs union (TR ZU)