SIEMENS

SIMATIC NET

PG/PC - PROFINET CP 1626

Operating Instructions

Preface

Description of the device 1

Hardware installation 2

Configuration 3

Operating hardware 4

Technical specifications 5

Configuration limits 6

Approvals A

08/2016

C79000-G8976-C434-01

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.

Siemens AG
Division Process Industries and Drives
Postfach 48 48
90026 NÜRNBERG
GERMANY

Document order number: C79000-G8976-C434
℗ 09/2016 Subject to change

Copyright © Siemens AG 2016.
All rights reserved

Preface

CP 1626 communications processor - 6GK1162-6AA01

Check that the product is complete. The following components are supplied with the CP 1626:

- CP 1626 communications processor
- Driver DVD for CP 1626

Note

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 1626

Content of this documentation

These operating instructions contain information about the installation and configuration of the CP 1626 communications processor.

Updated operating instructions on the Internet

You will find the current version of these operating instructions on the Product Support (https://support.industry.siemens.com/cs/ww/en/view/109737172) Internet pages

Further documentation

The documents listed below contain more detailed information on commissioning and using the communications processors. You will find this documentation on the Product Support pages on the Internet with the following link:
Support (https://support.industry.siemens.com/cs/ww/en/)

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

- **System manual SIMATIC NET Industrial Communication with PG/PC**
  - **Volume 1 - Basics**
    Entry ID:
    77376110 (https://support.industry.siemens.com/cs/ww/en/view/77376110)
  - **Volume 2 - Interfaces**
    Entry ID:
    77378184 (https://support.industry.siemens.com/cs/ww/en/view/77378184)

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

- **System manual Industrial Ethernet Network Manual**
  In this document, you will find detailed information on setting up an Industrial Ethernet network.
  Entry ID:
  27069465 (https://support.industry.siemens.com/cs/ww/en/view/27069465)
- **Manual SIMATIC PROFINET System Description**
  This provides you with basic knowledge of the PROFINET IO topics: network components, data exchange and communication, PROFINET IO, Component Based Automation, application example for PROFINET IO and Component Based Automation.
  Entry ID:
  19292127 (https://support.industry.siemens.com/cs/ww/en/view/19292127)
- **Manual From PROFIBUS DP to PROFINET IO**
  You should read this document if you already have an installed PROFIBUS system and want to change to a PROFINET system.
  Entry ID:
  19289930 (https://support.industry.siemens.com/cs/ww/en/view/19289930)
- **Manual SIMATIC NET - Twisted Pair and Fiber-optic Networks**
  With the information in this document, you can configure and set up your Industrial Ethernet networks.
  Entry ID:
  8763736 (https://support.industry.siemens.com/cs/ww/en/view/8763736)
- **Programming manual IO-Base User Programming Interface**
  This manual introduces you to writing user programs in the C/C++ programming language.
  Entry ID:
  26435491 (https://support.industry.siemens.com/cs/ww/en/view/26435491)
- **Programming manual I-Device User Programming Interface**
  This manual introduces you to writing user programs in the C/C++ programming language.
  Entry ID:
  109737176 (https://support.industry.siemens.com/cs/ww/en/view/109737176)
- **Programming manual SIMATIC NET DK-HN-IE PN IO Porting Instructions**
  This manual introduces you to initial commissioning of the DK-HN PN IO in Linux, the porting of the driver for the CP 1626 and the porting of the IO-Base Library to your target operating system.
  Entry ID:
  109737175 (https://support.industry.siemens.com/cs/ww/en/view/109737175)

SIMATIC NET documentation

You will find the entire SIMATIC NET documentation on the pages of Product Support:
10805878 (https://support.industry.siemens.com/cs/ww/en/ps/15247)

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

→ Entry type "Manual"

Trademarks

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

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

Industry Online Support

In addition to the product documentation, 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: (http://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: (http://sitrain.automation.siemens.com/DE/sitrain/default.aspx?AppLang=en)

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 only form one element of such a concept.

Customer is responsible to prevent unauthorized access to its plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent necessary and with appropriate security measures (e.g. use of firewalls and network segmentation) in place.

Additionally, Siemens' guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit (http://www.siemens.com/industrialsecurity)

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use 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://support.industry.siemens.com/cs/ww/en/ps/15247/pm)

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:

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

Table of contents

Preface **3**

1 Description of the device **9**

2 Hardware installation **15**

2.1 Important information 15

2.2 Procedure for installing the CP 1626 17

3 Configuration **19**

4 Operating hardware **21**

4.1 Operating systems 21

4.2 Diagnostics with SNMP 21
4.2.1 SNMP and CP 1626 21
4.2.2 Variables of the MIB-II standard 23
4.2.3 Private MIB of a CP 1626 25

4.3 Web server 26
4.3.1 Language settings 26
4.3.2 User management 27
4.3.3 Settings in "STEP 7 Professional (TIA Portal)" in the "Web server" tab. 27
4.3.4 Updating and storing information 29
4.3.5 Web pages 30
4.3.5.1 Intro 30
4.3.5.2 Start page 31
4.3.5.3 Identification 33
4.3.5.4 Diagnostics buffer 33
4.3.5.5 Module information 35
4.3.5.6 Communication 38
4.3.5.7 Topology 41
4.3.5.8 Media redundancy 47
4.3.5.9 Loading firmware 48

4.4 IO routing 49
4.4.1 What is IO routing and how is it used? 49
4.4.2 What types of IO routing exist? 50
4.4.3 How does the IO router work? 51
4.4.4 Examples of reading and writing 53
4.4.5 Example of reading input data 53
4.4.6 Example of reading output data 54
4.4.7 Example of the main and robot controller writing output data 55
4.4.8 Summary of the properties of IO routing 56
4.4.9 Configuring IO routing 57

4.5 Media redundancy (MRP) 57

4.6 Prioritized startup 58

4.7 Replacement of a module with another of the same type. 58

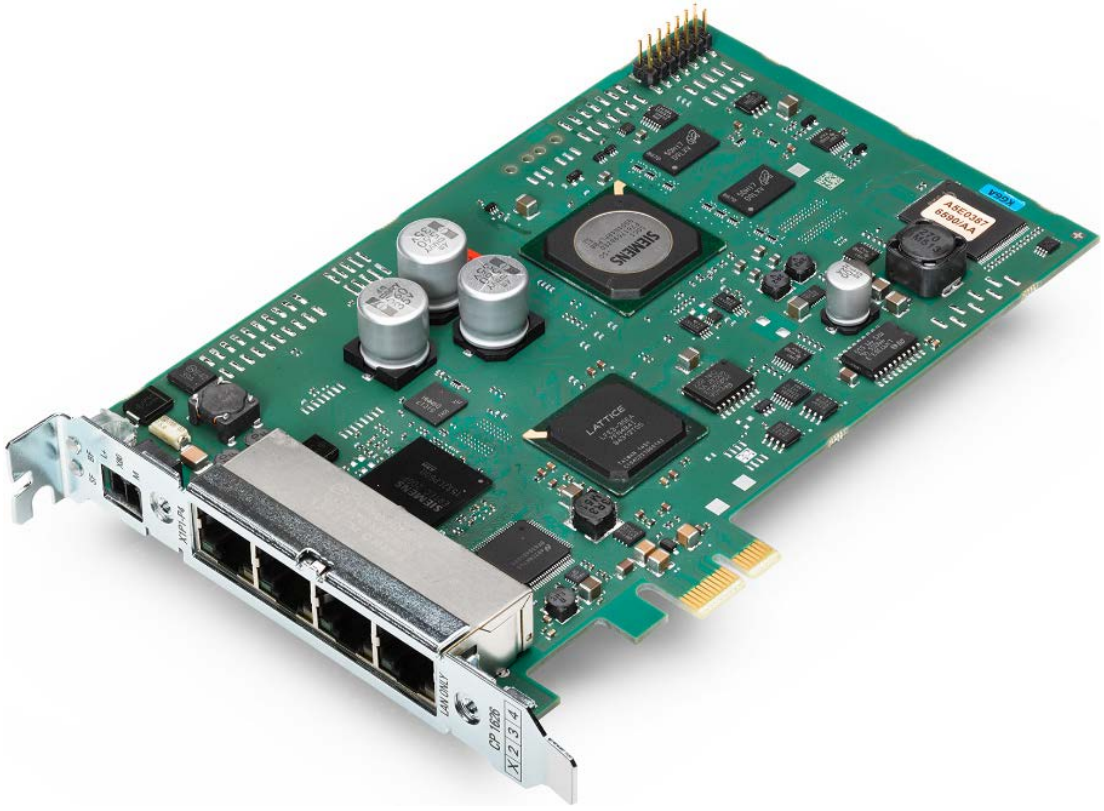
4.8 Notes and restrictions 59
5 Technical specifications 61
6 Configuration limits 63
A Approvals 65

Description of the device

1

Appearance

The following figure shows the CP 1626 communications processor.



Properties

The CP 1626 is a PCIe module for connecting PGs/PCs to Industrial Ethernet. The essential properties are as follows:

- Optimized for PROFINET IO
- With Ethernet real-time ASIC SOC-1 and ERTEC 200 P
- Four RJ-45 jacks for connection of end devices or other network components
- 2 integrated 2-port real-time switches
- Automatic hardware detection is supported
- PROFIenergy functions for turning the host PC on and off

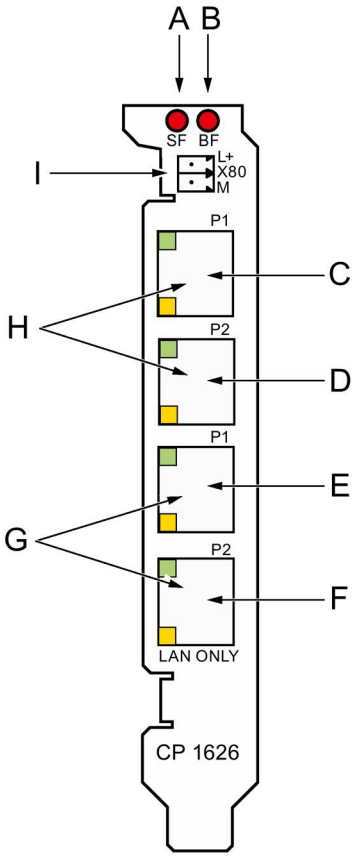
- Operation of IO device and IO controller at the same time
- Network separation (different IP subnets for IO device and IO controller operation)

Hardware requirement

To be able to operate, the CP 1626 requires a short PCIe slot with master capability.

LED display

The following figure shows the front panel of the CP 1626 communications processor:



A	LED for group errors
B	LED for bus fault
C	Port 1 of the X2 interface
D	Port 2 of the X2 interface
E	Port 1 of the X1 interface
F	Port 2 of the X1 interface
G	X1 interface
H	X2 interface
I	External power supply

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

BF LED	SF LED	Description
off	–	Communications connection is established.
on	–	Link status error has occurred.
flashing slowly	–	There are two possible causes: • An IO device cannot be addressed. • An IP address was assigned twice.
–	off	No fault/error.
–	on	Diagnostics information is available.
Alternating slow flashing and flashing of the 2 port LEDs (yellow and green) of the X1 interface		Flash test for recognizing the communications processor.
Alternating fast flashing		A disruption has occurred. In this case, diagnostics via the Web or using SNMP is no longer possible.
		Note If this error occurs, contact Technical Support. You will find the contact data in the section "Preface (Page 3)".

External power supply

The CP 1626 has a socket for connecting an external power supply.

With this power supply, the integrated real-time switches of the X1 and X2 interfaces can operate even if the PC is turned off.

It also allows the host PC to be turned on again after being switched off by PROFIenergy.

Ethernet

The CP 1626 is intended for operation in Ethernet networks.

It also has the following features:

- The connectors are designed for 100BaseTX.
- Data transmission speed of 100 Mbps in full/half duplex is supported.
- Autonegotiation (can also be turned off)
- Autocrossing

RJ-45 jacks

The connection of the communications processor 1626 to the LAN (local area network) is via one of the four RJ-45 jacks on the front panel of the communications processor.

In each case, 2 jacks are connected to the integrated real-time switch.

Jacks 1 and 2 are intended for IO device operation.

Jacks 3 and 4 allow IO controller and/or IO device operation.

Note

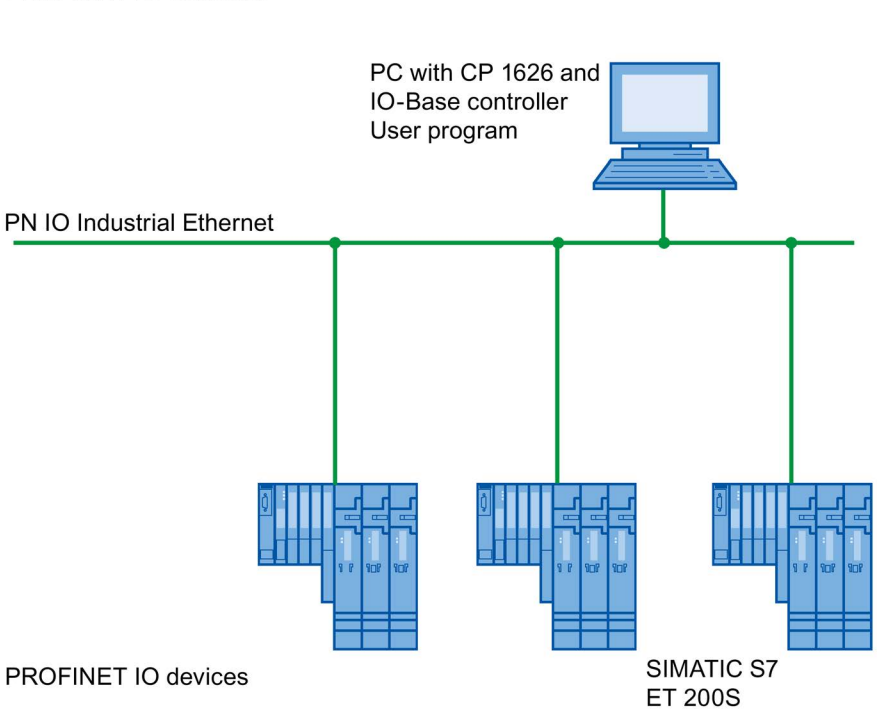
For the "network separation" property, use sockets 1 and 2 for one IP subnet and sockets 3 and 4 for the other IP subnet.

CP 1626 in a PC as IO controller

The following figure shows a typical application:
PC with CP 1626 as PROFINET IO controller at the IO controller level.

The IO-Base controller user program runs on the PC and accesses the functions of the IO-Base user programming interface.

The data traffic is handled via a CP 1626 with several SIMATIC S7 PROFINET IO devices ET 200S via Industrial Ethernet.

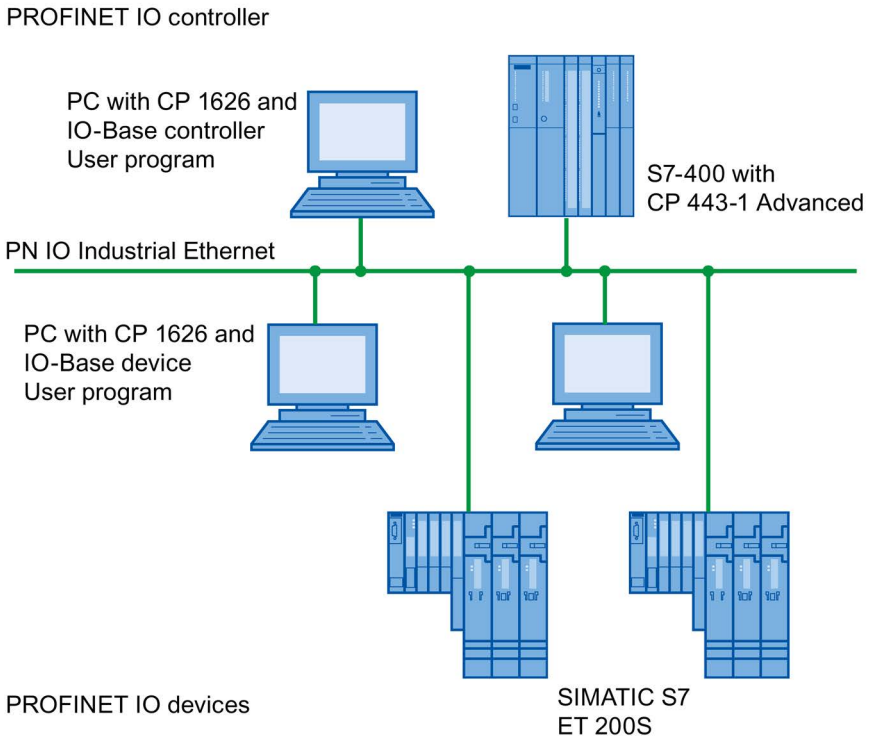


CP 1626 in a PC as IO device

The following figure shows a typical application:
Two PCs each with a CP 1626 as PROFINET IO device at the IO device level.

There are also a PC with a CP 1626 as PROFINET IO controller, a SIMATIC S7-400 with a CP 443-1 as PROFINET IO controller and two SIMATIC S7 ET 200S PROFINET IO devices connected in the network.

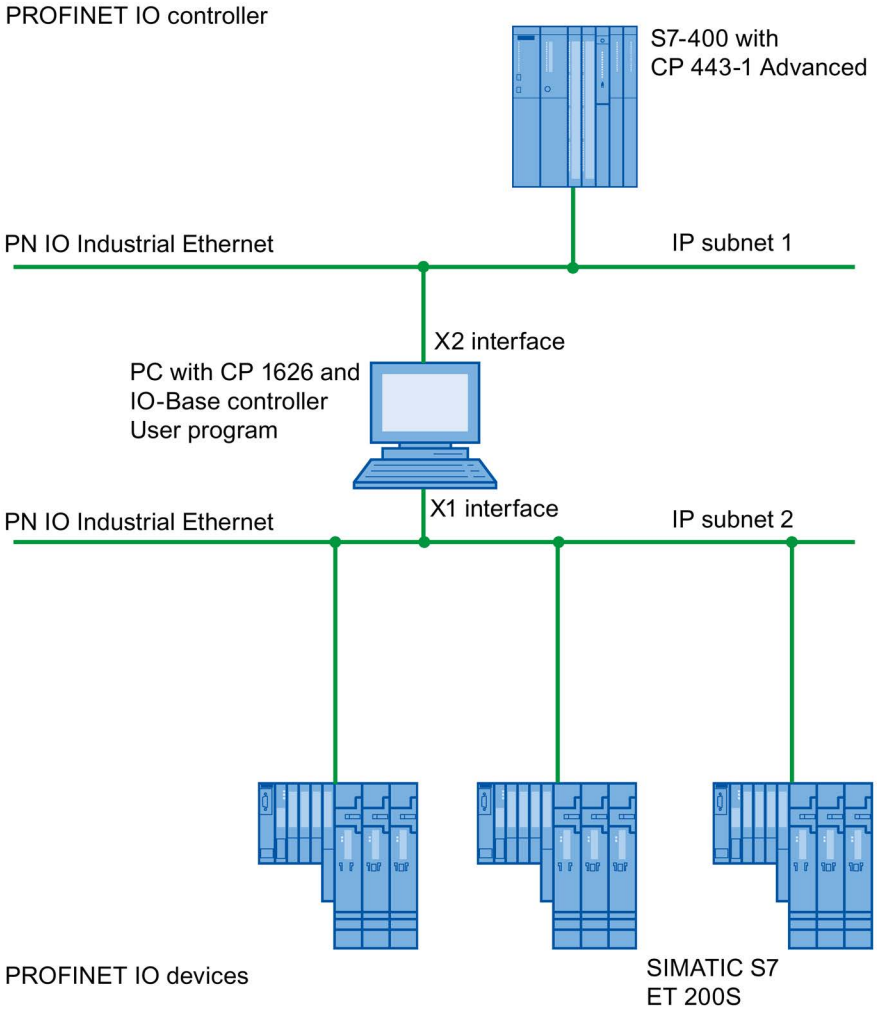
On the IO device PCs, there is an IO-Base device user program running that accesses the functions of the IO-Base user programming interface. The data traffic is handled via a CP 1626 to a PC as PROFINET IO controller or an S7-400 automation system with a CP 443-1 via Industrial Ethernet.



CP 1626 in a PC with network separation

The following figure shows the CP 1626 being used in "network separation". To do this the communications processor is connected to an automation system S7-400 with a CP 443-1 Advanced as PROFINET IO controller via the X2 interface with IP subnet 1.

Via the X1 interface of the CP 443-1 Advanced and IP subnet 2 the CP 1626 is connected to the SIMATIC S7 ET 200S PROFINET IO devices. This makes it possible to keep disruptive influences occurring in IP subnet 1 away from IP subnet 2 and there are more IP addresses available.



Hardware installation

2

2.1 Important information

Electrostatic sensitive components

Keep to the measures for preventing electrostatic charges when installing the communications processor.

(ESD - electrostatic sensitive devices)

Installing the CP 1626

Opening the PC and plugging or pulling the submodules is permitted only when the power is off.

Read the manual

Before installing the communications processor, read the section "Procedure for installing PCIe modules" or similar in the manual of your PC and keep to the instructions.

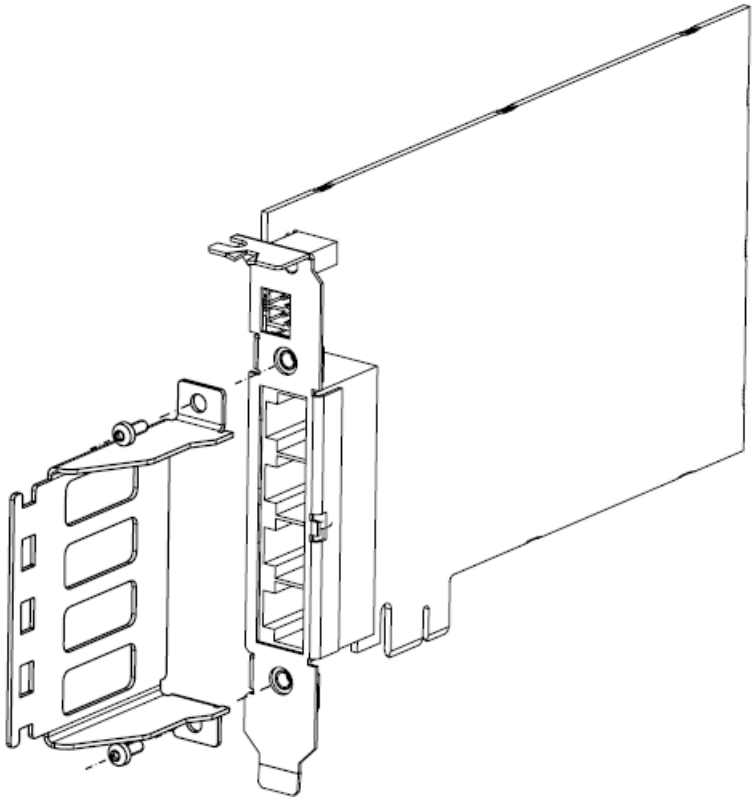
External power supply

The CP 1626 has a socket for connecting an external power supply.

With this power supply (12 to 24 VDC), the CP 1626 can operate as a switch even if the PC is turned off.

Use of a holding plate

When being used in environments with increased mechanical stress, installation with the holding plate supplied with the product is recommended (see following graphic). This improves the mechanical stability of the plug-in connection. You secure the outgoing cables to the holding plate with cable ties.



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).

2.2 Procedure for installing the CP 1626

Procedure for installing the CP 1626

⚠ WARNING

Do not put any damaged parts into operation!

Only put undamaged parts into operation!

Note

Lightning protection

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:

Type: BVT AVD 24

Article number: 918 422

Vendor: DEHN+SÖHNE GmbH+Co.KG, Hans Dehn Straße. 1, Postfach 1640, D - 92306 Neumarkt, Germany

Recommendation for installation when using Linux

Install the CP 1626 first and then install the CP 1626 driver.

Requirements and conditions

- If available, enable the plug-and-play mechanism in the BIOS of your PC.
- The CP 1626 communications processor requires a PCIe slot with master capability.

Note

Note on the number of possible CP 1626s in one PG/PC

A maximum of 1 CP 1626 can be installed in one PG/PC.

Installation and connection of the CP 1626

To install and connect up the CP 1626 follow the steps outlined below:

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 accompanying your PG/PC.
3. Remove the cover of a free PCI slot in your PC.
4. Remove the CP 1626 from its packaging.

Note

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

5. Insert the CP 1626 correctly in the PCIe slot. Make sure that the CP 1626 sits firmly and uniformly in the socket of the slot.
6. Close the PC housing as described in the manual accompanying your PG/PC.
7. Plug the connecting cable (TP) into the appropriate socket on the front panel of the CP 1626.
8. Plug the power supply connector into the socket again and turn on your PG/PC.
9. Optional: If required, connect the external power supply with a compatible plug-in connector.

Configuration 3

Configuring

After the communications processor has been installed in the PC, the communications processor needs to be configured.

For this the configuration tool "STEP 7 Professional (TIA Portal)" as of V 14 is required.

The remaining procedure is described in the information system of "STEP 7 Professional (TIA Portal)".

Downloading firmware

The CP 1626 ships with a current firmware version.

Always use the current drive for the CP 1626. This is supplied on the current SIMATIC NET CD. Takes the following actions:

- Download the firmware to the communications processor.
- Update and activate the driver of the communications processor on the PC.

You can download new firmware either via the use of program on the host PC or remotely via the integrated Web server of the communications processor.

Load files

The load file contains the firmware of the communications processor and other information that can be displayed by the firmware loader. Based on this information, it checks the compatibility with the device.

Example: The load file version V01.00.00 is supplied with the name "6GK1162-6AA01V01.00.00.upd".

For more information, refer to the following section and the dialog boxes themselves.

Starting the firmware download

Refer to the description of the Web server and to the section "SERV_CP_download() (download firmware or configuration)" in the document "IO-Base user programming interface".

Troubleshooting

If an exception error occurs in the firmware, recognizable by alternating and fast flashing of the bus fault and group error LEDs, if present remove the external power supply and turn the PC off and on again. If the error occurs 3 times in succession within 15 minutes since turning on, the firmware deletes the loaded configuration since this could be the cause of the exception error. If the exception error continues to occur, you can switch to the "backup firmware" by turning off and on 3 times.

Note

After a successful firmware load, the previous firmware is saved as "backup firmware".

Operating hardware

4

4.1 Operating systems

Operating the communications processor has been tested and released with the following operating systems:

- Windows 10 (64 bits)
- Windows 7 SP1 (64 bits)
- Suse Linux 13.2
- For IRT: Suse Linux 11.2 with RTAI 3.8

4.2 Diagnostics with SNMP

4.2.1 SNMP and CP 1626

Diagnostics with SNMP

Using SNMP (Simple Network Management Protocol), a network management station can configure and monitor SNMP-compliant devices. To allow this, a management agent is installed on the device with which the management station exchanges data using Get and Set requests.

MIB

A MIB (Management Information Base) is a type of database containing the description of the objects and functions of a device. SNMP clients access this information.

A distinction is made between standardized and private MIBs:

- Standardized MIBs are described in RFC documents.
- Private MIBs contain product-specific expansions.

MIB II describes a set of SNMP variables that is normally supported by all SNMP-compliant devices.

SNMP V1 and SNMP V2 protocols

With the SNMP V1 and SNMP V2 protocols, all the objects of MIB-II relevant for the product and the objects of a private MIB can be queried.

SNMP-compliance of a CP 1626

A management agent is integrated in the CP 1626.

The CP 1626 supports the SNMP V1 and SNMP V2 protocols.

In the MIB-II, the CP 1626 contains all groups except "egp and transmission" and "at".

The following SNMP capabilities are supported by the CP 1626:

- LLDP
- MIB II
- MRP
- private MIB

Security concept

Access with SNMP is controlled by the concept of communities.

Access	Community
Read-only access	public
Read and write access	private

Meaning of the abbreviations/acronyms and source of further information

In the following table, you can see the meaning of the abbreviations/acronyms used above and can also see where you can obtain further information.

Abbreviation/acronym	Meaning	Further information
SNMP	Simple Network Management Protocol	RFC 1157
SNMP V2	Simple Network Management Protocol Version 2 (administration, protocol operations and security)	RFC 1901 and RFC 1905
SMIv1	Structure and Identification of Management Information – Describes the structure of MIB objects.	RFC 1155
MIB-II	Management Information Base, Version 2	RFC 1213
Private MIB	MIB with product-specific expansions	Section "Private MIB of a CP 1626 (Page 25)" snpccp1626.mib

4.2.2 Variables of the MIB-II standard

Variables in the "System" directory

The following table shows several SNMP variables of the MIB II standard for monitoring the device status from the "System" directory:

Variable	Access rights	Description
sysDescr	Read only	Contains a vendor-specific identification of the device, for example "Siemens", "SIMATIC NET" or "CP 1626". A string with up to 255 characters is used. Data type: DisplayString
sysObjectID	Read only	Address (OID - Object Identifier) at which the device-specific SNMP variables are accessible. On the CP 1626, the OID is: 1.3.6.1.2.1.1.1.2.0

Note

The descriptions of the MIB objects not shown here can be found in the diagnostics manual "SIMATIC NET Network Management Diagnostics and Configuration with SNMP".

Diagnostics manual (https://support.industry.siemens.com/cs/ch/en/view/103949062)

Variables in the "Interfaces" directory

The following table shows several SNMP variables for monitoring the device status from the "Interface" directory:

SNMP variable	Access rights	Description
ifDescr	Read only	Description of and possibly other information for a port. The possible value is string with a maximum of 255 characters; for example "Siemens", "SIMATIC NET", "CP1626", "<MLFB>", "HW:<Hardware Version>", "FW:<Firmware Version>", "Fast Ethernet Port <Port number>". Explanation: The current value is entered in the pointed brackets. Data type: DisplayString
ifNumber	Read only	Number of network interfaces For a CP 1626, the value "6" is output for this variable (4 physical ports + 2 virtual port for the 1626 itself). Data type: Integer

SNMP variable	Access rights	Description
ifPhysAddress	Read only	Port MAC addresses of the CP 1626 • Index 1: MAC address of the interface X1 • Index 2 and 3: Port MAC address of the interface X1 • Index 4: MAC address of the interface X2 • Index 5 and 6: Port MAC address of the interface X2 Data type: PhysAddress
ifSpecific	Read only	Specific reference Here, a fixed value ".0.0" is used because there is no reference. Data type: OBJECT IDENTIFIER

Note

The descriptions of the MIB objects not shown here can be found in the diagnostics manual "SIMATIC NET Network Management Diagnostics and Configuration with SNMP".

Diagnostics manual (https://support.industry.siemens.com/cs/ch/en/view/103949062)

Port indexes

Port-specific objects can be addressed with "SNMP variable.portnumber“.

For the CP 1626, the interface index corresponds to the port number.

Example
The "IfOperStatus.1" variable determines the operating state ("up", "down" etc.) of port 1 of the CP 1626.

4.2.3 Private MIB of a CP 1626

Only variables for the LED status

The private MIB contains the following variables for the LED status:

Variable	Access rights	Description of the variable	Meaning of the values
snPCCP1626BFLedVal	Read only	Status of the bus fault LED	Data type for all LED value variables: Integer Possible values are: 1: LED off 2: LED on 3: LED flashes 4: LED flashes fast
snPCCP1626SFLedVal	Read only	Status of the system error LED	
snPCCP1626BFLed	Read only	Status of the bus fault LED	Data type for all LED variables: DisplayString Possible values are: off: LED off on: LED on blink: LED flashes fastBlink: LED flashes fast
snPCCP1626SFLed	Read only	Status of the system error LED	

Note

For the meaning of the LED signaling, refer to the section "Device description (Page 9)" of the communications processor.

Object identifier (OID)

For the CP 1626
The private MIB variables of the CP 1626 have the following object identifier (OID):

1.3.6.1.4.1.4329.6.1.2.6.1.1

or

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).siemens(4329).automation (6).automationProducts (1).automationSimaticNet (2).snPCCP (6).snPCCP1626(1).snPCCP1626Report(1)

Restrictions

Downloading a PROFINET IO configuration to a CP 1626 starts the SNMP agent. During the download, no SNMP diagnostics can therefore be performed. Afterwards the SNMP agent starts up again automatically.

4.3 Web server

Introduction

The Web server provides you with the option of monitoring your CP 1626 via the Internet or the internal company intranet and making a firmware update.. This allows evaluations and diagnostics over large distances. Messages and status information are displayed on HTML pages.

Web browser

To access the HTML pages on the CP 1626, you require a Web browser.

The following Web browsers are suitable for communication with the CP 1626:

- Internet Explorer (as of version 6.0)
- Mozilla Firefox (as of version 1.5)
- Google Chrome

Web access to the CP 1626 from a PG/PC

To access the Web server, follow these steps:

1. Connect the client (PG, PC) to the CP 1626 via the PROFINET interface X1 or X2.
2. Open the Web browser.
3. Enter the IP address of the CP 1626 in the "Address" box of the Web browser in the form https://a.b.c.d (example of an entry: https://192.168.3.141).
   The Start page of the CP 1626 opens. From the Start page, you can navigate to the other information.

Note

The communications processor must be assigned an IP address. Use the configuration tool "STEP 7 Professional (TIA Portal)" for this.

A maximum of 5 https connections are possible.

4.3.1 Language settings

Introduction

The Web server supports the following languages:

- German
- English

Requirements for displaying texts in various languages

To ensure that the Web server displays the various languages correctly, you need to set the language for the Web server in the properties dialog of the CP 1626 in "STEP 7 Professional (TIA Portal)".

See also

Settings in "STEP 7 Professional (TIA Portal)" in the "Web server" tab. (Page 27)

4.3.2 User management

Please refer to the information system in "STEP 7 Professional (TIA Portal)" for information on the possibilities provided by the user administration.

The type of configuration determines which pages of the Web server you can access. The following possibilities exist:

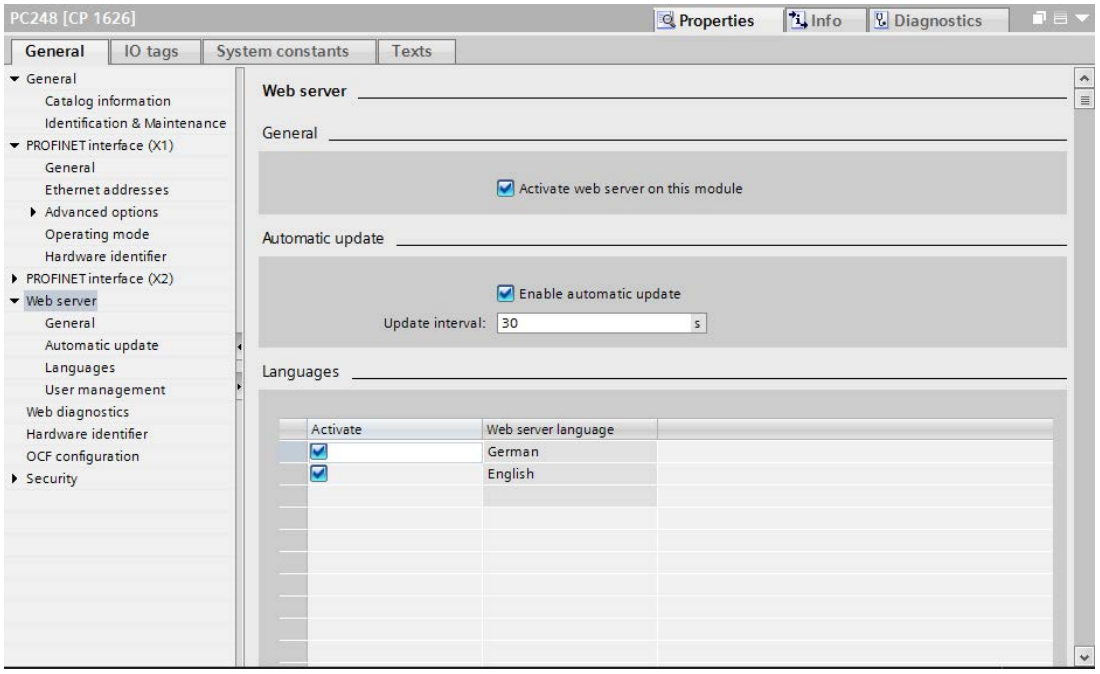
- You have activated the Web server and have not created any users other than the user "Everybody" with minimal access rights. In this scenario, you only have access to the intro and start page of the Web server after the configuration download.
  Notice: A firmware update via the Web server is not possible in this case.
- You have activated the Web server and created an additional user with the access rights "Perform firmware update" and "Query diagnostics". In this scenario, you have access to all pages of the Web server after the configuration download.
- You have not activated the Web server. In this scenario, you have no access to the Web server after the configuration download.

4.3.3 Settings in "STEP 7 Professional (TIA Portal)" in the "Web server" tab.

Requirements

To be able to use the functionality of the Web server, make the following settings in "STEP 7 Professional (TIA Portal)":

- Enable the Web server
- Enable automatic updates (optional)
- Set the language for the Web server



Enable the Web server

As default the Web server is disabled. To enable the Web server, follow the steps below:

1. Select the CP 1626 in the network view.
2. In the "General" tab go to "Web server".
3. Select the "Activate web server on this module" check box

Enable automatic updates

The following Web pages can be updated automatically:

- Start page
- Diagnostics buffer
- Module information
- Information on communication
- Topology
- Media redundancy

Follow the steps below to activate automatic update:

1. Select the CP 1626 in the network view.
2. In the "General" tab go to "Web server".

3. Select the "Enable automatic update" check box.
4. Enter the update interval in seconds.

Note

The update interval set in "STEP 7 Professional (TIA Portal)" is the shortest update time. Larger amounts of data or multiple HTTP connections increase the update time.

Set the language for the Web server

Select a maximum of two of the installed languages available for display devices for the Web. Follow the steps outlined below:

1. Select the CP 1626 in the network view.
2. In the "General" tab go to "Web server".
3. Select the required languages.

4.3.4 Updating and storing information

Updated screen content

As default setting in "STEP 7 Professional (TIA Portal)", the automatic update is disabled. This means that the screen display of the Web server returns static information.

You update the Web pages manually using the <F5> function key or the following icon:



Updated printouts

Printouts always show the current information of the CP 1626. It is therefore possible that the printed information is more up-to-date than the display on your screen.

You can obtain a print preview of the Web page with the following icon:



Filter settings have no influence on the printout. The printout of the "Module information" Web page always shows the complete content of the pages.

Disabling automatic updating for a single Web page

To disable the automatic updating of a Web page temporarily, select the following icon:



You can re-enable the automatic update with the <F5> function key or with the following icon:



Storing messages and diagnostics buffer entries

You can store diagnostics buffer entries in a CSV file. You save the data with the following icon:



A dialog opens in which you can specify the file name and target directory.

Note

Opening the CSV file in Microsoft Excel

To display the data correctly in Microsoft Excel, do not open the CSV file by double clicking on it. Import the file into Excel using the "Data" and "Import External Data" menu command.

4.3.5 Web pages

4.3.5.1 Intro

Establishing a connection to the Web server

You establish a connection to the Web server by entering the IP address of the configured CP 1626 in the address bar of the Web browser, for example https://192.168.1.158. The connection is established and the "Intro" page opens.

Here, we will show you how the various Web pages might look based on examples.

Intro

The following figure shows the first page called up by the Web server.



To access the pages of the Web server, click the "ENTER" link.

Note

Skipping the "Intro" Web page

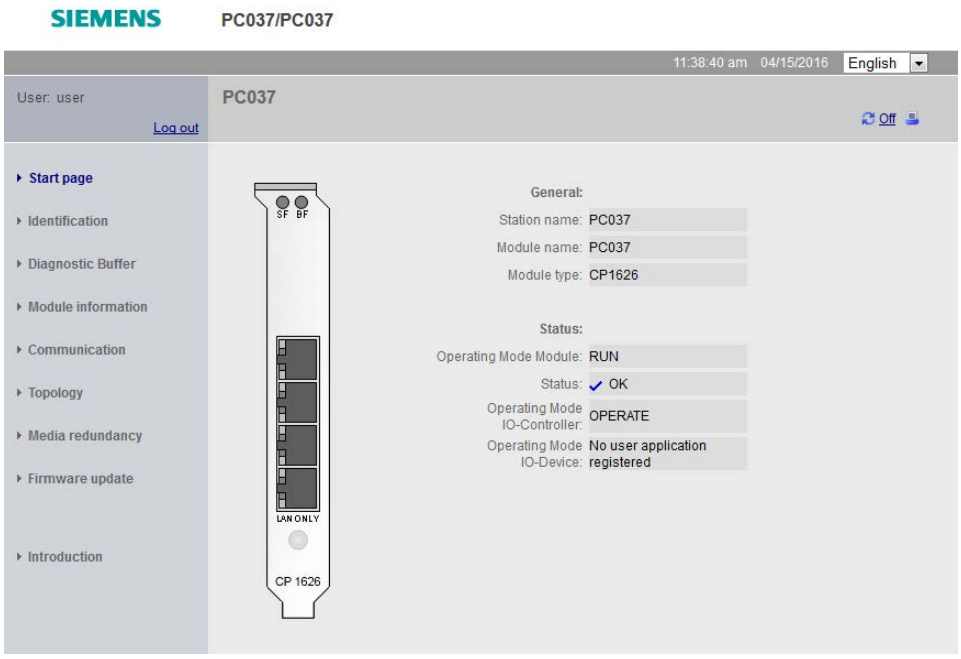
Select the "Skip Intro" check box to skip the Intro. In future, you will then come directly to the Start page of the Web server. To display the Intro again when you start the Web server, click the "Intro" link on the Start page.

4.3.5.2 Start page

Start page

On the Start page enter the user name and the password you configured during configuration of the Web server in "STEP 7 Professional (TIA Portal)".

The Start page provides you with information as shown in the following figure. The image of the CP 1626 indicates its current status regarding group errors and bus faults at the time the data was queried. The display of the port LEDs is static.



"General"

"General" contains information about the CP 1626 whose Web server you are currently connected to.

"Status"

"Status" contains information about the CP 1626 at the time of the query.

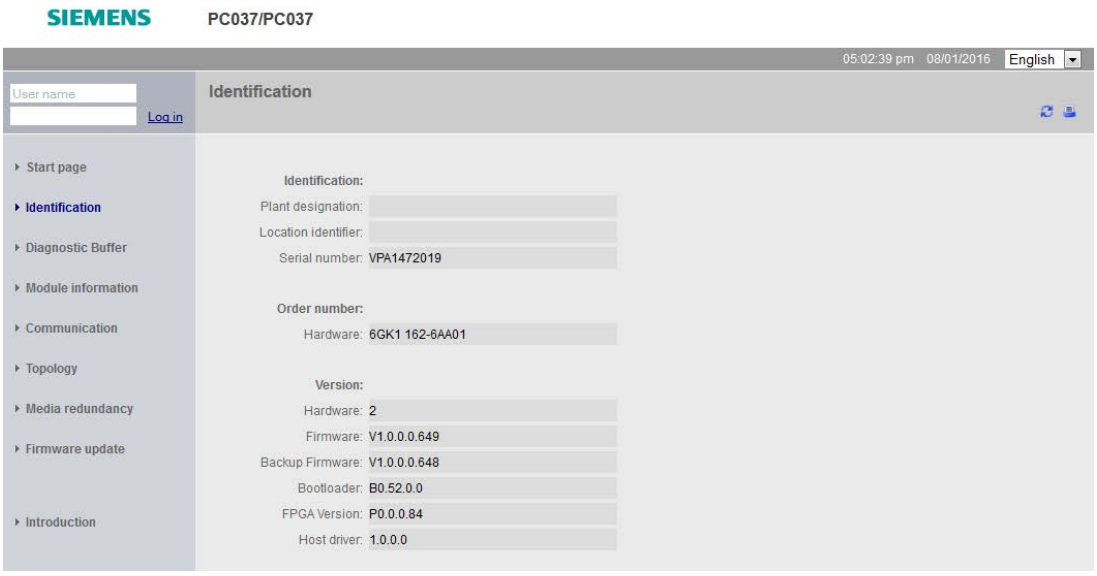
Reference

For information on http connections, see the section "Settings in "STEP 7 Professional (TIA Portal)" in the "Web server" tab. (Page 27)".

4.3.5.3 Identification

Characteristic data

You will find the characteristic data of the CP 1626 on the "Identification" Web page.



"Identification"

In the "Identification" information box you will find the plant designation, location identifier and the serial number. The plant designation and location identifier can be configured in the Properties dialog of the CP 1626 in "STEP 7 Professional (TIA Portal)", tab "General" > "Identification & Maintenance".

"Order number"

You will find the order number of the hardware in the "Order number" box.

"Version"

You will find the versions of the hardware, firmware, boot loader and the host driver in the "Version" info box.

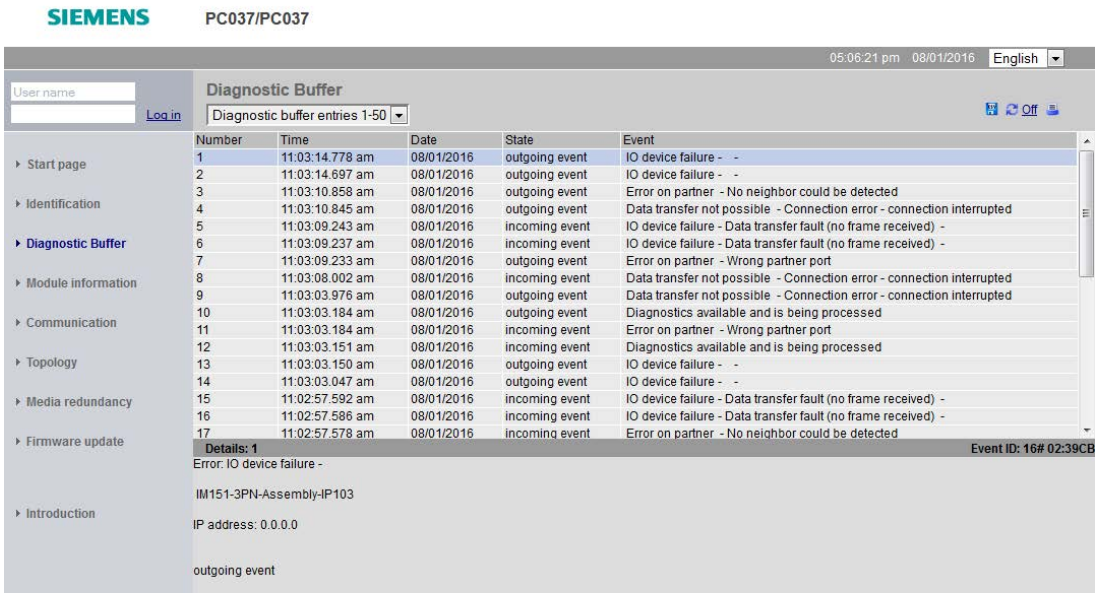
4.3.5.4 Diagnostics buffer

Requirement

You have enabled the Web server, made the language setting and compiled and downloaded the STEP 7 project with "STEP 7 Professional (TIA Portal)".

Diagnostics buffer

The content of the diagnostic buffer is displayed by the browser on the "Diagnostic buffer" Web page.



"Diagnostic buffer entries"

The diagnostic buffer can hold up to 3000 messages.

"Event"

The "Event" info box contains the diagnostic events with date and time.

"Details"

This box lists detailed information about the selected event.

Select the relevant event in the "Event" information box.

Point to note when switching over languages

In the top right corner, you can switch over the language, for example from German to English. If you change to a language that you have not configured, you will obtain the information as hexadecimal code instead of plain language.

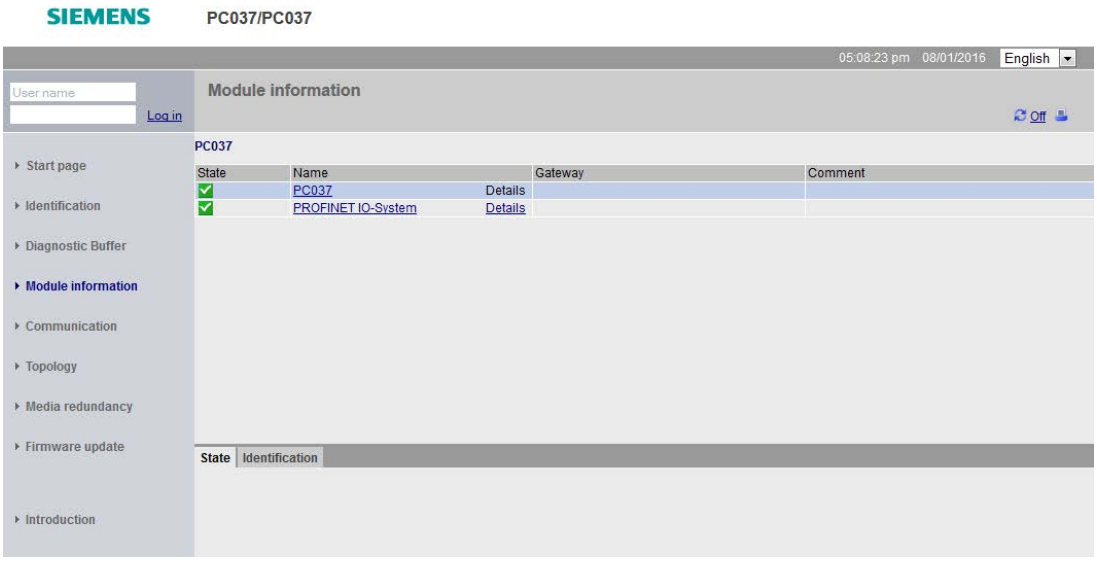
4.3.5.5 Module information

Requirement

You have enabled the Web server, made the language setting and compiled and downloaded the STEP 7 project with "STEP 7 Professional (TIA Portal)".

Module information

The status of a station is displayed with icons and comments on the "Module information" Web page.



Meaning of the symbols in the "Status" column

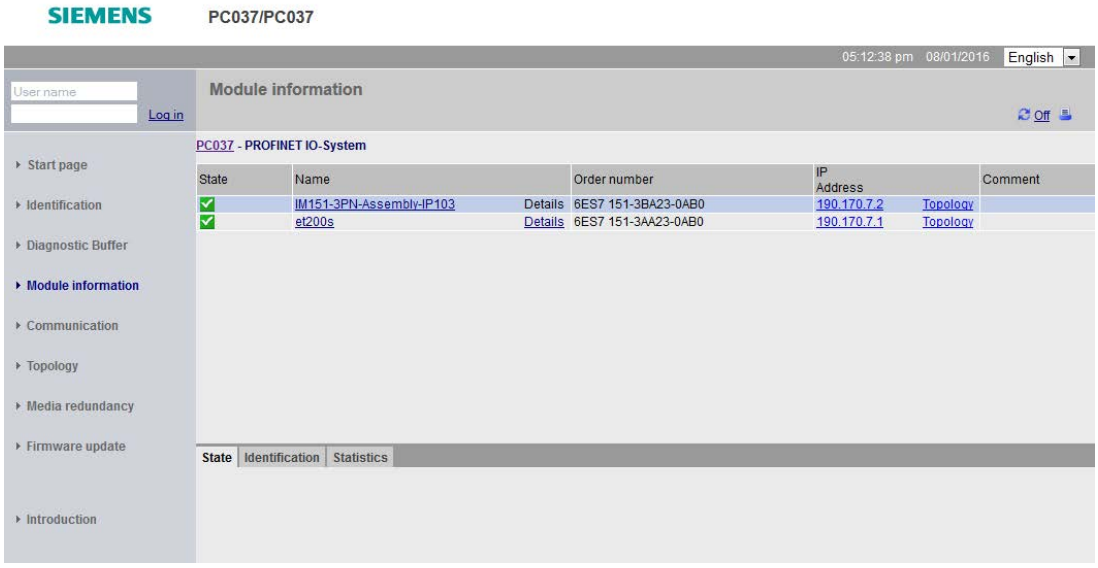
Symbol	Color	Meaning
	green	Component OK
	gray	• Deactivated PROFIBUS slaves or PROFINET devices
	black	Component cannot be accessed/Status cannot be determined • "Status not available" is always displayed when the CP 1626 is in STOP or during start up evaluation by "Report system error" for all configured I/O modules and I/O systems after re-starting the CP 1626. • However, this status can also be displayed temporarily during operation if a diagnostic interrupt burst occurs on all communications processors. • It is not possible to determine the status of communications processors on a subsystem that is connected to a communications processor.
	green	Maintenance required

Symbol	Color	Meaning
	yellow	Maintenance demanded
	red	Error - component failed or faulty
	-	Error in a lower communications processor level

Navigation to other module levels

The status of individual communications processors/modules/submodules is displayed when you navigate to other module levels:

- To higher module levels via the links in the display of the module levels
- To lower module levels via the links in the "Name" column



"Module information"

Depending on the selected level, the table shows information on the PC station, the DP master system, the PNIO master system, the nodes, the individual communications processors or even the modules or submodules of the station.

"Display of the module levels"

Via the links, you go to the "Module information" of the higher module levels.

"Details"

With the "Details" link, you obtain further information on the selected communications processor in the "Status" and "Identification" tabs.

"IP address"

If a link is available here, this will bring you to the Web server of the selected and configured I/O device.

"Topology"

The two web pages, "Topology" and "Module information", are linked. A click on "Topology" of the selected communications processor automatically takes you to this communications processor in the graphic view of the the set topology on the "Topology" Web page. The communications processor appears in the visible area of the "Topology" web page and the device head of the selected communications processor flashes for a few seconds.

"Status" tab

This tab contains information on the status of the selected communications processor if there is a fault or a message pending.

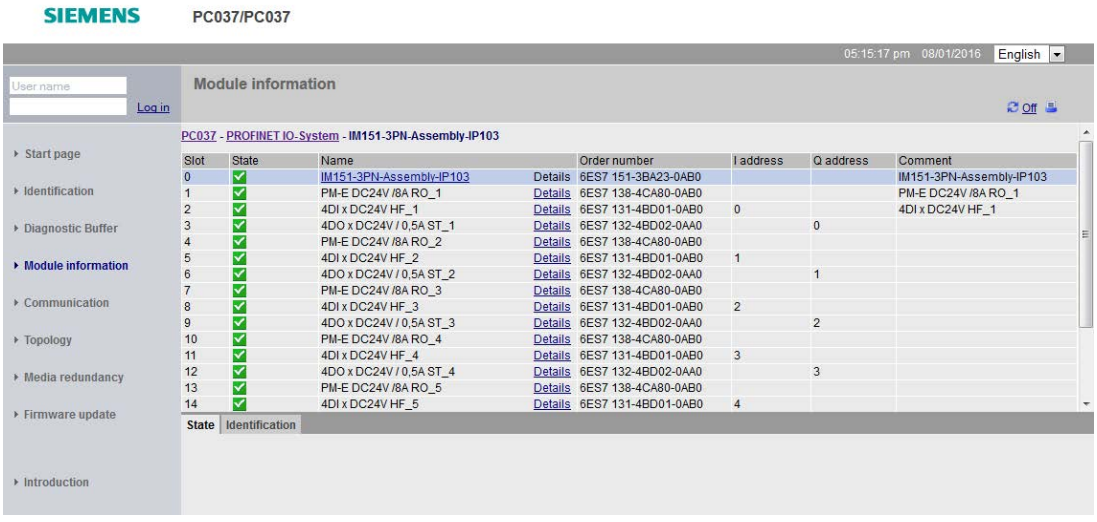
"Identification" Tab

This tab contains data to identify the selected communications processor.

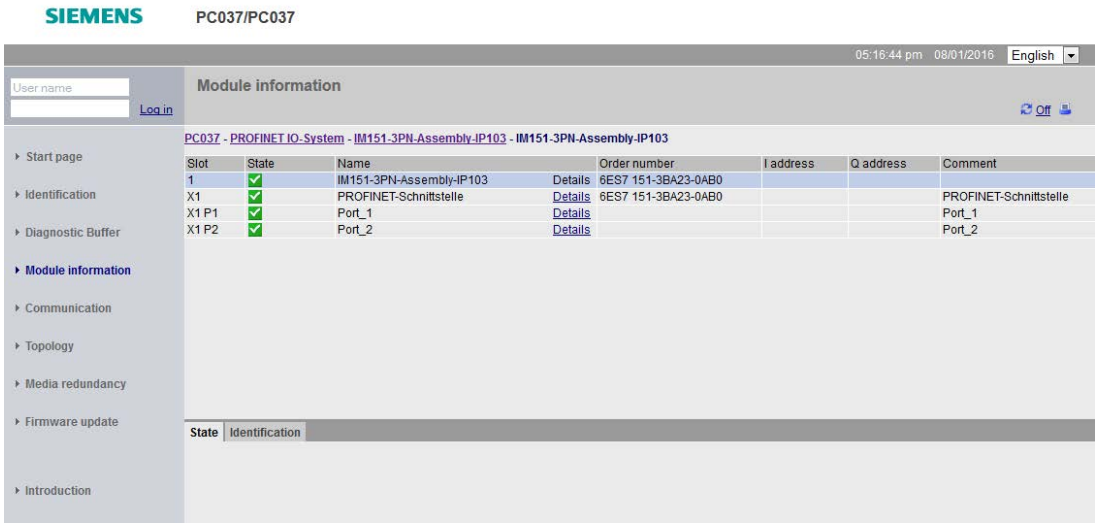
Note

In this tab, only data that was configured offline is displayed, but no online data of communications processors.

Example: Module information - module



Example: Module information - submodule



Reference

You will find more detailed information on "Module information" and on the topic of "Report system error" in the information system of "STEP 7 Professional (TIA Portal)".

4.3.5.6 Communication

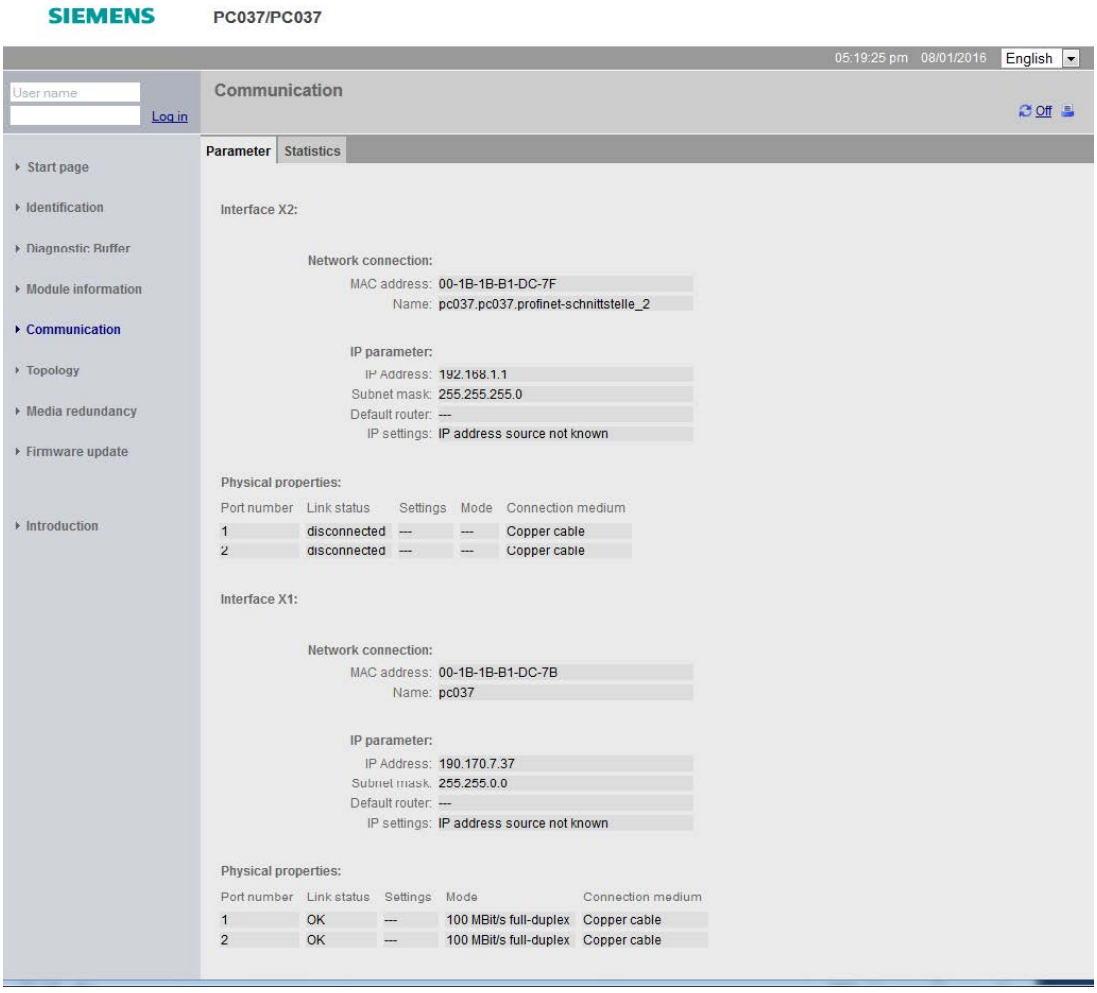
Overview

On the "Communication" Web page, you will find detailed information about the following tabs:

- Parameter
- Statistics

"Parameter" tab

Summarized information about the integrated PROFINET interface of the CP 1626 can be found in the "Parameter" tab.



"Network connection"

Here, you will find information identifying the integrated PROFINET interface of the relevant CP 1626.

"IP parameter"

Information on the configured IP address and number of the subnet in which the relevant CP 1626 is located.

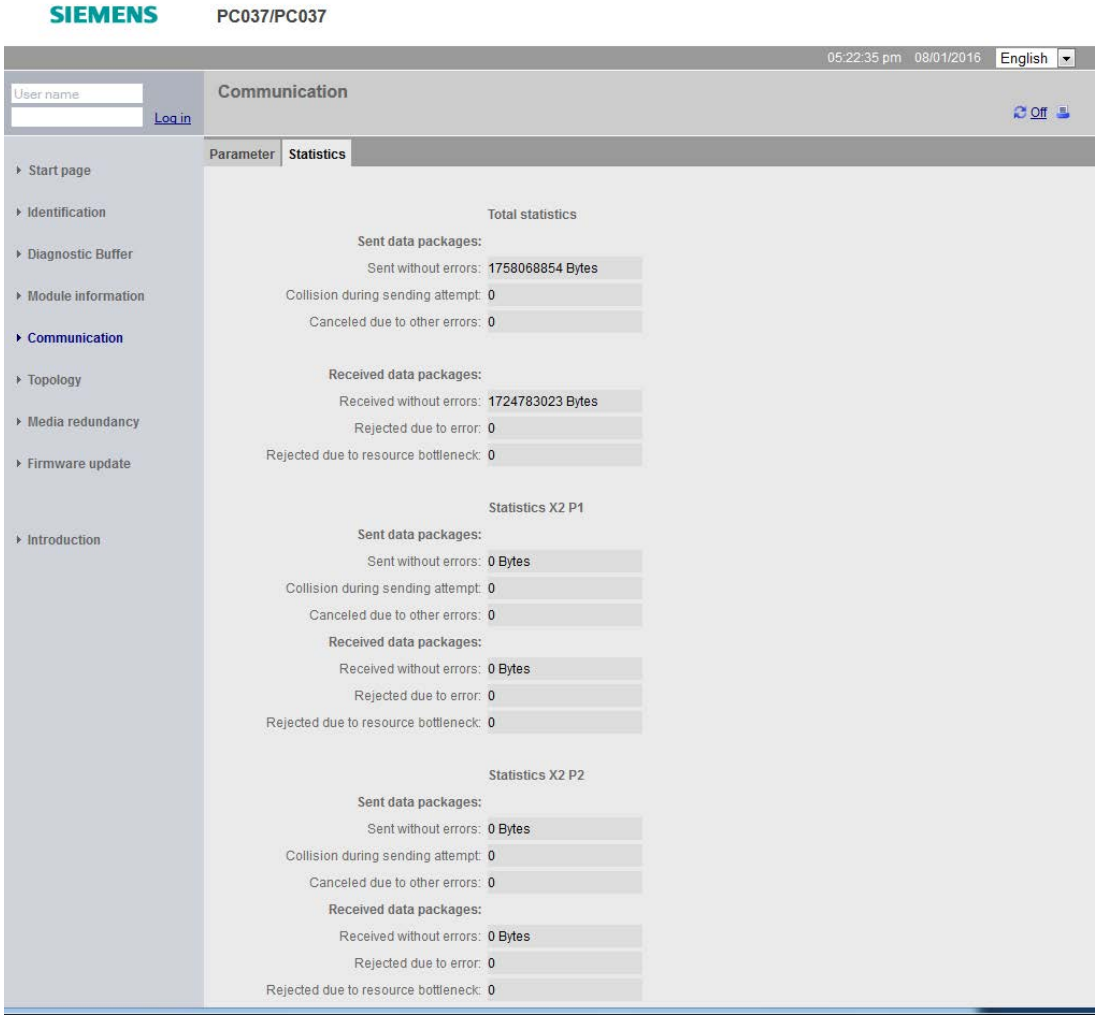
"Physical properties"

The "Physical properties" info box contains the following information:

- Port number
- Link status
- Settings
- Mode

"Statistics" tab

You will find information on the quality of the data transfer in the "Statistics" tab.



"Data package since"

Here you can see the time since the last power up or memory reset at which the first data packet was sent or received.

"Total statistics - Sent data packages"

You can evaluate the quality of the data transfer on the send line based on the statistics in this info box.

"Total statistics - Received data packages"

You can evaluate the quality of the data transfer on the receive line based on the statistics in this info box.

"Statistics Port x - Sent data packages"

You can evaluate the quality of the data transfer on the send line based on the statistics in this info box.

"Statistics Port x - Received data packages"

You can evaluate the quality of the data transfer on the receive line based on the statistics in this info box.

4.3.5.7 Topology

Topology of the PROFINET nodes

The "Topology" Web page provides information about the topological configuration and status of the PROFINET devices on your PROFINET IO system.

There are three tabs for the following views:

- Graphic view (set and actual topology)
- Table view (actual topology only)
- Status overview (without showing topological relationships)

The table view and status overview can be printed. Before printing, use the print preview of your browser and, if necessary, correct the format.

Set topology

Display of the configured topology of PROFINET devices set up on a PROFINET IO system, including corresponding status information in the Topology Editor of "STEP 7 Professional (TIA Portal)". The display includes neighboring PROFINET devices, provided their topological layout was configured as well. Here there is however no status view.
The view identifies the topological assignment of PROFINET devices that have failed, the differences between the set and actual topology, and interchanged ports.

Note

The configured set topology is always displayed in the following scenarios:

- When the "Topology" web page is called via the navigation bar
- When you change from the overview of PROFINET IO devices on the "Module information" Web page to the "Topology" Web page by means of "Topology" link

If no set topology was configured, the actual topology is called by default.

Actual topology

Displays the current topological structure of the "configured" PROFINET devices of a PROFINET IO system and the detectable directly neighboring unconfigured PROFINET devices (display of the neighbor relations as far as these can be detected; with these neighboring PROFINET devices, there is, however, no status display).

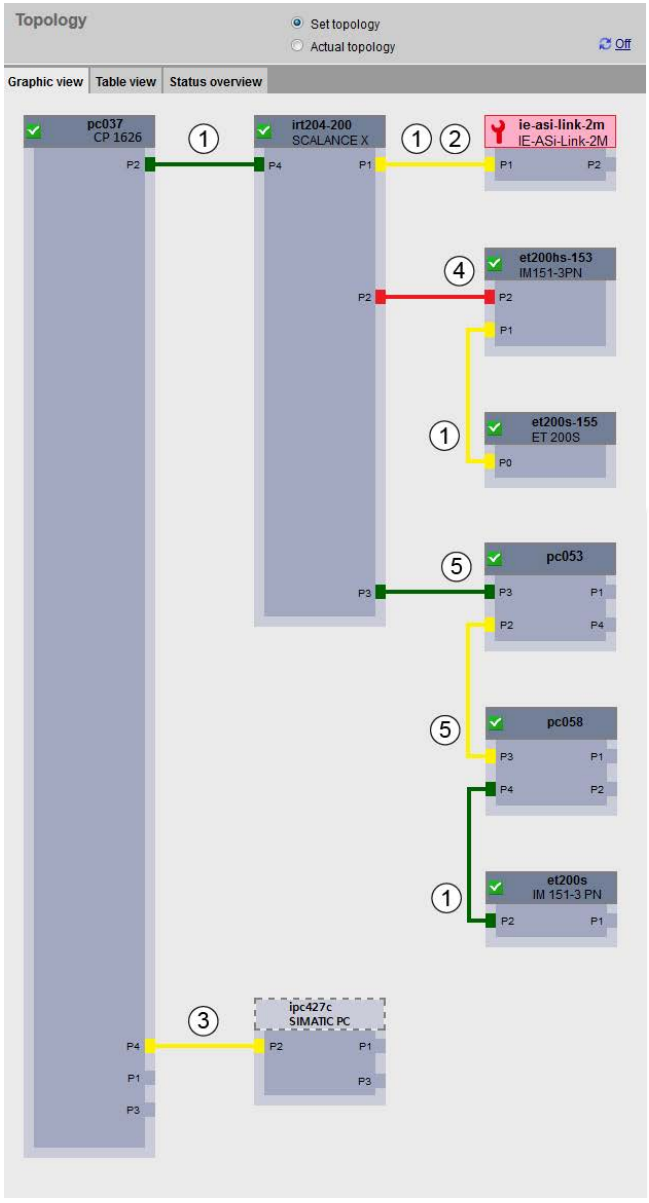
Topology - Graphic view

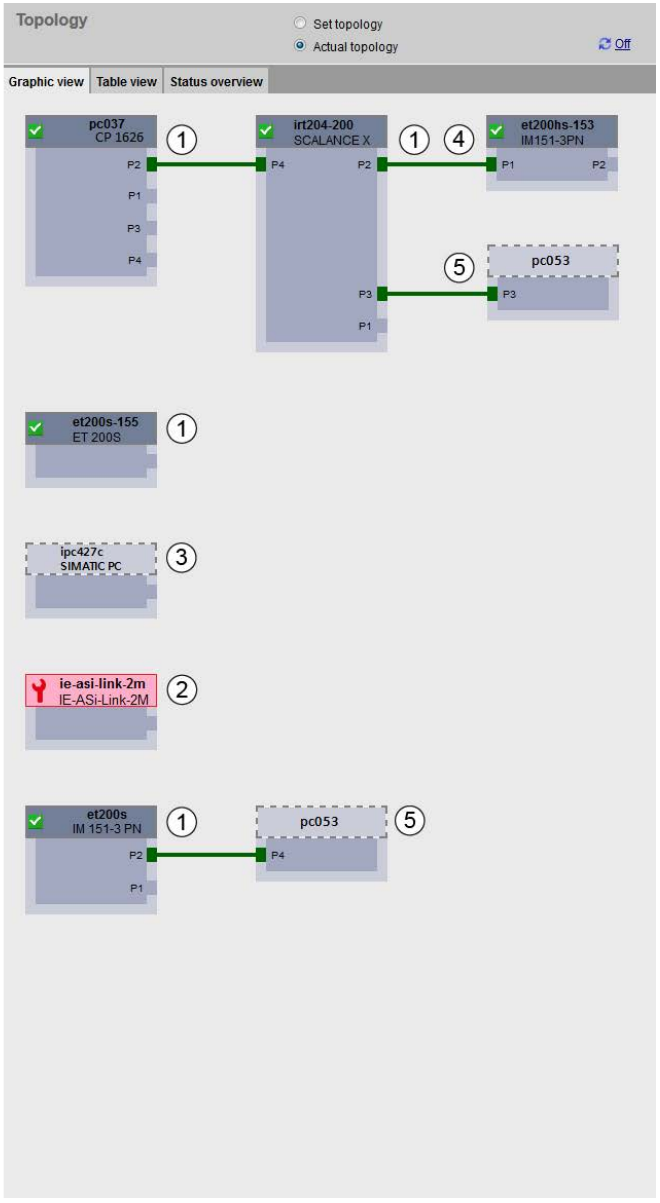
Requirement

For error-free use of the topology, the following conditions must be met:

- You completed the language settings.
- In the Topology Editor of "STEP 7 Professional (TIA Portal)", you configured the topological interconnection of ports (requisite for the display of the set topology and corresponding topological set connections).
- The STEP 7 project has been compiled and downloaded.

Set and actual topology - Graphic view





Meaning of the colored connections in the set/actual topology:

Connection	Meaning	
	Set topology	Actual topology
green	The current actual connection matches the configured set connection.	Connections detected
red	Mismatch between the current actual connection and the configured set connection (e.g., port interchanged).	-
yellow	Connection diagnostics not possible. Causes: • Disruption of communication with a IO device (e.g. cable was removed), • this involves a connection to a passive component, • this involves a connection to IO devices/PROFINET devices on a different IO controller or IO subsystem.	-

① Configured and accessible PROFINET nodes

Configured and accessible PROFINET nodes are displayed in dark gray. Connections show the ports used to connect the PROFINET nodes of a station.

② Configured but inaccessible PROFINET nodes

Configured but inaccessible PROFINET nodes are indicated in pink with a red frame (e.g. device failure, cable disconnected).

③ Deactivated nodes

All disabled configured PROFINET nodes are indicated in light gray.

④ Interchanged ports

Interchanged ports are highlighted in red color in the set topology view. The actual topology view indicates the actually connected ports, while the set topology view displays the configured set connections.

⑤ PROFINET devices of a different PROFINET IO subsystem

- In the set topology:
  A PROFINET device of a different PROFINET IO subsystem is identified by means of a green link (or red link for interchanged ports) if it can be reached and is directly adjacent to an accessible configured PROFINET device ①.
  When the PROFINET device cannot be reached from a different PROFINET IO subsystem a yellow link is diplayed.
  The connection between two PROFINET devices which belong to a different PROFINET IO subsystem cannot be identified and is always indicated in yellow.
- In the actual topology:
  The PROFINET device of a different PROFINET IO subsystem is not displayed unless

directly adjacent to a configured PROFINET device. This device is indicated by a light gray dashed line.

The status of PROFINET devices of a different PROFINET IO subsystem is not displayed in the device header.

Views after changes to the setup

- If a device fails, this device remains in the "Set topology" view at the same position but has a red border around the device head and a red wrench.
- After having failed, the device is displayed in the bottom area of the in the "Actual topology" view. This error state is indicated by means of a device header with red frame and a red wrench.

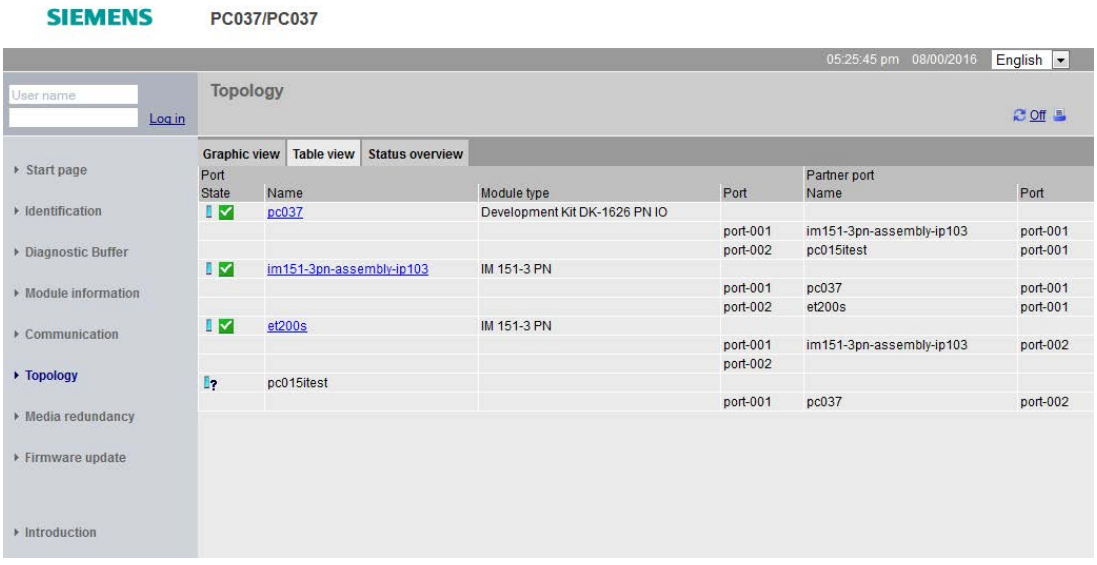
Link between the "Topology" and "Module information" Web pages

The two web pages, "Topology" and "Module information", are linked. A click on the header of a configured communications processor in the topology view automatically takes you to this communications processor on the "Module information" Web page.

See also section "Module information (Page 35)".

Topology -Table view

The "Table view" always shows the "Actual topology".



Meaning of the symbols indicating the status of the PROFINET nodes

Symbol	Meaning
	Configured and reachable PROFINET nodes
	Non-configured and reachable PROFINET nodes
	Configured but unreachable PROFINET nodes
	Nodes for which neighbor relations cannot be determined or for which the neighbor relationship could not be read out completely or only with errors

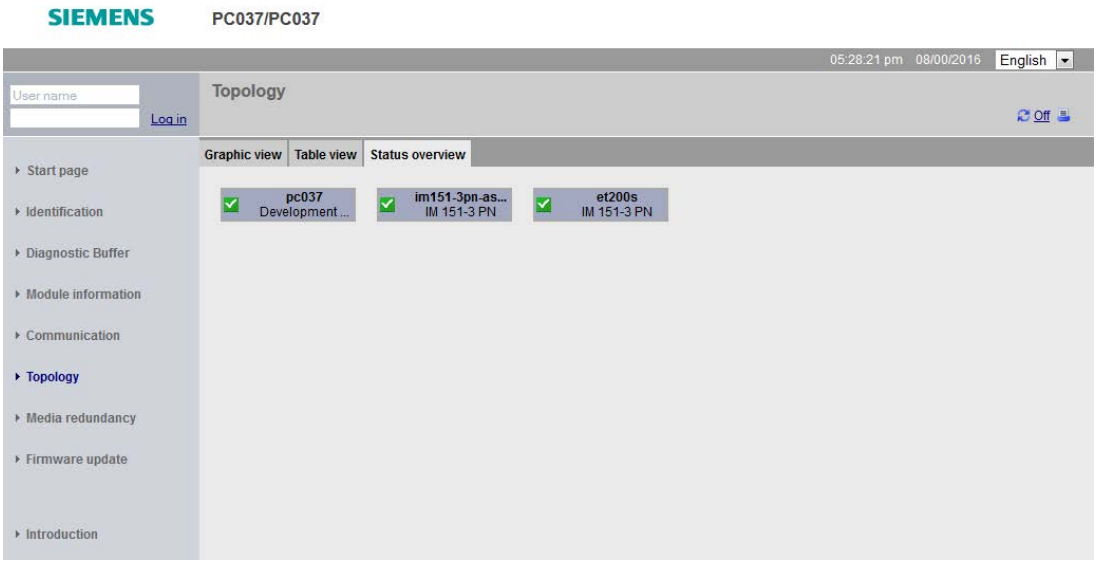
Meaning of the symbols indicating the module status of the PROFINET nodes

Symbol	Color	Meaning
	green	Component OK
	gray	• Deactivated PROFIBUS slaves or PROFINET devices
	black	Component cannot be accessed/Status cannot be determined • "Status not available" is displayed, for example whenever the CP 1626 is in STOP. • However, this status can also be displayed temporarily during operation if a diagnostic interrupt burst occurs on all communications processors. • It is not possible to determine the status of communications processors on a subsystem that is connected to a communications processor.
	green	Maintenance required
	yellow	Maintenance demanded
	red	Error - component failed or faulty
	-	Error in a lower communications processor level

Topology - Status overview

The "Status overview" provides a clear presentation of all PROFINET IO devices/PROFINET devices (without connection relations) on one page. Fast error diagnostics is possible based on the symbols that show the module statuses.

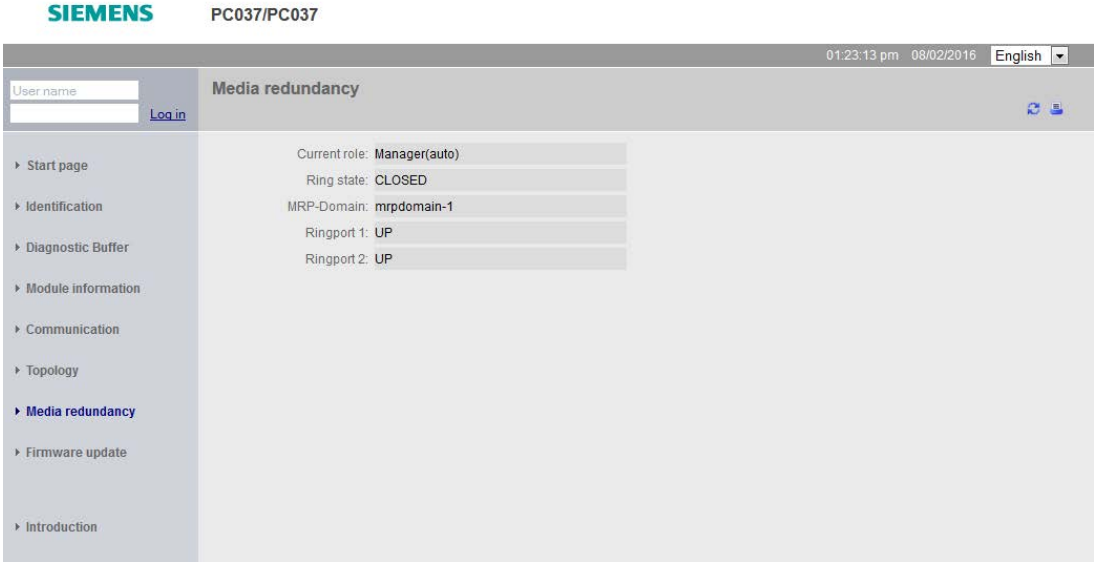
Once again, there is a link between the communications processors and the "Module information" Web page.



4.3.5.8 Media redundancy

Description

The " Media redundancy" Web page contains information on the status of the redundancy.



"Current Role" display

Value	Meaning
OFF	Media redundancy is deactivated in the ring topology.
MANAGER	The device is a redundancy manager.
CLIENT	The device is a redundancy client.

"Ring State" display

Value	Meaning
---	The device is not a redundancy manager. This means that the ring status cannot be displayed.
OPEN	The ring is open, there is a problem.
CLOSED	The ring is closed, there is no problem.

"MRP Domain" display

Name of the redundancy domain; this is set in "STEP 7 Professional (TIA Portal)".

"Ring Port 1 / Ring Port 2" display

The meaning of ring port 2 is analogous to that of ring port 1.

Value	Meaning
Port 1 - BLOCKED	The port does not allow any user data to pass through, only MRP frames.
Port 1 - DISABLED	The port was disabled.
Port 1 - UP	The port allows all frames through.
Port 1 - DOWN	The port does not have a link.

Note

Configuring in the STEP 7 project

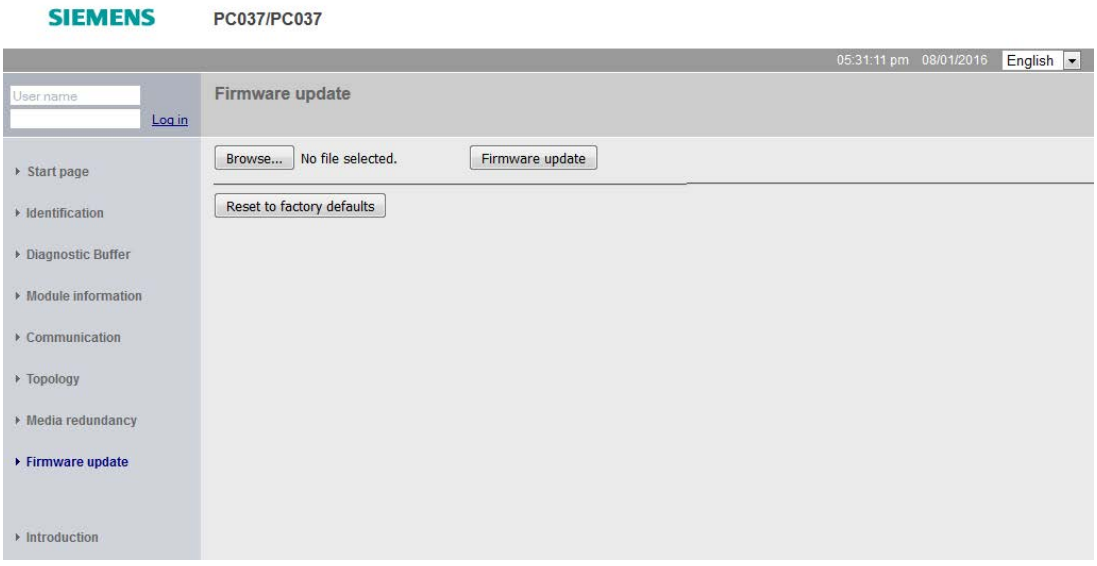
As an alternative, you can also make this setting in "STEP 7 Professional (TIA Portal)".

4.3.5.9 Loading firmware

Description

With the Web page "Download firmware" you can download different firmware to your communications processor.

You can also reset the communications processor to its factory settings, i.e. delete the configuration and IP parameters (the firmware is retained).



4.4 IO routing

This section answers the following questions:

- What is IO routing?
- When is IO routing used?
- What types of IO routing exist?
- How does the IO router work?

The configuration of an IO router is described in the information system of the configuration tool "STEP 7 Professional (TIA Portal)".

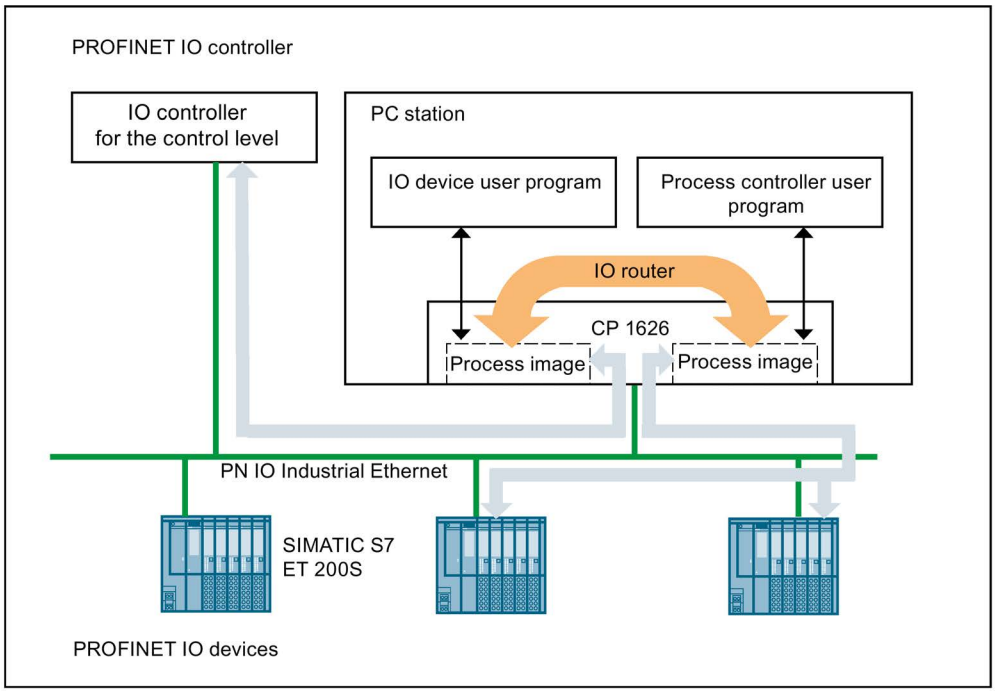
4.4.1 What is IO routing and how is it used?

Definition

Using IO routing, process data is exchanged between two PROFINET IO systems.

Example
A process controller user program controls a robot.
IO routing makes input/output data of the robot controller accessible to an IO controller for the control level that can both read and write the data.

IO routing is a function of the IO-Base user programming interface that is configured.



When does it make sense to use IO routing?

The advantages of IO routing are in situations when a complex plant or machine is planned with networked PROFINET IO systems.

Note

IO routing functionality is available only with PROFINET IO RT communication.

4.4.2 What types of IO routing exist?

Read and write

From the perspective of the IO controller for the control level, there are three IO routing tasks:

- Read process inputs
- Write process outputs
- Read process outputs

Read process inputs

Inputs are always read submodule-oriented.

This means that the IO controller for the control level (and the IO controller for the process level) can only ever read all bits of a submodule.

Write process outputs

When writing process outputs, on the other hand, there are two possible ways of writing:

- Writing submodule-oriented
  All process outputs of a submodule are written by the IO controller for the control level (submodule-oriented).
- Writing bit-oriented
  Individual configured process output bits or bit areas are written by the IO controller for the control level.

Read process outputs

Outputs are always read submodule-oriented. This means that the IO controller for the control level can only ever read all bits of a submodule.

4.4.3 How does the IO router work?

Requirements

A CP 1626 communications processor is required in a PC station. The communications processor can be both IO controller and IO device at the same time.

Configuration

The communications processor is first configured as an IO controller. Its process controller user program serves the IO devices assigned to it on the Industrial Ethernet bus.
The same communications processor is also configured as an IO device of an IO controller for the control level. This IO device is assigned transfer submodules in the configuration that represent the routed data.

Note

The program for this IO device in the PC station can be any IO device user program. It must simply run through the full initialization phase according to the IO-Base user program.

When operating the CP 1626 as an IO router, with a given cycle time fewer IO devices are possible than in the normal mode as a PROFINET IO controller. The number depends on the configuration.

If 2 IO controllers want to access a certain output submodule or bit of an output submodule, the following table shows which combinations are permitted.

	Access to data	IO controller 2	
Access to data	-	write	read
IO controller 1	write	No	Yes
	read	Yes	Yes

Example:

When IO controller 1 writes to a certain area of an output submodule, IO controller 2 cannot write to it at the same time; therefore: No.

You should avoid bit-by-bit assignment with transfer submodules.

In the configuration, input submodules can also be assigned bit-by-bit to multiple transfer submodules.

This function should, however, not be used because input submodules can fundamentally be read completely by two IO controllers at the same time.

Note

You do not need to worry about the transfer modules in your C user program because they are managed by the system itself.

Data exchange

The data exchange between the input and output data of the IO controller for the process level and input and output data of the IO controller for the control level is established automatically by the IO router.

Input data is transferred only submodule-oriented.

If you also use the function for writing outputs bit-oriented, the data from the process controller user program is "mixed" with the data of the IO controller for the control level according to the configuration; see Section "Examples of reading and writing (Page 53)".

Note on the IO-Base user programming interface

To support IO router functions, there are also two diagnostics services available (PNIO_CTRL_DIAG_CONFIG_IOROUTER_PRESENT, PNIO_CTRL_DIAG_CONFIG_OUTPUT_SLICE_LIST). Using these services, all output areas that can be written by the process controller user program can be identified.

These functions are only available for the process controller.

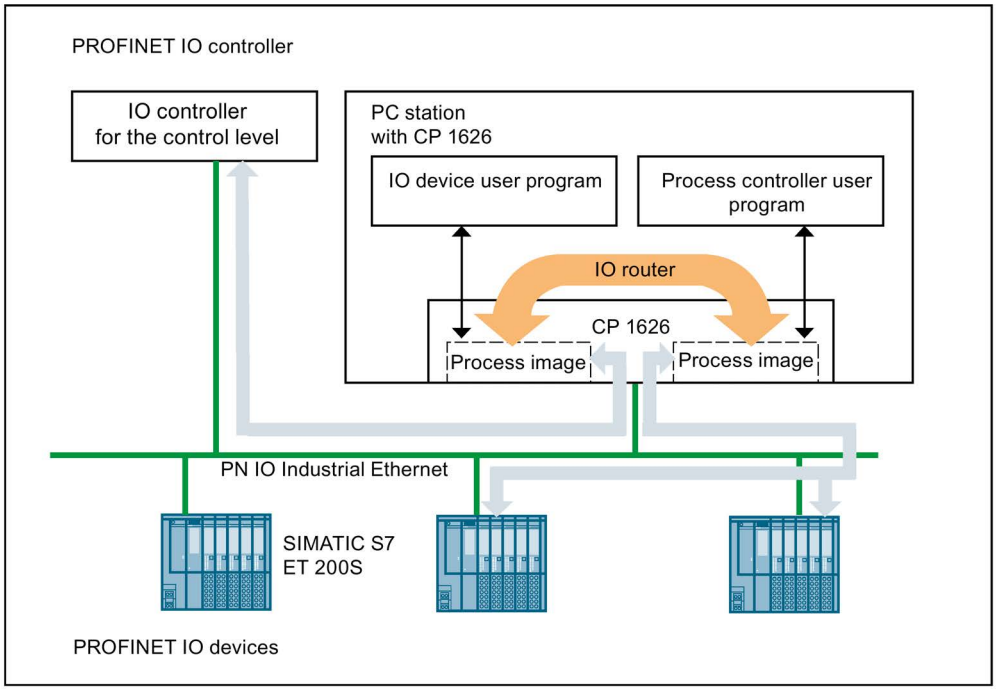
4.4.4 Examples of reading and writing

Description

A PC station contains an IO controller user program known as the IO controller for the process level that controls its IO devices via a CP 1626.

Outside the PC station, there is an external IO controller known as the IO controller for the control level that can write and read input/output bits of the IO controller for the process level via the IO router.

Process data is exchanged using the IO router functions.



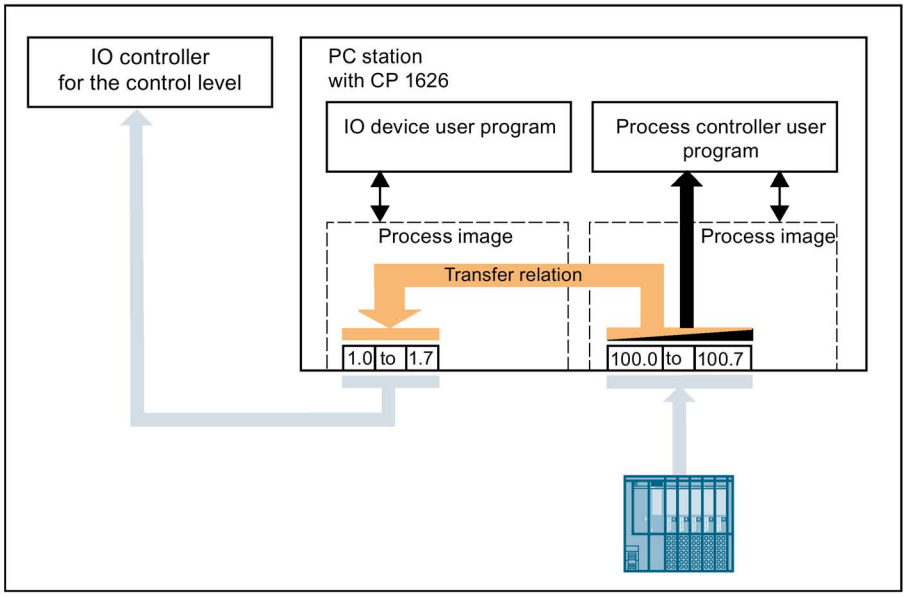
4.4.5 Example of reading input data

Description

The bits with addresses 100.0 to 100.7 of the input submodule and a length of 1 byte are read by the process controller user program.

The table and the figure illustrate that all bits of submodule 100 can be read by the IO controller for the control level via transfer submodule 1.

I/O bits of the IO controller for the control level	Transfer area (from the perspective of the IO controller for the control level)	I/O bits of the IO controller for the process level
1.0	read	100.0
to	-	to
1.7	read	100.7



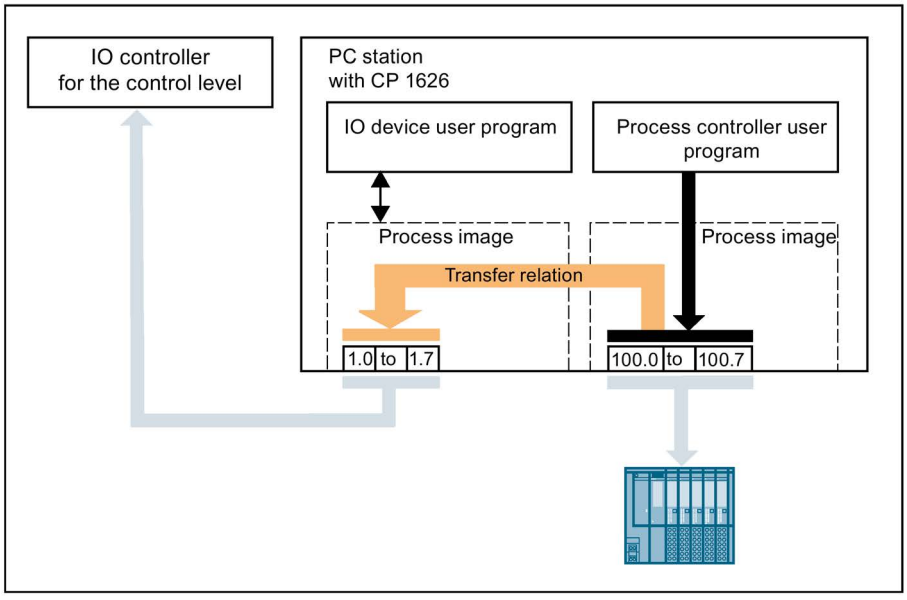
4.4.6 Example of reading output data

Description

The bits with addresses 100.0 to 100.7 of the output submodule and a length of 1 byte are written by the process controller user program. The IO controller for the control level reads this data.

The table and figure show which bits are read by the IO controller for the control level via transfer submodule 1.

I/O bits of the IO controller for the control level	Transfer relationship (from the perspective of the IO controller for the control level)	I/O bits of the IO controllers for the process level
1.0	read	100.0
to	-	to
1.7	read	100.7



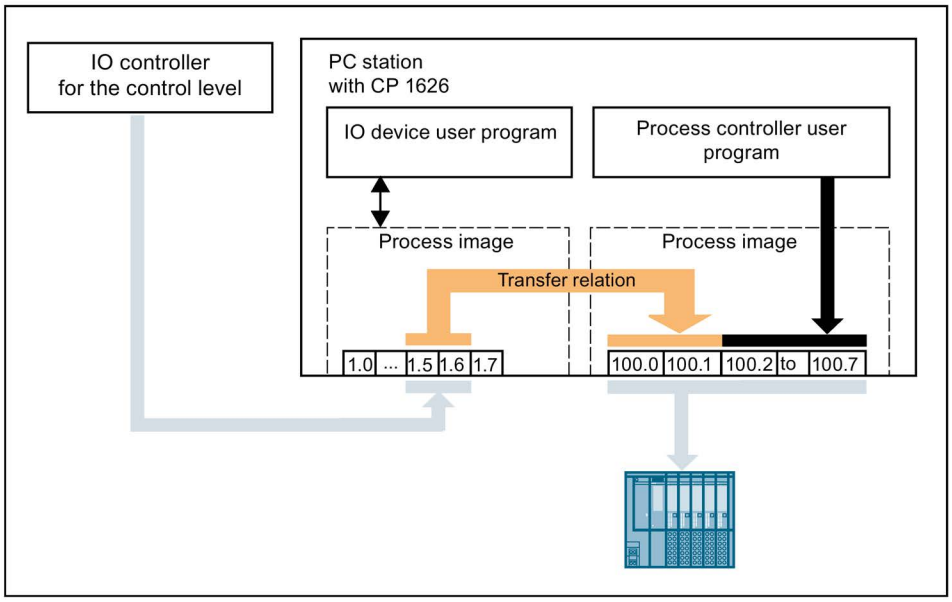
4.4.7 Example of the main and robot controller writing output data

Description

Both the IO controller for the process level and the IO controller for the control level will write input and output bits in output submodule 100. A transfer relation is therefore configured for address 1 in the transfer submodule.

The table and figure show which bits are written by the IO controller for the control level and which by the IO controller for the process level.

I/O bits of the IO controller for the control level	Transfer relationship (from the perspective of the IO controller for the control level)	I/O bits of the IO controller for the process level	Due to IO router configuration, assigned to …
1.5	Write	100.0	IO controller for the control level
1.6	Write	100.1	
-	-	100.2	IO controller for the process level
-	-	to	
-	-	100.7	



Note

The process controller user program always writes byte-oriented on the IO Base user programming interface.

Bits 100.0 and 100.1 are, however, replaced by the bits of the IO controller for the control level by the IO router before outputting to the submodule.

4.4.8 Summary of the properties of IO routing

Read

Both IO controllers can read input submodules of the process device at the same time.

Write

An output bit can only be written by one of the two IO controllers.

Two IO controllers can nevertheless write to different bits of the same output byte.

Write/read access by the IO controller for the process level to the input/output data of the process image is submodule- and byte-oriented over the IO-Base user programming interface.

Note

The IO controller for the process level may not write to output submodules in the process image that are configured fully for write access by the IO controller for the control level.

Data status

Note the following about the data status of a submodule if two IO controllers write to it:

Note

The local data status of a submodule written to by two IO controllers only has the status "GOOD" if the local status of both writes is "GOOD".

4.4.9 Configuring IO routing

Description

You configure the IO router in the "STEP 7 Professional (TIA Portal)" program.

In principle, the IO router is configured as follows.

Step	Description
1	Configure the CP 1626: • As I-device for the IO controller of the control level. • As IO controller for the process level.
2	Configure the IO router

4.5 Media redundancy (MRP)

Product-specific notes

This section describes specific information for the CP 1626 on the topic of "media redundancy". You will find a detailed description of "media redundancy" in the document "PROFINET with STEP 7 V14 (https://support.industry.siemens.com/cs/ww/en/view/49948856)" in the section "Media redundancy".

Version

In the CP 1626, the "MRP" method is used that conforms to the Media Redundancy Protocol (MRP) specified in the standard IEC 62439-2 Edition 1.0.

Ring ports

The MRP procedure is available at the ring ports 1 and 2 of the X1 interface.

4.6 Prioritized startup

Definition

An PROFINET IO device with the "prioritized startup" property can reach the data transfer phase extremely quickly after it is powered up.

Example

An industrial robot works with a tool whose actuators are controlled via IO devices. It has other tools stored in its magazine.

When the industrial robot changes tools, the "prioritized startup" property of the IO device is important. The faster the IO device is available for data transfer after turning on the power, the faster the robot can continue working.

How do I configure prioritized startup?

The "prioritized startup" property is taken into account in the configuration of the IO subsystem with the "STEP 7 Professional (TIA Portal)" program.

You will find more information on this topic in the "Commissioning PC Stations" configuration manual.

Settings of the Ethernet ports with prioritized startup

The default setting of the Ethernet ports of the communications processor is the "Automatic setting" unless you use the option Prioritized startup" for the connected IO devices. Then you need to select the value "TP 100 Mbps full duplex" in the "Transmission medium duplex" drop-down list with the program "STEP 7 Professional (TIA Portal)" on the tab "General" > "PROFINET interface [X1]" > "Advanced options" > "Port (X1 P1 R)". The communications partner also needs to be configured with fixed settings. The option "Prioritized startup" is particularly useful when IO devices need to be connected and disconnected during operation (tool change).

4.7 Replacement of a module with another of the same type.

Follow the steps below to replace a defective communications processor with another brand new communications processor:

1. Call up the function "SERV_CP_backup()" in your user program after you have installed and configured the communications processor. This saves the configuration of the communications processor in the folder "<public documents>\Siemens\SIMATIC.NET\CP1626" in Windows and in the folder "/etc/cp1626_config" in Linux.
2. Call up the function "SERV_CP_restore()" in your user program. This loads the configuration of the defective communications processor on the new replacement communications processor.

4.8 Notes and restrictions

Operation of the CP 1626 with IRT communication

To obtain the IRT StartApp callbacks in the real-time extension RTAI of the Linux operating system, the IRT user program must be started under "root" and "su" rights.

If the parameter "Intel® SpeedStep™tech" is located in the BIOS, it must be set to "disabled“ in IRT operation. It can be found, for example, in the Phoenix BIOS in "Advanced BIOS Features“

Restrictions

IRT operation is not possible with Windows operating systems.

Access to cyclic IRT data outside the callback event "PNIO_CP_CBE_STARTOP_IND" are not clock synchronized. This type of access has not been released.

Simultaneous operation of IO controller and IO device both with IRT communication on the same communications processor is not possible.

If an IO controller was configured for IRT communication, on the same CP 1626 only 1 IO device may be configured for IRT communication and operated at the same time.

Restarting the firmware of the communications processor

To restart the communications processor new, follow the steps below:

1. Disconnect the external power supply on the communications processor.
2. Restart the PC. (Turn the PC off for several seconds.)

Operation as a PROFIenergy device: No firmware update during PROFIenergy pause

Firmware updates, device name modifications and changing the IP address are not permitted during the PROFIenergy pause.

Interrupts for media redundancy

So that diagnostics interrupts for media redundancy can be reported, the redundancy master must be assigned to an IO device.

Firmware download

While downloading the firmware neither the IO-Base user programming interface nor the I-device user programming interface may be open.

Number of communications processors

A maximum of 1 CP 1626 can be operated in one PC.

Flood ping

Particularly high ping load on the ports of the communications processor, for example caused by a flood ping leads to failure of the connection IO controller-IO device. After turning off the disruption, the connection is restored (DEVICE_RETURN).

Short-circuiting the LAN ports

The accidental short circuiting of 2 LAN ports of the communications processor (both connectors of a network cable are plugged into the ports of the communications processor) leads to incorrect operation of the network and the communications processor. It may need to be reset to become functional again.

Load files

The firmware file is encrypted and signed. This ensures that only firmware published by Siemens can be loaded to the device.

Technical specifications

5

CP 1626 communications processor

The following technical specifications apply to the CP 1626 communications processor:

Data transfer	
Transmission rate	100 Mbps

Interfaces	
Connection to 10BaseT/100BaseTx	RJ-45 connectors (four)
Connection to PG/PC	PCI-Express X1 V1.0a Plug & Play

Voltage	
Power supply PCI-Express	3.3 VDC ± 9 % 12 VDC ± 8 %
Power supply (rated voltage)	12 ... 24 VDC

Current consumption	
PCI-Express voltage at +3.3 V	maximum 2.1 A
PCI-Express voltage at +12 V	maximum 0.1 A
External supply at +24 V	maximum 400 mA
External supply at +12 V	maximum 800 mA

Permitted environmental conditions	
Operating temperature	+0 °C to +70 °C
Transportation and storage temperature	-20 °C to +60 °C

Construction	
Module format	PC card, short PCIe format • Standard height • half length
Dimensions (H x W x D) in mm	126,3 x 21,6 x 180,5
Weight	110 g
Space required	PCIe slot

Requirements for the external power supply	
Electrical isolation	required
Voltage range	10.5 ... 32 VDC
CP 1626 current consumption with the PC turned off	approx. 0.4 A at 24 V

Power supply	
Plug-in connector FMC 1.5 / 2-ST-3.81 (ships with the product) or compatible	• Contact clearance 3.81 mm • Cable cross section: 0.2 mm^2 ... 1.5 mm^2

⚠ WARNING

External supply

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

Configuration limits

6

Configuration limits of the IO Controller (X1)

The IO controller of the CP 1626 has the configuration limits:

Cycle time (minimum)	250 µs
Maximum amount of IO data (including IOXS)	**PROFINET IO cycle**
6 250 bytes	250 µs
12 500 bytes	500 µs
25 000 bytes	1 ms
50 000 bytes	2 ms
10 0000 bytes	4 ms
Number of IO devices	Condition: 1 IO device has 128 bytes of input data and 128 bytes of output data
22	250 µs
45	500 µs
89	1 ms
179	2 ms
256*	4 ms
Maximum size of the data records	4096 bytes
Maximum number of IO devices	64 with IRT
Maximum number of IO devices	256 with RT

Configuration limits of the IO device (X1)

The IO device of the CP 1626 has the following configuration limits for the interface "X1":

Cycle time (minimum)	250 µs
Number of ARs (AR = Application Relationship)	2
Amount of IO data per AR	1434 bytes of data minus the number of inserted modules (input or output modules)
	1434 bytes of data minus twice the number of inserted modules (input or output mixed modules*)
Maximum module size	1024 bytes
Number of modules	512

* Mixed modules are modules that have both input and output data

Configuration limits of the IO device (X2)

The IO device of the CP 1626 has the following configuration limits for the interface "X2":

Cycle time (minimum)	1000 µs
Number of ARs (AR = Application Relationship)	2
Amount of IO data per AR	1434 bytes of data minus the number of inserted modules (input or output modules)
	1434 bytes of data minus twice the number of inserted modules (input or output mixed modules*)
Maximum module size	1024 bytes
Number of modules	512

* Mixed modules are modules that have both input and output data

Approvals

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 the 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)

Customs union of Russia, Belarus and Kazakhstan

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

KC approval - only for Korea

MSIP 요구사항 - For Korea only

Certification Number: MSIP-REM-S49-PCCP

A급 기기(업무용 방송통신기자재)

이 기기는 업무용(A급) 전자파 적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정 외의 지역에서 사용하는것을 목적으로 합니다.