SIEMENS

SIMATIC

CN 4100
CN 4100 Communication System

Equipment Manual

03/2022
A5E50871363-AB

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.

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Disclaimer of Liability

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

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Security information

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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 constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit
https://www.siemens.com/industrialsecurity.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the 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.

Preface

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Purpose of the documentation

This documentation provides comprehensive information on using the SIMATIC CN 4100 communication system:

- General information on the rack
- Configuration
- Installation
- Connecting
- Commissioning

Knowledge required

A basic knowledge of automation technology is required to understand the documentation.

The SIMATIC CN 4100 communication system may only be installed and operated by qualified personnel.

Scope of this documentation

This documentation applies to the following components of the SIMATIC CN 4100 communication system:

Component	Order number
Rack	6DL4170-1RB01-2XX0
CPU module	6DL4178-0BH01-0XX0
RS-232 serial communication module	6DL4172-4AX41-0XX0
RS-485 serial communication module	6DL4172-4AX51-0XX0

Note

Higher-priority documentation

The information for the specific components takes precedence over the information in this documentation. The statements in the product information always takes precedence over all other information.

Currently valid markings and approvals (Page 61)

Additional documentation

You can find more information on using the SIMATIC CN 4100 communication system in the following documents:

- CNET Operating Manual (includes, for example, the commissioning of SIMATIC CN 4100):
  CNET (https://support.industry.siemens.com/cs/de/de/view/109802239)
- Application example for SIMATIC CN 4100:
  FAQ (https://support.industry.siemens.com/cs/de/de/view/109801222)
- PCS 7 library for SIMATIC CN 4100:
  PCS 7 (https://support.industry.siemens.com/cs/de/de/view/109801221)

Conventions

The following terms are used synonymously in this documentation:

Term	Synonyms	Notes
Rack	• Rack • Backplane	Unless otherwise stipulated, refers to a station for providing the slots for CPUs and communications modules.
CPU module	• CPU • Controller • PLC	Unless otherwise stipulated, refers to a programmable logic controller.
Communications module	• Expansion module • Module • Electronic module • CM	Unless otherwise stipulated, refers to the objects of the communication system in which the electronics is implemented for communication via a serial or other interface.
Slot cover	BU cover	Components of the communication system: Unless otherwise stipulated, refers to the specific component to cover a slot.

Also read the notes marked as follows:

Note

A note contains important information on the product described in the documentation, on the handling of the product or on the section of the documentation to which particular attention should be paid.

Recycling and disposal

The products are low in pollutants and can be recycled. For environmentally compliant recycling and disposal of your electronic waste, please contact a company certified for the disposal of electronic waste.

System overview

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3.1 Notes on the SIMATIC CN 4100 system

The SIMATIC CN 4100 communication system is a coherent I/O system consisting of the rack, at least one controller and optional communications modules.

SIMATIC CN 4100 (Page 11)

This section gives you an overview of the most important features and areas of application of the communication system.

Areas of application

The SIMATIC CN 4100 communication system is suitable for use in various areas of application. SIMATIC CN 4100 can be adapted to the respective local requirements by scaling and adjustments, for example, through suitable configuration.

SIMATIC CN 4100 is intended for installation in a control cabinet.

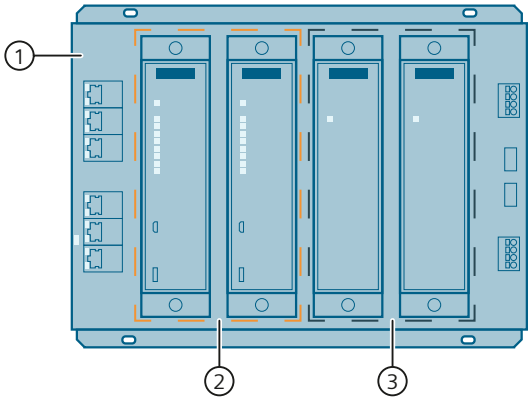
3.2 SIMATIC CN 4100

Definition

The SIMATIC CN 4100 communication system is a scalable I/O system (although only to a limited extent).

Design

The basic components of the communication system are shown in the following exemplary installation. The numbering shows the assembly sequence.



①	Rack:	Contains slots for the CPU modules and communications modules. Contains terminal points.
②	CPU modules:	Can be installed individually or as a redundant pair. CPUs are plugged into the rack.
③	Communications modules:	Optional modules with additional functions. These can also be installed individually or as a redundant pair. Communications modules are plugged into the rack.

3.3 Basic components of the system

3.3.1 Rack with 4 slots

Definition

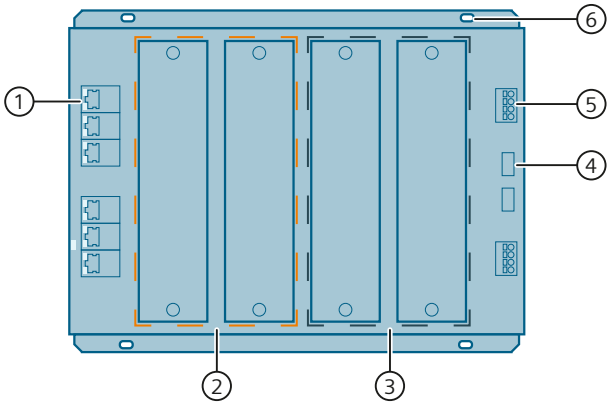
The core component of the SIMATIC CN 4100 communication system is the rack.

The rack with 4 slots provides the following:

- 2 slots for CPU modules
  - Redundant operation: 2 CPUs.
  - Simple operation: One CPU in "CPU 1" slot.
- 2 slots for communication modules.
- Power supply connections
- Network connections

Design of the front panel

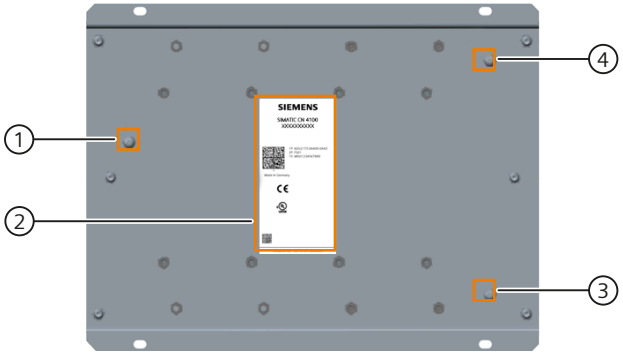
The following figure shows the front of the rack:



①	RJ45 Ethernet port (with display LEDs)
②	Slots for CPU modules
③	Slots for communications modules. Unused slots are equipped with a protective cover.
④	USB port
⑤	Power supply connection 24 V DC
⑥	Fastening hole

Design of the rear

The following figure shows the rear of the rack:



①	Screw for grounding the reference potential
②	Nameplate (Page 24)
③	Screw for connecting the shielding of the network cables X2, X2.1 and X2.2 to the metal enclosure
④	Screw for connecting the shielding of the network cables X1, X1.1 and X1.2 to the metal enclosure

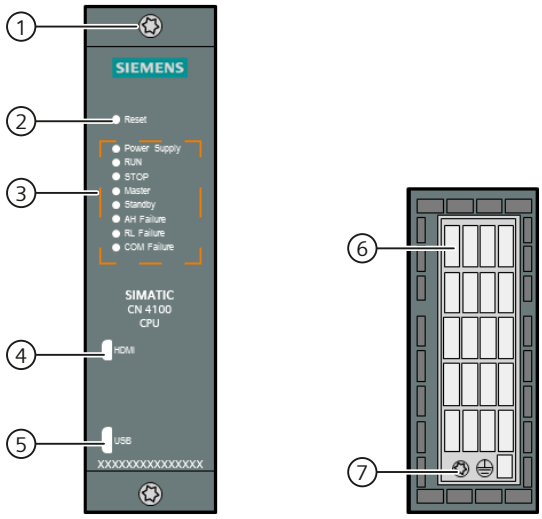
3.3.2 CPU module

Definition

In the CN 4100 communication system, only the CN 4100 CPU is used as the central control module.

Design of the front and bottom panel

The following figure shows the front panel and bottom of the CPU module:



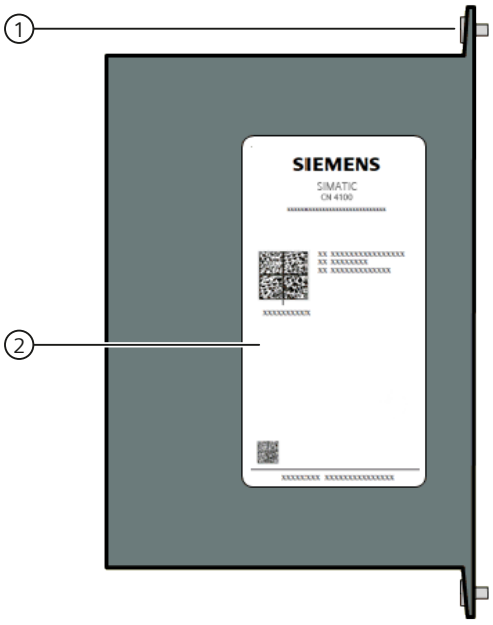
①	Fixing screw
②	Reset button
③	Status LEDs
④	Micro HDMI port
⑤	Micro USB port
⑥	Ventilation slot
⑦	PE terminal

Note

The Micro-HDMI port and Micro-USB port are intended for expert service only. These connections are not used during operation or for normal service work.

Design of the side

The following figure shows the left side of the CPU module:



①	Fixing screw
②	Nameplate (Page 24)

3.3.3 RS-232 serial communication module

Definition

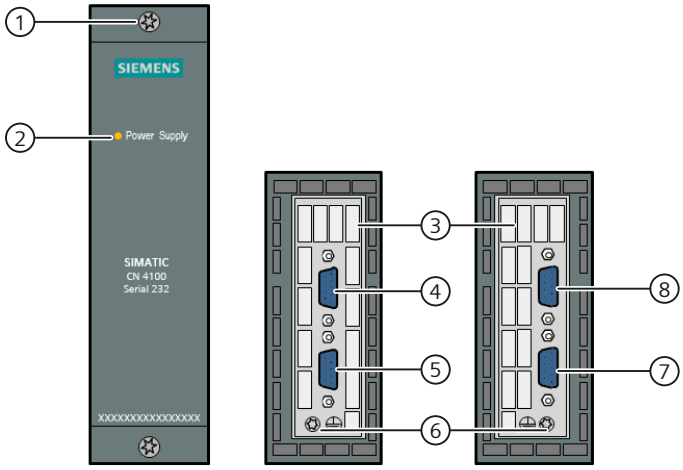
The RS-232 serial communication module has the following features:

- The communication module is equipped with four RS-232 interfaces for up to 921.6 Kbps.
- 4 TTL/RS-232 signal converter
- 4 RS-232/TTL signal converter

Design

The following figure shows the design of the RS-232 serial communication module.

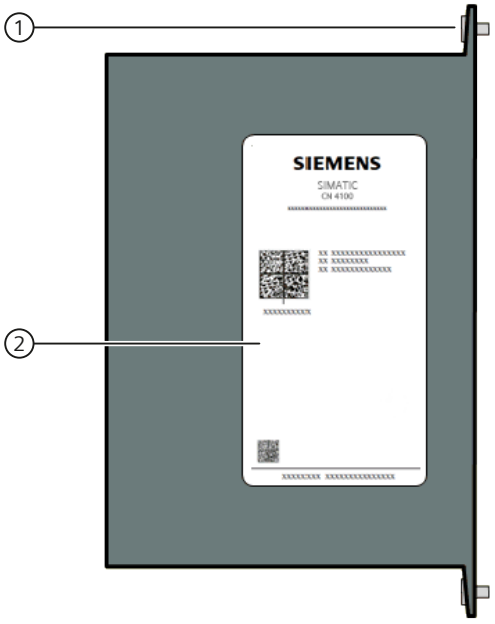
- Left side: View of front panel
- Middle: View from below
- Right side: View from above



①	Fixing screw
②	Status LED of the power supply
③	Ventilation slot
④	RS-232 connection: COM3
⑤	RS-232 connection: COM4
⑥	PE terminal
⑦	RS-232 connection: COM2
⑧	RS-232 connection: COM1

Design of the left side

The following figure shows the left side of the RS-232 serial communication module:



①	Fixing screw
②	Nameplate (Page 24)

3.3.4 RS-485 serial communication module

Definition

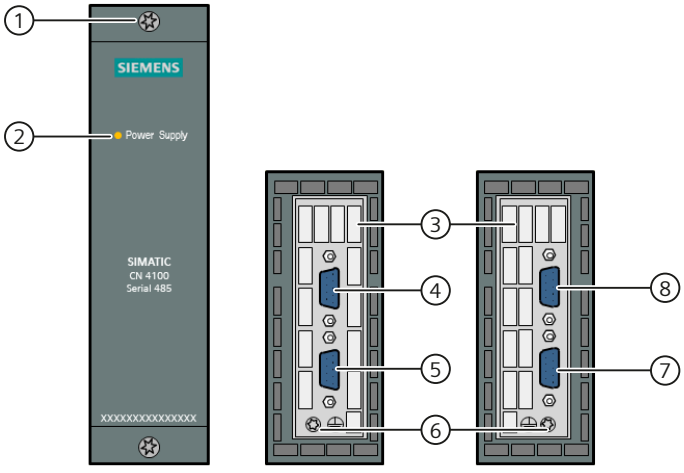
The RS-485 serial communication module has the following features:

- The communication module is equipped with four RS-485 interfaces for up to 921.6 Kbps.
- 4 TTL/RS-485 signal converter
- 4 RS-485/TTL signal converter

Design

The following figure shows the design of the RS-485 serial communication module.

- Left side: View of front panel
- Middle: View from below
- Right side: View from above

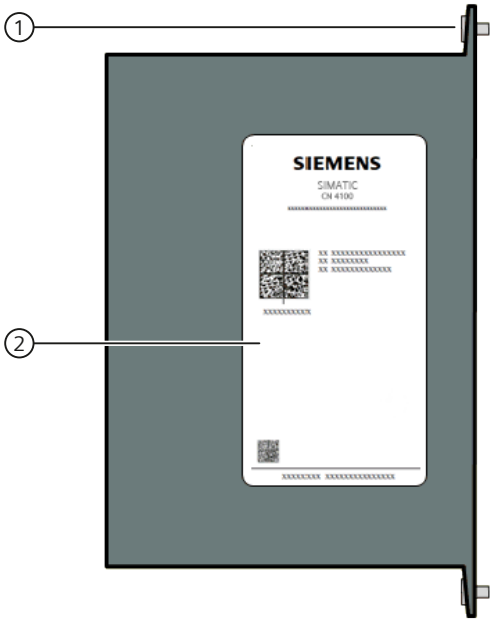


①	Fixing screw
②	Status LED of the power supply
③	Ventilation slot
④	RS-485 connection: COM3
⑤	RS-485 connection: COM4
⑥	PE terminal

⑦	RS-485 connection: COM2
⑧	RS-485 connection: COM1

Design of the left side

The following figure shows the left side of the RS-485 serial communication module:



①	Fixing screw
②	Nameplate (Page 24)

Plant engineering

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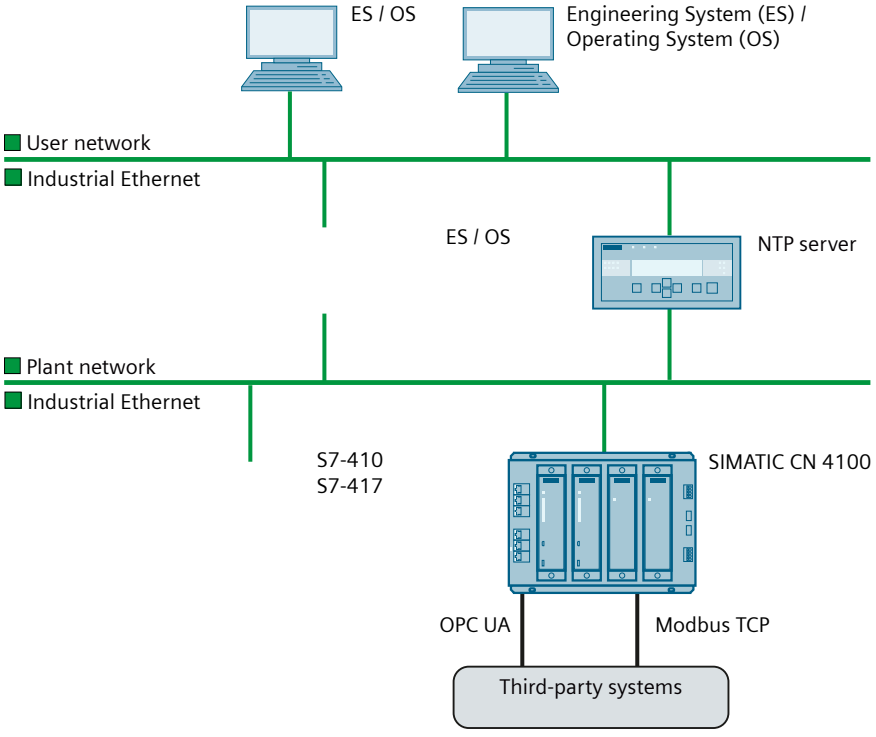
The position of the SIMATIC CN 4100 communication system in the topology and typical applications are shown in the figure below:



Note

Network security

To secure the communications of the plant network, you should use a SCALANCE firewall.

Note

Compatibility with S7-417

For the time being, only the CPU417-5H PN/DP (6ES7 417-5HT06-0AB0) is supported from firmware version v.6.0.10.

4.1 SIMATIC CN 4100 communication system configuration

When using the SIMATIC CN 4100 communication system, the following interfaces are available:

- The integrated Ethernet ports (X1 and X2), which can be connected to the plant network individually or redundantly.
- The integrated Ethernet ports (X1.1; X1.2 and X2.1; X2.2), which can be connected individually or redundantly to two Ethernet networks as interfaces to third-party systems.

Use of optional communication modules:

- RS-232 serial communication module: Can be connected individually or redundantly to four RS-232 serial interfaces to third-party systems.
- RS-485 serial communication module: Can be connected individually or redundantly to four RS-485 serial interfaces to third-party systems.

Configuration rules

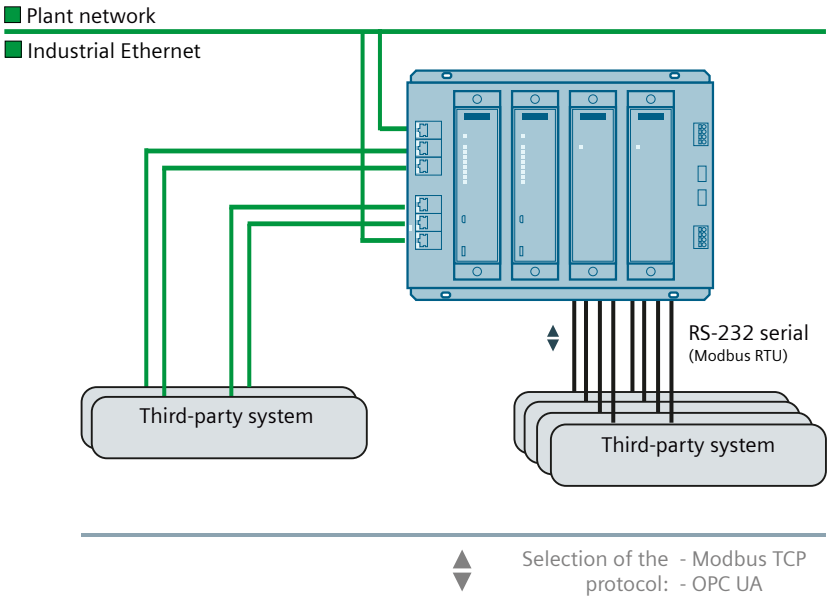
The following configuration rules apply:

- When a single CPU module is used, it must be plugged into the left CPU module slot.
- When a single communication module is used, it must be plugged into the left slot for communication modules.
- Communication modules can only be used redundantly with redundant CPU modules.
- A combination of different communication modules is not possible.
  Either:
  - A single communication module is used.
  - The same module type is used redundantly.

Configuration example

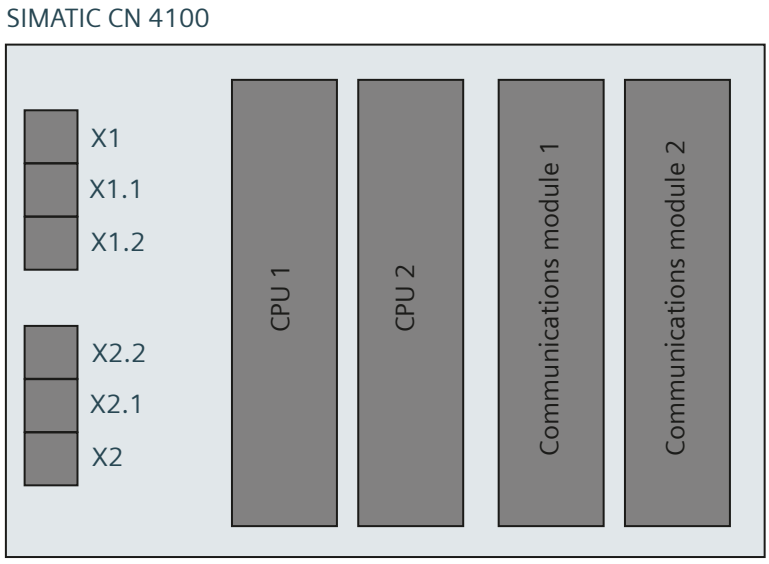
The following figure shows an example of the configuration of the SIMATIC CN 4100 communication system. Included are:

- A redundant connection to the plant network.
- Redundant Ethernet connections to two networks.
- Redundant RS-232 connections to four serial ports.



Configuration options

The following schematic diagram shows the basis for the configuration options with the modules and integrated connections:



The possible configurations are listed below. Each table row corresponds to one configuration.

Redundancy	**Slots for CPU**		**Slots for communications modules**		**Integrated connections**					
	CPU 1	**CPU 2**	**CM 1**	**CM 2**	**X1**	**X2**	**X1.1**	**X1.2**	**X2.1**	**X2.2**
Redundant	Yes	Yes	-	-	PN	PN	TCP	TCP	TCP	TCP
	Yes	Yes	RS232	RS232	PN	PN	TCP	TCP	TCP	TCP
	Yes	Yes	RS485	RS485	PN	PN	TCP	TCP	TCP	TCP
Non-redundant	Yes	-	-	-	PN	-	TCP	TCP	-	-
	Yes	-	RS232	-	PN	-	TCP	TCP	-	-
	Yes	-	RS485	-	PN	-	TCP	TCP	-	-

PN = Plant network

TCP = Ethernet (for TCP/IP interface to third-party systems)

Installation

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5.1 Notes on installation

You can mount the SIMATIC CN 4100 communication system in horizontal or vertical installation position. The preferred mounting position is horizontal mounting on a vertical wall.

Mechanical and climatic environmental conditions (Page 30)

There is information on the tightening torque for fastening components using screws.

Rules for fastening (Page 32)

There is a maximum mounting length when installing the system.

Maximum mechanical length (Page 71)

Note that there must be enough space for mounting and heat dissipation of the modules.

If you need to protect SIMATIC CN 4100 from access, install the system in a control cabinet.

Minimum clearances in the control cabinet (Page 25)

Rack

The specific CN 4100 rack is the mounting platform for the SIMATIC CN 4100 communication system.

The rack must be conductively connected to protective grounding when the system is in operation. Also note the supplementary information on electromagnetic compatibility.

- Electromagnetic compatibility (Page 62)
- Notes on protective grounding (Page 27)

5.2 Delivery

The delivery for the SIMATIC CN 4100 communication system includes the following components:

- The component itself
- Product information

Observe the following when unpacking the components:

- Keep the documentation included in the package in a safe place. It is required for initial commissioning and is part of the device.
- Check the packaging and contents for visible transport damage.
- Check the delivery for completeness. Inform your local Siemens contact in case of discrepancies or transport damage.

5.3 Information on the nameplate

Definition

The nameplate is attached to the product by the manufacturer to classify and describe the product.

Note

Only the information printed on the nameplate of the respective component is valid.

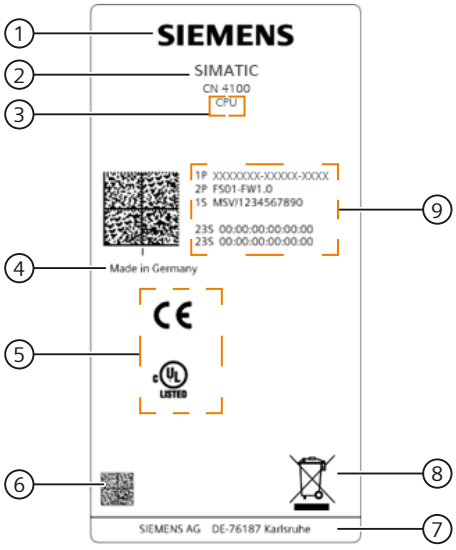
Approvals and certifications (Page 61)

The approvals and certifications shown below are examples only.

This section describes the information on the nameplates of the SIMATIC CN 4100 communication system components.

Design of the nameplate

The identification data on the nameplate is more extensive depending on the component. Example of a nameplate of the CPU module:



①	Company
②	Trademark
③	Module type
④	Country of manufacture
⑤	Approvals and certifications
⑥	Serial number
⑦	Manufacturer address

⑧	Instructions for disposal	
⑨	Identification data	The identification data are also provided as 2D code. 1P = Article No. (MLFB) 2P = Hardware and firmware version 1S = Serial number 23S • First line = MAC address of the 1st Ethernet interface (ports X1 and X2) second line • Second line = MAC address of the 2nd Ethernet interface (ports X1.x and X2.x)

Location of the nameplate

The nameplate is located at the following position of the module.

Component	Location of the nameplate
Rack	The nameplate is located on its rear.
CPU	The nameplate is located on the right side of the module.
RS-232 serial communication module	
RS-485 serial communication module	

5.4 Basics for mounting

5.4.1 Minimum clearances in the control cabinet

Definition

The installation depth of the SIMATIC CN 4100 is 162 mm. It is based on the components being plugged into each other (rack, CPU module and communications modules).

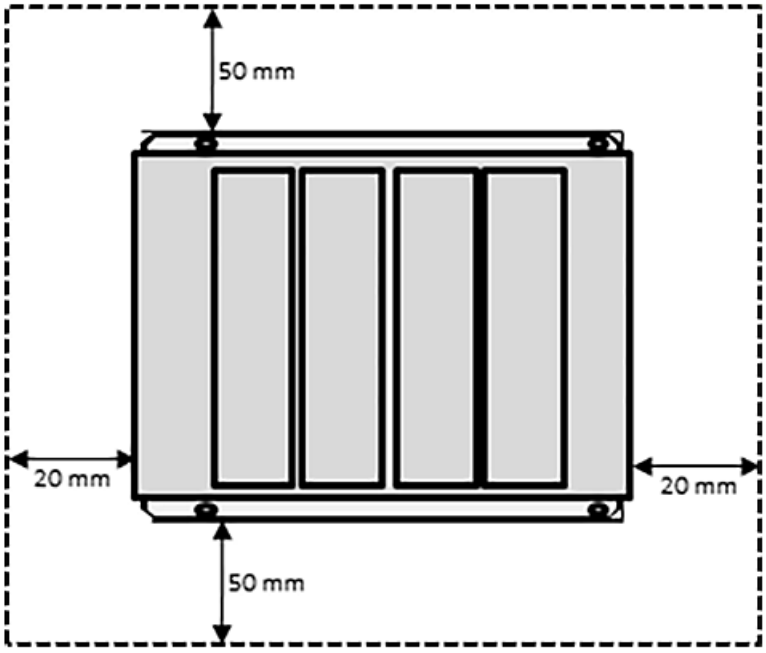
There should be at least 100 mm of space in front of the module front panel.

This is to provide heat dissipation.

Description

Observe the minimum distances of the system in the control cabinet or surrounding components. Leave enough space for the wiring and the connection of the communication cables.

When mounting the rack, you need to ensure that the following distances in millimeters are observed:



5.4.2 Dimensions for the drill hole

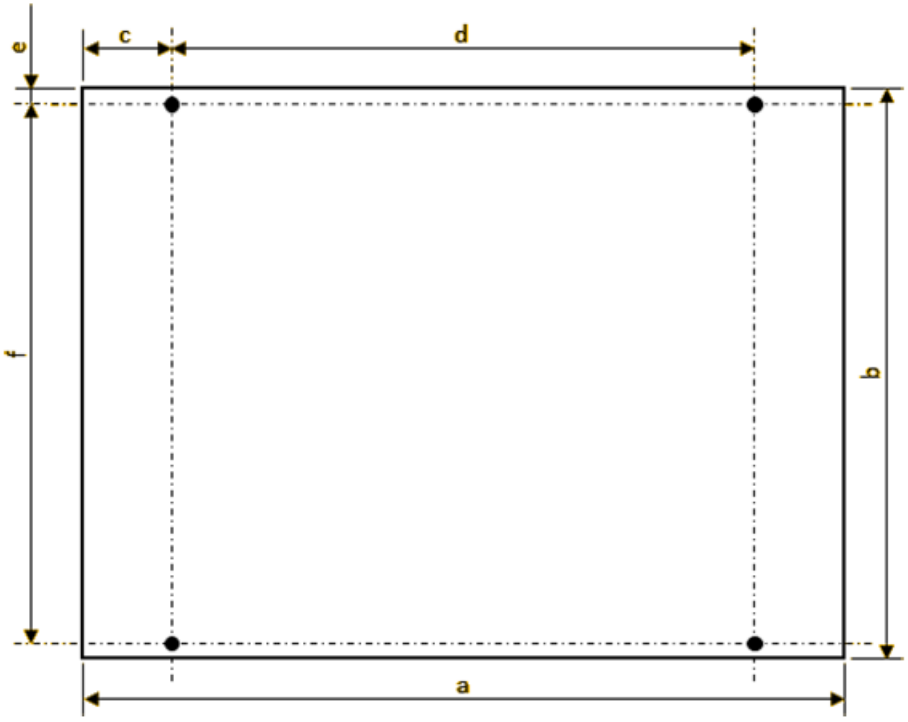
Definition

The dimensions for the holes depend on the rack. The rack has four holes for fixing screws.

Description

All drill holes are equidistant from the edges.

The following dimensions for the holes are available:



a	301 mm	Outer dimensions of the rack
b	226 mm	
c	38 mm	Horizontal distance from the edge to the center of the hole
d	225 mm	Horizontal distance between the centers of the holes
e	5 mm	Vertical distance from the edge to the center of the hole
f	216 mm	Vertical distance between the centers of the holes

5.4.3 Notes on protective grounding

The following table gives an overview of the most important measures for protective grounding.

Device	Measure
Rack	The rack must be bolted to a grounded metal surface. If this is not possible or if the metal surface is not connected to larger metal parts, the rack can be connected to a central grounding point with a cable.
CPU modules	Grounding via cable
Communications modules	

Grounding connection (Page 28)

Grounding via reference potential

The reference potential of the SIMATIC CN 4100 communication system can be connected to ground. A grounding screw is used for this.

Notes on the reference potential (Page 29)

Application (providing floating reference potential):

- Removing the grounding screw (Page 32)

Grounding via cable

- Grounding the rack with a cable (Page 34)
- Grounding the module with a cable (Page 36)

5.4.4 Grounding

5.4.4.1 Grounding connection

Definition

The ground connection is used to discharge the current to ground via a connection with good electrical conductivity. This is intended to minimize different electrical potential.

Description

- Low-resistance ground connections reduce the risk of electric shock in the event of a short-circuit or defect in the system.
- Low-resistance connections (large surface area, large contact area) reduce the effect of interference on the communication system or the radiation of interference signals. Effective shielding of cables and devices also makes a significant contribution to this.

⚠ CAUTION

Protective grounding

All Class 1 protective devices and all major metal parts must have protective grounding. This is the only way to protect operators from electric shock. It also dissipates interference transmitted through external power supply cables, signal cables, or cables to I/O devices.

5.4.4.2 Notes on the reference potential

If the SIMATIC CN 4100 communication system has been configured with grounded reference potential, any interference currents that occur are diverted to the protective conductor/local ground. A grounding screw contact is used for this.

Note

Grounding screw included in the scope of delivery

The rack is equipped with grounded reference potential. No modification of the supplied unit is required for grounded reference potential.

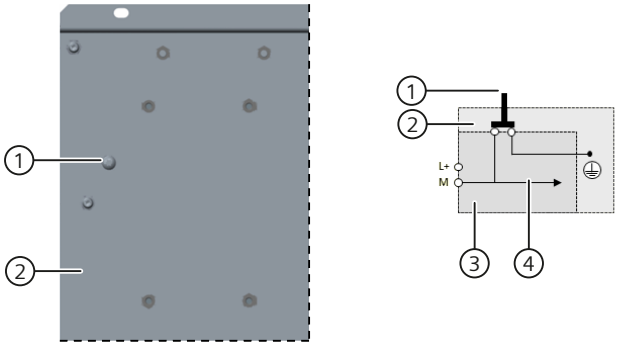
Note

Grounding screw no longer accessible

After mounting the rack, the grounding screw is no longer accessible.

Design

The following figure shows the configuration of a system with grounded reference potential:



①	Grounding screw in grounded state
②	Metal enclosure of the rack (grounded)
③	Power supply connection
④	Ground potential of the internal circuit

Installation with floating reference potential

Installation with floating reference potential may only be used in systems with central grounding.

5.4.4.3 Notes on cable shields

Both ends of the line shielding can be connected to ground (or system ground). This effectively suppresses interference in the high frequency range.

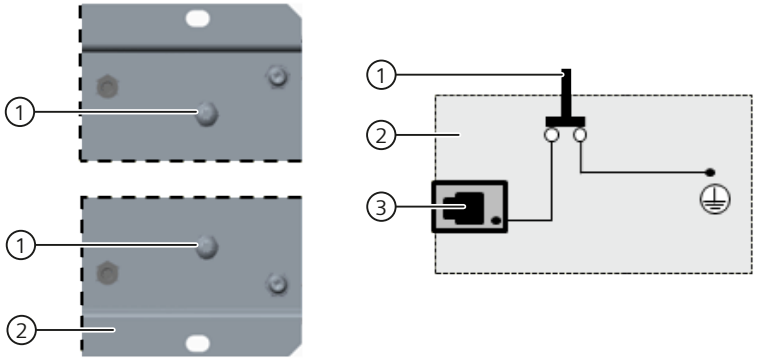
When you connect the shielding to ground on only one side (i.e., at the beginning or end of the line), you limit attenuation to the lower frequencies.

A one-sided shielding connection may be more suitable in the following cases:

- No line for potential equalization can be laid.
- Analog signals (some mA or µA) are transmitted.
- Foil shields (static shields) are used.

Configuration

The following figure shows the configuration of the SIMATIC CN 4100 rack with grounded cable shields.



①	Grounding screw in grounded state
②	Metal enclosure of the rack (grounded)
③	Ethernet port

5.5 Overview of the installation

The procedure described below shows how to install the SIMATIC CN 4100 communication system.

Requirement

- The supply voltage is switched off.
- You are familiar with the basics of installing the SIMATIC CN 4100 communication system. Notes on installation (Page 23)

CAUTION

Restrictions on installation

The following ambient temperatures are permissible:

- Vertical installation: -30 °C to 60 °C
- Horizontal installation: -30 °C to 45 °C

Procedure

The required sequence for installing the system is as follows:

1. Rack
2. CPU module(s)
3. Communications module(s)

Mounting a rack

When installing the SIMATIC CN 4100 communication system, start with the rack.

SIMATIC CN 4100 modules are "open equipment" according to IEC 61131-2 and an "open type" according to UL/CSA approval. The following alternative installation methods are prescribed to meet the specifications for safe operation in terms of mechanical strength, flame resistance, stability and protection against accidental contact:

- Installation in a suitable enclosure
- Installation in a suitable cabinet
- Installation in a suitably equipped, enclosed operating room

Access to these rooms must only be possible with a key or tool. Access to these enclosures, cabinets or electrical operating rooms is only to be permitted for trained or authorized personnel.

Note

Ambient and environmental conditions

The following aspects must be taken into account when planning the system application:

- Climatic and mechanical environmental conditions according to the "Technical specifications" section of the documentation.
- The device is only approved for indoor operation.
- Extreme ambient conditions must be avoided. The device must be protected against dust, moisture and heat.
- The device must not be exposed to direct sunlight.
- The ventilation slots of the device must not be covered.

Applications

- Mounting a rack (Page 33)
- Grounding the rack with a cable (Page 34)

Plugging in the modules

Plug the modules into the slots of the rack. Start from the left with the CPU modules.

If a slot is not equipped with a module, plug a slot cover onto the slot.

Application

- Plugging in the module (Page 35)
- Grounding the module with a cable (Page 36)

5.6 Installation

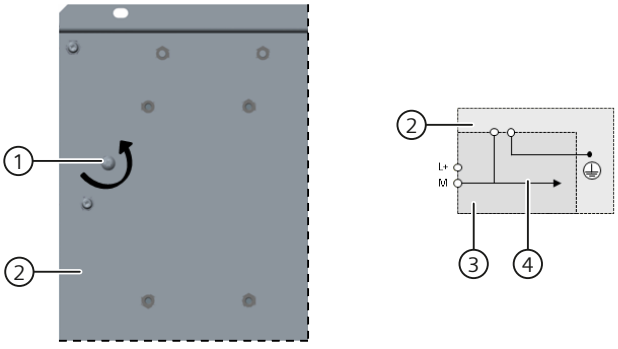
5.6.1 Removing the grounding screw

Requirement

- The rack is to be used in a system with central grounding.
  If the rack is to be used grounded, skip this topic.
- The rack has not yet been mounted.
- Required tools:
  - TX10 screwdriver to pull out the grounding screw

Procedure

Remove the grounding screw on the back of the rack. Note the following setup in doing so.



①	Grounding screw in grounded state
②	Metal enclosure of the rack (grounded)
③	Power supply connection
④	Ground potential of the internal circuit

Result

The reference potential of the rack is floating.

5.6.2 Mounting a rack

Requirement

- Minimum clearances in the control cabinet are known.
- The hole drilling template is available.
  Hole drilling template (Page 26)
- The rack is to be screwed to a grounded metal surface.
- The grounding settings on the back of the module have been checked. These settings must be made before installing the rack.
  Grounded reference potential (Page 29)
  Grounded cable shields (Page 29)

Required tools

- Tool appropriate for the selected type of mounting:
  - Allen wrench or screwdriver, appropriate for the screws used to tighten the fixing screws.
  - Drill bit ∅ 5.5 mm for drilling the fastening holes
- Screws suitable for your setup:
  - Cylinder head screw M5 according to ISO 1207/ISO 1580 (DIN 84/DIN 85) with nuts and spring washers
  - M5 hexagon head bolt according to ISO 4017 (DIN 4017) with nuts and spring washers.

Procedure

1. Mark the four fastening holes on the mounting plane.
2. Drill the four holes.
3. Mount the rack in such a way that there is sufficient space for mounting and heat dissipation of the modules.
4. Screw the rack to the base.

Note

Before installing controllers with floating reference potential, make the relevant settings on the rack.

Result

The rack is mounted and screwed to the base.

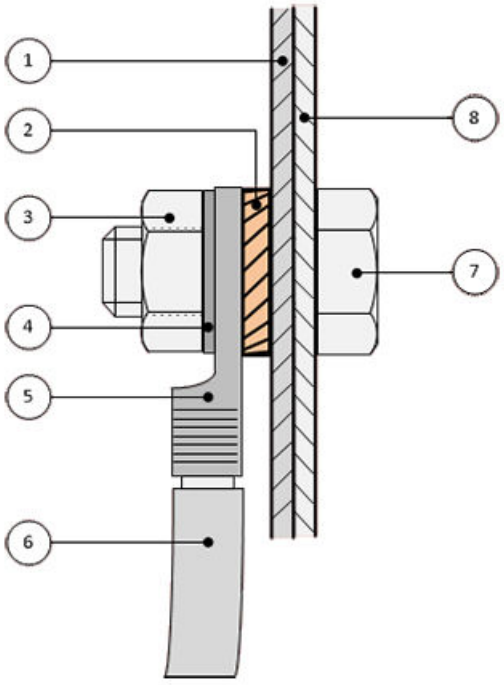
5.6.3 Grounding the rack with a cable

Requirement

- The basics for protective grounding are known.
- The rack is mounted and screwed to the base.
- The cable for grounding has a cross-section >=1.0 mm².

Procedure

Mount a cable with a cable lug on one of the fixing screws of the rack. Note the following setup in doing so.



①	Rack
②	Contact washer
③	Fastening nut
④	Washer
⑤	Cable lug
⑥	Cable
⑦	Fixing bolt
⑧	Mounting level

Result

The rack is grounded via a cable.

5.6.4 Plugging in the module

Requirement

- The rack is mounted.
- The rack is grounded.
- The power supply is switched off.
- Required tools:
  - TX20 screwdriver for tightening the fixing screws

Procedure

1. If necessary, remove the protective cover from the slot.
2. Insert the module into the slot.

   Note

   The edges of the slots are beveled to prevent incorrect installation of the modules.

   Note

   Pay attention to the slot assignment. CPU modules and communications modules have special slots and must not be interchanged.

3. Tighten the fixing screws of the module with a torque of 1.2 Nm.

Result

The module has been plugged in.

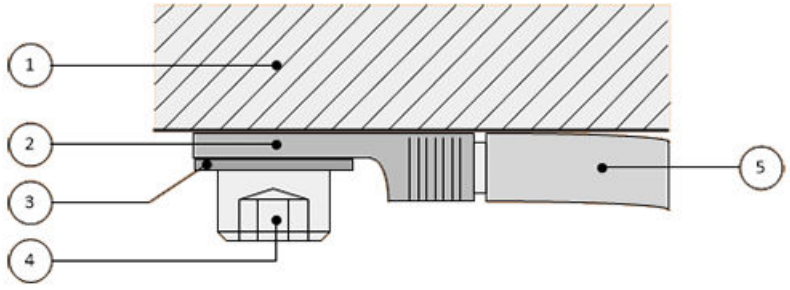
5.6.5 Grounding the module with a cable

Requirement

- The basics for protective grounding are known.
- The Module is mounted and screwed to the base.
- The cable for grounding has a cross-section >=1.0 mm^2.
- Required tools:
  - TX8 screwdriver for tightening the PE terminal screws

Procedure

1. Remove the washer and terminal screw.
2. Install a cable with a cable lug to the PE terminal of the module. Note the following setup in doing so:



①	Module
②	Cable lug
③	Washer
④	Clamping screw
⑤	Cable

3. Tighten the PE terminal screw with a torque of 0.51 Nm.

Result

The module is grounded with a cable.

Connecting

6

6.1 Notes on operation

Using the SIMATIC CN 4100 communication system in a plant requires that special rules and regulations be observed, depending on the area of application.

This section provides an overview of the most important rules that you need to observe when using the SIMATIC CN 4100 communication system.

Specific application

Observe the safety and accident prevention regulations that apply to specific applications, for example, the machinery directives.

EMERGENCY STOP devices

EMERGENCY STOP devices according to EN / IEC 60204 must remain in effect in all operating modes of the plant or system.

Avoiding dangerous system conditions

You must take suitable measures to ensure that dangerous operating states are also avoided in the following situations:

- The plant restarts after a voltage dip or power failure.
- Bus communication starts automatically after a fault.

If necessary, force an EMERGENCY OFF!

After unlocking the EMERGENCY STOP device, there must be no uncontrolled or undefined startup.

Supply voltage

Observe the following for the supply voltage:

- Typical functional extra-low voltage U_N = 24 VDC +20/-10 % (⎓)
  Ensure safe (electrical) isolation of the extra-low voltage (SELV/PELV).
  The following standard must be observed: EN / IEC / UL61010-2-201
- For buildings: If there is a risk of overvoltage, you need to provide lightning protection measures for external lightning protection (e.g. lightning protection elements).

- For supply voltage cables (24 V DC) and signals:
  If there is a risk of overvoltage, you need to provide lightning protection measures for internal lightning protection (e.g. lightning protection elements).
- SIMATIC CN 4100 in LAN networks:
  In LAN networks (Local Area Networks), you may only operate the SIMATIC CN 4100 with RJ45 interfaces if the following condition is met:
  All connected nodes must be operated with SELV/PELV type voltage supplies (e.g. power supply unit, battery) with safe electrically isolated functional extra-low voltage.

Line voltage

Observe the following for the line voltage:

- A disconnector (all-pole) must be provided in the building installation for fixed plants or systems without all-pole disconnectors.
- For the power supply, the configured rated voltage range must correspond to the local line voltage.
- The fluctuation/deviation of the line voltage from the rated value must be within the permissible tolerance for all circuits of the SIMATIC CN 4100.

Information on insulation, protection class, degree of protection and rated voltage (Page 65)

Protection against external electrical influences

Observe the following for protection against electrical influences or faults:

- For all plants with SIMATIC CN 4100, ensure that the plant is connected to a protective conductor with sufficient cross-section to dissipate electromagnetic interference.

6.2 Notes on wiring

The modules are supplied with the voltage potentials 24 V DC and M via the input terminals of the rack. The terminal blocks for supplying the L+ and M potentials are arranged on the rack.

The terminal PS1 supplies the slots CPU1 and CM1. The terminal PS2 supplies the slots CPU2 and CM2.

Note

Requirements for safety extra-low voltage (SELV)

The device may only be connected to a 24 V DC power supply that meets the requirements for safety extra-low voltage (SELV), EN / IEC / UL 61010-2-201 and DIN EN 61131-2.

If the device is used on a wall, in an open rack or other similar locations, an NEC Class 2 power source is required to meet the UL requirements (*).

*According to UL 60950-1 and National Electrical Code (r) (ANSI/NFPA 70).

In all other cases (according to IEC / EN / DIN EN 60950-1), either a limited power source (LPS = Low Power Source) or a line-side fuse or circuit breaker is required.

Limit the current to a value below 4.16 A. Recommended fuse: Max. 0.8 A for each power supply.

Cable cross-sections

The cable cross-sections depend on their particular application.

The cables must have a cross-section of 0.75 mm^2 to 2.5 mm^2 and a temperature class of over 80 °C.

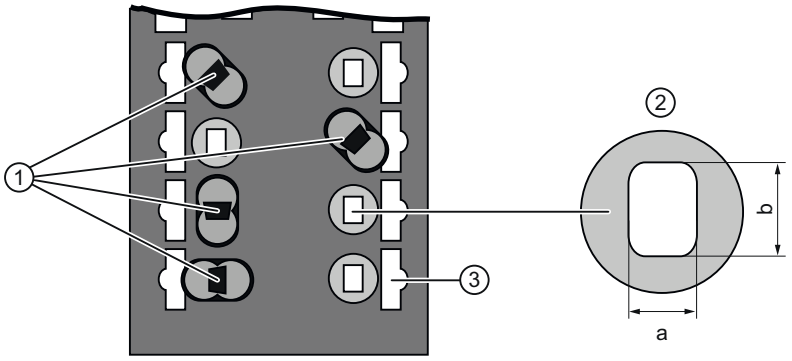
Note

Reverse polarity protection

The input power module of the SIMATIC CN 4100 system is protected against reverse polarity of the input voltage.

TWIN end sleeves for the push-in terminal leads

Due to the space required by TWIN end sleeves with a cross-section of 0.75 mm^2, you need to ensure a correct angle to the conductor alignment when crimping the TWIN end sleeves so that the conductors are optimally aligned.



①	Crimping TWIN end sleeves at the correct angle
②	Cross-section of the terminal compartment • a: 1.8 mm • b: 2.4 mm
③	Spring release

Mechanical and climatic environmental conditions (Page 61)

6.3 Overview of rack wiring

There are terminals for the supply voltage on the rack.

Supply voltage (Page 45)

Power supply

Note the technical specifications and the information on the supply voltage.

Notes on operation (Page 37)

Terminals for power supply

Observe the wiring rules for the SIMATIC CN 4100 communication system.

Notes on wiring (Page 38)

Connecting or disconnecting the power supply

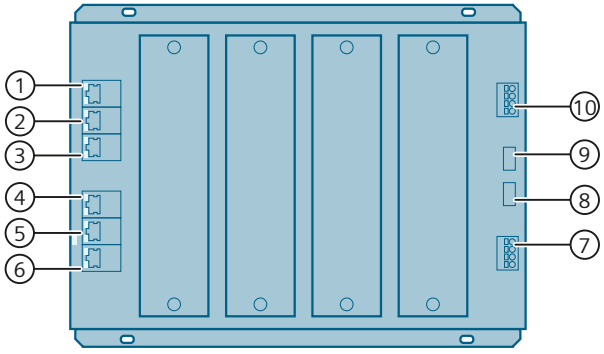
Connecting the supply voltage to the rack (Page 46)

Disconnecting the supply voltage from the rack (Page 46)

6.4 Supply of the rack

6.4.1 Connections of the rack

The rack has the following connections:



①	X1	RJ45 Ethernet port
②	X1.1	
③	X1.2	
④	X2.2	
⑤	X2.1	
⑥	X2	
⑦	PS2	Power supply connection
⑧	EXT2	USB 3.0 port
⑨	EXT1	
⑩	PS1	Power supply connection

6.4.2 Notes on the internal wiring of the rack

Definition

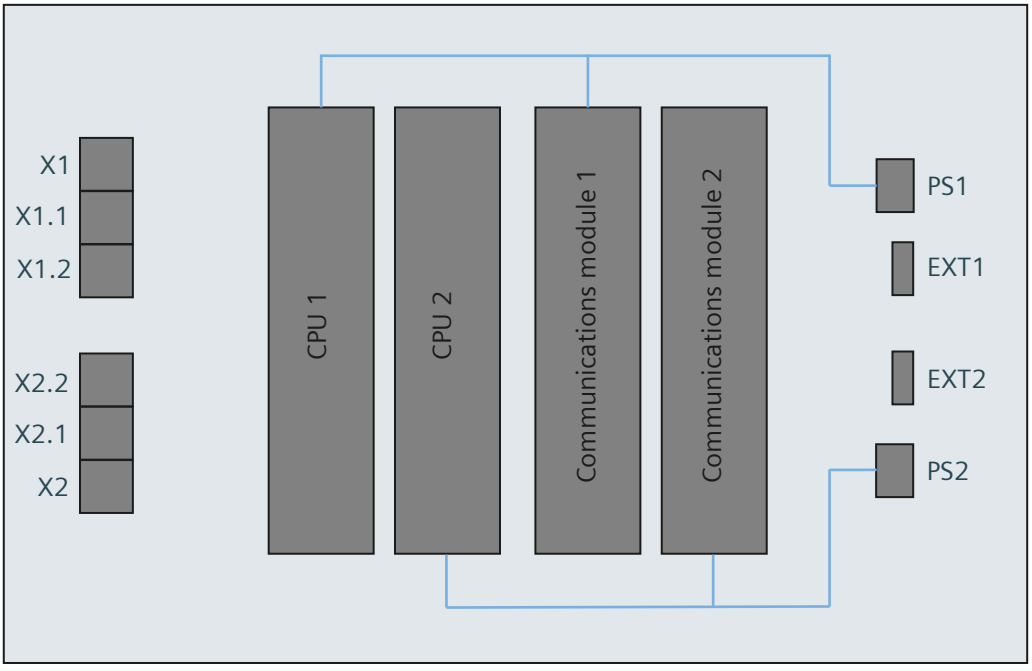
The internal wiring in the rack is shown in the following figures.

X1	RJ45 Ethernet port
X1.1	
X1.2	
X2.2	
X2.1	
X2	
PS1	Power supply connection
PS2	

Ext1	USB 3.0 port
Ext2	

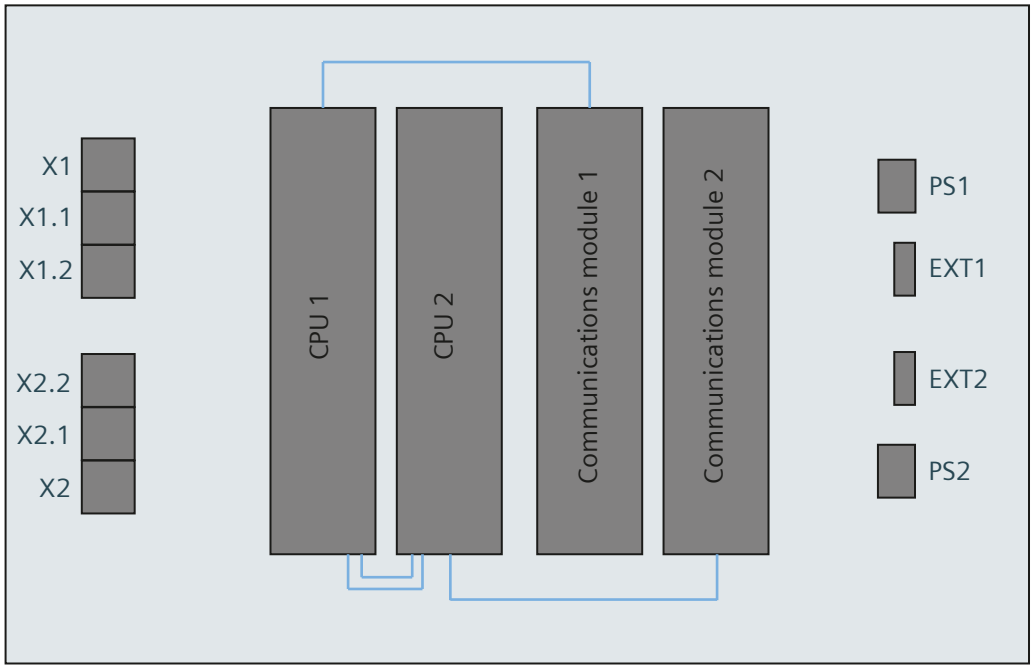
Internal wiring: Power supply

The wiring is shown in the following figure:



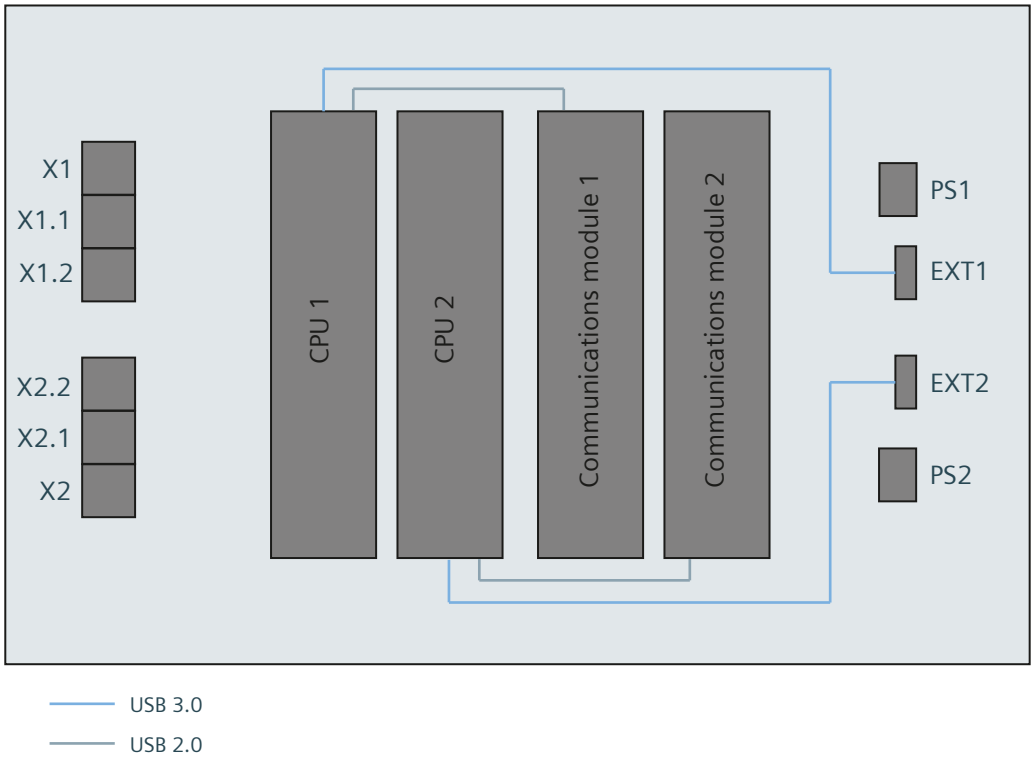
Internal wiring: Bus connections

The wiring is shown in the following figure:



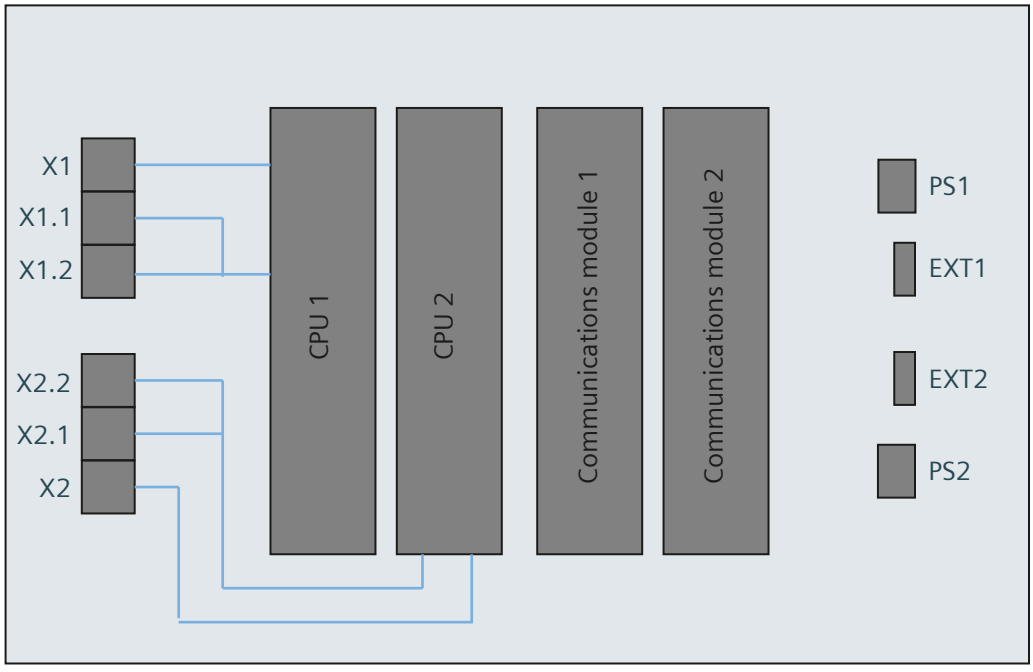
Internal wiring: USB ports

The wiring is shown in the following figure:



Internal wiring: Ethernet ports

The wiring is shown in the following figure:



6.4.3 Supply voltage

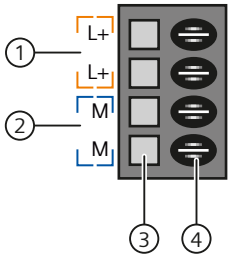
Definition

The supply voltage is used to operate the SIMATIC CN 4100 communication system.

You connect the supply voltage to the rack.

Description

The following figure shows a connection for the supply voltage:



①	Supply voltage L+
②	Ground

③	Spring release
④	Push-in terminal

6.4.4 Connecting the supply voltage to the rack

Requirement

- The supply voltage is switched off.
- The respective conductor is connected.
- Required tools:
  - Cable stripper

Procedure

1. Strip off 8 to 10 mm of the cable.
2. Insert the wire as far as possible into the push-in terminal.

Result

The supply voltage is connected to the rack.

6.4.5 Disconnecting the supply voltage from the rack

Requirement

- The supply voltage is switched off.
- The respective conductor is connected.
- Required tools:
  - Screwdriver size 3 to 3.5 mm

Procedure

1. Push in the spring release of the terminal as far as possible with the screwdriver.
2. Pull out the wire.

Result

The supply voltage is disconnected from the rack.

Commissioning

7

An operating system is already installed in the CPU module in the delivery state of the SIMATIC CN 4100.

After the first power-on, the operating system installs itself. In addition, the operating system prepares the services so that an initial setup can be performed. The entire process takes about 8 minutes. After the setup phase, the SIMATIC CN 4100 can be configured for use in the plant.

Description of the commissioning

Commissioning has to be done for all CPU modules. The following manuals describe the commissioning procedure:

- CNET Operating Manual (https://support.industry.siemens.com/cs/de/de/view/109802239)

Note

Adhere to the sequence

The SIMATIC CN 4100 image may only be installed after all modules have been installed. If you want to use communications modules, you must install them before the image installation.

Phases of commissioning

Commissioning is divided into phases and can be tracked by the status display.

Useful information on the commissioning phases (Page 47)

7.1 Useful information on the commissioning phases

There are LEDs on the CPU module to indicate the status of commissioning.

CPU module (Page 13)

Status LEDs of the CPU module (Page 55)

Each phase of commissioning can be tracked by a certain sequence of status changes of the LEDs.

Setup phase

After the installation and the first power-on of the SIMATIC CN 4100 communication system, SIMATIC CN 4100 goes through the setup phase. The BIOS and operating system (firmware) are set up automatically. At the end of the setup phase, the SIMATIC CN 4100 automatically reboots.

Note

Duration of the initial setup

The entire initial setup takes about 8 min.

When a BIOS update or firmware upgrade is required, the SIMATIC CN 4100 goes through the setup phase again as part of the update.

Application (status of the LEDs):

- Status of the LEDs during BIOS update (Page 48)
- Status of the LEDs during firmware installation (Page 49)

Configuration phase

After a successful setup phase, the SIMATIC CN 4100 communication system is ready for configuration. For this, the SIMATIC CN 4100 can be reached via its MAC address in the network.

A network connection must be established to configure the SIMATIC CN 4100.

Application (status of the LEDs):

- Status of the LEDs during system configuration (Page 50)

7.2 Phases

7.2.1 Status of the LEDs during BIOS update

Note the LED status during the BIOS update.

The following tables show the lighting of the respective LED at the respective time (in seconds).

BIOS update step 1 - LED status for successful installation

LEDs	After 1s	After 2s	After 3s	After 4s	After 5s
RUN	x		x		x
STOP	x		x		x
Master					
Standby					
AH failure		x		x	

LEDs	After 1s	After 2s	After 3s	After 4s	After 5s
RL failure		x		x	
COMM failure		x		x	

BIOS update step 2 - LED status for successful installation

LEDs	After 1s	After 2s	After 3s	After 4s	After 5s
RUN	x		x		x
STOP	x		x		x
Master					
Standby					
AH failure	x		x		x
RL failure		x		x	
COMM failure		x		x	

BIOS update - LED status for error

LEDs	After 1s	After 2s	After 3s	After 4s	After 5s
RUN	x	x	x	x	x
STOP	x	x	x	x	x
Master					
Standby					
AH failure	x	x	x	x	x
RL failure	x	x	x	x	x
COMM failure	x	x	x	x	x

7.2.2 Status of the LEDs during firmware installation

Note the LED status during firmware installation.

The following tables show the lighting of the respective LED at the respective time (in seconds).

LED status for successful installation

LEDs	After 1s	After 2s	After 3s	After 4s	After 5s
RUN	x		x		x
STOP	x		x		x
Master		x		x	
Standby					
AH failure					
RL failure					
COMM failure					

LED status for error

LEDs	After 1s	After 2s	After 3s	After 4s	After 5s
RUN	x	x	x	x	x
STOP	x	x	x	x	x
Master					
Standby					
AH failure	x	x	x	x	x
RL failure	x	x	x	x	x
COMM failure					

7.2.3 Status of the LEDs during system configuration

Note the LED status during configuration.

The following tables show the lighting of the respective LED at the respective time (in seconds).

LED status - CPU waiting for configuration

LEDs	After 1s	After 2s	After 3s	After 4s	After 5s
RUN	x		x		x
STOP	x		x		x
Master		x		x	
Standby		x		x	
AH failure					
RL failure					
COMM failure					

LED status - CPU starting up

Configuration data is loaded into the CPU.

LEDs	After 1s	After 2s	After 3s	After 4s	After 5s
RUN	x		x		x
STOP	x		x		x
Master	x		x		x
Standby		x		x	
AH failure					
RL failure					
COMM failure					

LED status for error

LEDs	After 1s	After 2s	After 3s	After 4s	After 5s
RUN	x	x	x	x	x
STOP	x	x	x	x	x
Master					
Standby	x	x	x	x	x
AH failure	x	x	x	x	x
RL failure					
COMM failure					

Operation

8

8.1 Operating the CPU module

8.1.1 Notes on the reset button

Definition

The reset button of the CPU module has the following functions:

- Switching on:
  Switching on the CPU module (Page 54)
- Restart:
  Restarting the CPU module (Page 54)
- Switching off:
  Switching off the CPU module (Page 55)
- Reset:
  Resetting the CPU module (Page 55)

Note

Note the supply voltage

The reset button does not disconnect the device from the supply voltage.

Note

Switching off is remembered

The CPU module remembers the last state of the reset button. When the CPU is switched off using the Reset button, the CPU stores this state.

Design

The reset button is located above the status LEDs on the front of the CPU module.

8.1.2 Using the reset button

8.1.2.1 Switching on the CPU module

Requirement

- You have adhered to the basics for mounting.
- The supply voltage is connected to the rack.
- For power-on again: The CPU has been switched off before via the reset button.

Procedure for commissioning after connection

Switch on the supply voltage.

Procedure for power-on again

Press the reset button.

Result

The CPU module is switched on and the system starts.

8.1.2.2 Restarting the CPU module

Requirement

- The supply voltage is connected to the rack.
- The CPU module has been started.

Procedure

Press the reset button.

Result

The system restarts after 10 seconds.

8.1.2.3 Switching off the CPU module

Requirement

- The supply voltage is connected to the rack.
- The CPU module has been started.

Procedure

Press and hold the reset button for 6 seconds.

Result

The system shuts down together with the CPU module.

8.1.2.4 Resetting the CPU module

Requirement

- The supply voltage is connected to the rack.
- The CPU module has been started.
- You are familiar with the status of the LEDs during operation.
  Status of the LEDs when using the Reset button (Page 57)

Procedure

1. Press the reset button.
2. Press the Reset button a second time within 10 seconds.

Result

The CPU is reset to the factory state.

8.1.3 Status LEDs of the CPU module

Definition

The status LEDs of the CPU module provide information about the operating mode of the CPU or indicate errors.

Status of the LEDs when using the Reset button (Page 57)

Meaning for redundant CPU modules

The following table shows the status LEDs and their meaning.

RTC = Runtime Container

LED	Master module		Standby module	
	Continuous light	**Flashes**	**Continuous light**	**Flashes**
Power supply	Power supply OK		Power supply OK	
RUN	RTC running		RTC running	
STOP	RTC stopped		RTC stopped	
Master	RTC is master Cycle / Engineering running		LED is off	
Standby	RTC has detected standby	Synchronization standby	RTC in standby mode	Synchronization standby
AH failure	Plant network disconnected		Plant network disconnected	
RL failure	Failure of redundancy connection (both)	Failure of redundancy connection (single)	Failure of redundancy connection (both)	Failure of redundancy connection (single)
COMM error	Error com plugin to field devices; Grouped with multiple com plugins		Error com plugin to field devices; Grouped with multiple com plugins	

Meaning for non-redundant CPU modules

The following table shows the status LEDs and their meaning.

RTC = Runtime Container

LED	Continuous light
Power supply	Power supply OK
RUN	RTC running
STOP	RTC stopped
Master	RTC is master Cycle / Engineering running
Standby	LED is off
AH failure	Plant network disconnected
RL failure	LED is off
COMM error	Error com plugin to field devices; Grouped with multiple com plugins

8.1.4 Phases

8.1.4.1 Status of the LEDs when using the Reset button

Note the LED status when using the Reset button.

The following tables show an illumination of the respective LED in sequence. The information is according to time in seconds.

LED status - after the first actuation

LEDs	1	2	3	4	5	6	7	8	9
RUN	x	x	x	x	x	x	x	x	x
STOP	x	x	x	x	x	x	x	x	x
Master	x								x
Standby		x						x	
AH failure			x				x		
RL failure				x		x			
COMM failure					x				

LED status - after the second actuation

LEDs	1	2	3	4	5	6	7
RUN	x		x		x		x
STOP	x		x		x		x
Master	x	x		x		x	x
Standby		x		x		x	x
AH failure		x		x		x	x
RL failure		x		x		x	x
COMM failure		x		x		x	x

8.2 Analyzing the communications modules

8.2.1 Power LED of the communication modules

Definition

An communications module has a power LED to indicate the status of its power supply.

Description

The following table shows the possible states of the LED and their meaning.

LED status	Meaning
Off	Power supply error
Continuous light	Power supply OK

8.3 LEDs of the RJ45 port

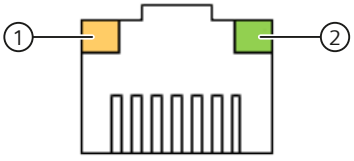
Definition

Each RJ45 port has two LEDs to indicate the status of its Ethernet connection.

RJ45 Ethernet ports are available on the following devices:

- Rack

Description



①	LED is off: 10 Mbps
	Green steady light: 100 Mbps
	Orange steady light: 1000 Mbps
②	Continuous light: Active connection (e.g. to a hub).
	Flashes: Activity

Maintenance and servicing

9

9.1 Notes on maintenance

When a SIMATIC CN 4100 communication system is configured redundantly, its modules may be replaced online.

Applications

- Replacing the module (Page 59)

9.2 Maintenance

9.2.1 Replacing the module

Requirement

- The rack is mounted.
- The protective grounding is mounted.
- Required tools:
  - TX20 screwdriver for tightening the fixing screws

Procedure

1. Switch off the power supply of the communications module.
   Switching off the CPU module (Page 55)
2. Loosen the fixing screws.
3. Remove the module to be replaced.
4. Install the new module.
   Plugging in the module (Page 35)
5. For a CPU module:
   - Commission the new CPU module.
     Switching on the CPU module (Page 54)

   For an communications module:
   - Switch on the power supply of the communications module.

Result

The module has been replaced.

Technical specifications

10

10.1 Standards and approvals

10.1.1 Currently valid markings and approvals

Introduction

This section contains the technical specifications of the system:

- The standards and test values that the SIMATIC CN 4100 communication system complies with and fulfills.
- The test criteria according to which the SIMATIC CN 4100 communication system was tested.

Validity of the information on the components

NOTICE
Markings and approvals In the documentation, you can find the markings and approvals which are generally possible or planned in the system. However, only the marking or approval printed on the SIMATIC CN 4100 system component is valid!

The SIMATIC CN 4100 system is certified as follows:

- CE (IEC 61131-2, IEC 60664-1, IEC 60695-11-10, EU Directive 2014/30/EU) for Europe
- UL 61010-2-201 for USA and Canada

The SIMATIC CN 4100 system is tested according to IACS E10 (test specification for type approval).

The SIMATIC CN 4100 system complies with RoHS (EN50581).

Reference

The certificates for the markings and approvals can be found on the Internet under Service&Support (https://support.industry.siemens.com/cs/).

10.1.2 CE marking

Introduction

The SIMATIC CN 4100 communication system meets the requirements and protection objectives of the following EC Directives and conforms to the harmonized European standards (EN) published for Programmable Logic Controllers in the Official Journals of the European Community:

- Low-voltage directive
- EMC Directive

You can find the EC Declarations of Conformity for download on the Internet (keyword "Declaration of Conformity").

Low-voltage directive

2014/35/EU "Electrical equipment designed for use within certain voltage limits" (Low Voltage Directive)
According to the requirements of EN 61010-2-201, the components of the SIMATIC CN 4100 communication system that fall under the Low Voltage Directive have been tested.

EMC Directive

2014/30/EU "Electromagnetic Compatibility" (EMC Directive)

Use in industrial environments

The SIMATIC CN 4100 communication system is designed for industrial use.

Area of application	Interference emission according to	Noise immunity according to
Industry	EN 61000-6-4	EN 61000-6-2

Use in power plants

The SIMATIC CN 4100 communication system meets the EMC specifications according to EN 61000-6-5.

General industry standards

The SIMATIC CN 4100 communication system is designed to meet or exceed most general industry standards. These are in particular:

- Power input on shielded and unshielded signal lines:
  IEC 61000-4-6 (Ed. 4.0 2013-10 + corr. 1:2015); EN 61000-4-6 (2014-02); DIN EN 61000-4-6 (2014-08)
- Immunity testing, high frequency electromagnetic field:
  IEC 61000-4-3 (2008-04+A2:2010-03); EN 61000-4-3 (2006-05+A1:2008-02+A2:2010-07); DIN EN 61000-4-3 (2011-04).
- Measurement of conducted emissions on telecommunication lines: 150 kHz - 30 MHz:
  EN 55016-2-1:2009-03+A1:2011-04+A2:2013-05 (CISPR 16-2-1).
- Burst – Immunity of shielded signal lines:
  IEC 61000-4-4 (2012-04); EN 61000-4-4 (2012-11); DIN EN 61000-4-4 (2013-04).
- ESD - Electrostatic discharge:
  IEC 61000-4-2 (2008-12 ed. 2); EN 61000-4-2 (2009-03); DIN EN 61000-4-2 (2009-12)
- Interference emission measurement:
  30 MHz - 1 GHz according to EN 55016-2-3:2010 (CISPR 16-2-3)
  1-6 GHz according to EN 55016-2-3:2010 (CISPR 16-2-3)

10.1.3 UKCA marking

UK CA

Importer UK:

Siemens plc

Manchester M20 2UR

10.1.4 cULus approval

Introduction

The cULus approval applies to:

- Rack
- CPU modules

Definition

c UL us

Underwriters Laboratories Inc. meet the following standards:

- UL 508 (Industrial Control Equipment)
- CSA C22.2 No. 142 (Process Control Equipment)

10.2 Technical specifications of components

10.2.1 Technical specifications - CPU module

Technical specifications TED

Article number	6DL4178-0BH01-0XX0
General information	
Product type designation	CPU modules 1 slot
HW functional status	FS02
Firmware version	V1.0
Engineering with	
• PCS 7 configurable/integrated from version	V9.0 SP3
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption, max.	400 mA; without USB power supply
Power loss	
Power loss, typ.	10 W
Memory	
Type of memory	Flash
Work memory	
• integrated	2 Gbyte; ECC
• expandable	No
Backup	
• present	Yes; Entire project maintenance-free in the integral EEPROM
FB	
• Number, max.	16 000
Hardware configuration	
Slots	
• required slots	1
Interfaces	
Number of industrial Ethernet interfaces	3
Protocols	
Supports protocol for PROFINET IO	No
EtherNet/IP	No
Modbus TCP	Yes
S7 protocol	Yes
OPC UA	Yes
OPC UA	

Article number	**6DL4178-0BH01-0XX0**
• Runtime license required	No
• OPC UA Client	Yes
– Security policies	Yes
– User authentication	Yes; "anonymous" or by user name & password
– Number of connections, max.	5
– Number of nodes of the client interfaces, max.	2 500
• OPC UA Server	No
Standards, approvals, certificates	
CE mark	Yes
UKCA mark	Yes
cULus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	45 °C
Dimensions	
Width	45 mm
Height	185 mm
Depth	112 mm
Weights	
Weight, approx.	0.44 kg

Approvals

EMC	
Emission of radio frequency interference according to IEC61000-6-4, EN 55016	Limit class A, for use in industrial environments
Received interference signals	According to IEC 61000-6-5

Degree of protection and protection class	
Degree of protection according to DIN EN 60529	IP20

Ambient conditions, tested according to IEC 61131-2	
Ambient temperature during operation, tested according to IEC 60068-2	
• Min.	• -30 °C
• Max.	• 60 °C with horizontal mounting; 45 °C with vertical mounting

Ambient conditions, tested according to IEC 61131-2	
Ambient temperature for storage/transport, tested according to IEC 60068-2	
• Min. • Max.	• -40 °C • 85 °C
Humidity without condensation during operation	
• Min. • Max.	• 5% • 95%
Air pressure during operation	
• Min. • Max.	• 795 hPa (corresponds to an elevation of 2000 m) • 1080 hPa (corresponds to an elevation of -1000 m)
Vibration	
• Operation • Transport	• Tested according to IEC 60068-2-6 • Tested according to IEC 60068-2-6
Shock test	Tested according to IEC 60068-2-27 and IEC 60068-2-31
Pollution degree according to ISA 71.04	G1; Operation in high ammonia and ozone environments is not included. For operation in 3C2 environments, measures must be taken to protect I/O system components from salt spray (e.g. building structure, air conditioning).

10.2.2 Technical specifications - rack

Technical specifications TED

Article number	6DL4170-1RB01-2XX0
General information	
Product type designation	rack
Hardware configuration	
Slots	
• Number of slots	
– of which for CPU, max.	2
Interfaces	
Number of industrial Ethernet interfaces	6
Number of USB interfaces	2
Protocols	
Supports protocol for PROFINET IO	No
EtherNet/IP	No
Modbus TCP	No
S7 protocol	No
OPC UA	No
Standards, approvals, certificates	
CE mark	Yes
UKCA mark	Yes
cULus	Yes
Use in hazardous areas	
• EAC Ex	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	45 °C

Connections

Interfaces	
USB ports	
• USB 2.0	• 1 port
• USB 3.0	• 1 port
Industrial Ethernet interfaces	
• 10/100/1000 Mbps	• 1 port
• 10/100/1000 Mbps switched	• 2 ports

10.2.3 Technical specifications - RS-232 serial module

Technical specifications TED

Article number	6DL4172-4AX41-0XX0
General information	
Product type designation	serial RS485 expansion module
Engineering with	
• PCS 7 configurable/integrated from version	V9.0 SP3
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption, max.	350 mA
Power loss	
Power loss, typ.	9 W
Hardware configuration	
Slots	
• required slots	1
Interfaces	
Number of RS 485 interfaces	4
Standards, approvals, certificates	
CE mark	Yes
UKCA mark	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	45 °C
Dimensions	
Width	45 mm
Height	185 mm
Depth	112 mm
Weights	
Weight, approx.	0.44 kg

10.2.4 Technical specifications - RS-485 serial module

Technical specifications TED

Article number	6DL4172-4AX51-0XX0
General information	
Product type designation	serial RS485 expansion module
Engineering with	
• PCS 7 configurable/integrated from version	V9.0 SP3
• PCS neo can be configured/integrated from version	V4.0
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption, max.	350 mA
Power loss	
Power loss, typ.	9 W
Hardware configuration	
Slots	
• required slots	1
Interfaces	
Number of RS 485 interfaces	4
Standards, approvals, certificates	
CE mark	Yes
UKCA mark	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	45 °C
Dimensions	
Width	45 mm
Height	185 mm
Depth	112 mm
Weights	
Weight, approx.	0.44 kg

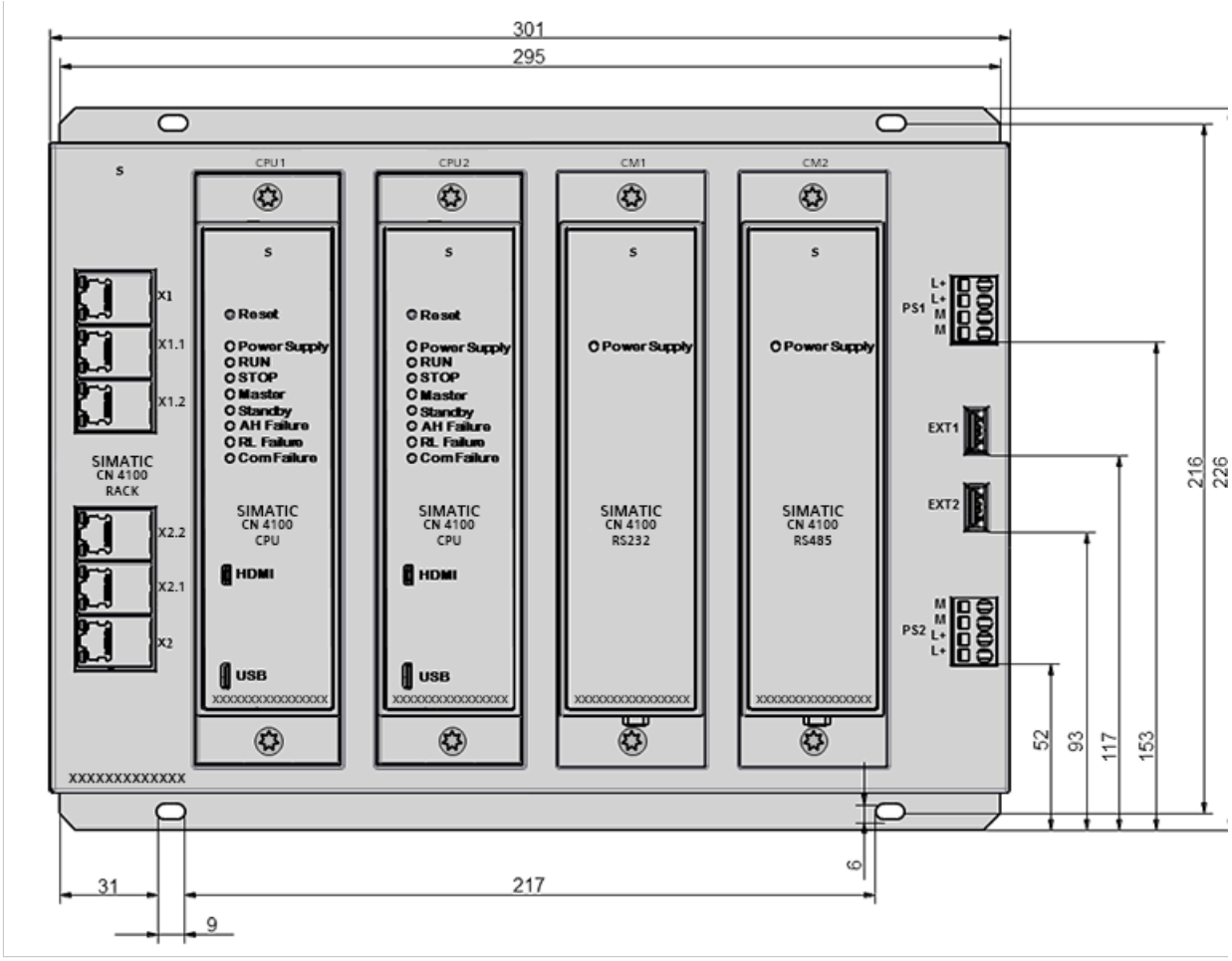
Dimension drawing

A

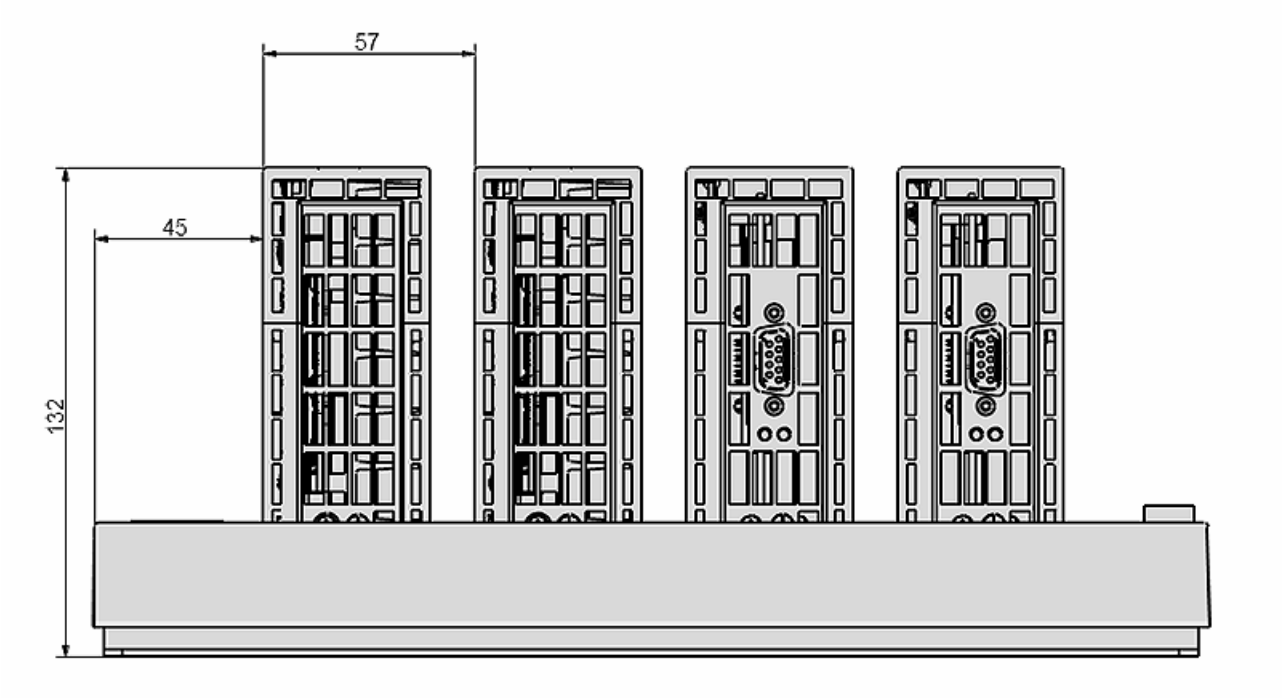
A.1 Dimensions of the rack

The following figures show the dimensions of the rack with four plugged-in modules (two CPU modules and two different communications modules).

Rack from the front



Rack from below



Data connections

B

B.1 Connections of the rack

B.1.1 USB 3.0 ports of the rack

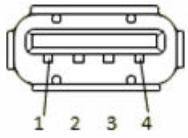
Definition

The USB 3.0 port is required for the setup and maintenance of the communication system.

Description

The rack is equipped with two USB 3.0 ports.

Design



Pin	Description
1	USB_P5V_fused (O)
2	USB_D0M (I/O)
3	USB_D0P (I/O)
4	USB_GND

B.1.2 Ethernet ports of the rack

Definition

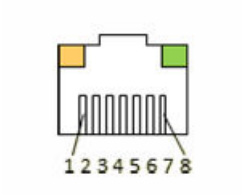
The RJ45 connection (Ethernet port) is required for the wired communication connection via Ethernet.

Description

The rack is equipped with the following Ethernet ports (10/100/1000 Mbps) for communication via fieldbus protocol or standard Ethernet:

- Two Ethernet ports for the plant network
- Four Ethernet ports for third-party systems

Design



Pin	Description
1	BI_DA+
2	BI_DA-
3	BI_DB+
4	BI_DC+
5	BI_DC-
6	BI_DB-
7	BI_DD+
8	BI_DD

B.2 Connections of the CPU module

B.2.1 Micro-HDMI port of the CPU module

Definition

The Micro-HDMI port can be used to connect a monitor.

Description

The CPU module is equipped with a Micro-HDMI port.

Design

Pin	Description
1	TMDS Data2+
2	TMDS Data2 shield
3	TMDS Data2–
4	TMDS Data1+
5	TMDS Data1 shield
6	TMDS Data1–
7	TMDS Data0+
8	TMDS Data0 shield
9	TMDS Data0–
10	TMDS Clock+
11	TMDS Clock shield
12	TMDS Clock–
13	CEC
14	Reserved (HDMI 1.0-1.3c), Utility/HEC/ARC (Optional, HDMI 1.4+ with HDMI Ethernet channel and audio return channel)
15	SCL (Line I^2C "Serial Clock" for DDC)
16	SDA (Line I^2C "Serial Data" for DDC)
17	DDC/CEC/ARC/HEC ground
18	+5 V (min. 0.055 A)
19	Hot Plug Detect (all versions) and HEC/ARC (optional, HDMI 1.4+ with HDMI Ethernet channel and audio return channel)

B.2.2 Micro-HDMI port of the CPU module

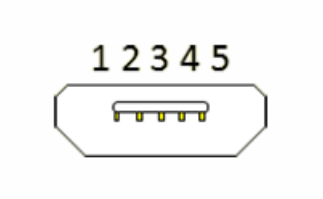
Definition

The Micro-USB port is required for the setup and maintenance of the CPU module.

Description

The CPU module is equipped with a USB port (type B).

Design



Pin	Description
1	USB_P5V_fused (O)
2	USB_D0M (I/O)
3	USB_D0P (I/O)
4	Not connected
5	USB_GND

B.3 Connections of the communication modules

B.3.1 RS-232 port of the RS-232 module

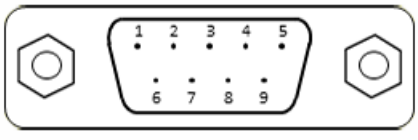
Definition

The RS-232 port is required as a serial interface for communication with external systems.

Description

The RS-232 communication module is equipped with four RS-232 ports.

Design



Pin	Description
1	DCD
2	RxD
3	TxD
4	DTR
5	GND

Pin	Description
6	DSR
7	RTS
8	CTS
9	RI

B.3.2 RS-485 port of the RS-485 module

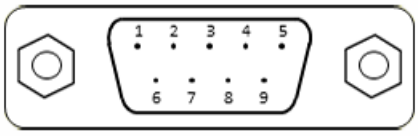
Definition

The RS-485 port is required as a serial interface for communication with external systems.

Description

The RS-485 communication module is equipped with four RS-485 ports.

Design



Pin	Description
1	Data-
2	Data+
3	-
4	-
5	GND
6	-
7	-
8	-
9	+

Service & Support

C

C.1 Service & Support

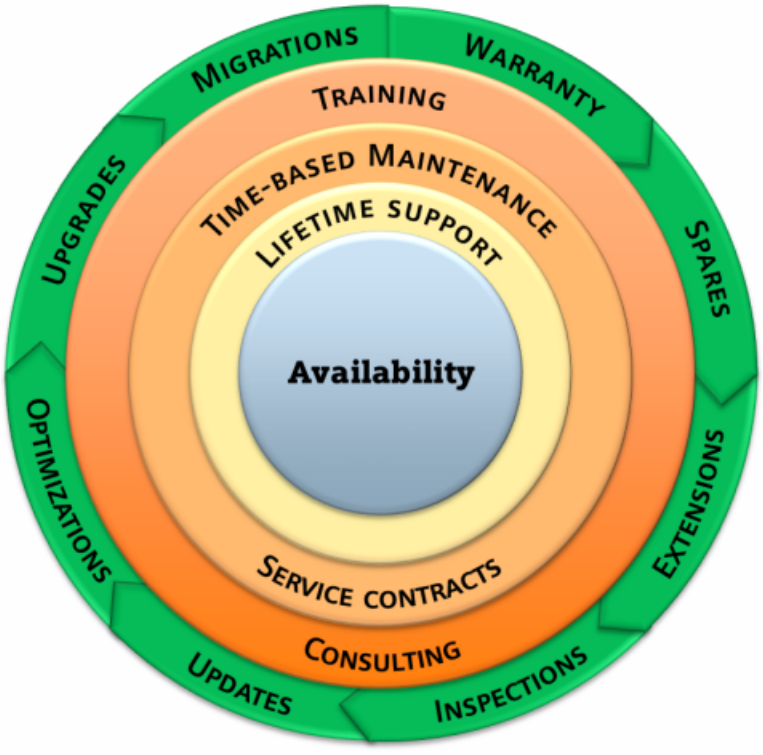
Attach / detach components

The components are maintenance-free.

Repairs to the components of the communication system itself may only be carried out by the manufacturer.

Warranty

The warranty is subject to compliance with the safety and commissioning instructions.



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Whether machine manufacturer, solution provider or plant operator: The range of services offered by Siemens Digital Industries includes comprehensive services for a wide variety of users in all sectors of the manufacturing and process industry.

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Support for planning and conception of your project: From a detailed analysis of the current situation and definition of objectives, to advice on product and system issues, to the elaboration of the automation solution.

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Extend your lead – through practical know-how directly from the manufacturer.

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Support for planning and development with needs-based services from configuration to implementation of an automation project.

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With Field Service, we offer services covering all aspects of commissioning and maintenance – so that the availability of your machines and systems is guaranteed in every situation.

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Plants and systems in all industries worldwide must operate with more and more availability. We support you in preventing downtime from the outset: With a worldwide network and optimal logistics chains.

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Downtimes mean trouble in operation and unnecessary costs. We help you keep both to a minimum – and offer you repair options worldwide.

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There is often great potential for increasing productivity or saving costs over the operating life of machines or plants.

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Examples of service programs:

- Service contracts
- Plant IT security services
- Life cycle services for drive technology
- SIMATIC remote support services

Advantages at a glance:

- Minimized downtime for more productivity
- Optimum maintenance costs thanks to customized scopes of service
- Calculable and therefore predictable costs

- Service reliability through guaranteed response and delivery time for spare parts
- Supplementation and relief of in-house service personnel
- Complete service from a single source, fewer interfaces and more know-how

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C.2 Information and Support

- You can find information about the technical support available in the appendix of this documentation.
- The technical documentation for the individual SIMATIC products and systems is available on the Internet (https://www.siemens.com/simatic-tech-doku-portal).
- You can find the online catalog and online ordering system on the Internet (https://mall.industry.siemens.com).
- Contact (https://support.industry.siemens.com/aspa_app/)