

SIEMENS

SIMATIC NET

Network components SCALANCE TAP


Operating Instructions


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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.

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Introduction

Purpose of the Operating Instructions

These operating instructions support you when installing and connecting up devices of the SCALANCE TAP product group.

Validity of the Operating Instructions

These operating instructions apply to the following devices:

- SCALANCE TAP104

Unless mentioned otherwise, the descriptions in these operating instructions refer to all devices of the SCALANCE TAP product group named above in the section on validity.

Designations used

Classification	Description	Terms used
Product line	The product line includes all devices and variants of all product groups. If information applies to all product groups within the product line, the term SCALANCE TAP is used.	SCALANCE TAP
Device	If information relates to a specific device, the device name is used.	e.g. SCALANCE TAP104

Further documentation

In the system manuals "Industrial Ethernet / PROFINET Industrial Ethernet" and "Industrial Ethernet / PROFINET passive network components", you will find information on other SIMATIC NET products that you can operate along with the devices of this product line in an Industrial Ethernet network.

There, you will find among other things optical performance data of the communications partner that you require for the installation.

You will find the system manuals here:

- On the data medium that ships with some products:
 - Product CD / product DVD
 - SIMATIC NET Manual Collection
- On the Internet pages of Siemens Industry Online Support:
 - Industrial Ethernet / PROFINET Industrial Ethernet System Manual (<https://support.industry.siemens.com/cs/ww/en/view/27069465>)
 - Industrial Ethernet / PROFINET Passive Network Components System Manual (<https://support.industry.siemens.com/cs/ww/en/view/84922825>)

SIMATIC NET manuals

You will find the SIMATIC NET manuals here:

- On the data medium that ships with some products:
 - Product CD / product DVD
 - SIMATIC NET Manual Collection
- On the Internet pages of Siemens Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/ps/15247>).

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 here:

- SIMATIC NET Manual Collection or product DVD
The DVD ships with certain SIMATIC NET products.
- On the Internet under the following address:
50305045 (<https://support.industry.siemens.com/cs/ww/en/view/50305045>)

Security information

1.1 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 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> (<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/cert> (<https://www.siemens.com/cert>).

Catalogs

You will find the article numbers for the Siemens products of relevance here in the following catalogs:

- SIMATIC NET Industrial Communication / Industrial Identification, catalog IK PI
- SIMATIC Products for Totally Integrated Automation and Micro Automation, catalog ST 70
- Industry Mall - catalog and ordering system for automation and drive technology, Online catalog (<https://mall.industry.siemens.com/goos/WelcomePage.aspx?regionUrl=/de&language=en>)

You can request the catalogs and additional information from your Siemens representative.

Device defective

If a fault develops, send the device to your SIEMENS representative for repair. Repairs on-site are not possible.

Recycling and disposal



The products are low in pollutants, can be recycled and meet the requirements of the WEEE directive 2012/19/EU for the disposal of electrical and electronic equipment.

Do not dispose of the products at public disposal sites.

For environmentally friendly recycling and the disposal of your old device contact a certified disposal company for electronic scrap or your Siemens contact (Product return (<https://support.industry.siemens.com/cs/ww/en/view/109479891>)).

Note the different national regulations.

Trademarks

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


SCALANCE, C-PLUG, OLM

Safety notices

Read the safety notices


Note the following safety notices. These relate to the entire working life of the device.

You should also read the safety notices relating to handling in the individual sections, particularly in the sections "Installation" and "Connecting up".

 CAUTION
To prevent injury and damage, read the manual before using the device.

Safety notices on use in hazardous areas

General safety notices relating to protection against explosion

 WARNING
EXPLOSION HAZARD
Do not open the device when the supply voltage is turned on.

Safety notices when using the device according to Hazardous Locations (HazLoc)

If you use the device under HazLoc conditions you must also keep to the following safety notices in addition to the general safety notices for protection against explosion:

This equipment is suitable only for use in Class I, Division 2, Groups A, B, C and D, Class I, Zone 2, Group IIC or non-hazardous locations.

This equipment is suitable for use in Class I, Zone 2, Group IIC or non-hazardous locations only.

Description of the device

3.1 Properties and functions

Purpose

With the SCALANCE TAP104 you can divert frames for diagnostics without a reaction in Ethernet based networks.

Basic function

The SCALANCE TAP104 is a fully passive component in the network. When de-energized it forwards all frames of a network connection transparently, even defective frames. The SCALANCE TAP104 itself does not feed any data into the network.

To be able to monitor the frames of a network connection with a diagnostics device, the SCALANCE TAP must be connected to a suitable power supply. The SCALANCE TAP then mirrors a send direction to one of the diagnostics ports TAP1.1 and TAP1.2.

Diagnostics ports

All frames sent via pins 1 and 2 of the two network ports are mirrored to the diagnostics port TAP1.1.

All frames sent via pins 3 and 6 of the two network ports are mirrored to the diagnostics port TAP1.2.

The send directions are not permanently assigned to pins 1-2 and 3-6, but depend on the following factors.

- Device type
 - End device (Data Terminal Equipment)
 - Connection device (Data Communication Equipment)
- Cabling
 - Straight through cable (straight through)
 - Crossover cable (cross over)
- "MDI/MDI-X Autocrossover" function

With the "MDI/MDI-X autocrossover" function, the send and receive contacts of an Ethernet port are assigned automatically. This means that it does not matter whether the port is connected using a crossover or straight through cable.

 - Cannot be configured, i.e. always active
 - Configurable

Setup guide

To determine the maximum cable lengths between a SCALANCE TAP, the connected network components and the diagnostics device, note the following information:

- ① + ② ≤ 100 m
- ① + ② + ③ ≤ 110 m

Example of a configuration

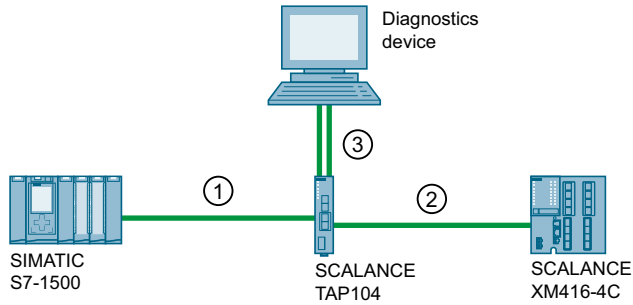



Figure 3-1 Example of a topology with a SCALANCE TAP

3.2 Product overview

Article numbers

Device	Description	Article number
SCALANCE TAP104	2 x 10/100 Mbps RJ-45 ports with securing collars, 2 x 10/100 Mbps RJ-45 ports without securing collars, unmanaged TAP (Test Access Port)	6GK5104-0BA00-1SA2

Unpacking and checking

<p> WARNING</p> <p>Do not use any parts that show evidence of damage</p> <p>If you use damaged parts, there is no guarantee that the device will function according to the specification.</p> <p>If you use damaged parts, this can lead to the following problems:</p> <ul style="list-style-type: none"> • Injury to persons • Loss of the approvals • Violation of the EMC regulations • Damage to the device and other components <p>Use only undamaged parts.</p>

1. Make sure that the package is complete.
2. Check all the parts for transport damage.

Components of the product

The following components are supplied with a SCALANCE TAP:

- SCALANCE TAP
- 3-pin terminal block for the power supply
- Instruction sheet with information on the product

Accessories

The following accessories are available for SCALANCE TAP:

Type	Properties	Article number
Desktop pedestal	Desktop pedestal for desktop installation	6GK5898-8MD00
19" mounting frame	19" mounting frame for installation in the 19" rack 1 height unit	6GK5898-8MR00
IE FC RJ-45 Plug 180	RJ-45 data plug-in connector (10/100 Mbps), for connecting to IE FC TP cables 2x2, with robust metal housing and FastConnect connector technology, 180° cable outlet.	6GK1901-1BB10-2AA0
IE FC RJ-45 plug 145	RJ-45 data plug-in connector (10/100 Mbps), for connecting to IE FC TP cables 2x2, with robust metal housing and FastConnect connector technology, 145° cable outlet.	6GK1901-1BB30-0AA0
IE FC TP standard cable GP 2x2 (type A)	Shielded TP installation cable for connection to FC Outlet RJ-45, for universal use, 4-wire, shielded, rigid wires for fast assembly	6XV1840-2AH10
IE FC TP trailing cable 2x2 (type C)	Shielded TP installation cable for connection to FC Outlet RJ-45, for use with drag chains, 4-wire, flexible wires for fast assembly	6XV1840-3AH10

3.3 Device view of a SCALANCE TAP

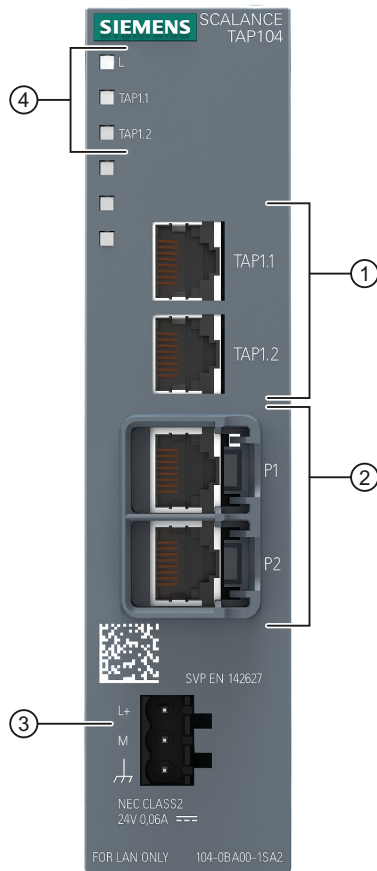
Spare parts

The following spare parts are available for SCALANCE TAP:

Component	Description	Article number
Spring-loaded terminal block, 3 terminals	3-terminal spring-loaded terminal block to connect the power supply (24 VDC), for SCALANCE X/W/S/M, pack of 5	6GK5 980-1CB10-0BA5

3.3 Device view of a SCALANCE TAP

The following figure shows an overview of the components of the SCALANCE TAP104.



- ① Electrical diagnostics ports without securing collars for connection of a diagnostics device
- ② Electrical network ports with securing collars for connection of network components
- ③ Power supply incl. grounding
- ④ LED display

The lower three LEDs have no function.

3.4 LED display

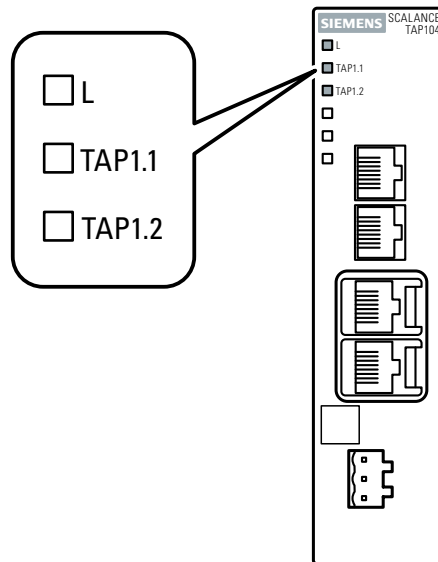


Figure 3-2 LED display on the front of the SCALANCE TAP104

Port LEDs "TAP"

The port LEDs "TAP1.x" show the status of data reception at the diagnostics ports. There is an LED for each diagnostics port.

LED color	LED status	Meaning
-	Off	Not receiving data at the diagnostics port
Green	Lit	Receiving data at the diagnostics port

Power LED "L"

The power LED "L" shows the status of the power supply.

LED color	LED status	Meaning
-	Off	The device de-energized or the power supply is lower than 18 V.
Green	Lit	The power supply is on, the device is ready for operation.

3.4 LED display

Installation and disassembly

4.1 Safety notices for installation

Safety notices

When installing the device, keep to the safety notices listed below.

 **WARNING**

If a device is operated in an ambient temperature of more than 60 to 70 °C, the temperature of the device housing may be higher than 70 °C. The device must therefore be installed so that it is only accessible to service personnel or users that are aware of the reason for restricted access and the required safety measures at an ambient temperature higher than 60 °C.

 **WARNING**

If the device is installed in a cabinet, the inner temperature of the cabinet corresponds to the ambient temperature of the device.

 **WARNING**

If the cable or conduit entry point exceeds 70 °C or the branching point of conductors exceeds 80 °C, special precautions must be taken. If the equipment is operated in an air ambient in excess of 60 °C, only use cables with admitted maximum operating temperature of at least 80 °C.

NOTICE

Improper mounting

Improper mounting may damage the device or impair its operation.

- Before mounting the device, always ensure that there is no visible damage to the device.
- Mount the device using suitable tools. Observe the information in the respective section about mounting.

 **WARNING**

Substitution of components may impair suitability of the equipment.

Safety notices on use in hazardous areas

General safety notices relating to protection against explosion

 **WARNING**

EXPLOSION HAZARD

Replacing components may impair suitability for Class 1, Division 2 or Zone 2.

 **WARNING**

The device is intended for indoor use only.

 **WARNING**

The device may only be operated in an environment of contamination class 1 or 2 (see EN/IEC 60664-1, GB/T 16935.1).

 **WARNING**

When used in hazardous environments corresponding to Class I, Division 2 or Class I, Zone 2, the device must be installed in a cabinet or a suitable enclosure.

Notes for use in hazardous locations according to ATEX, IECEx, UKEX and CCC Ex

If you use the device under ATEX, IECEx, UKEX or CCC Ex conditions you must also keep to the following safety instructions in addition to the general safety instructions for protection against explosion:

 **WARNING**

To comply with EU Directive 2014/34 EU (ATEX 114), UK-Regulation SI 2016/1107 or the conditions of IECEx or CCC-Ex, the housing or cabinet must meet the requirements of at least IP54 (according to EN/IEC 60529, GB/T 4208) in compliance with EN IEC/IEC 60079-7, GB 3836.8.

 **WARNING**

If the temperature of the cable or housing socket exceeds 60 °C or the temperature at the branching point of the cables exceeds 80 °C, special precautions must be taken. If the equipment is operated in an air ambient in excess of 60 °C, only use cables with admitted maximum operating temperature of at least 80 °C.

Safety notices when using according to FM

If you use the device under FM conditions you must also keep to the following safety notices in addition to the general safety notices for protection against explosion:

 **WARNING**

Wall mounting outside of the control cabinet or housing does not fulfill the requirements of the FM approval.

 **WARNING**

Wall mounting is only permitted if the requirements for the housing, the installation regulations, the clearance and separating regulations for the control cabinets or housings are adhered to. The control cabinet cover or housing must be secured so that it can only be opened with a tool. An appropriate strain-relief assembly for the cable must be used.

 **WARNING**

Substitution of components may impair suitability for Division 2.

 **WARNING**

Do not remove or replace while circuit is live when a flammable or combustible atmosphere is present.

 **WARNING**

Explosion hazard

Do not disconnect equipment when a flammable or combustible atmosphere is present.

 **WARNING**

EXPLOSION HAZARD

The equipment is intended to be installed within an enclosure/control cabinet. The inner service temperature of the enclosure/control cabinet corresponds to the ambient temperature of the module. Use installation wiring connections with admitted maximum operating temperature of at least 10 °C higher than maximum ambient temperature.

Note

You must not install the device on a wall in hazardous areas.

Further notes

NOTICE
Warming and premature aging of the network component due to direct sunlight
Direct sunlight can heat up the device and can lead to premature aging of the network component and its cabling.
Provide suitable shade to protect the network component against direct sunlight.

4.2 Types of installation

Types of installation

For the device, you have the following options:

- Wall mounting (no ceiling mounting)
- Installation on a DIN rail
- Installing on the S7-300 standard rail
- Installing on the S7-1500 standard rail
- Installation in a 19" mounting frame
- Installation on a desktop pedestal

Strain relief for the cables

Regardless of the type of installation, make sure that there is suitable strain relief for the connecting cable.

Shielding of cables

If cables are installed permanently, it is advisable to remove the insulation of the shielded cable and to establish contact on the shield/PE conductor bar.

Installation clearance

Keep to the minimum clearances to other components or to walls of a housing so that the convection ventilation of the device is not blocked.

- Below at least 10 cm
- Above at least 10 cm

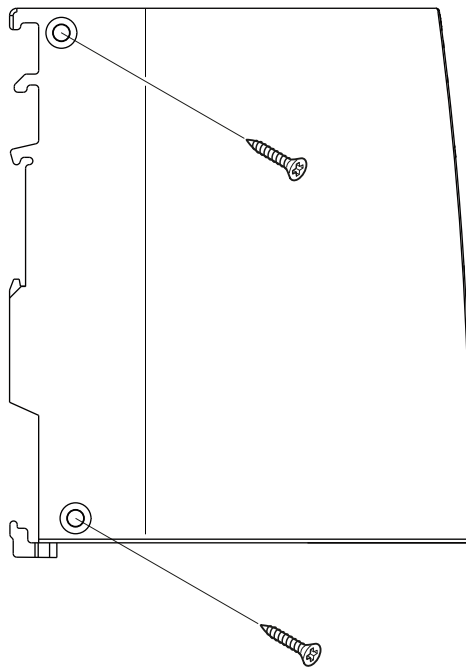
4.3 Wall mounting

Note

The wall mounting must be capable of supporting four times the weight of the device, but at least 50 N. For information on the weight, refer to the section "Technical specifications (Page 37)".

Installation

1. Prepare the drill holes for wall mounting. For the precise dimensions, refer to the section "Dimension drawings (Page 39)".
2. Secure the device to the wall with two screws. When mounting on a wall, use mounting fittings suitable for the type of wall.

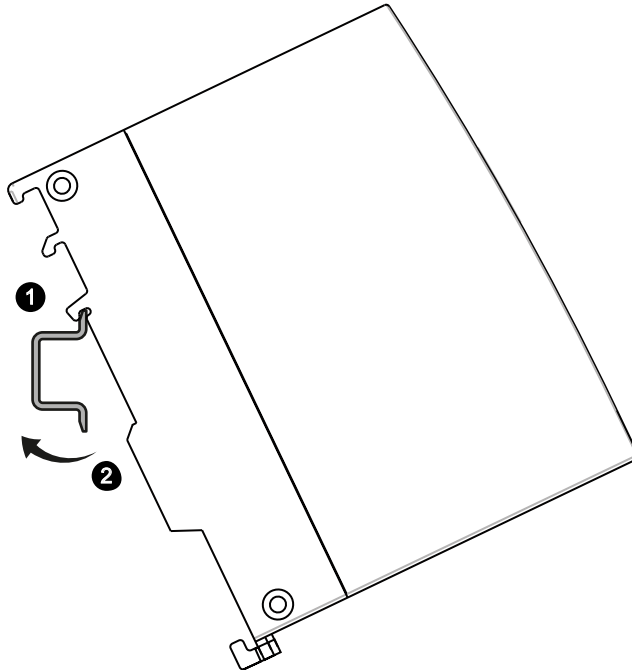


3. Connect the power supply, refer to the section "Power supply (Page 32)".
4. Connect the device to the local network, refer to the section "Properties and functions (Page 11)".
5. Connect the terminal via as short a cable as possible ≤ 150 mm and a large cross-sectional area of 1.5 mm^2 to the functional ground of the system, see section "Grounding (Page 33)".

4.4 Installing on the DIN rail

Installation

1. Place the third housing guide of the device on the top edge of the DIN rail ①.



2. Press the device down against the DIN rail until the spring catch locks in place ②.
3. Connect the power supply, refer to the section "Power supply (Page 32)".
4. Connect the device to the local network, refer to the section "Properties and functions (Page 11)".
5. Connect the terminal via as short a cable as possible ≤ 150 mm and a large cross-sectional area of 1.5 mm^2 to the functional ground of the system, see section "Grounding (Page 33)".
6. Also connect the DIN rails of a system with functional ground.

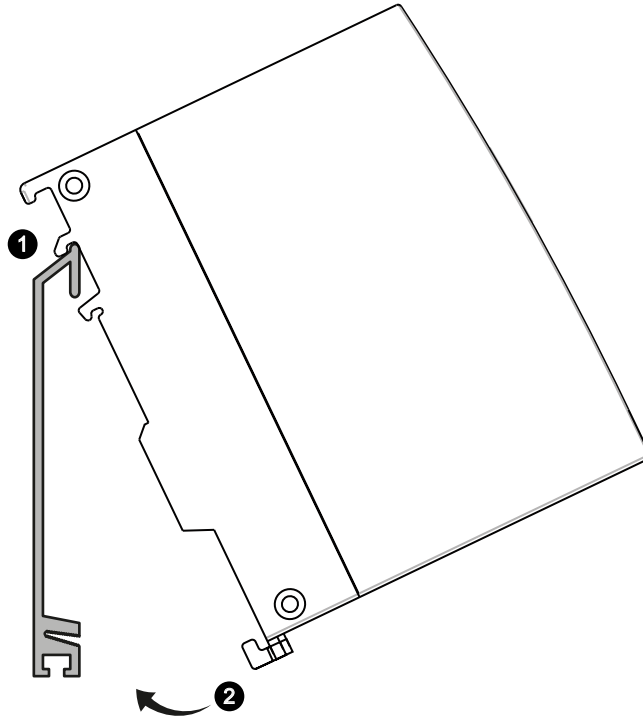
Dismantling

1. Disconnect all connected cables.
2. Using a screwdriver, pull down the catch on the rear of the device.
3. Pull lower part of the device away from the DIN rail.

4.5 Installing on the S7-300 standard rail

Installation

1. Place the second housing guide of the device on the top edge of the standard rail ①.



2. Press the device down against the standard rail until the spring catch locks in place ②.
3. Connect the power supply, refer to the section "Power supply (Page 32)".
4. Connect the device to the local network, refer to the section "Properties and functions (Page 11)".
5. Connect the terminal via as short a cable as possible ≤ 150 mm and a large cross-sectional area of 1.5 mm^2 to the functional ground of the system, see section "Grounding (Page 33)".

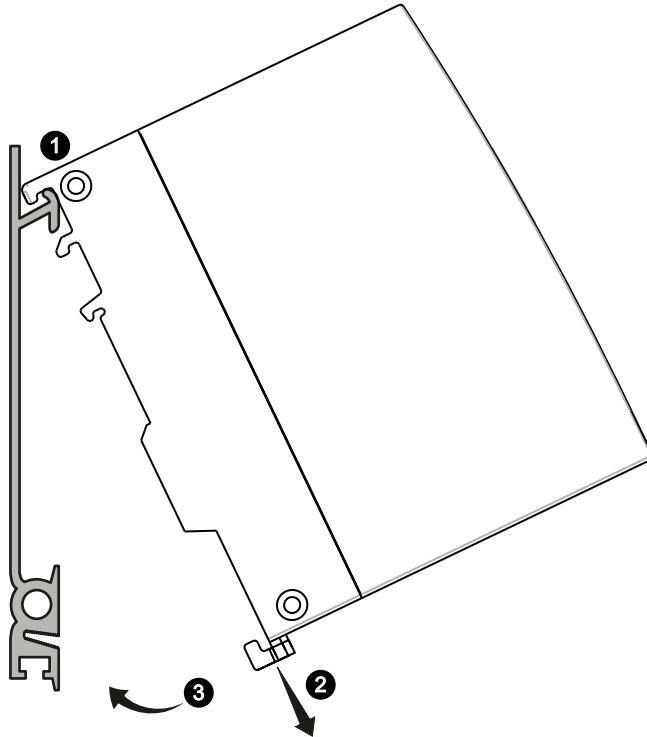
Dismantling

1. Disconnect all connected cables.
2. Using a screwdriver, pull down the catch on the rear of the device.
3. Remove the device from the standard rail.

4.6 Installing on the S7-1500 standard rail

Installation

1. Place the first housing guide of the device on the top edge of the standard rail ①.



2. Using a screwdriver, pull down the catch ② on the rear of the device.
3. Swing the device down while pulling down the catch ③. After it is released, the spring catch locks in place.
4. Connect the power supply, refer to the section "Power supply (Page 32)".
5. Connect the device to the local network, refer to the section "Properties and functions (Page 11)".
6. Connect the terminal via as short a cable as possible ≤ 150 mm and a large cross-sectional area of 1.5 mm^2 to the functional ground of the system, see section "Grounding (Page 33)".

Dismantling

1. Disconnect all connected cables.
2. Using a screwdriver, pull down the catch on the rear of the device.
3. Remove the device from the standard rail.

4.7 Installation in a 19" mounting frame

The 19" mounting frame is for installation of 2 SCALANCE TAP devices in a 19" rack.

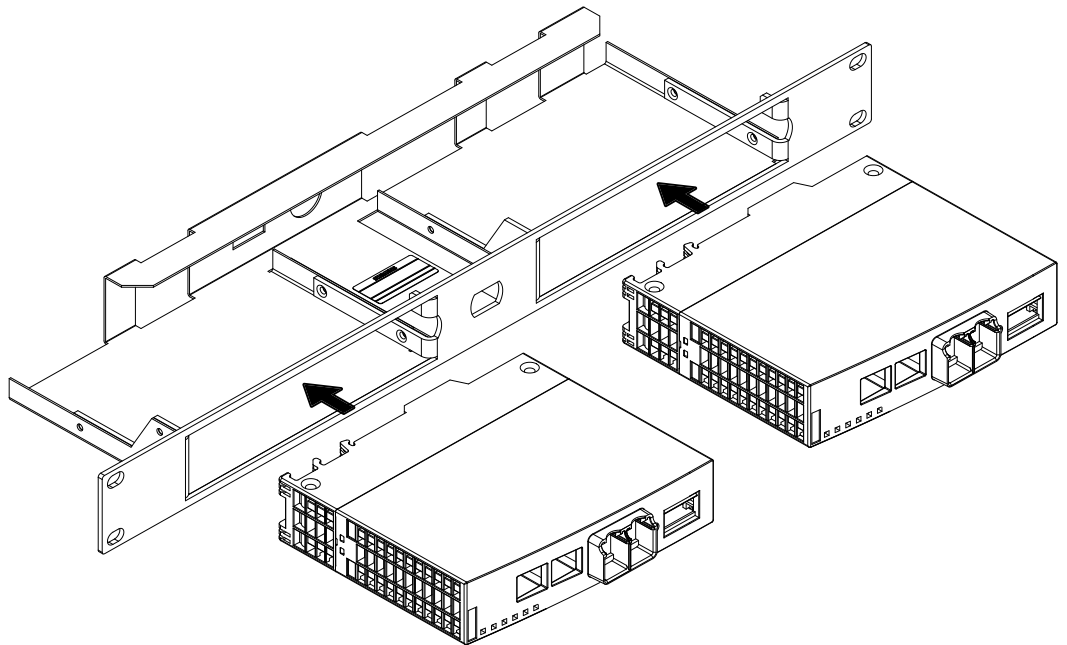
NOTICE

Approvals

The approvals according to ATEX, FM, IECEx, UL and UL Haz-Loc were not obtained in conjunction with this type of installation.

Installation

1. Push the devices into the mounting frame.



2. Press the devices with slight pressure onto the back wall until the spring catch locks in place.
3. Screw the mounting frame in the 19" rack. For the precise dimensions, refer to the section "Dimension drawings (Page 39)".
4. Connect the power supplies, refer to the section "Power supply (Page 32)".
5. Connect the device to the local network, refer to the section "Properties and functions (Page 11)".
6. Connect the terminal via as short a cable as possible ≤ 150 mm and a large cross-sectional area of 1.5 mm^2 to the functional ground of the system, see section "Grounding (Page 33)".

Dismantling

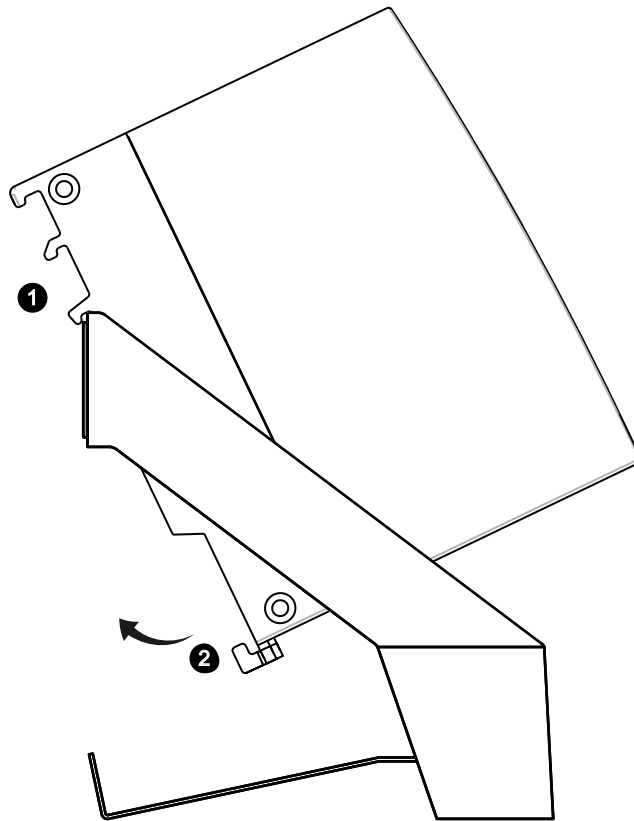
1. Disconnect all connected cables.
2. Loosen the attachment of the mounting frame.

3. Using a screwdriver, pull down the catch on the rear of the device.
4. Push the device out of the mounting frame.

4.8 Mounting on a pedestal

Installation

1. Place the third housing guide of the device on the top edge of the pedestal ①.



2. Press the device down against the pedestal until the spring catch locks in place ②.
3. Connect the power supply, refer to the section "Power supply (Page 32)".
4. Connect the device to the local network, refer to the section "Properties and functions (Page 11)".
5. Connect the terminal via as short a cable as possible ≤ 150 mm and a large cross-sectional area of 1.5 mm^2 to the functional ground of the system, see section "Grounding (Page 33)".

Dismantling

1. Disconnect all connected cables.
2. Using a screwdriver, pull down the catch on the rear of the device.
3. Remove the device from the pedestal.

4.9 Disassembly



WARNING

Improper disassembly

Improper disassembly may result in a risk of explosion in hazardous areas.

For proper disassembly, observe the following:

- Before starting work, ensure that the electricity is switched off.
- Secure remaining connections so that no damage can occur as a result of disassembly if the system is accidentally started up.


4.9 Disassembly


Connecting up

5.1 Safety when connecting up

Safety notices


When connecting up the device, keep to the safety notices listed below.


 WARNING
Power supply
The device is designed for operation with a directly connectable safety extra low voltage (SELV) from a limited power source (LPS).
The power supply therefore needs to meet at least one of the following conditions:
<ul style="list-style-type: none"> • Only safety extra low voltage (SELV) with limited power source (LPS) complying with IEC 60950-1 / EN 60950-1 / VDE 0805-1 or IEC 62368-1 / EN 62368-1 / VDE 62368-1 may be connected to the power supply terminals. • The power supply unit for the device must meet NEC Class 2 according to the National Electrical Code (r) (ANSI / NFPA 70).

 WARNING
Do not remove or replace while circuit is live when a flammable or combustible atmosphere is present.

Safety notices on use in hazardous areas

General safety notices relating to protection against explosion

 WARNING
EXPLOSION HAZARD
Do not connect or disconnect cables to or from the device when a flammable or combustible atmosphere is present.

 WARNING
Suitable cables at high ambient temperatures in hazardous area
At an ambient temperature of ≥ 60 °C, use heat-resistant cables designed for an ambient temperature at least 20 °C higher. The cable entries used on the enclosure must comply with the IP degree of protection required by EN IEC / IEC 60079-0, GB 3836.1.

 **WARNING**

Unsuitable cables or connectors

Risk of explosion in hazardous areas

- Only use connectors that meet the requirements of the relevant type of protection.
- If necessary, tighten the connector screw connections, device fastening screws, grounding screws, etc. according to the specified torques.
- Close unused cable openings for electrical connections.
- Check the cables for a tight fit after installation.

 **WARNING**

Lack of equipotential bonding

If there is no equipotential bonding in hazardous areas, there is a risk of explosion due to equalizing current or ignition sparks.

- Ensure that equipotential bonding is available for the device.

 **WARNING**

Unprotected cable ends

There is a risk of explosion due to unprotected cable ends in hazardous areas.


- Protect unused cable ends according to IEC/EN 60079-14.

 **WARNING**

Improper installation of shielded cables

There is a risk of explosion due to equalizing currents between the hazardous area and the non-hazardous area.

- Ground shielded cables that cross hazardous areas at one end only.
- Lay a potential equalization conductor when grounding at both ends.

 **WARNING**


Insufficient isolation of intrinsically safe and non-intrinsically safe circuits

Risk of explosion in hazardous areas

- When connecting intrinsically safe and non-intrinsically safe circuits, ensure that the galvanic isolation is performed properly in compliance with local regulations (e.g. IEC 60079-14).
- Observe the device approvals applicable for your country.


Notes for use in hazardous locations according to ATEX, IECEx, UKEX and CCC Ex


If you use the device under ATEX, IECEx, UKEX or CCC Ex conditions you must also keep to the following safety instructions in addition to the general safety instructions for protection against explosion:


 WARNING
Transient overvoltages
Take measures to prevent transient overvoltages of more than 40% of the rated voltage (or more than 119 V). This is the case if you only operate devices with SELV (safety extra-low voltage).

Safety notices when using the device according to Hazardous Locations (HazLoc)

If you use the device under HazLoc conditions you must also keep to the following safety notices in addition to the general safety notices for protection against explosion:

 WARNING
EXPLOSION HAZARD
You may only connect or disconnect cables carrying electricity when the power supply is switched off or when the device is in an area without inflammable gas concentrations.

 WARNING
Explosion hazard
Do not disconnect equipment when a flammable or combustible atmosphere is present.

 WARNING
Safety notice for connecting with a LAN ID (Local Area Network)
A LAN or LAN segment with all the interconnected devices should be contained completely in a single low voltage power distribution in a building. The LAN is designed either for "Environment A" according to IEEE802.3 or "Environment 0" according to IEC TR 62102.
Do not connect any electrical connectors directly to the telephone network (telephone network voltage) or a WAN (Wide Area Network).

5.2 Wiring rules

When wiring use cables with the following AWG categories or cross sections.

Wiring rules for ...		Screw/spring-loaded terminals
connectable cable cross sections for flexible cables ...	without wire end ferrule	0.25 - 2.5 mm ² AWG: 24 - 13
	with wire end ferrule with plastic ferrule**	0.25 - 2.5 mm ² AWG: 24 - 13
	with wire end ferrule without plastic ferrule**	0.25 - 2.5 mm ² AWG: 24 - 13
	with TWIN wire end ferrule**	0.5 - 1 mm ² AWG: 20 - 17
Stripped length of the cable		8 - 10 mm
Wire end ferrule according to DIN 46228 with plastic ferrule**		8 - 10 mm

* AWG: American Wire Gauge

** See note "Wire end ferrules"

Note

Wire end ferrules

Use crimp shapes with smooth surfaces, such as provided by square and trapeze shaped crimp cross sections.

Crimp shapes with wave-shaped profile are unsuitable.

5.3 Power supply

Information on the power supply

- The power supply is connected using a 3-pin plug-in terminal block (spring-loaded terminal). The terminal block ships with the device and can also be ordered as a spare part.
- The power supply is connected over a high resistance with the enclosure to allow an ungrounded set up. The power supply is non-floating.
- Note the wiring rules.
- When you connect the power supply you activate the SCALANCE TAP to divert the mirrored frames to the diagnostics device.

Position and assignment

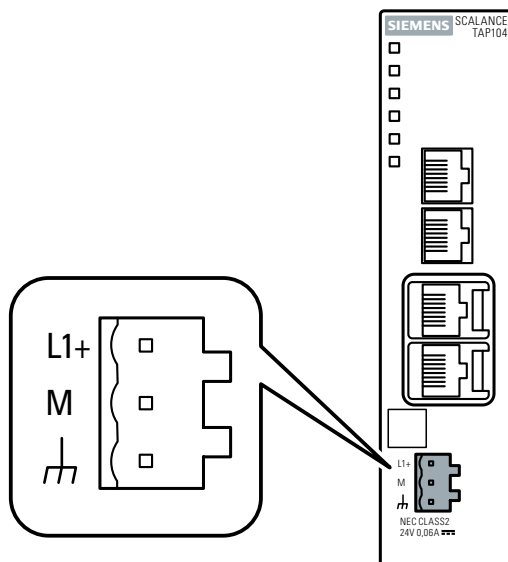



Figure 5-1 Position of the power supply on the SCALANCE TAP and the assignment of the terminal block

Contact	Assignment
L1+	24 VDC
M	Ground
	Functional ground, refer to the section Grounding (Page 33)"

External power supply

Note

Permitted external power supplies

The power supply unit to supply the SCALANCE TAP must comply with the requirements for a limited power source according to IEC/EN60950-1, section 2.5.

The external power supply for the SCALANCE TAP must meet the requirements for NEC class 2 circuits as specified in the National Electrical Code® (ANSI/NFPA 70).

Refer to the section "Safety when connecting up (Page 29)" and the installation instructions and instructions for use of the manufacturer of the power supply, the battery or the accumulator.

5.4 Grounding

EMC disturbances are diverted to ground via ground. This increases the immunity of the data transmission.

It is crucial for the correct operation of ground that the connection to the reference potential surface always has low impedance. Such a connection of the functional ground of the device

does not go first through the cable channel and then to the mounting plate or DIN rail terminal, but goes directly to the mounting plate or DIN rail terminal.

The SCALANCE TAP has a terminal for grounding, refer to the section "Power supply (Page 32)".

The terminal is identified by the following symbol for the grounding.



1. Connect the terminal of the device with as short a cable as possible ≤ 150 mm and a large cross-sectional area ≥ 2.5 mm² to the functional ground of the system. In many cases, the entire metallic construction of the system serves as ground.
2. Also connect the standard rails of a system with ground.

Protective earth/functional ground

The connection of the reference potential surface with the protective earth system is normally in the cabinet close to the power feed-in. This earth conducts fault currents to ground safely and according to DIN/VDE 0100 is a protective earth to protect people, animals and property from too high contact voltages.


Apart from the protective earth, there is functional grounding in the cabinet. According to EN60204-1 (DIN/VDE 0113 T1) electrical circuits must be grounded. The chassis (0 V) is grounded at one defined point. Here, once again the grounding is implemented with the lowest leakage resistance to ground in the vicinity of the power feed-in.

With automation components, functional ground also ensures interference-free operation of a controller. Via the functional ground, interference currents coupled in via the connecting cables are discharged to ground.

In terms of the large-area and low impedance implementation, a functional ground set up for this purpose generally also meets the requirements of protective earth. On the other hand, protective earth does not always meet the requirements of functional ground. In general while the connection for protective earth is always low resistance, it is not necessarily low impedance.

The resistance of a connection for protective earth must always be as small as possible to divert fault currents safely to ground. The length of a protective earth cable can therefore be several meters (m) long, without seriously impairing this effect. For a functional ground for diverting HF disturbances, this cable does however have impedance and is therefore not suitable.

Upkeep and maintenance

 **WARNING**

Unauthorized repair of devices in explosion-proof design

Risk of explosion in hazardous areas

- Repair work may only be performed by personnel authorized by Siemens.


 **WARNING**

Impermissible accessories and spare parts

Risk of explosion in hazardous areas

- Only use original accessories (Page 12) and original spare parts (Page 12).
- Observe all relevant installation and safety instructions described in the manuals for the device or supplied with the accessories or spare parts.



 **CAUTION**

Hot surfaces

Risk of burns during maintenance work on parts with a surface temperature above 70 °C (158 °F).

- Take appropriate protective measures, for example, wear protective gloves.
- Once maintenance work is complete, restore the touch protection measures.

NOTICE

Cleaning the housing

If the device is not in a hazardous area, only clean the outer parts of the housing with a dry cloth.

If the device is in a hazardous area, use a slightly damp cloth for cleaning.

Do not use solvents.

Technical specifications

The following technical specifications apply to the SCALANCE TAP104.

Technical specifications		
Attachment to Industrial Ethernet		
Electrical connectors	Quantity	4
	Connector	RJ-45 jack
	Properties	Half / full duplex
	Transmission rate	10 / 100 Mbps
Electrical data		
Power supply	Rated voltage	24 VDC
	Voltage range (incl. tolerance)	18 ... 31.2 VDC safety extra-low voltage (SELV)
	Design	Terminal block, 3 terminals
Current consumption	24 VDC	60 mA
Effective power loss		1.44 W
Overvoltage category		CAT II
Fusing		0.5 A / 60 V
Permitted ambient conditions		
Ambient temperature	During operation up to 2500 m	-40 °C to +70 °C
	During storage	-40 °C to +85 °C
	During transportation	-40 °C to +85 °C
Relative humidity	During operation at 25 °C	≤ 95 % no condensation
Housing, dimensions and weight		
Design	Compact module S7-1500	
Housing material	Polycarbonate (PC-GF10)	
Degree of protection	IP20	
Dimensions (W x H x D)	35 x 152 x 135 mm	
Weight	240 g	
Installation options	<ul style="list-style-type: none"> • Wall mounting • Installation on a DIN rail • Mounting on an S7-300 standard rail • Mounting on an S7-1500 standard rail • Installation in a 19" rack • Mounting on a pedestal 	
Mean time between failure (MTBF)		
MTBF (EN/IEC 61709; 40 °C)	> 375 years	

Dimension drawings

8.1 SCALANCE TAP

Dimensions are specified in mm.

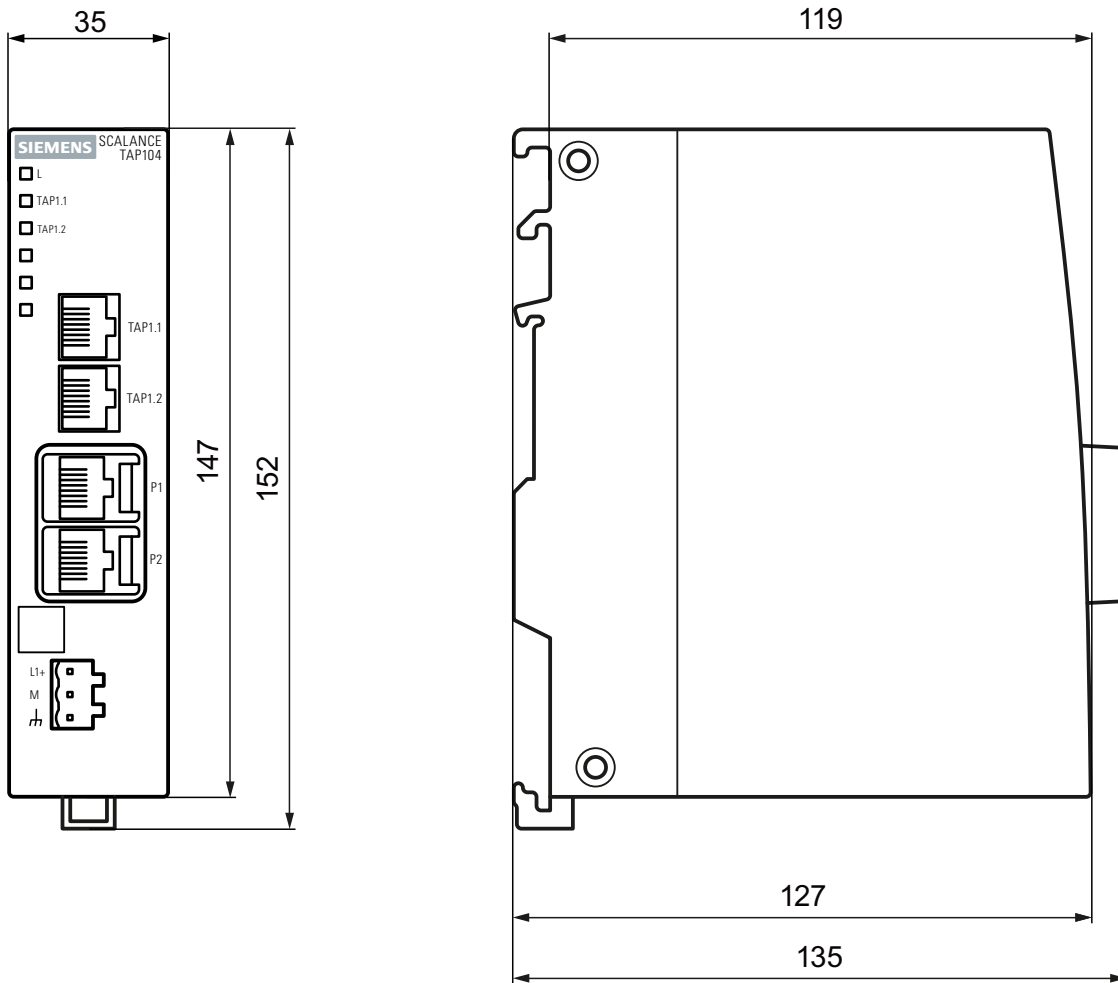


Figure 8-1 Front view and side view

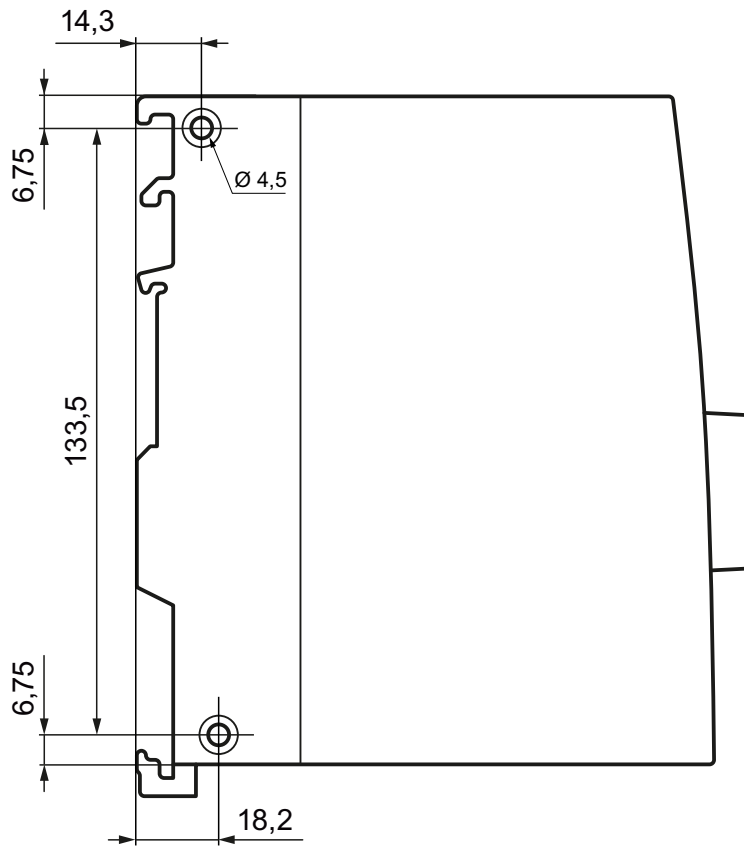


Figure 8-2 Drilling template

8.2 19" installation frame

Dimensions are specified in mm.

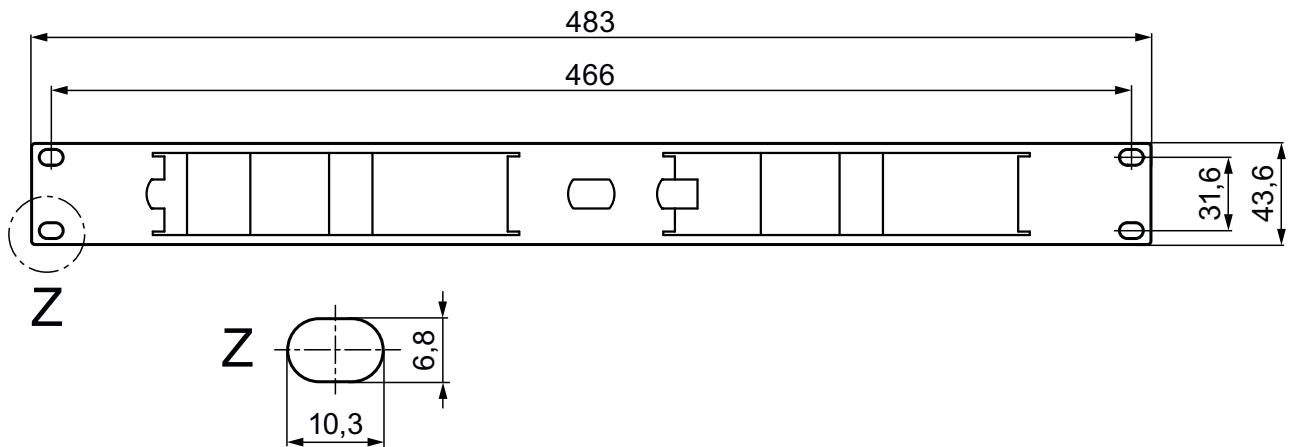


Figure 8-3 Front view

Certifications and approvals

The SIMATIC NET products described in these Operating Instructions have the approvals listed below.

Note

Issued approvals on the type plate of the device

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

Current approvals on the Internet

You will find the current approvals for the product on the Internet pages of Siemens Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/ps/15273/cert>).

Notes for the manufacturers of machines

This product is not a machine in the sense of the EC Machinery Directive or the Supply of Machinery (Safety) Regulations (UK).

There is therefore no declaration of conformity relating to the EC Machinery Directive 2006/42/EEC or the Supply of Machinery (Safety) Regulations 2008 (UK) for this product.

If the product is part of the equipment of a machine, it must be included in the procedure for obtaining the EU/UK conformity assessment by the manufacturer of the machine.

Machinery directive

The product is a component in compliance with the EC Machinery Directive 2006/42/EEC and the Supply of Machinery (Safety) Regulations 2008 (UK).

According to the Machinery Directive respectively the Supply of Machinery (Safety) Regulations (UK), we are obliged to point out that the product described is intended solely for installation in a machine.

Before the final product can be put into operation, it must be tested to ensure that it conforms with the Machinery Directive 2006/42/EEC and the Supply of Machinery (Safety) Regulations 2008 (UK).

EC declaration of conformity



The SIMATIC NET products described in these operating instructions meet the requirements and safety objectives of the following EC directives and comply with the harmonized European

standards (EN) which are published in the official documentation of the European Union and here.

- **2014/34/EU (ATEX explosion protection directive)**
Directive of the European Parliament and the Council of 26 February 2014 on the approximation of the laws of the member states concerning equipment and protective systems intended for use in potentially explosive atmospheres, official journal of the EU L96, 29/03/2014, pages. 309-356
- **2014/30/EU (EMC)**
EMC directive of the European Parliament and of the Council of February 26, 2014 on the approximation of the laws of the member states relating to electromagnetic compatibility; official journal of the EU L96, 29/03/2014, pages. 79-106
- **2011/65/EU (RoHS)**
Directive of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, official journal of the EC L174, 01/07/2011, pages 88-110

You will find the EC declaration of conformity for these products on the Internet pages of Siemens Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/ps/15273/cert>).

The EC Declaration of Conformity is available for all responsible authorities at:

Siemens Aktiengesellschaft
Digital Industries
DE-76181 Karlsruhe
Germany

UK Declaration of Conformity



The UK declaration of conformity is available to all responsible authorities at:

Siemens Aktiengesellschaft
Digital Industries
Process Automation
DE-76181 Karlsruhe
Germany

Importer UK:


Siemens plc,
Manchester M20 2UR

You can find the current UK Declaration of Conformity for these products on the Internet pages under Siemens Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/ps/15273/cert>).

The SIMATIC NET products described in this document meet the requirements of the following directives:

- UK-Regulation
SI 2016/1107 Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016, and related amendments
- EMC Regulation
SI 2016/1091 Electromagnetic Compatibility Regulations 2016, and related amendments
- RoHS Regulation
SI 2012/3032 Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012, and related amendments

ATEX, IECEx, UKEX and CCC Ex certification

 WARNING
Risk of explosion in hazardous areas
When using SIMATIC NET products in hazardous area zone 2, make absolutely sure that the associated conditions in the following document are adhered to: "SIMATIC NET Product Information Use of subassemblies/modules in a Zone 2 Hazardous Area". You will find this document
<ul style="list-style-type: none"> • on the data medium that ships with some devices. • on the Internet pages under Siemens Industry Online Support (https://support.industry.siemens.com/cs/ww/en/view/78381013).
Enter the document identification number "C234" as the search term.

The markings of the electrical devices are:



II 3 G Ex ec IIC T4 Gc
 DEKRA 18ATEX0025 X
 DEKRA 21UKEX0001 X
 IECEx DEK 18.0017X
 Importer UK:
 Siemens plc,
 Manchester
 M20 2UR
 (Ex na IIC T4 Gc, not on the nameplate)
 2020322310002626
 2020322310002915
 2020322310002987

The products meet the requirements of the following standards:

- EN/IEC 60079-7, GB 3836.8
- EN IEC/IEC 60079-0, GB 3836.1

You will find the current versions of the standards in the currently valid certificates.

EMC directive (electromagnetic compatibility)

The SIMATIC NET products described in these operating instructions meet the requirements of EU directive 2014/30/EU "Electromagnetic Compatibility" (EMC Directive) for the following areas of application.

Applied standards:

- EN 61000-6-1 Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
- EN 61000-6-2 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
- EN 61000-6-3 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
- EN 61000-6-4 Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments

You will find the current versions of the standards in the currently valid EC declaration of conformity.

RoHS

The SIMATIC NET products described in these operating instructions meet the requirements on the restriction of the use of certain hazardous substances in electrical and electronic equipment according to the EU Directive 2011/65/EU as well as the UK-Regulation SI 2012/3032 and their associated amendments.

Applied standard:

- EN IEC 63000

FM

The product meets the requirements of the standards:

- Factory Mutual Approval Standard Class Number 3611
- FM Hazardous (Classified) Location Electrical Equipment:
Non Incendive / Class I / Division 2 / Groups A,B,C,D / T4 and
Non Incendive / Class I / Zone 2 / Group IIC / T4

cULus approval for industrial control equipment



cULus Listed IND. CONT. EQ.

Underwriters Laboratories Inc. complying with

- UL 61010-2-201
- CAN/CSA-IEC 61010-2-201

Report no. E85972

cULus Approval for Information Technology Equipment



cULus Listed I. T. E.

Underwriters Laboratories Inc. complying with

- UL 60950-1 (Information Technology Equipment)
- CSA C22.2 No. 60950-1-03

Report no. E115352

cULus Approval Hazardous Location



HAZ. LOC.

cULus Listed I. T. E. FOR HAZ. LOC.

Underwriters Laboratories Inc. complying with

- UL 60950-1 (Information Technology Equipment)
- ANSI/ISA 12.12.01-2007
- CSA C22.2 No. 213-M1987

Approved for use in

Cl. 1, Div. 2, GP A, B, C, D T4

Cl. 1, Zone 2, GP IIC T4

Report no. E240480

Note for Australia - RCM

The product meets the requirements of the RCM standard.

Applied standards:

- AS/NZS CISPR11 (Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement).
- EN 61000-6-4 Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments

You will find the current versions of the standards in the currently valid RCM SDoCs (Self-Declaration of Conformity).

MSIP 요구사항 - For Korea only

A급 기기(업무용 방송통신기자재)

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Marking for the customs union



EAC (Eurasian Conformity)

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

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

Installation guidelines

The devices meet the requirements if you adhere to the installation and safety instructions contained in this documentation and in the following documentation when installing and operating the devices.

- "Industrial Ethernet / PROFINET Industrial Ethernet" System Manual (<https://support.industry.siemens.com/cs/ww/en/view/27069465>)
- "Industrial Ethernet / PROFINET - Passive Network Components" System Manual (<https://support.industry.siemens.com/cs/ww/en/view/84922825>)
- "EMC Installation Guidelines" configuration manual (<https://support.industry.siemens.com/cs/ww/en/view/60612658>)



WARNING

Personal injury and property damage can occur

The installation of expansions that are not approved for SIMATIC NET products or their target systems may violate the requirements and regulations for safety and electromagnetic compatibility.

Only use expansions that are approved for the system.

Note

The test was performed with a device and a connected communications partner that also meets the requirements of the standards listed above.

When operating the device with a communications partner that does not comply with these standards, adherence to the corresponding values cannot be guaranteed.

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