SIEMENS

SIMATIC NET

Industrial Wireless LAN SCALANCE W788-x / W748-1

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

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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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Introduction

1

1.1 Information on the Operating Instructions

Validity of the Operating Instructions

These operating instructions cover the following products:

	Article no. of the RoW version	Article no. of the US version	Article number of the Israel version
Access points			
SCALANCE W788-1 RJ-45	6GK5788-1FC00-0AA0	6GK5788-1FC00-0AB0	-
SCALANCE W788-1 M12	6GK5788-1GD00-0AA0	6GK5788-1GD00-0AB0	-
Dual access points			
SCALANCE W788-2 RJ-45	6GK5788-2FC00-0AA0	6GK5788-2FC00-0AB0	6GK5788-2FC00-0AC0
SCALANCE W788-2 M12	6GK5788-2GD00-0AA0	6GK5788-2GD00-0AB0	-
SCALANCE W788-2 M12 EEC	6GK5788-2GD00-0TA0	6GK5788-2GD00-0TB0	-
Ethernet client modules			
SCALANCE W748-1 RJ-45	6GK5748-1FC00-0AA0	6GK5748-1FC00-0AB0	-
SCALANCE W748-1 M12	6GK5748-1GD00-0AA0	6GK5748-1GD00-0AB0	-

If information relates to all the named products, the term SCALANCE W7x8 will be used.

These operating instructions apply to the following software version:

- SCALANCE W7x8 with firmware as of version 6.1

Purpose of the Operating Instructions

Using the Operating Instructions, you will be able to install and connect the SCALANCE W7x8 correctly. The configuration and the integration of the device in a WLAN are not described in these instructions.

Documentation on the accompanying CD

You will find detailed information about configuration in the SCALANCE W700 configuration manuals on the accompanying SIMATIC NET IWLAN CD under the file name:

PH_SCALANCE-W780-W740-WBM_0.pdf and **PH_SCALANCE-W780-W740-CLI_0.pdf**

Note

Make sure that you read the explanations and instructions in the README.txt file

Security information

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

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

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

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

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

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

Trademarks

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SIMATIC NET, SCALANCE, C-PLUG, RCOAX

Security recommendations

2

To prevent unauthorized access, note the following security recommendations.

General

- You should make regular checks to make sure that the device meets these recommendations and/or other security guidelines.
- Evaluate your plant as a whole in terms of security. Use a cell protection concept with suitable products.
- When the internal and external network are disconnected, an attacker cannot access internal data from the outside. Therefore operate the device only within a protected network area.
- For communication via non-secure networks use additional devices with VPN functionality to encrypt and authenticate the communication.
- Terminate management connections correctly (WBM. Telnet, SSH etc.).

Physical access

- Restrict physical access to the device to qualified personnel.
- The memory card or the PLUG (C-PLUG, KEY-PLUG, security PLUG) contains sensitive data such as certificates, keys etc. that can be read out and modified.

Software (security functions)

- Keep the software up to date. Check regularly for security updates of the product. You will find information on this on the Internet pages "Industrial Security (http://www.siemens.com/industrialsecurity)".
- Inform yourself regularly about security advisories and bulletins published by Siemens ProductCERT (http://www.siemens.com/cert/en/cert-security-advisories.htm).
- Only activate protocols that you really require to use the device.
- Use the security functions such as address translation with NAT (Network Address Translation) or NAPT (Network Address Port Translation) to protect receiving ports from access by third parties.
- Restrict access to the device with a firewall or rules in an access control list (ACL - Access Control List).
- If RADIUS authentication is via remote access, make sure that the communication is within the secured network area or is via a secure channel.
- The option of VLAN structuring provides good protection against DoS attacks and unauthorized access. Check whether this is practical or useful in your environment.

- Enable logging functions. Use the central logging function to log changes and access attempts centrally. Check the logging information regularly.
- Configure a Syslog server to forward all logs to a central location.
- Use WPA2/ WPA2-PSK with AES to protect the WLAN. If iPCF or iPCF-MC is used, use the AES encryption.

Passwords

- Define rules for the use of devices and assignment of passwords.
- Regularly update passwords and keys to increase security.
- Change all default passwords for users before you operate the device.
- Only use passwords with a high password strength. Avoid weak passwords for example password1, 123456789, abcdefgh.
- Make sure that all passwords are protected and inaccessible to unauthorized personnel.
- Do not use the same password for different users and systems or after it has expired.

Keys and certificates

This section deals with the security keys and certificates you require to set up HTTPS (HyperText Transfer Protocol Secured Socket Layer).

- We strongly recommend that you create your own HTTPS certificates and make them available.

  There are preset certificates and keys on the device. The preset and automatically created HTTPS certificates are self-signed.

  We recommend that you use HTTPS certificates signed either by a reliable external or by an internal certification authority. The HTTPS certificate checks the identity of the device and controls the encrypted data exchange. You can install the HTTPS certificate via the WBM (System > Load and Save).
- Handle user-defined private keys with great caution if you use user-defined SSH or SSL keys.
- Use the certification authority including key revocation and management to sign the certificates.
- Verify certificates and fingerprints on the server and client to avoid "man in the middle" attacks.
- We recommend that you use certificates with a key length of 2048 bits.
- Change keys and certificates immediately, if there is a suspicion of compromise.

Secure/non-secure protocols

- For the DCP function, enable the "DCP read-only" mode after commissioning.
- Avoid and disable non-secure protocols, for example Telnet and TFTP. For historical reasons, these protocols are still available, however not intended for secure applications. Use non-secure protocols on the device with caution.
- The following protocols provide secure alternatives:
  - SNMPv1/v2 → SNMPv3

    Check whether use of SNMPv1 is necessary. SNMPv1 is classified as non-secure. Use the option of preventing write access. The product provides you with suitable setting options.

    If SNMP is enabled, change the community names. If no unrestricted access is necessary, restrict access with SNMP.

    Use SNMPv3 in conjunction with passwords.
  - HTTP → HTTPS
  - Telnet → SSH
  - SNTP → NTP
- Use secure protocols when access to the device is not prevented by physical protection measures.
- To prevent unauthorized access to the device or network, take suitable protective measures against non-secure protocols.
- If you require non-secure protocols and services, operate the device only within a protected network area.
- Restrict the services and protocols available to the outside to a minimum.

Available protocols per port

The following list provides you with an overview of the open ports on this device.

The table includes the following columns:

- **Protocol**

  All protocols that the device supports
- **Port number**

  Port number assigned to the protocol
- **Port status**
  - Open

    The port is always open and cannot be closed.
  - Open (when configured)

    The port is open if it has been configured.

- **Factory setting**
  - Open

    The factory setting of the port is "Open".
  - Closed

    The factory setting of the port is "Closed".
- **Authentication**

  Specifies whether or not the protocol is authenticated.

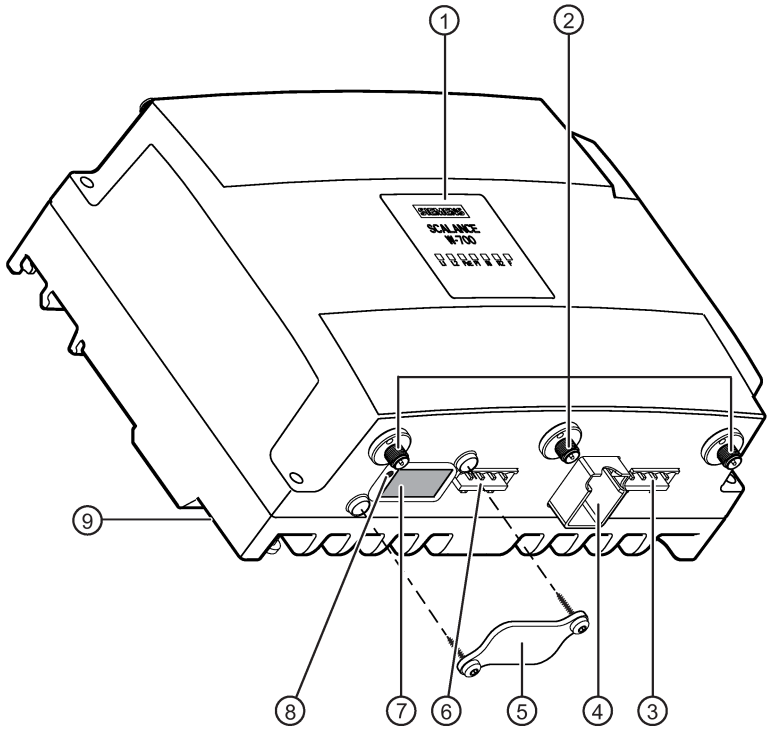
Protocol	Port number	Port status	Factory setting of the port	Authentication
SSH	TCP/22	Open (when configured)	Open	Yes
TELNET	TCP/23	Open (when configured)	Open	Yes
HTTP	TCP/80	Open (when configured)	Open	Yes
HTTPS	TCP/443	Open (when configured)	Open	Yes
SNTP NTP	UDP/123	Open (when configured)	Closed	No
SNMP	UDP/161	Open (when configured)	Open	Yes
PROFINET	UDP/34964, UDP/49154, 49155	Open	Open	No
Syslog	UDP/514	Open (when configured)	Open	No
EtherNet/IP	TCP/44818, UDP/2222,44818	Open (when configured)	Open	No
DHCP	UDP/67,68	Open (when configured)	Closed	No
RADIUS	UDP/1812,1813	Open (when configured)	Closed	No
TFTP	UDP/69	Open (when configured)	Closed	No

Description of the device

3

3.1 Description of the device

W7x8x-x RJ-45 - degree of protection IP30



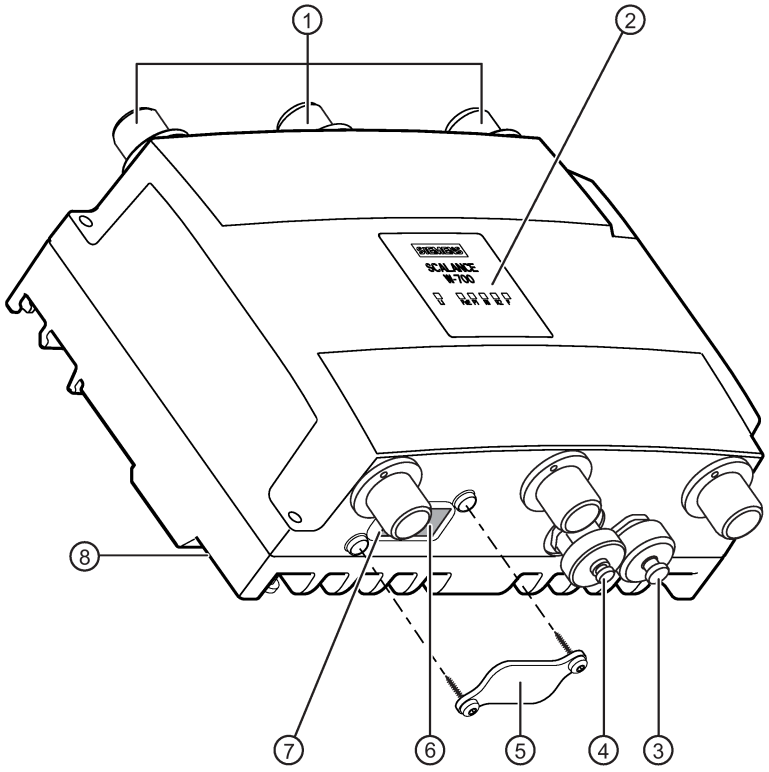
① LEDs
② Connecting connectors, R-SMA type female
- Devices with one IWLAN interface: 3 connectors on the top (covered in the figure).
- Devices with two IWLAN interfaces: 3 connectors on the top and 3 on the underside.

③ Connector for power supply
④ Connector for Ethernet, RJ-45 type
⑤ Screw-down cover for the
- reset button and the
- PLUG compartment (not with W788C)

⑥ Connector for the digital input/output (not with W788C)
⑦ PLUG compartment (not with W788C)
⑧ Reset button
⑨ Grounding connector (thread M4) on the back of the device

Figure 3-1 Device description of the RJ-45 variant

W7x8x-x M12 - degree of protection IP65



① Connecting connectors, N-Connect type female
- Devices with one IWLAN interface: 3 connectors on the top (covered in the figure).
- Devices with two IWLAN interfaces: 3 connectors on the top and 3 on the underside.

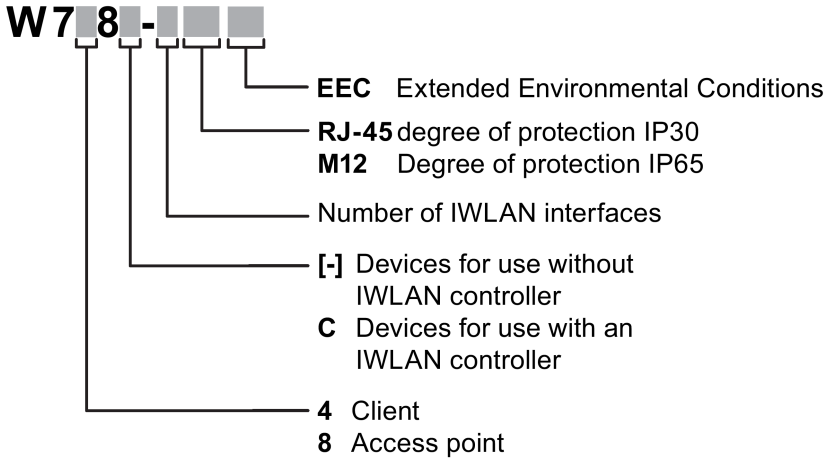
② LEDs
③ Connector for the supply voltage, type M12 (with cover)
④ Connector for Ethernet, M12 type (with cover)
⑤ Screw-down cover for the
- reset button and the
- PLUG compartment (not with W788C)

⑥ PLUG compartment (not with W788C)
⑦ Reset button (covered in the figure)
⑧ Grounding connector (thread M4) on the back of the device

Figure 3-2 Device description of the M12 variant

3.2 Structure of the type designations

The type designation of a SCALANCE W7x8 is made up of several parts that have the following meaning:



3.3 Components of the product

The following components are supplied with the product:

- SCALANCE W7x8
- Only with device variant M12 / IP65:
  - 2 protective caps for the M12 sockets
- Only with device variant RJ-45 / IP30:
  - 4-pin terminal block for the supply voltage
  - 4-pin terminal block for the digital input/output
- 2 screws for mounting on an S7-300 standard rail
- SIMATIC NET Industrial Wireless LAN CD

Note

The mounting set with the holding plate does not ship with the device, see Accessories (Page 15).

Please check that the consignment you have received is complete. If the consignment is incomplete, contact your supplier or your local Siemens office.

3.4 Accessories

Technical data subject to change.

You will find further information on the accessories program in the Industry Mall. (https://mall.industry.siemens.com)

PLUG

Component	Description	Article number
C-PLUG	Configuration PLUG, Exchangeable storage medium (32 MB) for the configuration data	6GK1 900-0AB00
KEY-PLUG features	Enabling of iFeatures and exchangeable storage medium for storage of configuration data	
	KEY-PLUG W780 iFeatures AP	6GK5 907-8PA00
	KEY-PLUG W740 iFeatures Client	6GK5 907-4PA00
KEY-PLUG W700 Security	W700 Security Enabling of “Inter AP Blocking” and exchangeable storage medium for storage of configuration data	6GK5907-0PA00

3.4.1 Installation

Installation

Component	Description	Article number
Mounting set	The mounting set with the holding plate for attachment to an S7-300 rail, a 35 mm DIN rail or a mast.	6GK5798-8ML00-0AB3

M12 data plug-in connector

Component	Description		Article number
IE FC M12 PLUG PRO 2x2	M12 data plug-in connector for IE FC TP cables 2x2, IP65/67, D-coded, axial cable outlet	1 connector per package	6GK1 901-0DB20-6AA0
		8 connectors per package	6GK1 901-0DB20-6AA8

Data line

Component	Description	Article number
IE FC TP STANDARD CABLE GP2X2 (PROFINET type A)	Standard bus cable, TP installation cable for connection to FC OUTLET RJ-45, for universal use, 4-wire, shielded, CAT 5E Sold by the meter	6XV1 840-2AH10
IE FC TP ROBUST STANDARD CABLE GP 2X2 (PROFINET type A)	Standard bus cable, ATPE outer jacket for connection to FC RJ-45 PLUG and FC OUTLET RJ-45, fixed installation, for universal use, 4-wire, shielded, CAT 5 Sold by the meter	6XV1 841-2A
IE FC TP ROBUST FLEXIBLE CABLE GP 2X2 (PROFINET type B)	Flexible bus cable, TPE outer jacket for connection to FC RJ-45 PLUG and FC OUTLET RJ-45, flexible wires, 4-wire, shielded, CAT 5 Sold by the meter	6XV1 841-2B
IE FC TP FLEXIBLE CABLE GP 2X2 (PROFINET type B)	Flexible bus cable, TP installation cable, flexible wires, shielded, CAT 5 Sold by the meter	6XV1 870-2B
IE FC TP TRAILING CABLE 2X2 (PROFINET type C)	Highly flexible bus cable, TP installation cable for connection to FC OUTLET RJ-45, for use in drag chains, 4-wire, shielded, CAT 5 Sold by the meter	6XV1 840-3AH10
IE TP TORSION CABLE 2X2 (PROFINET type C)	Highly flexible bus cable, TP installation cable for use in highly flexible applications (torsion), 4-wire Sold by the meter	6XV1 870-2F
IE CONNECTING CABLE M12-180/IE RJ45	Flexible IE connecting cable, 4-wire, preassembled with a 4-pin M12 plug (D-coded) and an IE FC RJ-45 plug 145	6XV1 871-5T*
IE CONNECTING CABLE M12-180/M12-180	Flexible IE connecting cable, 4-wire, preassembled with two 4-pin M12 plugs (D-coded)	6XV1 870-8A*

* Available in different lengths

Cabinet feedthrough

Component	Description	Article number
IE M12 PANEL FEEDTHROUGH	Cabinet feedthrough for conversion from M12 connector technology (D-coded, IP65) to RJ-45 connector technology (IP20) pack of 5	6GK1 901-0DM20-2AA5
IE M12 PANEL FEEDTHROUGH PRO	Cabinet feedthrough for conversion from M12 connector technology (D-coded, IP65) to M12 connector technology (D-coded, IP65) pack of 5	6GK1 901-0DM30-2AA5
IE M12 PANEL FEEDTHROUGH 4X2	Cabinet feedthrough for conversion from M12 connector technology (X-coded, IP65/67) to RJ-45 connector technology (X-coded, IP20) pack of 5	6GK1 901-0DM40-2AA5

Component	Description	Article number
N-Connect/N-Connect female/female Panel Feedthrough	Panel feedthrough for wall thicknesses up to a maximum of 4.5 mm, two N-Connect female connectors.	6GK5 798-2PP00-2AA6
N-Connect/SMA-Connect female/female Panel Feedthrough	Panel feedthrough for wall thicknesses up to a maximum of 5.5 mm, two N-Connect/SMA female connectors.	6GK5 798-0PT00-2AA6

Energy cable

Component	Description	Article number
Energy cable 2 x 0.75	Energy cable for connection of signaling contact and power supply 24 VDC, stranded wire 2 x 0.75 mm^2, capable of trailing, not assembled Sold by the meter	6XV1 812-8A
Robust Energy Cable 4 x 0.75	Energy cable for connection of power supply 24 VDC, 4-wire stranded 4 x 0.75 mm^2, robust, flexible, not assembled Sold by the meter	6XV1 801-2A
M12 PLUG-IN CABLE	Flexible plug-in power cable to connect the power supply 24 VDC, 4-wire, preassembled with a 4-pin M12 plug and an M12 socket (A-coded)	6XV1 801-5D*

* Available in different lengths

Socket

Component	Description	Article number
IE POWER M12 CABLE CONNECTOR PRO	Socket for the 24 VDC power supply. 4-pin, A-coded pack of 3	6GK1 907-0DC10-6AA3

Lightning protection

Component	Description	Article number
LP798-1N	Lighting protector with N/N female/female connector with gas discharge technology	6GK5798-2LP00-2AA6
LP798-2N	Lighting protector with N/N female/female connector with quarter wave technology	6GK5798-2LP10-2AA6

Terminating resistor

Component	Description	Article number
TI795-1N	Electrical connection N-Connect, male	6GK5795-1TN00-1AA0
TI795-1R	Electrical connection RSMA-Connect, male	6GK5 795-1TR10-0AA6

3.4.2 Flexible connecting cables and antennas

3.4.2.1 Flexible connecting cables

N-Connect/R-SMA flexible connecting cable for RJ-45

Flexible connecting cable for connecting an antenna to a SCALANCE W700. Preassembled with two connectors N male and R-SMA male

Length	Article number
0.3 m	6XV1875-5CE30
1 m	6XV1875-5CH10
2 m	6XV1875-5CH20
5 m	6XV1875-5CH50
10 m	6XV1875-5CN10

For railway applications, the following connecting cable are available:

Length	Article number
1 m	6XV1875-5TH10
2 m	6XV1875-5TH20
5 m	6XV1875-5TH50

Flexible connecting cable N-Connect/N-Connect

Flexible connecting cable for connecting an antenna to a SCALANCE W700 with N-Connect connectors.
Preassembled with two N male connectors:

Length	Article number
1 m	6XV1875-5AH10
2 m	6XV1875-5AH20
5 m	6XV1875-5AH50
10 m	6XV1875-5AN10

For railway applications, the following connecting cable are available:

Length	Article number
1 m	6XV1875-5SH10
2 m	6XV1875-5SH20
5 m	6XV1875-5SH50

Flexible connecting cable IWLAN QMA/N-Connect male/female

Adapter cable for connecting a MIMO antenna with QMA connectors with the flexible connecting cables. Preassembled with two connectors QMA male and N-Connect female. pack of 3

Length	Article number
1 m	6XV1875-5JH10

For railway applications, the following connecting cable is available Note: Scope of delivery: Pack of 1

Length	Article number
1 m	6XV1875-5VH10

3.4.2.2 Antennas

Note

When you select an antenna, keep in mind the national approvals for your device.

You will find more information in the following Link (http://www.siemens.com/wireless-approvals)

The SCALANCE W786-2IA RJ-45 uses internal omni antennas (3/4 dBi at 2.4 GHz or 5 GHz).

Type	Properties	Article number
ANT792-4DN	RCoax helical antenna, circular polarization, 4 dBi, 2.4 GHz, N-Connect female.	6GK5 792-4DN00-0AA6
ANT792-6MN	Omni antenna, mast/wall mounting, 6 dBi 2.4 GHz, N-Connect female	6GK5 792-6MN00-0AA6
ANT792-8DN	Directional antenna, mast/wall mounting, 14 dBi 2.4 GHz, N-Connect female	6GK5 792-8DN00-0AA6
ANT793-4MN	RCoax λ5/8 antenna with vertical polarization, 6 dBi, 5 GHz, N-Connect female.	6GK5 793-4MN00-0AA6

Type	Properties	Article number
ANT793-6DG	Wide angle antenna, mast/wall mounting, 9 dBi 5 GHz, 2 x N-Connect female	6GK5 793-6DG00-0AA0
ANT793-6DT	Wide angle antenna (MIMO), mast/wall mounting, 8 dBi 5 GHz, 3 x QMA connector female	6GK5 793-6DT00-0AA0
ANT793-6MN	Omni antenna, mast/wall mounting, 5 dBi 5 GHz, N-Connect female	6GK5 793-6MN00-0AA6
ANT793-8DJ	Directional antenna, mast/wall mounting, 18 dBi 5 GHz, 2 x N-Connect female	6GK5 793-8DJ00-0AA0
ANT793-8DK	Directional antenna, mast/wall mounting, 23 dBi 5 GHz, 2 x N-Connect female	6GK5 793-8DK00-0AA0
ANT795-4MA	Omni antenna, directly on the device, 3/5 dBi 2.4 GHz and 5 GHz, IP30, R-SMA connector male for direct mounting on the device, connector angle adjustable 0° to 180°.	6GK5 795-4MA00-0AA3
ANT795-4MC	Omnidirectional antenna, 3/5 dBi, 2.4 GHz and 5 GHz, IP65, N-Connect male for direct installation on the device, straight connector.	6GK5 795-4MC00-0AA3
ANT795-4MD	Omnidirectional antenna, 3/5 dBi, 2.4 GHz and 5 GHz, IP65, N-Connect male for direct installation on the device, 90° connector.	6GK5 795-4MD00-0AA3
ANT795-6DC	Wide angle antenna, mast/wall mounting, 9 dBi 2.4 GHz and 5 GHz, N-Connect female	6GK5 795-6DC00-0AA0
ANT795-6MN	Omni antenna, mounted on roof/vehicle, 6/8 dBi 2.4 GHz and 5 GHz, N-Connect female	6GK5 795-6MN10-0AA6
ANT795-6MT	Omni antenna (MIMO), mounted on roof/vehicle/ceiling, 5/7 dBi 2.4 GHz and 5 GHz, 3 x QMA connector female	6GK5 795-6MT00-0AA0
ANT793-8DL	Directional antenna vertical-horizontal polarized, 5 GHz, 14dBi, IP66, 2xN-Connect female	6GK5 793-8DL00-0AA0
ANT793-8DP	Directional antenna, mast/wall mounting, 13 / 13.5 dBi 4.9 GHz and 5 GHz, N-Connect female	6GK5 793-8DP00-0AA0
ANT795-4MX	Omnidirectional antenna, 2/2,5 dBi, 2.4 GHz and 5 GHz, IP69K, N-Connect male	6GK5 795-4MX00-0AA0
ANT795-6MP	Omnidirectional antenna, 5/7 dBi, 2.4 GHz and 5 GHz, IP65/67, N-Connect female	6GK5 795-6MP00-0AA0

Type	Properties	Article number
ANT896-6MM	Omnidirectional antenna for mobile wireless, WLAN and GPS, WLAN: 6/7 dBi, 2.4 GHz and 5 GHz, IP68, IP69 K, QMA-Connect female, port 2	6GK5 896-6MM00-0AA0
IWLAN RCoax Cable 2,4 GHz PE 1/2"	Omni antenna, 0 dBi 2.400 - 2.485 GHz, N-Connect female.	6XV1875-2A
IWLAN RCoax Cable 5 GHz PE 1/2"	Omni antenna, 0 dBi 5.150 – 5.875 GHz, N-Connect female.	6XV1875-2D

NOTICE

ANT795-4MA

The ANT795-4MA antenna has degree of protection IP30 and is therefore only suitable for dry environments.

Note

ANT793-8DJ

The antenna ANT793-8DJ may only be used with the flexible connecting cable 6XV1875-5CH50 (5 m length) or 6XV1875-5CN10 (10 m length). Other flexible connecting cables are not permitted.

Notice for USA/Canada

Only one antenna per device can be used (connected to R1A1, R1A2 or R2A1, R2A2).

Note

ANT793-8DK

The antenna ANT793-8DK may only be used with the flexible connecting cable 6XV1875-5CN10 (10 m length). Other flexible connecting cables are not permitted.

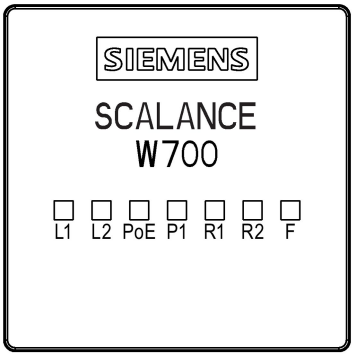
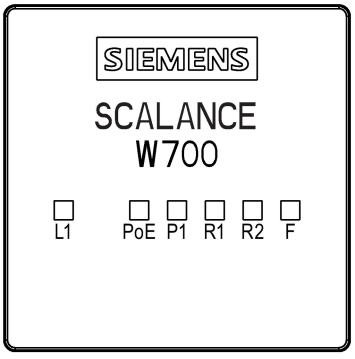
Notice for USA/Canada

Only one antenna per device can be used (connected to R1A1, R1A2 or R2A1, R2A2).

3.5 LED display

Information on operating status and data transfer

On the front of the housing, several LEDs provide information on the operating status of the SCALANCE W7x8:

LEDs with RJ-45 variants	LEDs with M12 variants
	

Note

The "R2" LED only exists on devices with two IWLAN interfaces.

LED	Color	Meaning
L1	Off	Power supply too low
	Green	Power supply L1.
L2	Off	Power supply too low
	Green	Power supply L2. NOT WITH M12 VARIANTS.
PoE	Green	Power supply using Power over Ethernet.
P1	Green	There is a connection via the Ethernet interface (Link).
	Green and yellow flashing alternately	Data transfer via the Ethernet interface.

LED	Color	Meaning
R1	Green	*SCALANCE W7x8 in access point mode:* The WLAN interface is initialized and ready for operation. *SCALANCE W7x8 in client Mode:* There is a connection over the first WLAN interface.
	Green and yellow flashing alternately	Data transfer over the first WLAN interface.
	Flashing fast yellow	*SCALANCE W7x8 in access point mode:* With 802.11h, the channel is scanned for one minute for primary users before the channel can be used for data traffic. *SCALANCE W7x8 in client mode:* The client waits for the MAC address due to the setting "Automatic" for the "MAC mode" parameter and is connected to no access point.
	Yellow flashing 3 x short, 1 x long	*SCALANCE W7x8 in client mode:* The client waits for the MAC address due to the setting "Automatic" for the "MAC mode" parameter and is connected to an access point.
R2	Green	*SCALANCE W7x8 in access point mode:* The WLAN interface is initialized and ready for operation. *SCALANCE W7x8 in client mode:* The LED is always off because the 2nd interface is not available in client mode.
	Green and yellow flashing alternately	*SCALANCE W7x8 in access point mode:* Data transfer over the second WLAN interface. *SCALANCE W7x8 in client mode:* The LED is always off because the 2nd interface is not available in client mode.
	Flashing fast yellow	*SCALANCE W7x8 in access point mode:* With 802.11h, the channel is scanned for one minute for primary users before the channel can be used for data traffic. *SCALANCE W7x8 in client mode:* The LED is always off because the 2nd interface is not available in client mode.

LED	Color	Meaning
F	Red	An error occurred during operation with the SCALANCE W7x8.
	Red R1 or R2 flashing yellow simultaneously	A primary user was found on all enabled channels.
P1 R1 R2	Flashing yellow	"Flashing" enabled using SIMATIC NET Primary Setup Tool (PST).

Note

Primary user (radar) on all enabled channels

If the device detects a primary user (for example radar signals) on all enabled channels of WLAN interface 1, the LEDs **F** and **R1**/**R2** flash. No data traffic is then possible for the next 30 minutes. After this time, the device runs the scan again and checks whether a primary user still exists. If no primary user is detected, data traffic is possible again.

The wait time of 30 minutes is necessary due to legal requirements and cannot be shortened even by restarting the device.

3.6 Reset button

Position

NOTICE
Loss of water and dust protection
If the cover is not mounted correctly, the device is not water and dust proof.

The Reset button is located behind the screw-down cover on the underside of the housing, see Device description (Page 11).

Functions

The reset button has the following functions:

- **Restart of the device**

  To restart the device, press the Reset button briefly.

  Note

  If you make changes to the configuration and restart immediately afterwards with the reset button, the changes may be lost. If you restart the device using the WBM (menu command "System > Restart") or using the CLI (command "restart" in the Privileged EXEC Modus), the configuration changes are always retained.

- **Loading new firmware**

  If the "Load & Save" menu command of Web Based Management is unsuccessful, the reset button can be used to load new firmware. This situation can occur if there is a power outage during the normal firmware update. You will find further information in the configuration manual in Downloading new firmware using TFTP without WBM and CLI (Page 48).

- **Resetting the device to the factory defaults**

  The device can be reset to the factory defaults during operation. You will find more detailed information in the configuration manual in Resetting the device to factory defaults (Page 47).

NOTICE
Previous settings
If you reset, all the changes you have made will be overwritten by factory defaults.

NOTICE
Inadvertent reset
An inadvertent reset can cause disturbances and failures in the configured network with further consequences.

Mounting

4

CAUTION

Minimum distance to antennas

Fit the device so that there is a minimum clearance of 20 cm between antennas and persons.

WARNING

If a device is operated in an ambient temperature of more than 50 °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 50 °C.

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.

General notes on use according to ATEX and IECEx

WARNING

To comply with EC Directive 2014/34/EU (ATEX 114) or the conditions of IECEx, this enclosure or cabinet must meet the requirements of at least IP54 in compliance with EN 60529.

4.1 Securing the housing

Grounding connector

⚠ WARNING

Operation of the W7x8 only with connected grounding cable

To operate the SCALANCE W7x8 safely, the housing must make contact with a grounding cable. Do not use the SCALANCE W7x8 without a grounding cable connected.

The grounding cable is fixed to the housing with a screw. On the rear of the device there is an M4 threaded hole for this purpose, seeDrilling pattern (Page 29).

Mount the grounding cable before you mount the device

Installation options

To install the W7x8, you have the following options:

- Wall mounting
- Installing on the S7-300 standard rail
- Installing on a DIN rail

⚠ CAUTION

Danger of injury by falling objects

If the SCALANCE W7x8 is subjected to strong vibration (> 10 g), mounting on a 35 mm DIN rail does not provide adequate support. Under such conditions, the device can come out of the mounting and may cause injury.

In this case, install the device on an S7-300 standard rail or on a wall.

Installation location

There are no restrictions regarding the installation location for the device. Antennas, in particular directional antennas, must be mounted according to their characteristics.

Note

- If you are installing outdoors, use the SCALANCE W786.

- The minimum distance to fluorescent lamps should be 0.5 m.

- When installed in a cabinet, we recommend that you do not install relays on the same or on directly neighboring mounting rails.

4.2 Wall mounting

Use the holes in the housing to screw the device to the wall or on a horizontal surface. The location of the holes can be seen in the following figure:

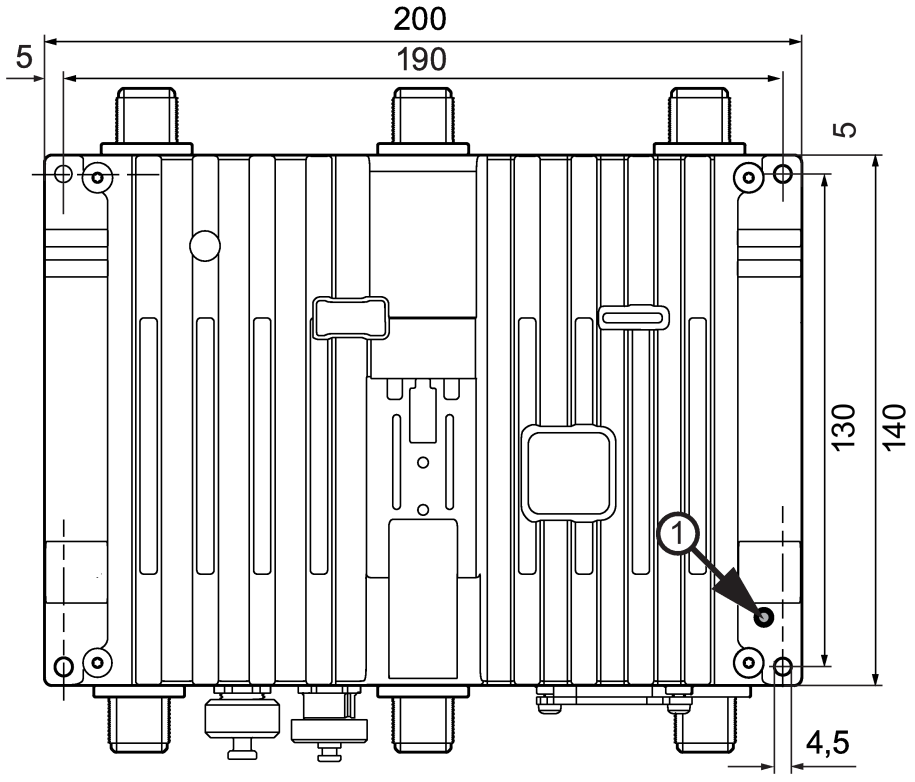


Figure 4-1 Drilling pattern (dimensions in mm)

① Ground connector (thread M4)

4.3 Installing on the S7-300 standard rail

Follow the steps below to install the SCALANCE W7x8 on a vertical S7-300 rail:

1. Place the device on the upper edge of the S7-300 standard rail (position A).
2. Screw the device to the rail using the supplied screw (position B).

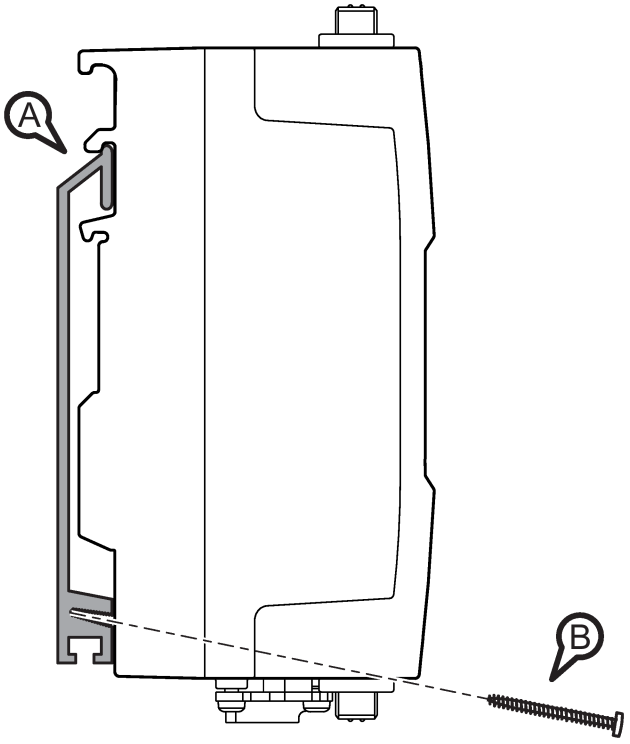


Figure 4-2 Installing on an S7-300 standard rail

4.4 Installing on a DIN rail

The SCALANCE W7x8 is suitable for rail mounting on 35 mm DIN EN 50022 rails.

Bracket for DIN rail mounting

Note

The bracket for installation on a DIN rail does not ship with the product, seeAccessories (Page 15).

The bracket consists of the following parts:

- 1 DIN rail slider
- 1 spring
- 2 screws

Mount the bracket on the rear of the device as shown in the figure below:

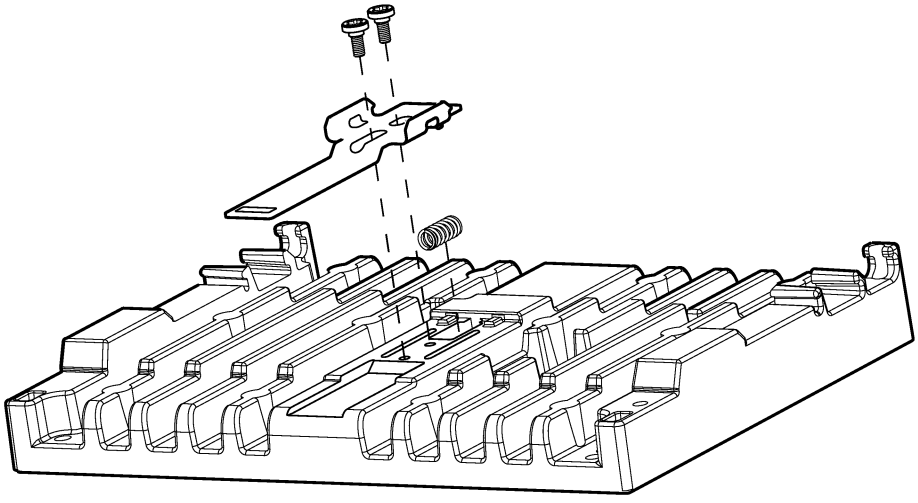


Figure 4-3 Fitting the DIN rail slider

Installing on the DIN rail

The following figure shows the W7x8 mounted on a DIN rail. Follow the steps outlined below:

1. Place the device on the upper edge of the DIN rail (position A).
2. Pull the spring-mounted DIN rail slider (position B) down and press the device against the DIN rail until it locks in place.

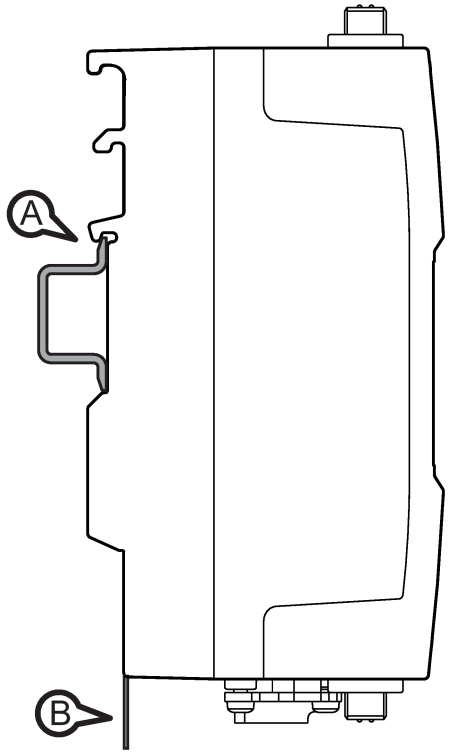


Figure 4-4 Installing on a DIN rail

Connecting up

5

5.1 Safety when connecting up

Safety notices

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

⚠ WARNING

EXPLOSION HAZARD

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

⚠ WARNING

EXPLOSION HAZARD

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

Note

Strain relief of the interfaces

To prevent weights or mechanical movement that can affect an interface causing interrupted contact, fix the cables to a cable guide or rail at short intervals.

Note

Close unused sockets

Close all unused M12 sockets with protective caps (torque at least 0.4 Nm) to achieve the specified type of protection.

5.2 Lightning protection, power supply and grounding

Lightning protection



WARNING

Danger due to lightning strikes

Antennas installed outdoors must be within the area covered by a lightning protection system. Make sure that all conducting systems entering from outdoors can be protected by a lightning protection potential equalization system.

When implementing your lightning protection concept, make sure you adhere to the VDE 0182 or IEC 62305 standard.

Suitable lightning protectors are available in the accessories (Page 15) of SIMATIC NET Industrial WLAN.

Note

We recommend that you use the maintenance-free lightning protector LP798-2N.

Exception: When there is also DC power supplied via the antenna cable. In this case, only the lightning protector LP798-1N can be used.



WARNING

Danger due to lightning strikes

Installing this lightning protector between an antenna and a SCALANCE W700 is not adequate protection against a lightning strike. The LP798-1N lightening protector only works within the framework of a comprehensive lightning protection concept. If you have questions, ask a qualified specialist company.

Note

The requirements of EN61000-4-5, surge immunity tests on power supply lines, are met only when a Blitzductor is used with 24 VDC:

BVT AVD 24
type No. 918 422
manufacturer: DEHN+SÖHNE GmbH+Co.KG, Hans Dehn Str. 1, Postfach 1640, D - 92306 Neumarkt, Germany

Supply voltage

⚠ WARNING

Safety extra low voltage

The equipment is designed for operation with Safety Extra-Low Voltage (SELV) by a Limited Power Source (LPS).

This means that only SELV / LPS (Limited Power Source) complying with IEC 60950-1 / EN 60950-1 / VDE 0805-1 must be connected to the power supply terminals or the power supply unit for the equipment power supply must comply with NEC Class 2, as described by the National Electrical Code (r) (ANSI / NFPA 70).

If the equipment is connected to a redundant power supply (two separate power supplies), both must meet these requirements.

⚠ WARNING

Transient overvoltages

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

Grounding



⚠ WARNING

Danger to life from overvoltage, fire hazard

When using outdoor antennas, the shared or even grounded pin of the circuit must be connected to the shield of the coaxial cable and with all touchable conductive parts and circuits. Otherwise, in the event of a fault there may be illegally high voltages on touchable parts.

NOTICE

Damage to the device due to potential differences

To fully eliminate the influence of electromagnetic interference, the device must be grounded. There must be no potential difference between the following parts, otherwise the device or other connected device could be severely damaged:

- Housing of the SCALANCE W700 and the ground potential of the antenna.
- Housing of the SCALANCE W700 and the ground potential of a device connected over Ethernet.
- Housing of the SCALANCE W700 and the shield contact of the connected Ethernet cable.

Connect both grounds to the same foundation earth or use an equipotential bonding cable.

General notes on use according to ATEX and IECEx

WARNING

EXPLOSION HAZARD

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

WARNING

EXPLOSION HAZARD

Do not press the reset button if there is a potentially explosive atmosphere.

WARNING

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

General notes on use in hazardous areas according to UL-HazLoc

WARNING

EXPLOSION HAZARD

Do not connect or disconnect while the circuit is live or unless the area is known to be free of ignitible concentrations.

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

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

5.3 Power supply and Ethernet

Connecting the power supply

Models RJ-45 / degree of protection IP30

The four-pin connecting socket has the following pin assignment:

Pin	Signal	Description
1	L1+	24 VDC
2	M1	Ground
3	M2	Ground
4	L2+	24 VDC

The M12 socket for the power supply has the following pin assignment:

Pin	Signal	Description
1	L1	24 VDC
-	-	-
3	M1	Ground
-	-	-

Power over Ethernet (PoE)

With the SCALANCE W7x8, power supply using Power over Ethernet (PoE) is also possible. The devices support the standards 802.3at type 1 (IEEE 802.3af) and IEEE 803.at type 2.

- Gigabit Ethernet

  When you connect to gigabit Ethernet, the power supply is a phantom power supply over data wires 1, 2, 3 and 6. This corresponds to alternative A according to IEEE 802.3af.

- Fast Ethernet

  On an 8-wire Fast Ethernet cable, the power is supplied via the free data wires 4, 5, 7 and 8. This corresponds to alternative B according to IEEE 802.3af.

Note

Disabling the PoE power supply

Before you pull a plug via which the device is supplied with power using PoE, disable the relevant PoE power supply.

Note

No power sourcing equipment (PSE)

The W7x8 cannot be used as a PoE power supply for other devices.

Note

Grounding connector

The device has a grounding connector on the back of the device (screw M4), see position ① in the drilling pattern (Page 29). Connect the grounding cable before you mount the device. Refer to the information in the section Mounting (Page 27).

Ethernet connector

Depending on the model, the connection of the SCALANCE W7x8 to Ethernet is either via an RJ-45 interface or via an M12 interface.

5.4 Antenna connectors

Note

Tightening torque

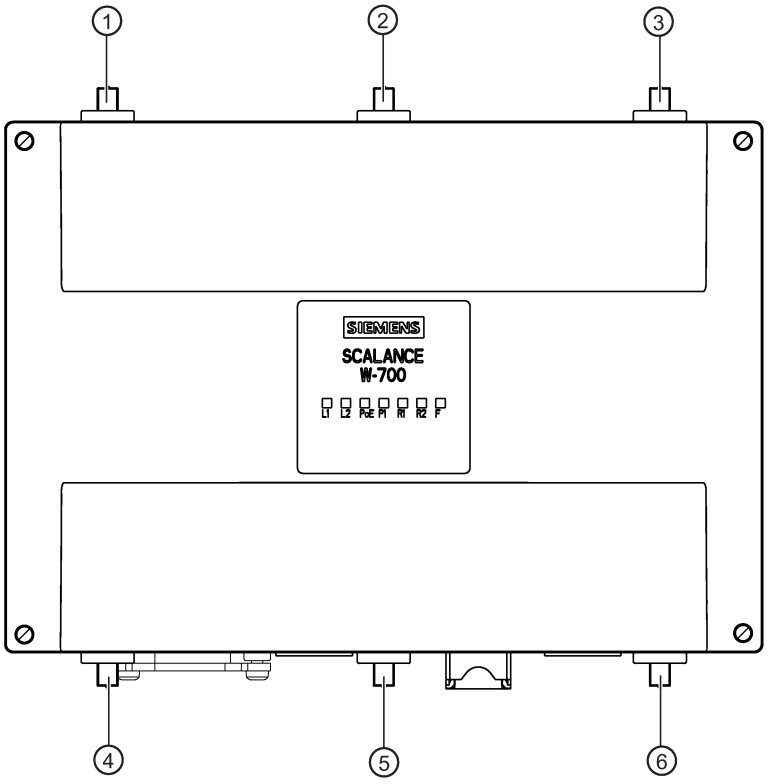
The following tightening torques apply to the connectors:

- with N-Connect connectors: 1.7 Nm
- with SMA/R-SMA connectors: 1 Nm

R-SMA for degree of protection IP30

The variants of the SCALANCE W7x8 RJ-45 have antenna sockets of the type R-SMA:

- Variants with an IWLAN interface (W7x8-1) have 3 antenna sockets on the top of the device.
- Variants with two IWLAN interfaces (W788-2) have 6 antenna sockets, 3 on the top and 3 on the underside of the device.



① R1A1
② R1A2
③ R1A3
④ R2A1
⑤ R2A2
⑥ R2A3

Figure 5-1 Antenna connector IP30

N-Connect for degree of protection IP65

The variants of the SCALANCE W7x8 M12 have antenna sockets of the type N-Connect:

- Variants with an IWLAN interface (W7x8-1) have 3 antenna sockets on the top of the device.
- Variants with two IWLAN interfaces (W788-2) have 6 antenna sockets, 3 on the top and 3 on the underside of the device.

Note

Cabinet installation

When installing the SCALANCE W7x8 in a cabinet, you need to use detached antennas. A suitable flexible connecting cable for a connection between SCALANCE W778/W738 and a detached antenna are available from SIMATIC NET. You will find detailed information in the section Flexible connecting cables and antennas (Page 18).

Note

If both interfaces of access points with two IWLAN interfaces are operated in the same frequency range,

- the distance between the antennas connected to R1A1, R1A2, R1A3 and those connected to R2A1, R2A2, R2A3 must be at least 1 m.
- there may be wireless interference on one or both IWLAN interfaces if the transmit power is higher than 15 dB.

Note

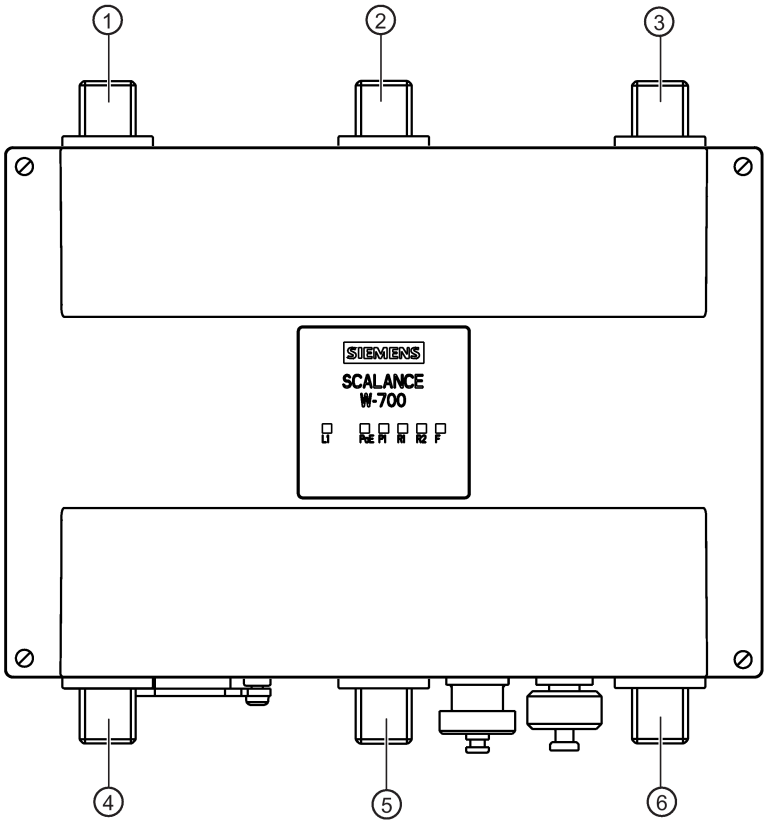
Terminating resistor

Each WLAN interface has three antenna connectors. Connectors that are not used must have a terminating resistor fitted, see Accessories.

The antennas R1A1 and R2A1 must be always be connected as soon as the associated WLAN Interface is turned on. if no antenna is connected, the relevant interface must also be disabled for RX and TX. Otherwise, there may be transmission disruptions.

You will find information on the configuration of the antennas in the following documents:

- SCALANCE W7x8
  SCALANCE W700 configuration manual, section "Configuring antennas"
- SCALANCE W7x8C
  SCALANCE WLC711 User Guide, section "Configuring wireless AP radio properties"



① R1A1
② R1A2
③ R1A3
④ R2A1
⑤ R2A2
⑥ R2A3

Figure 5-2 Antenna connector IP65

5.5 Digital input/output

A digital input/output is only available with the RJ-45 variants.

The digital input/output (relay contact) is a floating switch with which error/fault states can be signaled by breaking the contact.

NOTICE
Damage due to voltage being too high or too low The voltage at the digital input/output must not exceed 30 VDC and not fall below -30 VDC, otherwise the digital input/output will be destroyed.

The digital input/output is connected to a 4-pin plug-in terminal block with the following pin assignment:

Pin	Signal	Function
1	DQ (output)	Relay 24 VDC / 1 A
2	1L (output)	Relay 24 VDC / 1 A
3	DI (input plus)	24 VDC
4	1M (input ground)	-

5.6 Replacing the PLUG (C-PLUG or KEY-PLUG)

NOTICE
Do not remove or insert a C-PLUG / KEY-PLUG during operation!
A PLUG may only be removed or inserted when the device is turned off.
The device checks whether or not a PLUG is inserted at one second intervals. If it is detected that the PLUG was removed, there is a restart.
If a KEY-PLUG was inserted in the device, the device changes to a defined error state following the restart. With SCALANCE W, the available wireless interfaces are deactivated in this case.

NOTICE
Loss of water and dust protection
If the cover is not mounted correctly, the device is not water and dust proof.

How it works

If a new C-PLUG or KEY-PLUG with a valid license is inserted in a SCALANCE W7x8, the configuration stored locally on the device is saved on the PLUG.

If an incorrect PLUG, for example from another product or a damaged plug is inserted, the device signals an error with the red LED. The user then has the choice of either removing the PLUG again or selecting the option to reformat the PLUG.

In terms of the PLUG, the WLAN devices work in two modes:

- Without PLUG

  The device stores the configuration in internal memory. This mode is active when no PLUG is inserted.

- With PLUG

  The configuration stored on the PLUG is displayed over the user interfaces. If changes are made to the configuration, the device stores the configuration directly on the PLUG and in the internal memory. This mode is active as soon as a PLUG is inserted. As soon as the device is started with a PLUG inserted, the SCALANCE W700 starts up with the configuration data on the PLUG.

Position

The PLUG slot is on the top of the device housing under a cover, see Device description (Page 11).

Removing the PLUG

Follow the steps below to remove a PLUG from the device:

1. Turn off the power to the device.
2. Remove the cover of the PLUG on the underside of the device.
3. Insert a screwdriver between the front edge of the PLUG and the slot and release the PLUG.
4. Remove the PLUG from the slot.
5. Screw the cover back onto the device.

Inserting the PLUG

Follow the steps below to insert a PLUG in the device:

1. Turn off the power to the device.
2. Remove the cover of the PLUG on the underside of the device.
3. The housing of the PLUG has a protruding ridge on the long side. The slot has a groove at this position. Insert the PLUG correctly oriented into the slot. The PLUG is correctly inserted when it is completely inside the device and does not jut out of the slot.
4. Screw the cover back onto the device.

Licenses on the KEY-PLUG

A C-PLUG only stores information about the configuration of a device. In addition to the configuration, a KEY-PLUG also contains a license with which you can enable special functions, for example iFeatures. You will find the article numbers in Accessories (Page 15).

Upkeep and maintenance 6

6.1 Restoring the factory settings

NOTICE
Previous settings If you reset, all the settings you have made will be overwritten by factory defaults.

NOTICE
Inadvertent reset An inadvertent reset can cause disturbances and failures in a configured network with further consequences.

With the reset button

When pressing the button, remember the information in the section "Reset button (Page 25)" in the operating instructions.

Follow the steps below to reset the device parameters to the factory settings:

1. Turn off the power to the device.
2. Loosen the screws of the cover.
3. Remove the cover.
4. Now press the Reset button and reconnect the power to the device while holding down the button.
5. Hold down the button until the red fault LED (F) stops flashing after approximately 10 seconds and is permanently lit.
6. Now release the button and wait until the fault LED (F) goes off again.
7. The device then starts automatically with the factory settings.

Via the configuration

You will find detailed information on resetting the device parameters using the WBM and CLI in the configuration manuals:

- Web Based Management, section "Restart"
- Command Line Interface, section "Reset and Defaults"

6.2 Firmware update via WBM or CLI not possible

Cause

If there is a power failure during the firmware update, it is possible that the device is no longer accessible using Web Based Management or the CLI.

When pressing the button, make sure you adhere to the instructions in the section "Reset button".

Solution

You can then also assign firmware to a SCALANCE W700 using TFTP.
Follow the steps below to load new firmware using TFTP:

1. Turn off the power to the device.
2. Now press the Reset button and reconnect the power to the device while holding down the button.
3. Hold down the button until the red fault LED (F) starts to flash after approximately 2 seconds.
4. Now release the button. The bootloader waits in this state for a new firmware file that you can download by TFTP.
5. Connect a PC to the SCALANCE W700 over the Ethernet interface.
6. Assign an IP address to the SCALANCE W700 with the Primary Setup Tool.
7. Open a DOS box and change to the directory where the file with the new firmware is located and then execute the command "tftp -i <ip address> PUT <firmware>". As an alternative, you can use a different TFTP client.
8. Close the cover to ensure that the device is closed and water and dust proof.

Note

Use of CLI and TFTP in Windows 7

If you want to access the CLI or TFTP in Windows 7, make sure that the relevant functions are enabled in Windows 7.

Result

The firmware is transferred to the device.

Note

Please note that the transfer of the firmware can take several minutes. During the transmission, the red error LED (F) flashes.

Once the firmware has been transferred completely to the device, the device is restarted automatically.

Technical specifications

7

7.1 Technical specifications of the SCALANCE W7x8-1)

The following technical specifications apply to the following devices:

- SCALANCE W788-1 RJ45
- SCALANCE W788-1 M12
- SCALANCE W748-1 RJ45
- SCALANCE W748-1 M12

Note

Bridging a power outage is possible only with an input voltage of 24 VDC (-15% to +20%).

Note

You will find detailed information on the transmit power and receiver sensitivity in the document "Leistungsdaten 802.11abgn PCIe Minicard / Characteristics 802.11abgn PCIe Minicard" (REF_W700-RadioInterface.pdf).

Technical specifications		
Data transfer		
Ethernet transfer rate		10 / 100 / 1000 Mbps
Wireless transmission rate		1 ... 450 Mbps
Wireless standards supported		IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11h IEEE 802.11n
Power supply standards supported	Type	IEEE 802.3at type 1 (802.3af) IEEE 802.3at type 2 (Power over Ethernet)
	Class	Class 3 *)
Attachment to Industrial Ethernet		
RJ-45 variants	Quantity	1
	Design	RJ-45 jack
	Properties	Half duplex/full duplex, autocrossover, autonegotiation, autosensing, PoE, floating
M12 variants	Quantity	1
	Design	M12 socket
	Properties	Half duplex/full duplex, autocrossover, autonegotiation, autosensing, PoE, floating

Technical specifications		
Permitted cable lengths (Ethernet)	**(Alternative combinations per length range)**	
	IE TP torsion cable	0 ... 55 m
		0 ... 45 m + 10 m TP cord
	IE FC TP marine cable IE FC TP trailing cable IE FC TP flexible cable IE FC TP FRNC cable IE FC TP festoon cable IE FC TP food cable	0 ... 85 m 0 ... 75 m + 10 m TP cord
	IE FC TP standard cable	0 ... 100 m
		0 ... 90 m + 10 m TP cord
Wireless interface		
IWLAN interface	Quantity	1
Antenna connector	Quantity	3
	Design • RJ-45 variants • M12 variants	 • R-SMA female • N Connect, female
	Impedance	50 Ω nominal
Frequency range		2412 ... 2480 MHz 4920 ... 5875 MHz
Electrical data		
Power supply	Direct 24 VDC supply • Supply voltage from terminal block/socket • Permitted range • Design – RJ-45 variants – M12 variants • Properties	 • 24 VDC Safe Extra Low Voltage (SELV) • 19.2 to 28.8 VDC – Terminal block, 4 terminals – M12 connectors • Not electrically isolated
	Supply voltage from PoE • Supply voltage from terminal block/socket • Permitted range • Design • Properties	 • 48 VDC • 36 to 57 VDC • Via RJ-45 jacks • Electrically isolating Corresponding to IEEE802.3at Insulation resistance > 2 MOhms
Fusing		2.5 A / 24 VDC
		1 A / 48 VDC PoE
Current consumption	At 24 VDC / max.	650 mA

Technical specifications		
Effective power loss	At 24 VDC / max.	15.6 W
	At 24 VDC / typical	10.7 W
Digital input	Quantity	1
	Design	Terminal block, 2 terminals
	Status "0"	13 to 30 VDC
	Status "1"	-30 to 3 VDC
	Max. input current	8 mA
	Max. cable length	30 m
	Properties	Inputs isolated from electronics.
Permitted ambient conditions		
Ambient temperature	During operation	-20 ℃ to +60 °C
	During storage	-40 ℃ to +70 °C
	During transportation	-40 °C to +70 °C
Relative humidity	During operation	≤ 95% at 25 °C, no condensation
Operating altitude	During operation	≤ 2,000 m above sea level at max. 60 °C ambient temperature
Contaminant concentration	According to IEC 60721	
Design, dimensions and weight		
Degree of protection		
• RJ-45 variants	• IP30	
• M12 variants	• IP65	
Weight	1.7 kg	
Dimensions (W x H x D)		
• RJ-45 variants	• 158 x 200 x 79 mm	
• M12 variants	• 175.2 x 200 x 79 mm	
Installation options	• Wall mounting • Mounting on an S7-1500 standard rail With additional holding plate • Mast mounting • Mounting on a DIN rail • Mounting on an S7-300 standard rail	
Mean time between failure (MTBF)		
	At 40 °C ambient temperature	41 years

*) The PoE class depends on the hardware version of the device. Devices with a hardware version ≥ 3 have PoE class 3. Devices with a lower hardware version have PoE class 4.

7.2 Technical specifications of the SCALANCE W7x8-2)

The following technical specifications apply to the following devices:

- SCALANCE W788-2 RJ45
- SCALANCE W788-2 M12
- SCALANCE W788-2 M12 EEC

Note

Bridging a power outage is possible only with an input voltage of 24 VDC (-15% to +20%).

Note

You will find detailed information on the transmit power and receiver sensitivity in the document "Leistungsdaten 802.11abgn PCIe Minicard / Characteristics 802.11abgn PCIe Minicard" (REF_W700-RadioInterface.pdf).

Technical specifications		
Data transfer		
Ethernet transfer rate		10 / 100 / 1000 Mbps
Wireless transmission rate		1 ... 450 Mbps
Wireless standards supported		IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11h IEEE 802.11n
Power supply standards supported	Type	IEEE 802.3at type 1 (802.3af) IEEE 802.3at type 2 (Power over Ethernet)
	Class	Class 4
Attachment to Industrial Ethernet		
RJ-45 variants	Quantity	1
	Design	RJ-45 jack
	Properties	Half duplex/full duplex, autocrossover, autonegotiation, autosensing, PoE, floating
M12 variants	Quantity	1
	Design	M12 socket
	Properties	Half duplex/full duplex, autocrossover, autonegotiation, autosensing, PoE, floating

Technical specifications		
Permitted cable lengths (Ethernet)	**(Alternative combinations per length range)**	
	IE TP torsion cable	0 ... 55 m
		0 ... 45 m + 10 m TP cord
	IE FC TP marine cable	0 ... 85 m
	IE FC TP trailing cable IE FC TP flexible cable IE FC TP FRNC cable IE FC TP festoon cable IE FC TP food cable	0 ... 75 m + 10 m TP cord
	IE FC TP standard cable	0 ... 100 m
		0 ... 90 m + 10 m TP cord
Wireless interface		
IWLAN interface	Quantity	2
Antenna connector	Quantity	6
	Design • RJ-45 variants • M12 variants	• R-SMA female • N Connect, female
	Impedance	50 Ω nominal
Frequency range		2412 ... 2480 MHz 4920 ... 5875 MHz
Electrical data		
Power supply	Direct 24 VDC supply • Supply voltage from terminal block/socket • Permitted range – Non EEC variants – EEC variants • Design – RJ-45 variants – M12 variants • Properties	• 24 VDC Safe Extra Low Voltage (SELV) – 19.2 to 28.8 VDC – 16.8... 31.2 VDC (UL approvals only valid for 19.2 ... 28.8 VDC) – Terminal block, 4 terminals – M12 connectors • Not electrically isolated
	Supply voltage from PoE • Supply voltage from terminal block/socket • Permitted range • Design • Properties	• 48 VDC • 36 to 57 VDC • Via RJ-45 jacks • Electrically isolating Corresponding to IEEE802.3at Insulation resistance > 2 MOhms

Technical specifications		
Fusing		2.5 A / 24 VDC
		1 A / 48 VDC PoE
Current consumption	At 24 VDC / max.	650 mA
Effective power loss	At 24 VDC / max.	15.6 W
	At 24 VDC / typical	15 W
Digital input	Quantity	1
	Design	Terminal block, 2 terminals
	Status "0"	13 ... 30 VDC
	Status "1"	-30 to 3 VDC
	Max. input current	8 mA
	Max. cable length	30 m
	Properties	Inputs isolated from electronics.
Permitted ambient conditions		
Ambient temperature	During operation	-20 ℃ to +60 °C
	During storage	-40 ℃ to +70 °C
	During transportation	-40 °C to +70 °C
Relative humidity	During operation	≤ 95% at 25 °C, no condensation
Operating altitude	During operation	≤ 2,000 m above sea level at max. 60 °C ambient temperature
Contaminant concentration	According to IEC 60721	
Design, dimensions and weight		
Degree of protection		
• RJ-45 variants	• IP30	
• M12 variants	• IP65	
Weight	1.7 kg	
Dimensions (W x H x D)		
• RJ-45 variants	• 158 x 200 x 79 mm	
• M12 variants	• 175.2 x 200 x 79 mm	
Installation options	• Wall mounting • Mounting on an S7-1500 standard rail With additional holding plate • Mast mounting • Mounting on a DIN rail • Mounting on an S7-300 standard rail	
Mean time between failure (MTBF)		
	At 40 °C ambient temperature	41 years

Dimension drawings

8

The following dimensions are specified in mm.

Dimension drawing of the SCALANCE W7x8-2 RJ45 (degree of protection IP30)

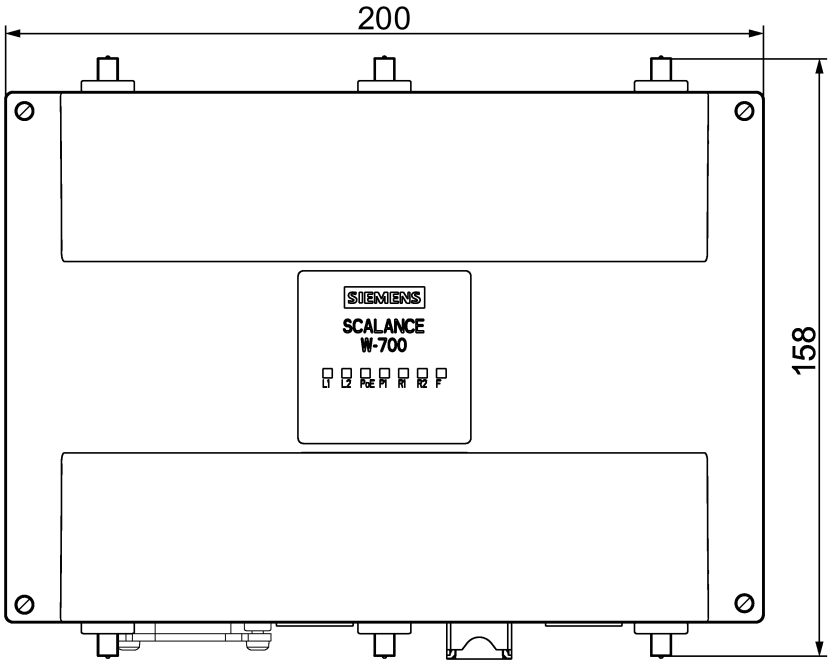


Figure 8-1 Front view RJ-45

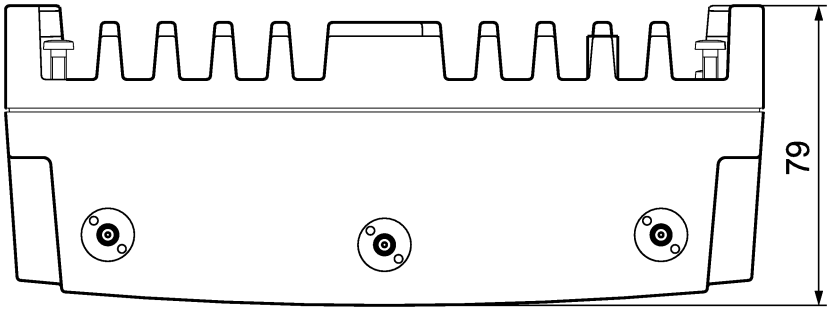


Figure 8-2 View from above RJ-45

Dimension drawing of the SCALANCE W7x8-2 M12 (degree of protection IP65)

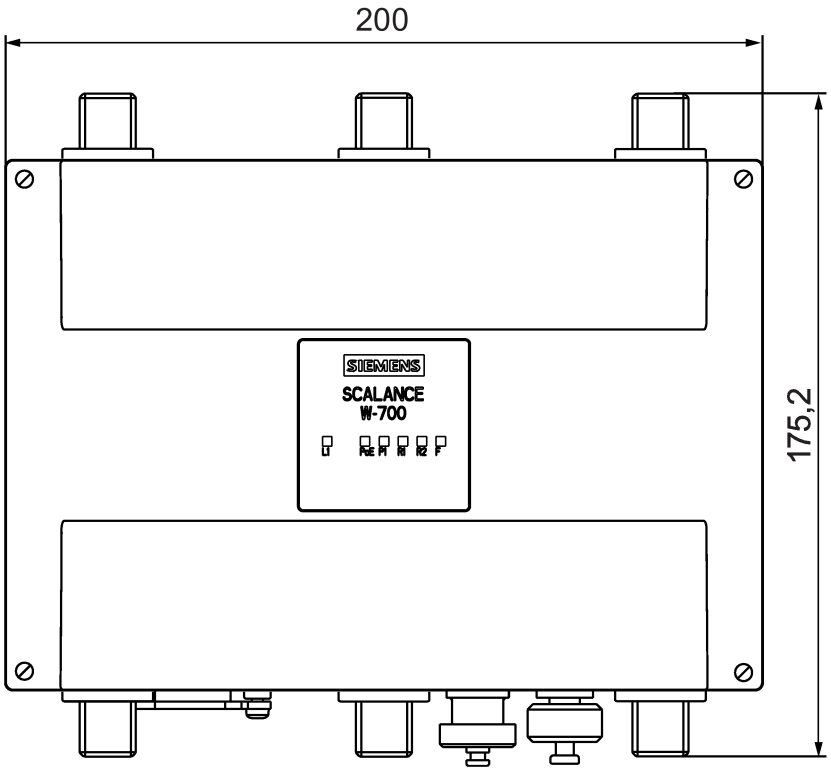


Figure 8-3 Front view M12

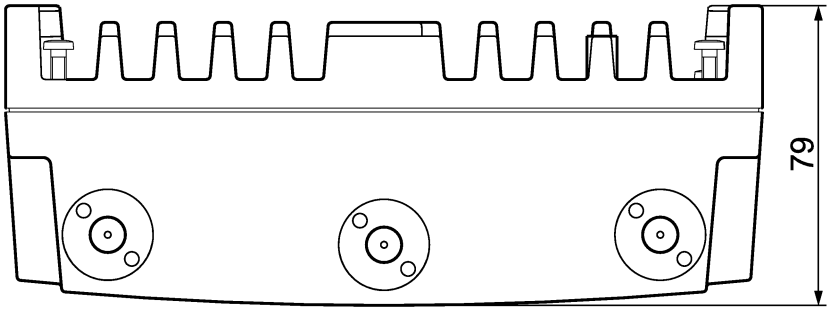


Figure 8-4 View from above M12

Certification

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You will find the approvals of the products in the reference work "Approvals SCALANCE W700 802.11n" on the Internet pages of Siemens Industry Online Support:

- Using the search function:

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

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

- In the navigation panel on the left-hand side in the area "Industrial Communication":

  Industrial communication (http://support.automation.siemens.com/WW/view/en/10805878/133300)

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

  "Entry list" tab, Entry type "Manuals / Operating Instructions"

You will find the documentation for the SIMATIC NET products relevant here on the data storage medium that ships with some products:

- Product CD / product DVD
- SIMATIC NET Manual Collection
- SIMATIC NET IWLAN CD

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