

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

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

1.1 Information on the Operating Instructions

Validity of the Operating Instructions

These operating instructions cover the following products:

Product	Article number	Article number US version	Article number 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	6GK5 788-2GD00-0TC0
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 6.3

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 DVD

You can find detailed information about configuration in the SCALANCE W700 configuration manuals on the accompanying DVD 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 constitute one element of such a concept.

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

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

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

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

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:

SIMATIC NET, SCALANCE, C-PLUG, RCoax

Security recommendations

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 (<https://www.industry.siemens.com/topics/global/en/industrial-security/pages/default.aspx>).
- 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 firmware up to date. Check regularly for security updates of the product. You will find information on this on the Internet pages "Industrial Security (<https://www.siemens.com/industrialsecurity>)".
- Inform yourself regularly about security advisories and bulletins published by Siemens ProductCERT (<https://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.

- Use a central logging server to log changes and access operations. Operate your logging server within the protected network area and check the logging information regularly.
- 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 and services

- 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.
- Check whether use of the following protocols and services is necessary:
 - Non-authenticated and unencrypted ports
 - LLDP
 - Syslog
 - DHCP options 66/67
 - TFTP
- The following protocols provide secure alternatives:
 - SNMPv1/v2c → SNMPv3
Check whether use of SNMPv1/v2c is necessary. SNMPv1/v2c 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
 - TFTP → SFTP
- 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.
- For the DCP function, enable the "Read Only" mode after commissioning.

List of available services

The following is a list of all available services and their ports through which the device can be accessed.

The table includes the following columns:

- **Service**

The services that the device supports

- **Default port status**

This is the status of the port in the delivery state (factory setting).

- **Configurable port/service**

Indicates whether the port number or the service can be configured via WBM / CLI.

- **Authentication**

Specifies whether the communication partner is authenticated.

If optional, the authentication can be configured as required.

- **Encryption**

Specifies whether the transfer is encrypted.

If optional, the encryption can be configured as required.

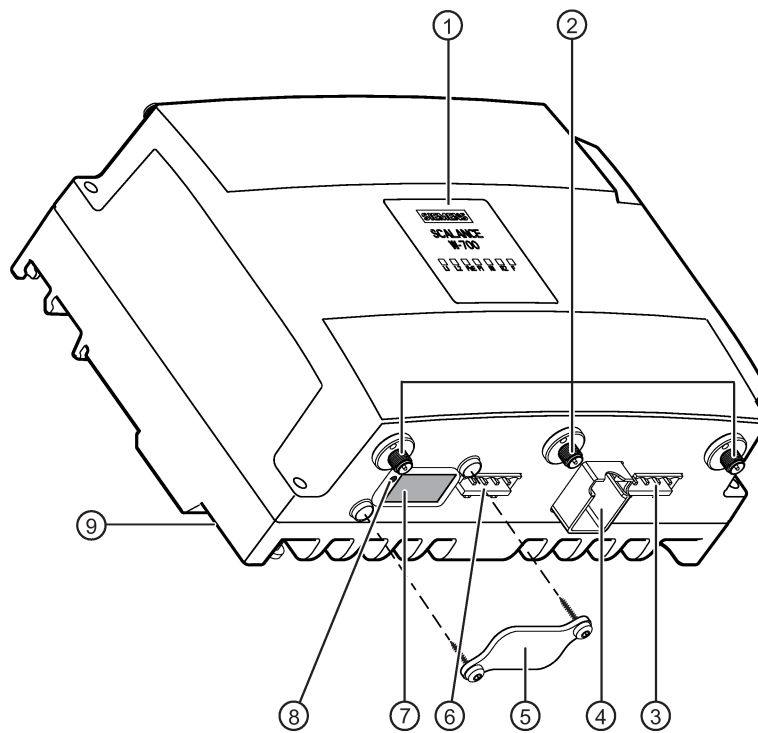
Service	Protocol/port number	Default port status	Configurable		Authentication	Encryption
			Port	Service		
DHCP client	UDP/68	Outgoing only	--	✓	--	--
DHCP server	UDP/67	Closed	--	✓	--	--
DNS client	TCP/53 UDP/53	Outgoing only	--	✓	--	--
EthernetIP	TCP/44818, UDP/2222 UDP/44818	Closed	--	✓	--	--
HTTP	TCP/80	Open	✓	✓	✓	--
HTTPS	TCP/443	Open	✓	✓	✓	✓
NTP Client	UDP/123	Outgoing only	✓	✓	--	--
PROFINET	UDP/34964 UDP/49154 UDP/49155	Open	--	✓	--	--
RADIUS	UDP/1812	Closed	✓	✓	✓	--
Remote Capture	TCP/2002	Closed	--	✓	--	--
SFTP client	TCP/22	Closed	✓	✓	✓	✓
SMTP client	TCP/25	Closed	✓	✓	--	--
SNMPv1/V2c	UDP/161	Open	✓	✓	--	--
SNMPv3	UDP/161	Open	✓	✓	Optional	Optional
SNMP traps	UDP/162	Outgoing only	--	✓	--	--
SNTP Client	UDP/123	Outgoing only	✓	✓	--	--
SSH	TCP/22	Open	✓	✓	✓	✓
Syslog Client	UDP/514	Closed	✓	✓	--	--
Telnet	TCP/23	Open	✓	✓	✓	--
TFTP client	UDP/69	Closed	✓	✓	--	--
DCP	--	Open	--	✓	--	--
LLDP	--	Open	--	✓	--	--
RSTP	--	Open	--	✓	--	--
iPRP	--	Open	--	✓	--	--
MSTP	--	Closed	--	✓	--	--

Service	Protocol/port number	Default port status	Configurable		Authentication	Encryption
			Port	Service		
IPv6	--	Closed	--	✓	--	--
SIMATIC NET TIME	--	Closed	--	✓	--	--

Description of the device

3.1 Description of the device

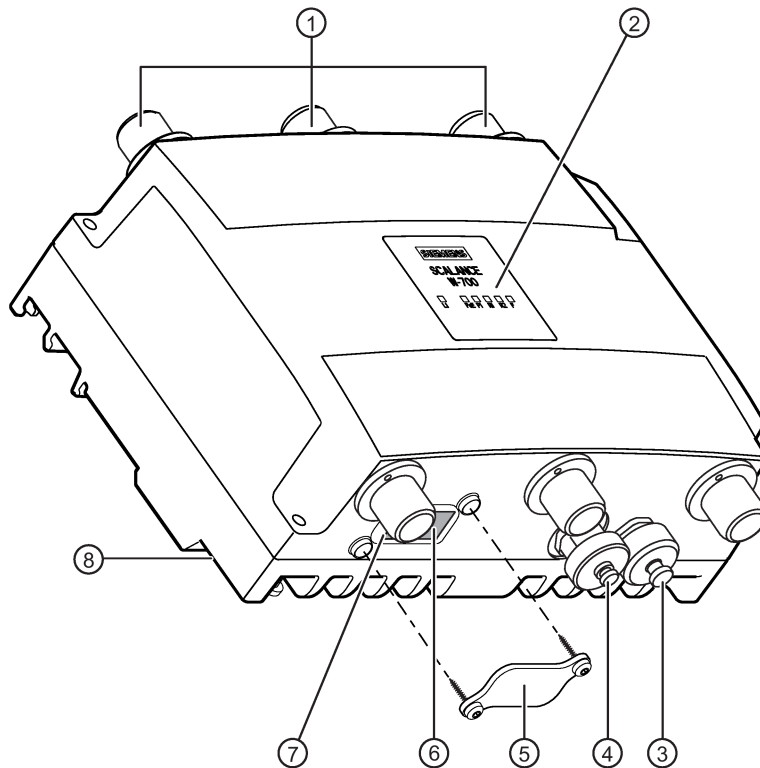
SCALANCE W7x8x-x RJ45 - IP30 degree of protection



- 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 SCALANCE W7x8 RJ45

SCALANCE W7x8x-x M12 - IP65 degree of protection

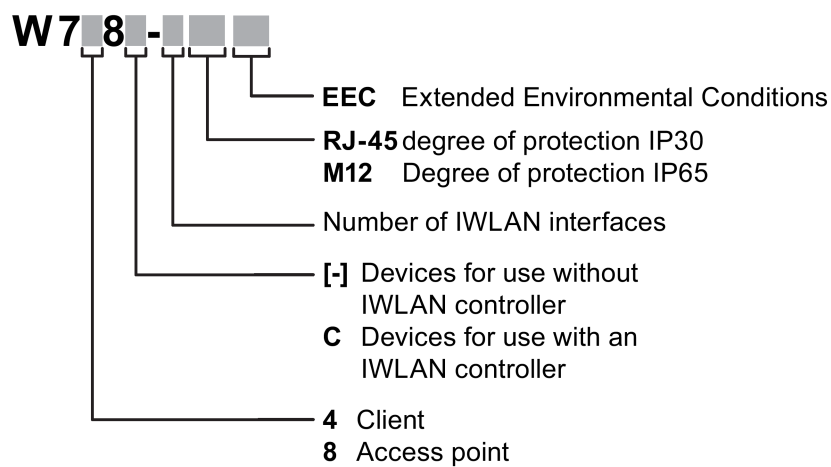


- ① Connecting connectors, N-Connect type female
 - Devices with one IWLAN interface: 3 connectors on the top (covered in the figure).
 - Devices with two IWLAN interfaces: 3 connectors on the top and 3 on the underside.
- ② LEDs
- ③ Connector for the supply voltage, type M12 (with cover)
- ④ Connector 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 SCALANCE W7x8 M12

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 RJ45 / 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 adapter is not included in the scope of delivery, see Accessories.

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 range of accessories in the Industry Mall (<https://mall.industry.siemens.com>)

PLUG

Component	Description	Article number
C-PLUG	Configuration PLUG Exchangeable storage medium for configuration data.	
	32 MB	6GK1900-0AB00
	256 MB	6GK1900-0AB10
KEY-PLUG features	Enabling of iFeatures and exchangeable storage medium for storage of configuration data	
	KEY-PLUG W780 iFeatures AP	6GK5907-8PA00
	KEY-PLUG W740 iFeatures Client	6GK5907-4PA00
KEY-PLUG W700 Security	W700 Security Enabling of "Inter AP Blocking" and exchangeable storage medium for storage of configuration data	6GK5907-0PA00

Mounting adapter

Component	Description	Article number
DIN rail adapter	Mounting adapter for installation on the DIN rail 35mm according to DIN EN 50022 for SCALANCE W788 M12 / RJ45 and SCALANCE W748 M12 / RJ45 Scope of delivery: DIN rail slider including fastening material 3 items per package	6GK5798-8ML00-0AB3

Plug-in connector Industrial Ethernet

For the M12 variants the following plug-in connector is required:

Component	Description	Article number
IE FC M12 PLUG PRO 4 x 2	Industrial Ethernet FastConnect M12 Plug PRO 4 x 2 M12 plug-in connector with rugged metal housing and FC connector technology, with axial cable outlet (X coded)	1 connector per package 6GK1901-0DB30-6AA0
		8 connectors per package 6GK1901-0DB30-6AA8

3.4 Accessories

For the RJ-45 variants the following plug-in connector is required:

Component	Description	Article number
IE FC RJ45 PLUG 180 4 x 2	Industrial Ethernet FastConnect RJ45 Plug 180 4 x 2, RJ45 plug-in connector; CAT6A; (10/100/1000/10000 Mbps) with rugged metal housing and FC connector technology, for IE FC Cable 4 x 2 (24 AWG); 180° cable outlet	1 connector per package
		10 connectors per package
		50 connectors per package
		6GK1901-1BB12-2AA0
		6GK1901-1BB12-2AB0
		6GK1901-1BB12-2AE0

Cables Industrial Ethernet

Component	Description	Article number
IE FC TP cable 4 x 2	Industrial Ethernet FastConnect TP standard cable GP 4 x 2, TP installation cable CAT6A for connection to IE FC RJ45 Plug 4 x 2, 24 AWG Sold by the meter	6XV1878-2A

* Available in different lengths

Cabinet feedthrough

Component	Description	Article number
IE M12 PANEL FEEDTHROU GH 4 x 2	Cabinet feedthrough for conversion from M12 connector technology (X-coded, IP65/67) to RJ-45 connector technology (X-coded, IP20) pack of 5	6GK1901-0DM40-2AA5
N-Connect/N-Connect female/Female panel feed-through	Panel feedthrough for wall thicknesses up to a maximum of 4.5 mm, two N-Connect female connectors.	6GK5798-2PP00-2AA6
N-Connect/SMA-Connect female/Female panel feed-through	Panel feedthrough for wall thicknesses up to a maximum of 5.5 mm, two N-Connect/SMA female connectors.	6GK5798-0PT00-2AA6

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 , trailing type, not assembled Sold by the meter	6XV1812-8A
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	6XV1801-2A
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)	6XV1801-5D*

* 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	6GK1907-0DC10-6AA3

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	6GK5795-1TR10-0AA6

3.4.1 Flexible connecting cables and antennas

3.4.1.1 Flexible connecting cables

Flexible connecting cable N-Connect/R-SMA

Flexible connecting cable for connecting an antenna to a SCALANCE W device with R-SMA connectors, preassembled with a connector 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 W device 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

3.4.1.2 Antennas

Note

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

You can find additional information under Wireless approvals

(<https://www.siemens.com/wireless-approvals>).

Type	Properties	Article number
ANT792-4DN	RCoax helical antenna, circular polarization, 4 dBi, 2.4 GHz, N-Connect female.	6GK5792-4DN00-0AA6
ANT792-6MN	Omni antenna, mast/wall mounting, 6 dBi 2.4 GHz, N-Connect female	6GK5792-6MN00-0AA6
ANT792-8DN	Directional antenna, mast/wall mounting, 14 dBi 2.4 GHz, N-Connect female	6GK5792-8DN00-0AA6
ANT793-6DG	Wide angle antenna, mast/wall mounting, 9 dBi 5 GHz, 2 x N-Connect female	6GK5793-6DG00-0AA0
ANT793-6MN	Omni antenna, mast/wall mounting, 5 dBi 5 GHz, N-Connect female	6GK5793-6MN00-0AA6
ANT793-8DJ	Directional antenna, mast/wall mounting, 18 dBi 5 GHz, 2 x N-Connect female	6GK5793-8DJ00-0AA0
ANT793-8DK	Directional antenna, mast/wall mounting, 23 dBi 5 GHz, 2 x N-Connect female	6GK5793-8DK00-0AA0
ANT793-8DQ	Circular polarized antenna, mast mounting, 18 dBi, 5.8 GHz, 1 x N-Connector female	6GK5793-8DQ00-0AA0
ANT795-4MA	Omni antenna, directly on the device, 3/5 dBi 2.4 GHz and 5 GHz, IP30, R-SMA connector male for direct installation on the device, angle connector adjustable 0° to 180°.	6GK5795-4MA00-0AA3
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.	6GK5795-4MC00-0AA3
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.	6GK5795-4MD00-0AA3
ANT795-6DC	Wide angle antenna, mast/wall mounting, 9 dBi 2.4 GHz and 5 GHz, N-Connect female	6GK5795-6DC00-0AA0
ANT795-4MB	Omnidirectional antenna, 2/3 dBi 2.4 GHz and 5 GHz, IP30, R-SMA connector female for direct mounting on the device, angle connector adjustable 0° to 90°.	6GK5795-4MB00-0Ax0
ANT795-6MN	Omni antenna, mounted on roof/vehicle, 6/8 dBi 2.4 GHz and 5 GHz, N-Connect female	6GK5795-6MN10-0AA6
ANT795-6MT	Omni antenna (MIMO), mounted on roof/vehicle/ceiling, 5/7 dBi 2.4 GHz and 5 GHz, 3 x QMA connector female	6GK5795-6MT00-0AA0

Type	Properties	Article number
ANT793-8DL	Directional antenna vertical-horizontal polarized, 5 GHz, 14dBi, IP66, 2xN-Connect female	6GK5793-8DL00-0AA0
ANT793-8DP	Directional antenna, mast/wall mounting, 13 / 13.5 dBi 4.9 GHz and 5 GHz, N-Connect female	6GK5793-8DP00-0AA0
ANT795-4MX	Omnidirectional antenna, 2/2.5 dBi, 2.4 GHz and 5 GHz, IP69K, N-Connect male	6GK5795-4MX00-0AA0
ANT795-6MP	Omnidirectional antenna, 5/7 dBi, 2.4 GHz and 5 GHz, IP65/67, N-Connect female	6GK5795-6MP00-0AA0
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	6GK5896-6MM00-0AA0
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

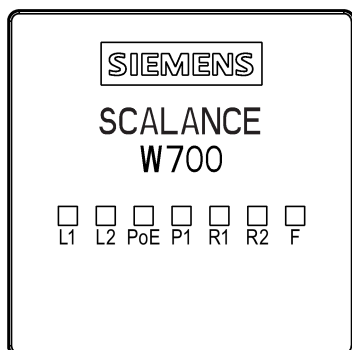
Only one antenna per device can be used (connected to R1A1, R1A2 or R2A1, R2A2).

3.5 LED display

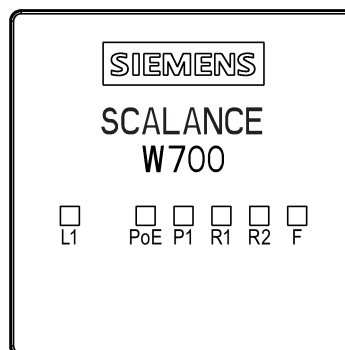
Information on operating status and data transfer

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 L1 too low.
	Green 	Power supply L1 is applied.
L2 ¹⁾	Off 	Power supply L2 too low.
	Green 	Power supply L2 is applied.
PoE	Off 	The device is not supplied using PoE.
	Green 	The device is supplied using PoE.

LED	Color	Meaning
P1	Off 	There is no connection over the Ethernet port P1.
	Green 	There is a connection over the Ethernet port P1 (link).
	Flashing green and yellow 	Data transfer over the Ethernet interface P1.
R1	Off 	The WLAN interface 1 is deactivated.
	Green 	<i>SCALANCE W7x8 in access point mode:</i> The WLAN interface 1 is initialized and ready for operation. <i>SCALANCE W7x8 in client mode:</i> There is a connection over the WLAN interface 1.
	Flashing green and yellow 	Data transfer via the WLAN interface 1.
	Flashing yellow 	<i>SCALANCE W7x8 in client mode:</i> The client is searching for a connection to an access point.
	Flashing yellow  Interval: 100 ms on / 100 ms off	<i>SCALANCE W7x8 in access point mode:</i> With DFS (802.11h), the channel is scanned for one minute for competing radar signals before the channel can be used for data traffic. <i>SCALANCE W7x8 in client mode:</i> The client waits for the MAC address due to the setting "Automatic" for the "MAC mode" parameter and is not connected to an access point.
	Flashing yellow and green  Interval: 3x (100 ms on / 100 ms off) 1x 1000 ms on	<i>SCALANCE W7x8 in client mode:</i> The client waits for the MAC address due to the setting "Automatic" for the "MAC mode" parameter and is connected to an access point.

3.5 LED display

LED	Color	Meaning
R2	Off 	The WLAN interface 2 is deactivated. <i>SCALANCE W7x8 in client mode:</i> The LED is always off because WLAN interface 2 is not available in client mode.
	Green 	<i>SCALANCE W7x8 in access point mode:</i> The WLAN interface 2 is initialized and ready for operation.
	Flashing green and yellow 	<i>SCALANCE 7x8 in access point mode:</i> Data transfer via the WLAN interface 2.
	Flashing yellow  Interval: 100 ms on / 100 ms off	<i>SCALANCE W7x8 in access point mode:</i> With DFS (802.11h), the channel is scanned for one minute for competing radar signals before the channel can be used for data traffic.
F	Off 	No fault/error.
	Red 	The device is starting up or an error has occurred.
	Flashing red  Interval: 500 ms on / 500 ms off	The bootloader waits in this state for a new firmware file that you can download by TFTP.
	Flashing red  Interval: 2000 ms on / 200 ms off	Firmware on PLUG: The device is performing a firmware update or downgrade.
	Red  Simultaneous R1/R2 yellow flashing 	A competing radar signal was found on all enabled channels.

LED	Color	Meaning
P1 R1 R2	Flashing yellow 	The port LEDs flash for detection of device location. The "Flash" function is activated with the SIMATIC NET Primary Setup Tool (PST).

1) Not for SCALANCE W748-1 M12, SCALANCE W788-2 M12 and SCALANCE W788-2 M12 EEC

Note

Primary user (radar) on all enabled channels

If the device detects a competing radar signal on all enabled channels of the WLAN interfaces, the **F** LED is lit 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 13).

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 56).

- **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 54).

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

Requirements for the cabinet/enclosure

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) according to EN 60079-7.

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, see Drilling pattern (Page 31).

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 the S7-1500 standard rail
- Installing on a DIN rail



CAUTION

Danger of injury by falling objects

If the SCALANCE W7x8 is subjected to strong vibration ($> 10\text{ g}$), 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

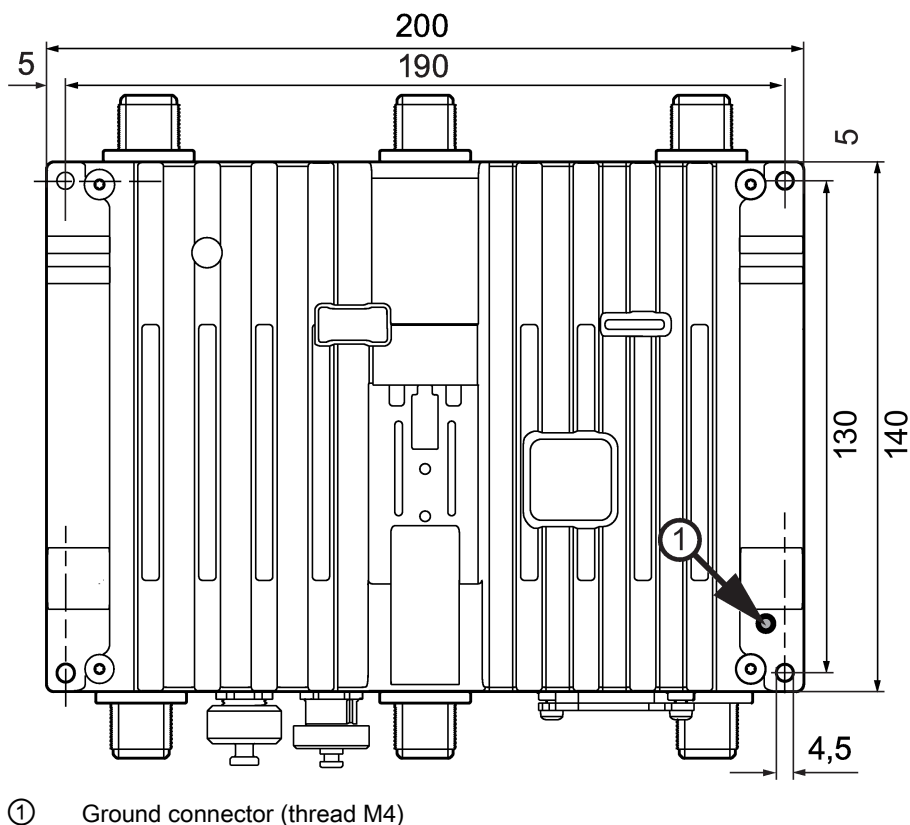
There are no restrictions regarding the installation location for the device. Antennas, in particular directional antennas, must be mounted according to their characteristics.

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 drill holes can be seen in the following figure. The following dimensions are specified in mm.



① Ground connector (thread M4)

Figure 4-1 Drilling template

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).

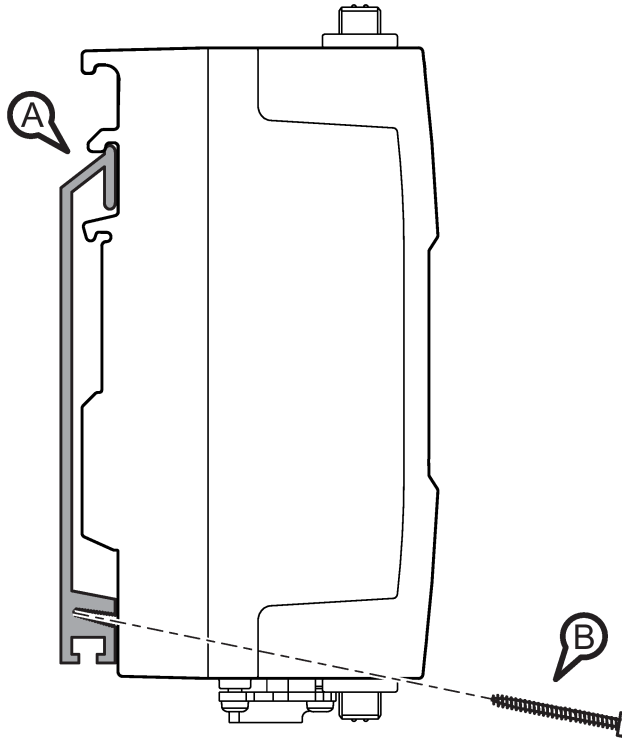


Figure 4-2 Installing on an S7-300 standard rail

4.4 Installing on the S7-1500 standard rail

Follow the steps below to install the SCALANCE W7x8 on a vertical S7-1500 rail:

1. Place the device on the upper edge of the S7-1500 standard rail (position A).
2. Screw the device to the rail using the supplied screw (position B).

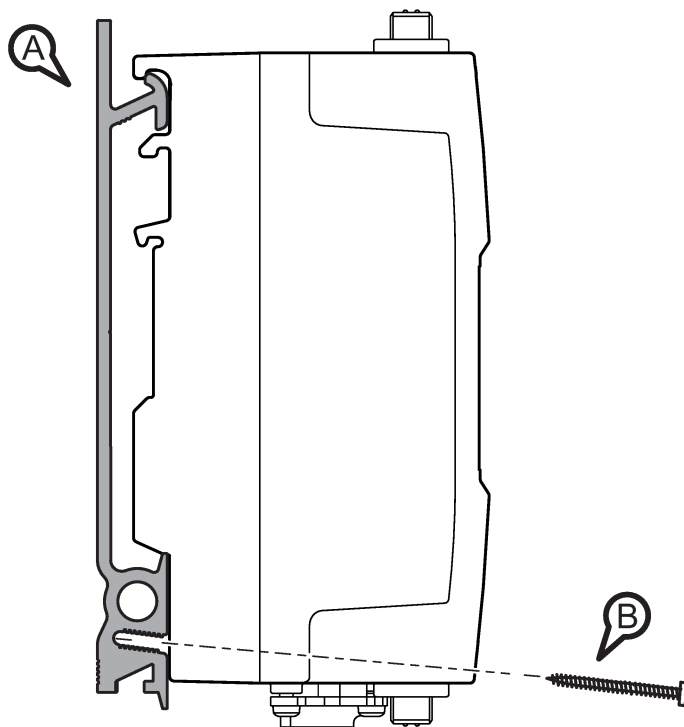


Figure 4-3 Installing on an S7-1500 standard rail

4.5 Installing on a DIN rail

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

Mounting adapter for DIN rail

Note

The mounting adapter for installation on a DIN rail is not included in the scope of delivery, see Accessories (Page 17).

The mounting adapter consists of the following parts:

- 1 DIN rail slider
- 1 spring
- 2 screws

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

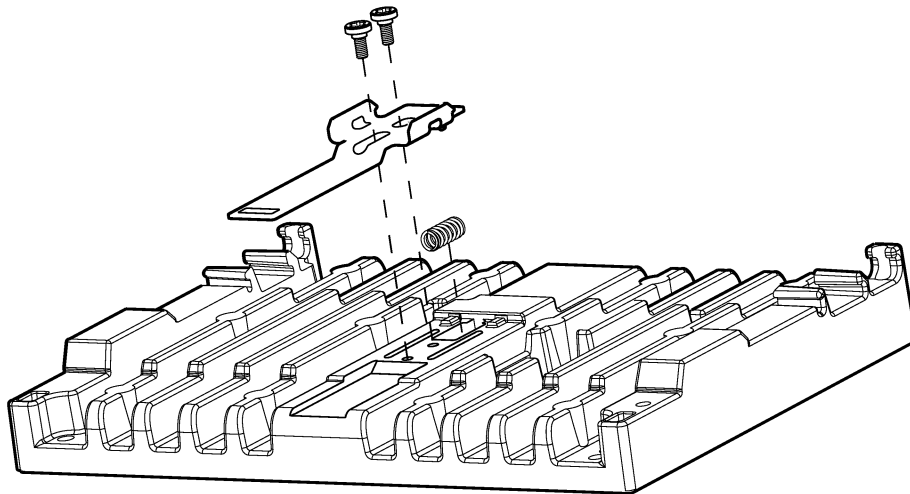


Figure 4-4 Fitting the DIN rail slider

Installing on the DIN rail

The following figure shows the SCALANCE 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.

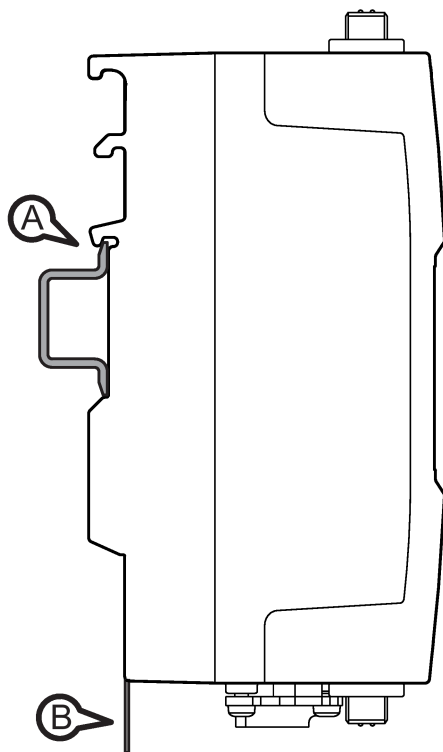


Figure 4-5 Installing on a DIN rail

Connecting up

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 for the Ethernet cables

In order to avoid mechanical stress on the Ethernet cables and resulting interruption of the contact, fasten the cables at a short distance from the connector using a cable guide or busbar.

Note

Close unused sockets

Close all unused M12 sockets with protective caps (tightening 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 17) of SIMATIC NET Industrial WLAN.

- Lightning protection element LP798-1N (article number 6GK5798-2LP00-2AA6)
- Lightning protection element LP798-2N (article number 6GK5798-2LP10-2AA6)

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 use the lightning protector LP798-1N.



! 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 lightning protector only works within the framework of a comprehensive lightning protection concept. If you have any questions, please contact a qualified specialist.

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

article number: 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

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.

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 802.3at 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 31). Connect the grounding cable before you mount the device. Refer to the information in the section Mounting (Page 29).

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 RJ45 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.

NOTICE
R-SMA antenna connector When securing antennas to the device, only the screw cap (see figure) of the antenna can be rotated. Rotating the entire antenna could damage the R-SMA connector of the device.

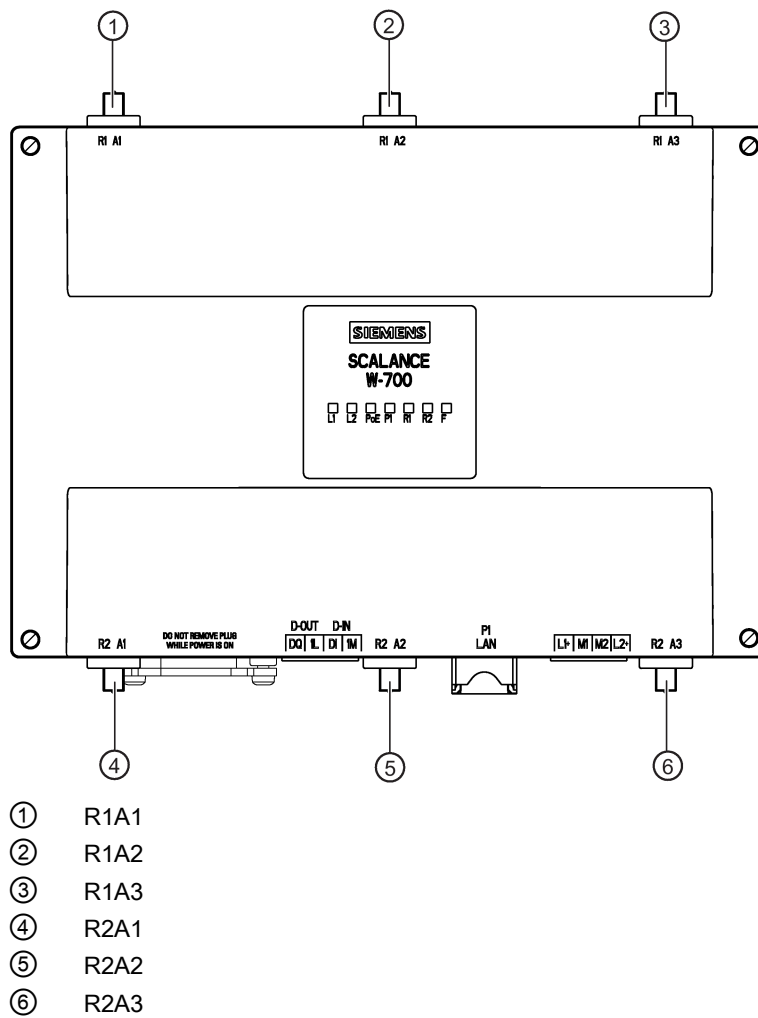


Figure 5-1 Antenna connector IP30

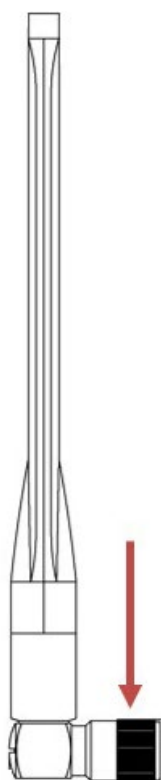


Figure 5-2 Figure of the ANT795-4MA; the arrow points to the screw cap.

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 W7x8 and a detached antenna are available from SIMATIC NET. You will find detailed information in the section Flexible connecting cables and antennas (Page 20).

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 (Page 17).

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"
-

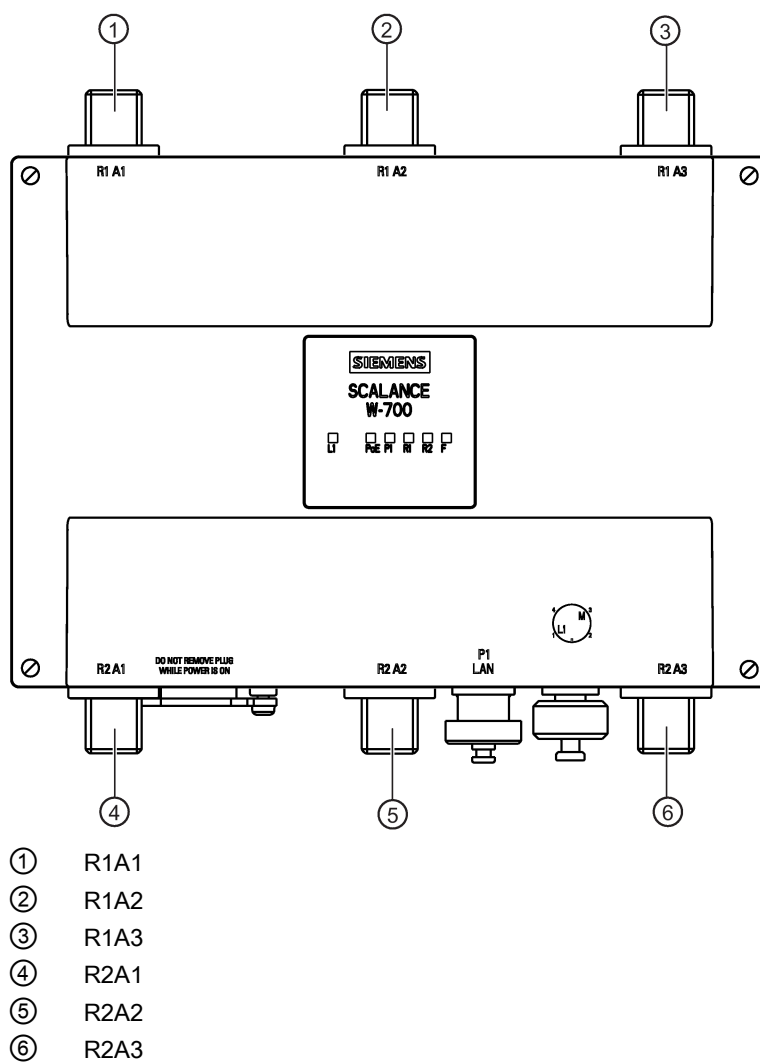


Figure 5-3 Antenna connector IP65

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 13).

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 17).

Upkeep and maintenance

6.1 Device configuration with PRESET-PLUG

Please note the additional information and security notes in the operating instructions of your device.

NOTICE
Do not remove or insert a PLUG during operation
A PLUG may only be removed or inserted when the device is turned off.

Note**Support as of V6.0**

The PRESET-PLUG functionality is supported as of firmware version V6.0.

With the PRESET-PLUG, you can install the same device configuration (start configuration, user accounts, certificates) including the corresponding firmware on multiple devices.

The PRESET PLUG is write-protected.

You configure the PRESET PLUG using the Command Line Interface (CLI).

Creating a PRESET-PLUG

You create the PRESET PLUG using the Command Line Interface (CLI). You can create a PRESET-PLUG from any PLUG. To do this, follow the steps outlined below:

Note**Using configurations with DHCP**

Create a PRESET-PLUG only from device configurations that use DHCP. Otherwise disruptions will occur in network operation due to multiple identical IP addresses.

You assign fixed IP addresses extra following the basic installation.

Requirement

- A PLUG is inserted in the device on which you want to configure the PRESET-PLUG functionality.

Procedure

1. Start the remote configuration using Telnet (CLI) and log on with a user with the "admin" role.
2. Change to the Global configuration mode with the command "configure terminal".

6.1 Device configuration with PRESET-PLUG

3. You change to the PLUG configuration mode with the "plug" command.
4. Create the PRESET-PLUG with the "presetplug" command.
The firmware version of the device and the current device configuration incl. user accounts and certificates are stored on the PLUG and the PLUG is then write protected.
5. Turn off the power to the device.
6. Remove the PRESET-PLUG.
7. Start the device either with a new PLUG inserted or with the internal configuration.

Procedure for installation with the aid of the PRESET-PLUG

1. Turn off the power to the device.
2. If it exists, remove the PLUG from the slot. You will find further information on this in the operating instructions of your device.
3. Insert the PRESET-PLUG correctly oriented into the slot. The PRESET-PLUG is correctly inserted when it is completely inside the device and does not jut out of the slot.
4. Turn on the power to the device again.
If there is a different firmware version on the device to be installed compared with that on the PRESET-PLUG, an upgrade/downgrade of the firmware is performed. You can recognize this by the red F-LED flashing (flashing interval 2 sec. on/2 sec. off).
Afterwards the device is restarted and the device configuration incl. users and certificates on the PRESET-PLUG is transferred to the device.
5. Wait until the device has fully started up.
(the red F-LED is off)
6. Turn off the power to the device after the installation.
7. Remove the PRESET-PLUG.
8. Start the device either with a new PLUG inserted or with the internal configuration.

Note

KEY-PLUG

If you have created the PRESET-PLUG from a KEY-PLUG, for operation with this configuration, you require an inserted KEY-PLUG.

IN this case before recommissioning the device you need to insert the relevant KEY-PLUG.

Note**Restore factory defaults and restart with a PRESET PLUG inserted**

If you reset a device to the factory defaults, when the device restarts an inserted PRESET PLUG is formatted and the PRESET PLUG functionality is lost. You then need to create a new PRESET PLUG. The keys stored on the KEY-PLUG for releasing functions are retained.

We recommend that you remove the PRESET PLUG before you reset the device to the factory settings.

Formatting a PRESET-PLUG (resetting the preset function)

You format the PRESET PLUG using the Command Line Interface (CLI) to reset the preset function. To do this, follow the steps outlined below:

1. Start the remote configuration using Telnet (CLI) and log on with a user with the "admin" role.
2. Change to the Global configuration mode with the command "configure terminal".
3. You change to the PLUG configuration mode with the "plug" command.
4. Enter the command "factoryclean".
The PRESET-PLUG is formatted and the preset function is reset.
5. Write the current configuration of the device with the "write" command.

6.2 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, make sure you observe the information in the "Reset button (Page 28)" section 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.

With the Primary Setup Tool

Follow the steps below to reset the device parameters to the factory defaults with the Primary Setup Tool.

1. Select the device whose parameters you want to reset.
2. Click on the menu item "Reset" in the "Module" tab.
3. Confirm the prompt with "OK".

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"

6.3 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 W 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 W over the Ethernet interface.
6. Assign an IP address to the SCALANCE W 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.

See also

Reset button (Page 28)

Technical specifications

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

7.1 Technical specifications of the SCALANCE W7x8-1)

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	0 ... 75 m + 10 m TP cord
	IE FC TP flexible cable	
	IE FC TP FRNC cable	
	IE FC TP festoon cable	
	IE FC TP food cable	
	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 Terminal block, 4 terminals
		M12 variants M12 connectors
	Impedance	50 Ω nominal
Frequency range		2412 ... 2480 MHz
		4920 ... 5875 MHz
Electrical data		
Direct 24 VDC supply	Supply voltage from terminal block/socket	24 VDC Safety Extra Low Voltage (SELV)
	Permitted range	19.2 to 28.8 VDC
	Design	RJ-45 variants Terminal block, 4 terminals
		M12 variants M12 connectors
	Properties	Not electrically isolated
Supply voltage from PoE	Supply voltage from terminal block/socket	48 VDC
	Permitted range	36 to 57 VDC
	Design	Via RJ-45 jack
	Properties	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
Effective power loss	At 24 VDC / max.	15.6 W
	At 24 VDC / typical	10.7 W

7.1 Technical specifications of the SCALANCE W7x8-1)

Technical specifications		
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 °C to +60 °C
	During storage	-40 °C 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
Degree of protection		
IP code	RJ-45 variants	IP30
	M12 variants	IP65
Dimensions and weight		
Dimensions (W x H x D)	RJ-45 variants	200 x 158 x 79 mm
	M12 variants	200 x 175.2 x 79 mm
Weight	1.7 kg	
Installation options		
Direct	Wall mounting	
With additional holding plate	Mast mounting	
	Mounting on a DIN rail	
	Mounting on an S7-300 standard rail	
	Mounting on an S7-1500 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

7.2 Technical specifications of the SCALANCE W7x8-2)

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	0 ... 75 m + 10 m TP cord
	IE FC TP flexible cable	
	IE FC TP FRNC cable	
	IE FC TP festoon cable	
	IE FC TP food cable	
	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 R-SMA female
		M12 variants N Connect, female
	Impedance	50 Ω nominal
Frequency range		2412 ... 2480 MHz
		4920 ... 5875 MHz
Electrical data		
Direct 24 VDC supply	Supply voltage from terminal block/socket	24 VDC Safety Extra Low Voltage (SELV)
	Permitted range	Non EEC variants 19.2 to 28.8 VDC
		EEC variants 16.8... 31.2 VDC (UL approvals only valid for 19.2 ... 28.8 VDC)
	Design	RJ-45 variants: Terminal block, 4 terminals
		M12 variants M12 connectors
	Properties	Not electrically isolated
Supply voltage from PoE	Supply voltage from terminal block/socket	48 VDC
	Permitted range	36 to 57 VDC
	Design	Via RJ-45 jack
	Properties	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
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

7.2 Technical specifications of the SCALANCE W7x8-2)

Technical specifications		
	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 °C to +60 °C
	During storage	-40 °C 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
Degree of protection		
IP code	RJ-45 variants	IP30
	M12 variants	IP65
Dimensions and weight		
Dimensions (W x H x D)	RJ-45 variants	200 x 158 x 79 mm
	M12 variants	200 x 175.2 x 79 mm
Weight	1.7 kg	
Installation options		
Direct	Wall mounting	
With additional holding plate	Mast mounting	
	Mounting on a DIN rail	
	Mounting on an S7-300 standard rail	
	Mounting on an S7-1500 standard rail	
Mean time between failure (MTBF)		
	At 40 °C ambient temperature	41 years

Dimension drawings

The following dimensions are specified in mm.

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

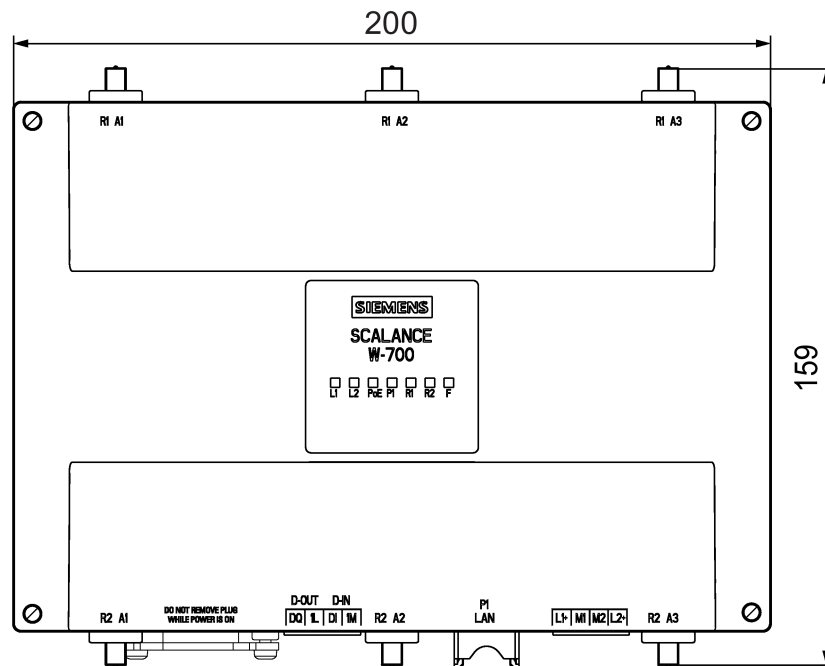


Figure 8-1 Front view RJ-45

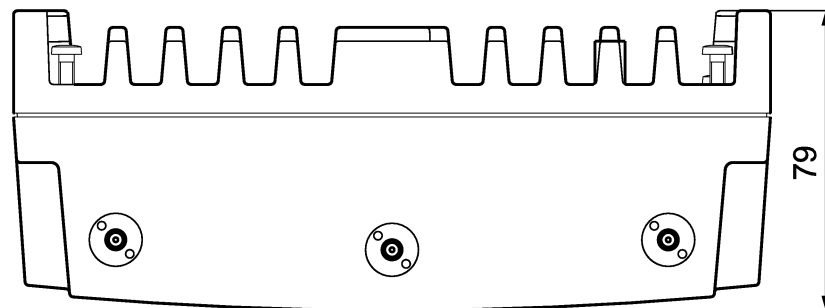


Figure 8-2 View from above RJ-45

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

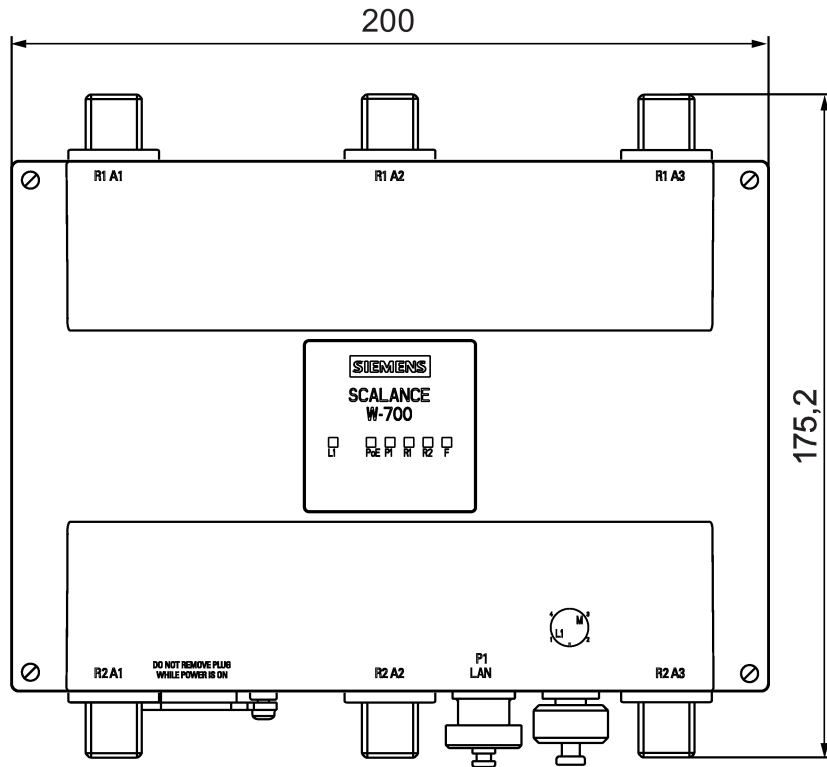


Figure 8-3 Front view M12

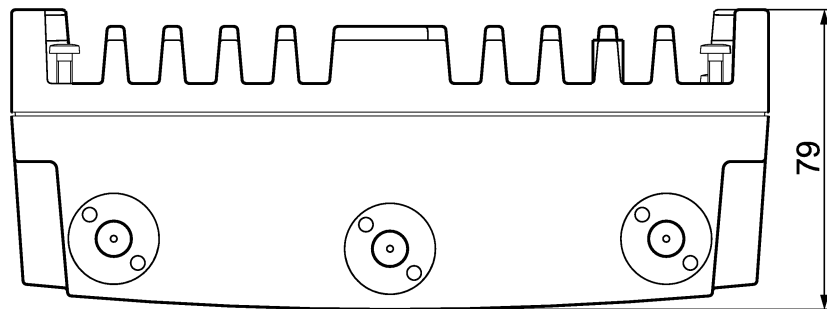


Figure 8-4 View from above M12

Certification

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 at Siemens Industry Online Support
(<https://support.industry.siemens.com/cs/ww/en/>)
- Using the search function at Industrial communication
(<https://support.industry.siemens.com/cs/ww/en/ps/15859/man>)

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

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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