# SIEMENS

## SIMATIC NET

## Industrial Wireless LAN SCALANCE W788-x / W748-1

**Operating Instructions** 

Introduction	1
Security recommendations	2
Description of the device	3
Mounting	4
Connecting up	5
Upkeep and maintenance	6
Technical specifications	7
Dimension drawings	8
Certification	9

### 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.

### **A**DANGER

indicates that death or severe personal injury will result if proper precautions are not taken.

### 

indicates that death or severe personal injury may result if proper precautions are not taken.

### 

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:

### 

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 <sup>®</sup> 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.

## Table of contents

1	Introduction		
	1.1	Information on the Operating Instructions	5
2	Security r	recommendations	7
3	Descriptio	on of the device	11
	3.1	Description of the device	11
	3.2	Structure of the type designations	13
	3.3	Components of the product	14
	3.4 3.4.1 3.4.1.1 3.4.1.2	Accessories Flexible connecting cables and antennas Flexible connecting cables Antennas	
	3.5	LED display	22
	3.6	Reset button	25
4	Mounting		
	4.1	Securing the housing	
	4.2	Wall mounting	29
	4.3	Installing on the S7-300 standard rail	
	4.4	Installing on the S7-1500 standard rail	31
	4.5	Installing on a DIN rail	32
5	Connectir	ng up	
	5.1	Safety when connecting up	35
	5.2	Lightning protection, power supply and grounding	
	5.3	Power supply and Ethernet	
	5.4	Antenna connectors	41
	5.5	Digital input/output	45
	5.6	Replacing the PLUG (C-PLUG or KEY-PLUG)	46
6	Upkeep a	and maintenance	
	6.1	Device configuration with PRESET-PLUG	49
	6.2	Restoring the factory settings	52
	6.3	Firmware update via WBM or CLI not possible	54

7	Technical specifications		57
	7.1	Technical specifications of the SCALANCE W7x8-1)	57
	7.2	Technical specifications of the SCALANCE W7x8-2)	60
8	Dimension	drawings	63
9	Certification		65
	Index		67

## Introduction

### 1.1 Information on the Operating Instructions

### Validity of the Operating Instructions

These operating instructions cover the following products:

	Article number	Article number US version	Article number IL 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 6.2

### 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

### Introduction

1.1 Information on the Operating Instructions

### 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.

Additionally, Siemens' guidance on appropriate security measures should be taken into account. For additional information on industrial security measures that may be implemented, please visit

Link (https://www.siemens.com/industrialsecurity)

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

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

### Trademarks

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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 (<u>https://www.industry.siemens.com/topics/global/en/industrial-</u> 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 software 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.

- 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  $\rightarrow$  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.

- −  $HTTP \rightarrow HTTPS$
- 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	UDP/123	Open (when configured)	Closed	No
NTP				
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/2222,4 4818	Open (when configured)	Open	No
DHCP	UDP/67,68	Open (when configured)	Closed	No
RADIUS	UDP/1812,1 813	Open (when configured)	Closed	No
TFTP	UDP/69	Open (when configured)	Closed	No

## Description of the device

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

3.1 Description of the device

### 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)
- 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

### 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. (<u>https://mall.industry.siemens.com</u>)

### PLUG

Component	Description	Article number
C-PLUG	Configuration PLUG,	6GK1900-0AB00
	Exchangeable storage medium (32 MB) for the configura- tion data	
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	6GK5907-0PA00
W700 Securi- ty	Enabling of "Inter AP Blocking" and exchangeable storage medium for storage of configuration data	

### Mounting set

Component	Description	Article number
Mounting set	Mounting set can only be used in conjunction with SCALANCE W-786; consisting of holding plate for wall mounting, for mounting on an S7-300 rail and a DIN rail and for mast mounting with additional hose clips	6GK5798-8MG00-0AA0

### 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	Industrial Ethernet FastConnect M12 Plug PRO 4x 2 M12 Plug-in connect-	1 connector per package	6GK1901-0DB30-6AA0
4x2	or with rugged metal housing and FC connector technology, with axial cable outlet (X coded)	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 RJ-45 PLUG 180 4x2	Industrial Ethernet FastConnect RJ45 Plug 180 4x 2, RJ45 plug-in connect-	1 connector per package	6GK1901-1BB12-2AA0
	or; CAT6A; (10/100/1000/10000 Mbps) with rugged metal housing and	10 connectors per package	6GK1901-1BB12-2AB0
	Cable 4x 2 (24 AWG); 180° cable outlet	50 connectors per package	6GK1901-1BB12-2AE0

### **Cables Industrial Ethernet**

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

\* Available in different lengths

### Cabinet feedthrough

Component	Description	Article number
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	6GK1901-0DM40-2AA5
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.	6GK5798-2PP00-2AA6
N-Connect/SMA- Connect fe- male/female Panel Feedthrough	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 <sup>2</sup> , capable of trailing, 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 <sup>2</sup> , 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	6GK5795-1TN00-1AA0
	N-Connect, male	
TI795-1R	Electrical connection	6GK5795-1TR10-0AA6
	RSMA-Connect, male	

3.4 Accessories

### 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 W700 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 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	

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

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

Туре	Properties	Article number
ANT792-4DN	RCoax helical antenna, circular polariza- tion, 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
ANT793-4MN	RCoax $\lambda$ 5/8 antenna with vertical polari- zation, 6 dBi, 5 GHz, N-Connect female.	6GK5793-4MN00-0AA6
ANT793-6DG	Wide angle antenna, mast/wall mount- ing, 9 dBi 5 GHz, 2 x N-Connect female	6GK5793-6DG00-0AA0
ANT793-6DT	Wide angle antenna (MIMO), mast/wall mounting, 8 dBi 5 GHz, 3 x QMA con- nector female	6GK5793-6DT00-0AA0
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

3.4 Accessories

Туре	Properties	Article number
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°.	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 mount- ing, 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, connector angle 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
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 wire- less, 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

3.4 Accessories

### 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

### 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		
SIEMENS SCALANCE W700 L1 L2 POE P1 R1 R2 F		[ 	SIEMENS SCALANCE W700 Poe P1 R1 R2 P	

### Note

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

LED	Color	Meaning	
L1 Off Power supply too		Power supply too low, is outside the permitted range.	
	Green	Power supply L1	
L2	Off Power supply too low, is outside the permitted range.		
	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 yel- low flashing alternately	Data transfer via the Ethernet interface	

3.5 LED display

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 yel- low flashing alternately	Data transfer via 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 usersbefore 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" forthe "MAC mode" parameter and is connected to no access point.		
	Yellow flashing 3 x short, 1 x long	<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.		
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 yel- low 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 usersbefore 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 clientmode.		
F	Red	An error occurred during operation with the SCALANCE W7x8.		
	Red R1 or R2 flash- ing yellow simul- taneously	A primary user was found on all enabled channels.		
	Red: Flashes at the interval: 2 sec. on / 0.2 sec. off	An upgrade/downgrade of the firmware is installed from the plug: Afterwards the device is restarted and the device configuration incl. users and certificates stored on the PRESET-PLUG is transferred to the device.		
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

IOTICE	<u> </u>

#### 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 54).

### • 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 52).

#### 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.

Description of the device

3.6 Reset button

## Mounting

### 

### 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.

## 

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

#### 

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

### 4.1 Securing the housing

### Grounding connector

### 

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

### 

### 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

### 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.

### 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 4-4 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 4-5 Installing on a DIN rail

### Mounting

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.



**EXPLOSION HAZARD** 

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

### 

**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

### 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.



### 

### 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 article number: 918 422 Manufacturer: DEHN+SÖHNE GmbH+Co.KG, Hans Dehn Str. 1, Postfach 1640, D -92306 Neumarkt, Germany

### Supply voltage

### 

### 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.

## 

### 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.

5.2 Lightning protection, power supply and grounding

### General notes on use according to ATEX and IECEx

EXPLOSION HAZARD

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

### 

EXPLOSION HAZARD

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

### 

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



**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.

5.3 Power supply and Ethernet

### 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.

5.4 Antenna connectors



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"

Connecting up

5.4 Antenna connectors



### 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)

### 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).

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

### 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).

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

## Upkeep and maintenance

### 6.1 Device configuration with PRESET-PLUG

Please not 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. 6.1 Device configuration with PRESET-PLUG

### 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".
- 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.

6.1 Device configuration with PRESET-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.
- 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

### 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, 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.

### 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".

6.2 Restoring 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"

6.3 Firmware update via WBM or CLI not possible

### 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 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.
- 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.

6.3 Firmware update via WBM or CLI not possible

### 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 25)

6.3 Firmware update via WBM or CLI not possible

## **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	Туре	IEEE 802.3at type 1 (802.3af) IEEE 802.3at type 2 (Power over Ethernet)
	Class	Class 3 *)
Attachment to Industrial Ethern	et	
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 combined	nations per length range)	
	IE TP torsion cable	9	0 55 m
			0 45 m + 10 m TP cord
	IE FC TP marine c	able	0 85 m
	IE FC TP trailing c	able	0 75 m + 10 m TP cord
	IE FC TP flexible of	cable	
	IE FC TP FRNC ca	able	
	IE FC TP festoon of	cable	
	IE FC TP food cab	ble	
	IE FC TP standard	l 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	m 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 / typica	l	10.7 W
Digital input	Quantity		1
	Design		Terminal block, 2 terminals
	Status "0"		13 to 30 VDC
	Status "1"		-30 to 3 VDC

7.1 Technical specifications of the SCALANCE W7x8-1)

Technical specifications		
	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	$\leq$ 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	158 x 200 x 79 mm
	M12 variants	175.2 x 200 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 (MT	BF)	
	At 40 °C ambient temperature	41 years

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

7.2 Technical specifications of the SCALANCE W7x8-2)

### 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	Туре	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
Permitted cable lengths (Ethernet)	(Alternative combinations per length r	ange)
	IE TP torsion cable	0 55 m
		0 45 m + 10 m TP cord

Technical specifications			
	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 o	able	
	IE FC TP festoon	cable	
	IE FC TP food cal	ble	
	IE FC TP standar	d 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	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 fro	om terminal	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
5			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 / typica	al	15 W
Digital input	Quantity	-	1
U I <sup></sup>	Desian		Terminal block. 2 terminals
	Status "0"		13 30 VDC
	Status "1"		-30 to 3 VDC
	Max input curren	ł	8 mA
Max. input current		U 11/2 V	

7.2 Technical specifications of the SCALANCE W7x8-2)

Technical specifications		
	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	158 x 200 x 79 mm
	M12 variants	175.2 x 200 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**

8

The following dimensions are specified in mm.

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



### 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:

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

## Index

### Α

Antenna cables, 18 Antennas, 18 Article numbers, 5

### С

Cables Permitted lengths, 57, 60 Configuration manuals, 53 Connectors, 14

### D

Dimension drawings, 63 Documentation on the CD, 5

### Е

Ethernet, 39

### F

Factory defaults, 25, 25, 52 Factory setting, 52

### G

Grounding, 36, 37

### I

Installation DIN rail, 32 S7-300 standard rail, 30 Wall mounting, 29 Interfaces, 57, 60

### L

LED display, 22 Lightning protection, 36 Loading firmware, 25, 25

### Ρ

Power supply, 39 Primary user radar, 22 Protective caps, 14

### R

Reset button, 25, 25 Reset device, 25, 25, 52, 52 Resetting the device, 25, 25 Restart of the device, 25, 25 Restore Factory Defaults, 52

### S

Safety extra low voltage, 36, 37 Safety notices Use in hazardous areas, 35 when connecting up, 35 Scope of delivery, 14 SELV, 36 Supply voltage, 37

### Т

Technical specifications, 57, 57, 60, 60 Type designations, 13