SIEMENS

SIMATIC NET

Industrial Wireless LAN SCALANCE W788-xPRO/RR / W74x-1PRO/RR

Operating Instructions

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Introduction 2

2.1 Information on the Operating Instructions

Validity of the Operating Instructions

These operating instructions cover the following products:

- SCALANCE W788-1PRO
- SCALANCE W788-2PRO
- SCALANCE W788-1RR
- SCALANCE W788-2RR
- SCALANCE W744-1PRO
- SCALANCE W746-1PRO
- SCALANCE W747-1RR

These operating instructions apply to the following software version:

- SCALANCE W788-xPRO/RR or W74x-1PRO/RR with firmware as of version 4.4

Purpose of the Operating Instructions

Based on the Operating Instructions, you will be able to install and connect up the SCALANCE W788-xPRO/RR or W74x-1PRO/RR 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 on configuration in the configuration manual SCALANCE W-700 on the accompanying CD in the file:

PH_SCALANCE-W-700_76.pdf

Note

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

2.2 Type designations

Abbreviations used

The information in the manuals for the SCALANCE W-700 product family often applies to more than one product variant. In such situations, the designations of the products are shortened to avoid having to list all the type designations. The following table shows how the abbreviations relate to the product variants.

Product group	The designation . . . stands for . . .	Product name
Ethernet client modules (IP30, cabinet installation)	W74x-1	W744-1 W746-1 W747-1
Ethernet client modules (IP65, installed outside a cabinet)	W74x-1PRO/RR	W744-1PRO W746-1PRO W747-1RR
All Ethernet client modules SCALANCE W	W74x	W744-1 W746-1 W747-1 W744-1PRO W746-1PRO W747-1RR
Access points (IP30, cabinet installation)	W784-1xx	W784-1 W784-1RR
Access points (IP65, installed outside a cabinet, extreme climatic requirements)	W786-xPRO/RR	W786-1PRO W786-2PRO W786-3PRO W786-2RR
Access points (IP65, installed outside a cabinet)	W788-xPRO/RR	W788-1PRO W788-2PRO W788-1RR W788-2RR
Access points with the "RR" range of functions	W78x-xRR	W784-1RR W786-2RR W788-1RR W788-2RR

Product group	The designation . . . stands for . . .	Product name
All SCALANCE W access points	W78x	W788-1PRO W788-2PRO W788-1RR W788-2RR W786-1PRO W786-2PRO W786-3PRO W786-2RR W784-1 W784-1RR
All SCALANCE W devices	W -700	W788-1PRO W788-2PRO W788-1RR W788-2RR W744-1PRO W746-1PRO W747-1RR W786-1PRO W786-2PRO W786-3PRO W786-2RR W784-1 W784-1RR W744-1 W746-1 W747-1

3.2 LED displays

Information on the operating status and data transfer of the SCALANCE W-788-xPRO/RR or W74x-1PRO/RR

There are several LEDs on the front of the SCALANCE W788-xPRO/RR or W74x-1PRO/RR that provide information its operating status:

Note

If the LED for the WLAN interface is not green when the device starts up, although it is activated, the interface is not ready for operation (interface not initialized).

The main reason for this is usually that during commissioning of a SCALANCE W788-xPRO/RR or W74x-1PRO/RR products, a waiting time of up to 15 minutes can occur when the ambient temperature is below zero. The device is ready for operation at the specified ambient temperature as soon as the LED for the WLAN interface is lit green.

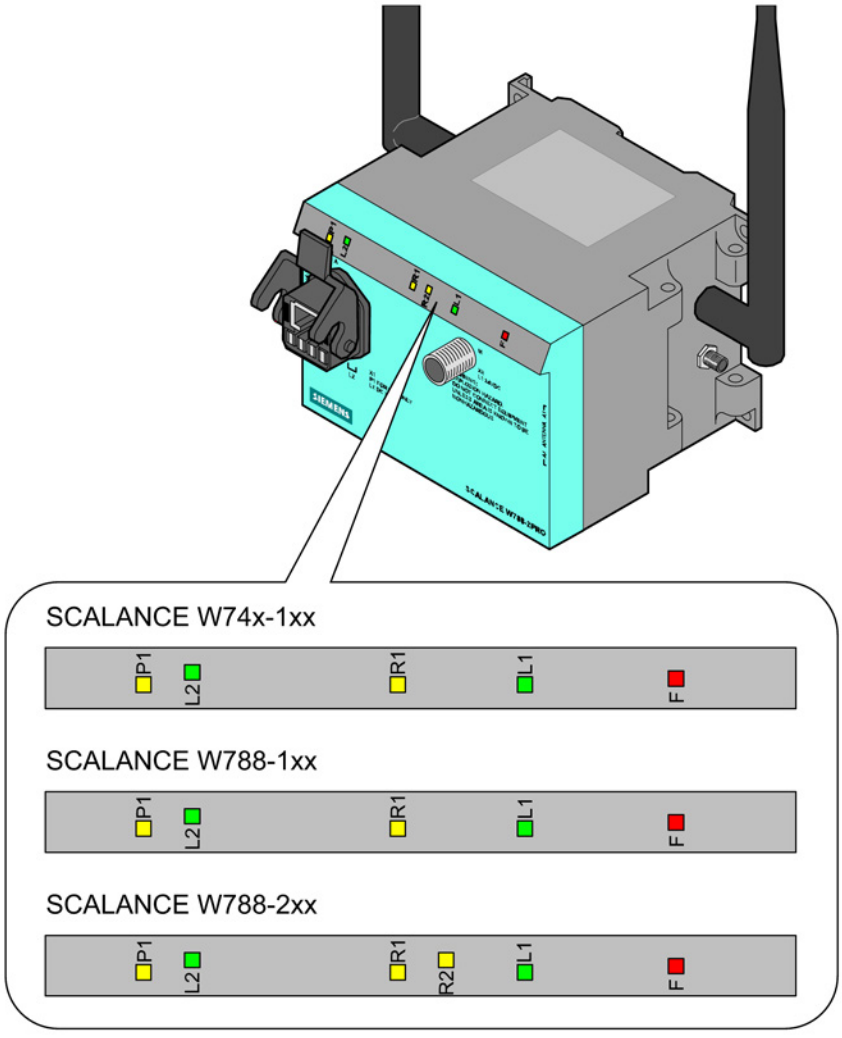


Figure 3-1 LEDs of the SCALANCE W788-xPRO/RR or W74x-1PRO/RR

5.8 Cabling for power supply and Ethernet

Suitable cables

The following cables are available for connecting a SCALANCE W788-xPRO/RR or SCALANCE W74x-1PRO/RR to the power supply and Ethernet:

- IE hybrid cable 2 x 2 + 4 x 0.34 (order no. 6XV1870-2J)

  The two data wire pairs are separately shielded. This cable is particularly suitable for assembly with the IE IP 67 hybrid connector.

- IE FC TP standard cable 4 x 2 GP (order no. 6XV1870-2E)

  In these cable types, two wires are twisted. All four pairs of wires are inside a common shield.

- 2 x 2 IE cable, the optional power supply (18 - 48 V DC) is over M12 connectors.

Cable selection and interference exposure

A decisive factor in the selection of a cable type is the electromagnetic interference to which the current lines between the power supply and the FC RJ-45 modular outlet are subjected. Due to the separate shielding of the data wires, such interference has less effect on the data transmission on a hybrid cable than on TP standard cable or TP flexible cable.

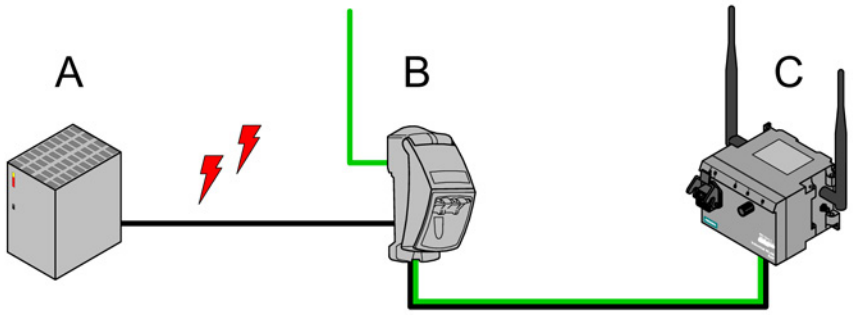


Figure 5-3 Wiring a SCALANCE W788-xPRO/RR with electromagnetic interference between the power supply and modular outlet
A power supply
B FC RJ-45 modular outlet with power insert
C SCALANCE W788-xPRO/RR

Technical specifications 6

6.1 Technical specifications for the SCALANCE W788-xPRO/RR and W74x-1PRO/RR

Device variants

The technical specifications of the

- SIMATIC NET SCALANCE W744-1PRO
- SIMATIC NET SCALANCE W746-1PRO
- SIMATIC NET SCALANCE W747-1RR
- SIMATIC NET SCALANCE W788-1PRO
- SIMATIC NET SCALANCE W788-2PRO
- SIMATIC NET SCALANCE W788-1RR
- SIMATIC NET SCALANCE W788-2RR

are largely identical. Unless indicated otherwise in the table, the following tables apply to all the devices listed above:

Data transfer

Ethernet transfer rate	10/100 Mbps
Wireless transmission rate	1 ... 54 Mbps (108 Mbps)
Wireless standards supported	802.11a 802.11b 802.11g 802.11h
Power supply standards supported	802.3af (Power over Ethernet)

Interfaces

Note

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

Power	• M12 connector 24 VDC, 48 VDC (minimum permitted voltage 18 VDC, maximum permitted voltage 57 VDC) • Power contacts in hybrid connector 24 VDC, 48 VDC (minimum permitted voltage 18 VDC, maximum permitted voltage 57 VDC) • RJ-45 jack Power over Ethernet (48 VDC) The following applies to all named power contacts: Power supply cables isolated according to IEEE 802.3af, isolation resistance > 2 Mohms.
Data	IE IP67 hybrid connector R-SMA antenna sockets (2 x or 4 x with the 788-2PRO)

Electrical data

Maximum power consumption	< 9 W
Typical power consumption (a wireless card)	6 W
Typical power consumption (two wireless cards)	7 W

Construction

Dimensions without antennas (W x H x L)	125 mm x 88 mm x 108 mm
Weight	approx. 1050 g

Permitted ambient conditions

Operating temperature	-20°C to 60°C
Transportation/storage temperature	-40°C to 70°C
Degree of protection	Tested to IP65

MTBF information (mean time between failure)

MTBF	67 years

Transmit power

Table 6- 1 Transmit power in IEEE 802.11b mode (2.4 GHz)

Data rate [Mbps]	P_0 [dBm]
1	20
2	20
5.5	20
11	20

Table 6- 2 Transmit power in IEEE 802.11g mode (2.4 GHz)

Data rate [Mbps]	P_0 [dBm]
6	17
9	17
12	17
18	17
24	17
36	17
48	17
54	16

Table 6- 3 Transmit power in IEEE 802.11a/h mode (5 GHz)

Data rate [Mbps]	P_0 [dBm]
6	17
9	17
12	17
18	17
24	17
36	16
48	15
54	13.5

Receiver sensitivity

Table 6- 4 Receiver sensitivity in IEEE 802.11b mode (2.4 GHz)

Data rate [Mbps]	P_e [dBm]
1	-98
2	-94
5.5	-92
11	-90

Table 6- 5 Receiver sensitivity in IEEE 802.11g mode (2.4 GHz)

Data rate [Mbps]	P_e [dBm]
6	-93
9	-92
12	-91
18	-88
24	-85
36	-82
48	-77
54	-76

Table 6- 6 Receiver sensitivity in IEEE 802.11a/h mode (5 GHz)

Data rate [Mbps]	P_e [dBm]
6	-90
9	-89
12	-88
18	-86
24	-83
36	-80
48	-75
54	-74

Certification 7

7.1 Approvals for the SCALANCE W788-xPRO/RR and 74x-1PRO/RR

CE conformity

The products

SIMATIC NET SCALANCE W788-1PRO
SIMATIC NET SCALANCE W788-2PRO
SIMATIC NET SCALANCE W788-1RR
SIMATIC NET SCALANCE W788-2RR

SIMATIC NET SCALANCE W744-1PRO
SIMATIC NET SCALANCE W746-1PRO
SIMATIC NET SCALANCE W747-1RR

in the version put into circulation by Siemens AG conform to the regulations of the following European directive:

- 99/5/EC
  Directive of the European Parliament and of the Council on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity. Conformity with the basic requirement of the directive is attested by adherence to the following standards:
- EN 60950-1
  Information technology equipment - Safety - Part 1: General requirements
- EN 301489-1 V1.9.2
  Electromagnetic compatibility and radio spectrum matters (ERM) - Electromagnetic compatibility for radio equipment and services - Part 1 : Common technical requirements (V1.9.2).
- EN 301489-17 V2.2.1
  Electromagnetic compatibility and radio spectrum matters (ERM) - Electromagnetic compatibility for radio equipment and services - Part 17: Specific conditions for 2.4 GHz broadband transmission systems and 5 GHz high performance RLAN equipment
- EN 300328 V1.7.1
  Electromagnetic Compatibility and Radio Spectrum Matters (ERM); — Broadband transmission systems — Data transmission equipment operating in the 2.4 GHz ISM band and using spread spectrum modulation techniques — Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
- EN 301893 V1.7.1
  Broadband Radio Access Networks (BRAN) - 5 GHz high performance RLAN - Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive

- EN 50385
  Product standard to demonstrate the compliance of radio base stations and fixed terminal stations for wireless telecommunication systems with the basic restrictions or the reference levels related to human exposure to radio frequency electromagnetic fields (110 MHz-40 GHz) - General public
- 1999/519/EC
  Council recommendation on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)

Devices connected to the system must meet the relevant safety regulations.

The EC Declaration of Conformity is available for the responsible authorities according to the above-mentioned EC Directive at the following address:

Siemens Aktiengesellschaft
Industry Sector
Postfach 4848
D-90026 Nürnberg

This declaration certifies compliance with the directives named above, but does not guarantee any specific properties.

Note

The specified approvals apply only when the corresponding mark is printed on the product.

ATEX, cULus and FM approvals

The products

SIMATIC NET SCALANCE W788-1PRO
SIMATIC NET SCALANCE W788-2PRO
SIMATIC NET SCALANCE W788-1RR
SIMATIC NET SCALANCE W788-2RR

SIMATIC NET SCALANCE W744-1PRO
SIMATIC NET SCALANCE W746-1PRO
SIMATIC NET SCALANCE W747-1RR

have the following approvals

- EN 60079-15:2005
  EN 60079-0:2006
  II 3 G Ex nA II T..
  KEMA 07 ATEX 0145X
- c-UL-us:
  UL 60950-1 CSA C22.2 No. 60950-1
- c-UL-us for hazardous location*:
  ISA 12.12.01-2000, CSA C22.2 No. 213-M1987
  CL. 1, Div. 2 GP. A.B.C.D T..
  CL. 1, Zone 2, GP, IIC, T..
  CL. 1, Zone 2, AEx nC IIC T..

- FM 3611 Hazardous (Classified) Location Electrical Equipment:
  Non Incendive / Class I / Division 2 / Groups A,B,C,D / T* and
  Non Incendive / Class I / Zone 2 / Group IIC / T*

(T.. / T* = For detailed information on the temperature class, refer to the type plate)

Other approvals

The products

SIMATIC NET SCALANCE W788-1PRO
SIMATIC NET SCALANCE W788-2PRO
SIMATIC NET SCALANCE W788-1RR
SIMATIC NET SCALANCE W788-2RR

SIMATIC NET SCALANCE W744-1PRO
SIMATIC NET SCALANCE W746-1PRO
SIMATIC NET SCALANCE W747-1RR

meet the stipulations of the following directives or standards:

- Directive 72/245/EC, last changed by directive 2006/28/EC
  Type approval number e1*72/245*2006/28*5328*00
  E1: Number of the approval 035328, extension no. 01
- EN 50155 (VDE 0115 Part 200, March 2008)

Note

The specified approvals apply only when the corresponding mark is printed on the product.

Certification ID

The following table shows the product names and the corresponding certification ID:

Type	Number of supported IP nodes	Number of supported MAC nodes	iPCF mode	Certification ID Order no. Order no. US variant
W788-1PRO	Multiple	Multiple	No	**RAP-W1-RJ-E1** 6GK5788-1AA60-2AA0 6GK5788-1AA60-2AB0
W788-2PRO	Multiple	Multiple	No	**RAP-W2-RJ-E2** 6GK5788-2AA60-2AA0 6GK5788-2AA60-2AB0
W788-1RR	Multiple	Multiple	Yes	**RAP-W1-RJ-E1** 6GK5788-1AA60-6AA0 6GK5788-1AA60-6AB0
W788-2RR	Multiple	Multiple	Yes	**RAP-W2-RJ-E2** 6GK5788-2AA60-6AA0 6GK5788-2AA60-6AB0
W744-1PRO	1	1	No	**RAP-W1-RJ-E1** 6GK5744-1AA60-2AA0 6GK5744-1AA60-2AB0
W746-1PRO	Multiple	Multiple	No	**RAP-W1-RJ-E1** 6GK5746-1AA60-4AA0 6GK5746-1AA60-4AB0
W747-1RR	Multiple	Multiple	Yes	**RAP-W1-RJ-E1** 6GK5747-1AA60-6AA0 6GK5747-1AA60-6AB0