

SIMATIC NET

A5E02280448-02

Release 11/2008

Operating Instructions (Compact)

SCALANCE W788-1PRO	(Access Point)
SCALANCE W788-2PRO	(Dual Access Point)
SCALANCE W788-1RR	(Access Point IPCF)
SCALANCE W788-2RR	(Dual Access Point IPCF)
SCALANCE W744-1PRO	(Ethernet Client Module)
SCALANCE W746-1PRO	(Ethernet Client Module)
SCALANCE W747-1RR	(Ethernet Client Module IPCF)

Bitte beachten Sie die Warnhinweise und zusätzlichen Informationen in der Betriebsanleitung (kompakt) in Ihrer Sprache im Internet:

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Please observe the warnings and additional information in the user manual (compact) in your language in the Internet:

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Osservare le avvertenze di sicurezza e le informazioni aggiuntive nel manuale d'istruzioni (compatto) nella propria lingua in Internet:

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ليغش التال ليلدب قة قحلم الة في فاض الة تام ول عمل او ري ذحت الة تاداشرا ة اعارم عاجرب
تنترت الة ككبش قيرط نع كل ذوا هب ثدحتت ي تال ة لالاب و (جمدم ال)
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Legal notices


Information on the safety notices and correct usage

Concept of the warning notices

This manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. Notices relating to your personal safety are highlighted by a warning triangle; notices relating to property damage only do not have a warning triangle. Warnings in descending order according to the degree of danger are shown as follows.

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

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

 CAUTION
with a warning triangle indicates that minor personal injury can result if proper precautions are not taken.

CAUTION
without a warning triangle indicates that damage to property can result if proper precautions are not taken.

NOTICE
indicates that an undesirable result or status can occur if the relevant notice is ignored.

If more than one degree of danger is present, the notice representing the highest degree of danger will be used. A notice warning of injury to persons with a warning triangle may also include a warning relating to property damage.

Qualified personnel

The device/system described here must only be set up and operated in conjunction with this documentation. Only **qualified personnel** should be allowed to install and work on this equipment/system. Qualified persons in the sense of the safety-related notices in this documentation are defined as persons who are authorized to commission, to ground, and to tag circuits, equipment, and systems in accordance with established safety practices and standards.

Correct usage of Siemens products

Note the following:

WARNING

Siemens products may only be used for the applications indicated in the catalog and in the relevant technical documentation. If third-party products and components are used, these must be recommended or approved by Siemens. These products can only function correctly and safely if they are transported, stored, set up, mounted, installed, commissioned, operated and maintained correctly. The permitted environmental and ambient conditions must be adhered to. Notices in the relevant documentation must be observed.

Trademarks

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Disclaimer

We have checked the contents of this manual for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections included in subsequent editions.

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Introduction

Information on the Operating Instructions (compact) SCALANCE W788-xPRO/RR and W74x-1PRO/RR

Validity of the Operating Instructions (compact)

These Operating Instructions (compact) 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 (compact) apply to the following software version:

- SCALANCE W788-xPRO/RR or W74x-1PRO/RR with firmware as of version 4.1

Purpose of the Operating Instructions (compact)

Based on the Operating Instructions (compact), 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 the operating instructions for the products listed above on the accompanying CD, file name

BA_SCALANCE-W788-xPRORR-W74x-1PRORR_76.pdf

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

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

Description

Components of the product

The following parts belong to the consignment of the SCALANCE W788-xPRO/RR or W74x-1PRO/RR:

- SCALANCE W788-xPRO/RR or W74x-1PRO/RR
- 2 OMNI antennas ANT795-4MR
- 1 IE IP 67 hybrid plug-in connector
- 1 protective cap for the M12 socket
- 2 (or 4 with SCALANCE W788-2PRO or SCALANCE W788-2RR) sealing plugs for the R-SMA sockets
- 1 SIMATIC NET Industrial Wireless LAN CD with the Operating Instructions for the SCALANCE W788-xPRO/RR and W74x-1PRO/RR
- 1 Operating Instructions (compact) SCALANCE W788-xPRO/RR or W74x-1PRO/RR in printed form

Please check that the consignment you have received is complete. If it is not complete, please contact your supplier or your local Siemens office.

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.

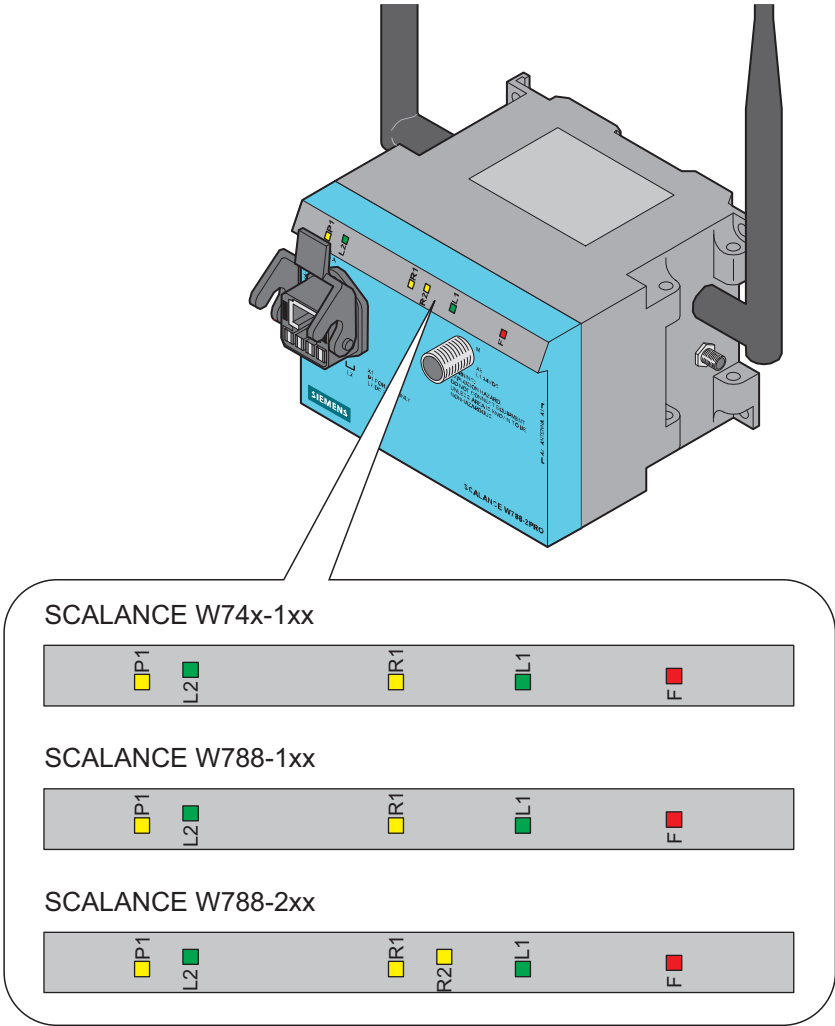


Figure 2-1 LEDs of the SCALANCE W788-xPRO/RR or W74x-1PRO/RR

LED	Color	Meaning
P1	Yellow	Data transfer over the Ethernet interface (traffic).
	Green	There is a connection over the Ethernet port. (Link)
	Flashing yellow	PRESET-PLUG detected.
	Yellow/green	PRESET function completed successfully.
	Flashing green	"Flashing" enabled over PST.
L2	Green	Power supply over the hybrid connector X1 (PoE or energy contacts).
R1	Yellow	Data transfer over the first WLAN interface.
	Green	<i>W788-xPRO/RR in access point mode:</i> The WLAN interface is initialized and ready for operation. <i>W788-xPRO/RR in client mode or W74x-1PRO/RR:</i> There is a connection over the first WLAN interface.
	Flashing green	<i>W788-xPRO/RR in access point mode:</i> The channels are being scanned. <i>W788-xPRO/RR in client mode or W74x-1PRO/RR:</i> The client is searching for a connection to an access point or ad hoc network.
	Green flashing quickly	<i>W788-xPRO/RR in access point mode:</i> With 802.11h, the channel is scanned for one minute for primary users before the channel can be used for data traffic. <i>W788-xPRO/RR in client mode or W74x-1PRO/RR:</i> The client waits for the adopt MAC address due to the setting <Auto find 'Adopt MAC'> and is connected to no access point.
	Green 3 x fast ,1 x long flashing	<i>W788-xPRO/RR in client mode or W74x-1PRO/RR:</i> The client waits for the adopt MAC address due to the setting <Auto find 'Adopt MAC'> and is connected to an access point.
	Flashing yellow	PRESET-PLUG detected.
	Yellow/green	PRESET function completed successfully.

LED	Color	Meaning
R2	Yellow	<p><i>W788-xPRO/RR in access point mode:</i> Data transfer over the second WLAN port.</p> <p><i>W788-xPRO/RR in client mode or W74x-1PRO/RR:</i> The LED is always off because the 2nd interface is not available in client mode.</p>
	Green	<p><i>W788-xPRO/RR in access point mode:</i> The WLAN interface is initialized and ready for operation.</p> <p><i>W788-xPRO/RR in client mode or W74x-1PRO/RR:</i> The LED is always off because the 2nd interface is not available in client mode.</p>
	Flashing green	<p><i>W788-xPRO/RR in access point mode:</i> The channels are being scanned.</p> <p><i>W788-xPRO/RR in client mode or W74x-1PRO/RR:</i> The LED is always off because the 2nd interface is not available in client mode.</p>
	Green flashing quickly	<p><i>W788-xPRO/RR in access point mode:</i> With 802.11h, the channel is scanned for one minute for primary users before the channel can be used for data traffic.</p> <p><i>W788-xPRO/RR in client mode or W74x-1PRO/RR:</i> The LED is always off because the 2nd interface is not available in client mode.</p>
	Flashing yellow	PRESET-PLUG detected.
	Yellow/green	PRESET function completed successfully.
L1	Green	Power supply over the M12 connector (X2).
F	Red	An error has occurred during operation of the SCALANCE W788-xPRO/RR or W74x-1PRO/RR.

Reset button

Functions of the reset button

The reset button is on the rear of the device below the sealing screw directly beside the C-PLUG and has several functions:

- Restart of the device
To restart the device, press the Reset button.
- Loading new firmware
If the normal procedure with the Load & Save menu of Web Based Management does not work, the reset button can be used to load new firmware. This situation can occur if there was a power outage during the normal firmware update.
- Restoring the default parameters (factory defaults)
- Adopting the configuration data from the PRESET PLUG.

Mounting

Securing the housing

Grounding terminal

WARNING

To operate the SCALANCE W788 safely, the housing must make contact with a chassis ground cable. Do not use the SCALANCE W788 without a ground cable connected.

The ground cable can be connected to one of the securing screws. To allow this, several of the screw contact surfaces in the housing do not have a powder coating. You will find these contact surfaces on the right-hand side of the housing (when looking at the front of the housing).

Wall mounting or standard rail

Note

Installation location

There are no restrictions regarding the installation location for the device.

Antennas, in particular directional antennas, must be mounted in keeping with their characteristics (refer to the technical specifications of the antenna --> Radiation pattern diagrams).

There are two ways of securing the housing:

- **Wall mounting**
Use the holes in the housing to screw the device to the wall or on a horizontal surface.
- **Standard rail mounting**
Mount the SCALANCE W788-xPRO/RR or W74x-1PRO/RR on a 90 mm long, vertically mounted section of standard rail (S7-300). In this case, the standard rail serves as an adapter between the wall and SCALANCE W788-xPRO/RR or W74x-1PRO/RR. If you want to mount the SCALANCE W788-xPRO/RR or W74x-1PRO/RR along with a PS791-1PRO, you will require a 150 mm long standard rail.

Make sure that there is suitable strain relief for the connecting cable.

CAUTION

Premature aging of the device and cables due to UV radiation

For applications outdoors, the use of the hardware SCALANCE W786 is advisable due to its greater suitability.

Protect the SCALANCE W788-xPRO/RR or W74x-1PRO/RR from direct sunlight by providing suitable shade. This avoids unwanted heating of the device and prevents premature aging of the device and cabling. When operating the SCALANCE W outdoors, it must be mounted so that it is protected from UV.

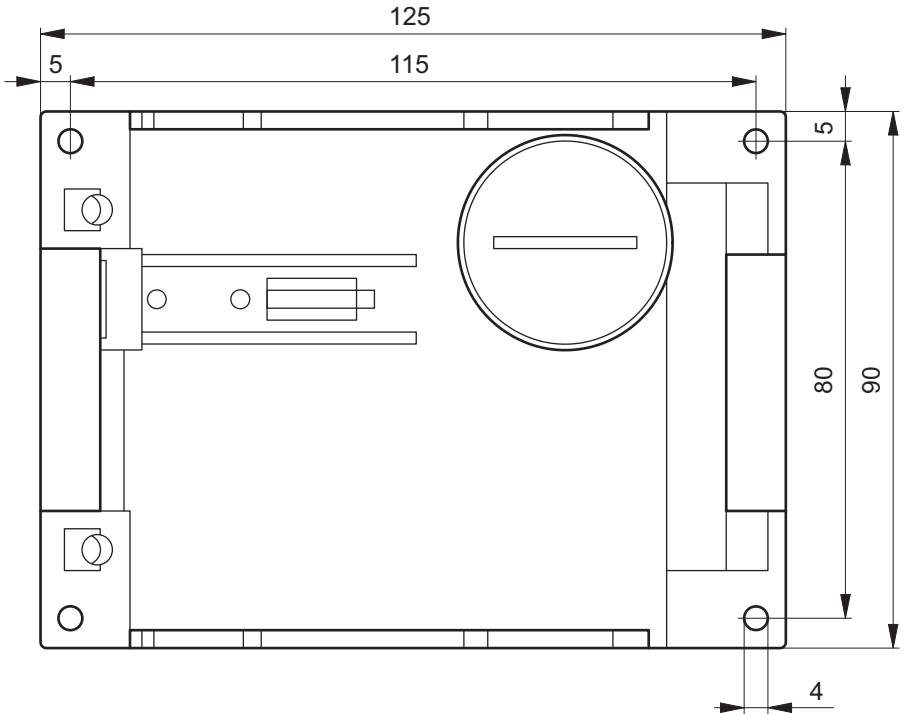
UV radiation can discolor the front panel of the SCALANCE W788-xPRO/RR or W74x-1PRO/RR. Discoloring of the front panel does not impair the mechanical stability of the device. The device must also not be subjected to long periods of rain (provide cover to protect from rain). The cover should be made of a synthetic material since metal impairs the radiation of radio waves.

Note

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.

Drilling template for the SCALANCE W788-xPRO/RR and SCALANCE W74x-1PRO/RR

Drill holes for wall mounting



Connecting up

Connectors for external antennas and power supply

Hybrid female connector and M12 male connector

The SCALANCE W788-xPRO / W788-xRR / W74x-1xx is attached to Ethernet via a hybrid socket on the front of the housing (position **A** in the figure). This port also has contacts for the operating voltage.

CAUTION

PoE with power source equipment

Note the following if you use PoE with a PSE (Power Source Equipment):
The chassis of an additional 24 V power supply must not be grounded!

CAUTION

Strain relief for the hybrid cable

Make sure that there is strain relief for the hybrid cable socket in both directions (along the cable axis and transverse). Forces can be exerted on the socket simply from the weight of the hybrid cable, for example when the SCALANCE W is installed high up.

Note

Protective cap for the hybrid socket

If you do not use the hybrid socket, this must be covered with a protective cap, otherwise IP 65 protection is lost. A suitable protective cap is available as an accessory (order no. 6ES7194-1JB10-0XA0). If you do not use the M12 connector, the supplied protective cap must also be fitted to retain the IP65 degree of protection.

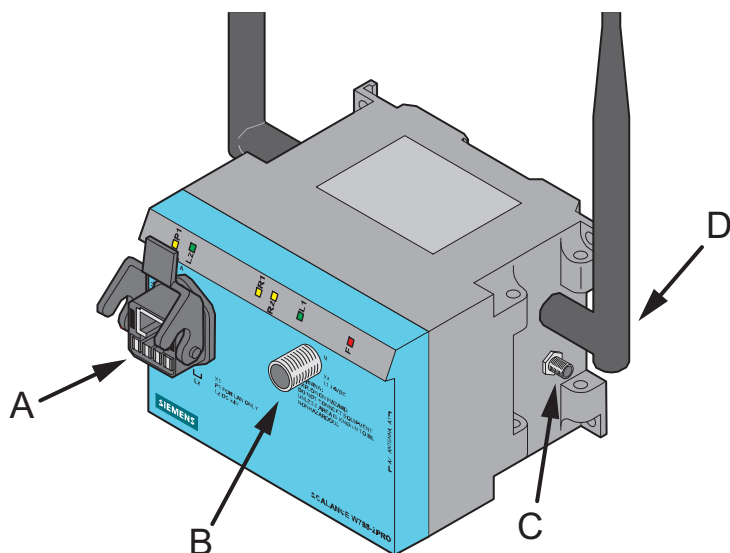


Figure 4-1 Connectors of the SCALANCE W788-xPRO/RR or W74x-1PRO/RR. The additional antenna connectors (position C) only exist for the types W788-2PRO and W788-2RR.

As an alternative or in addition to this, you can also use the M12 plug for the power supply (position B in the previous figure).

You can fit additional antennas to the sides of the SCALANCE W788-2PRO and SCALANCE W788-2RR with an antenna cable (position C in the previous figure). If you install the SCALANCE W788-xPRO/RR or W74x-1PRO/RR in a cabinet, you will need to unscrew the antennas due to the restricted communication (position D in the figure). In this case, the connection is over detached antennas installed outside the cabinet. On the front panel, there is also an identifier for the antenna connectors. The A connectors are on the right-hand side and B connectors B on the left-hand side.

Suitable connecting cable for a connection between SCALANCE W788-xPRO/RR or W74x-1PRO/RR and a detached antenna are available from SIMATIC NET. You will find detailed information in the section "Suitable antenna cables and antennas for the SCALANCE W-700".

Arrangement of interfaces and connectors

Note

The distance between the antennas of the various WLAN interfaces must be at least 1 m.

NOTICE

Terminating resistor

Each WLAN interface has two antenna connectors. If you use only one connector, make sure that you connect a terminating resistor to the second connector to ensure trouble-free operation of the SCALANCE W788-xPRO/RR or W74x-1PRO/RR.

The following figure shows the location of the sockets for the individual interfaces:

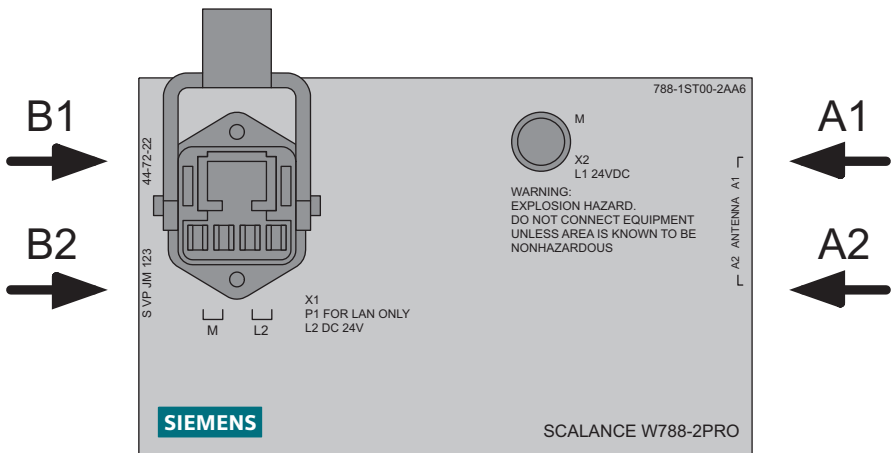


Figure 4-2 Antenna connectors of the SCALANCE W788-xPRO/RR or W74x-1PRO/RR. The antenna connectors **A2** and **B2** only exist for the types W788-2PRO and W788-2RR.

Replacing the C-PLUG

Procedure

Follow the steps below to replace the C-PLUG of a SCALANCE W788-xPRO/RR or W74x-1PRO/RR:

Note

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

- **Without C-PLUG**
The device stores the configuration in internal memory. This mode is active when no C-PLUG is inserted.
 - **With C-PLUG**
The configuration stored on the C-PLUG is displayed over the user interfaces. In this mode, the internal memory is neither read nor written. If changes are made to the configuration, the device stores the configuration directly on the C-PLUG. This mode is active when a C-PLUG is inserted. As soon as the device is started with a C-PLUG inserted, the WLAN device starts up with the configuration data on the C-PLUG.
-

1. Turn off the power to the device.
2. Remove the old SCALANCE W788-xPRO/RR or W74x-1PRO/RR from its mounting and open the sealing screw on the rear with a coin or broad screwdriver.
3. Remove the C-PLUG.
4. Open the sealing screw of the new device in the same way and insert the C-PLUG of the old device.
5. Replace the sealing screws of both devices.

If a new C-PLUG is inserted in a SCALANCE W788-xPRO/RR or W74x-1PRO/RR, the configuration stored locally on the device is saved to the C-PLUG. If an incorrect C-PLUG (for example from another device 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 C-PLUG again or selecting the option to reformat the C-PLUG and use it.



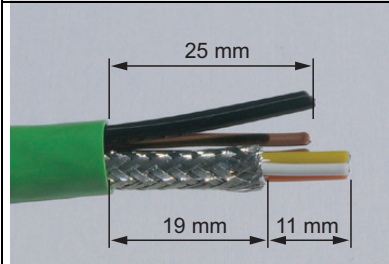
Note

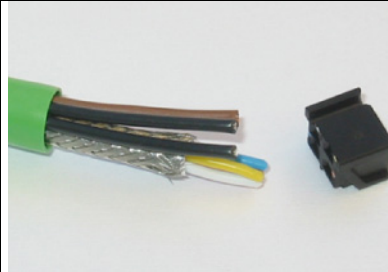
It is essential that the configuration on the C-PLUG was generated with a firmware version \leq the firmware version on the destination device.

Example: A C-PLUG with version V3.0 cannot be used for a SCALANCE W78x with firmware version V2.4.

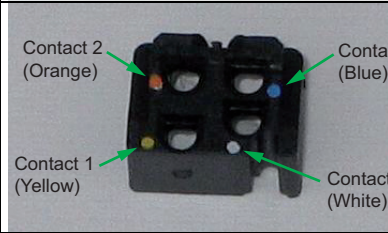
Assembling an IE hybrid cable 2 x 2 + 4 x 0.34 with an IE IP 67 hybrid connector

Procedure

	<p>Remove the two inner shells of the universal sealing ring to adapt it to the diameter of the hybrid cable.</p>
	<p>Push the bushing, washer, adapted universal sealing ring and the housing over the cable jacket.</p>
	<p>Remove the following lengths of cable jacket and shield braid:</p> <ul style="list-style-type: none"> • 25 mm for the power leads. • 30 mm jacket for the data leads (shorten the braid by 11 mm). <p>Cut off the filler at the height of the cable jacket.</p>

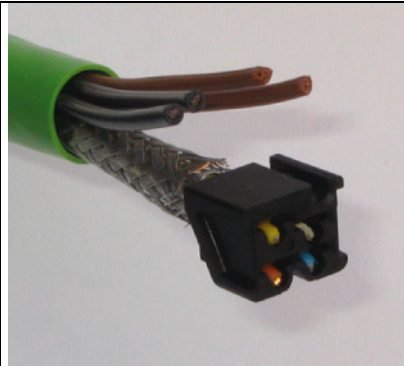


Arrange the data leads according to the color codes on the splice element. The following table shows the assignment of the data leads.

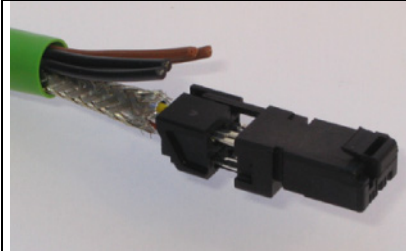
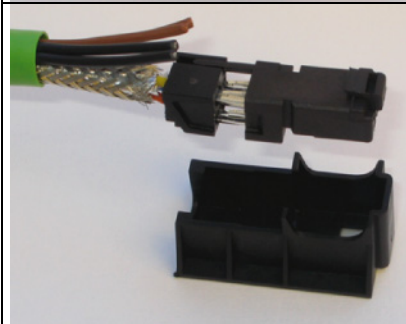
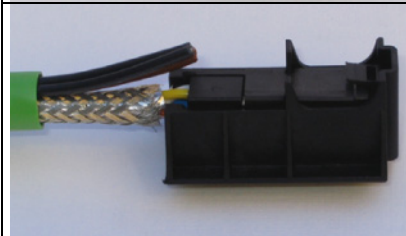
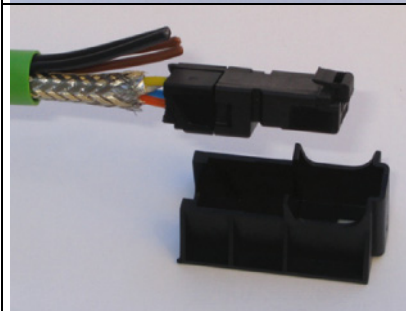


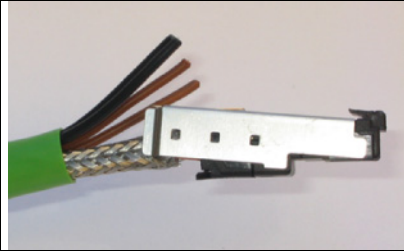
Contact and color assignment of the splice element.

Wire color code (standard)	White	Blue	Yellow	Orange
Connector color code (Siemens IE)	White	Blue	Yellow	Orange
Siemens IE FC RJ-45 socket (reference)	3	6	1	2

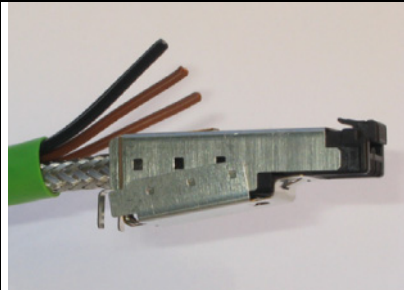


Insert the all the data leads at the same time into the splice element is far as they will go.

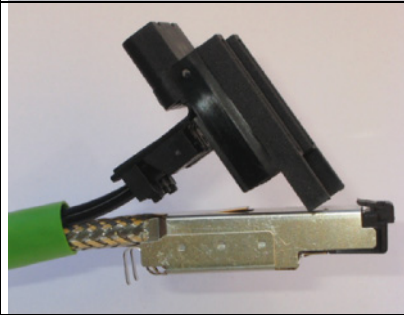
	<p>Close the splice element and RJ-45 data module until they lock together.</p>
	<p>Insert the data module and the splice element into the supplied IDC assembly tool.</p>
	<p>Press the data module and the IDC assembly tool together to establish the installation piercing connection.</p>
	<p>Remove the assembled data module from the IDC assembly tool.</p>



Position the top shield plate and press it over the cable shield.



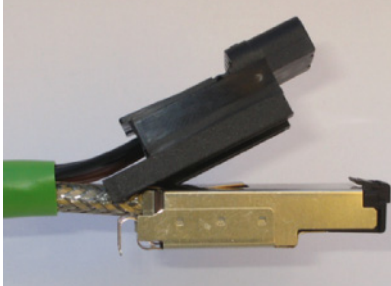
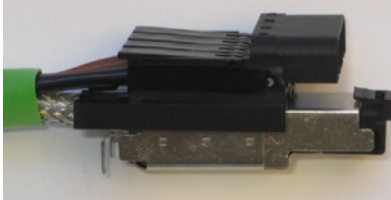


Position the lower shield plate and press it and the upper shield plate together until they lock together with an audible "click".



Arrange the power leads and insert them as far as they will go into the hinge elements of the isolation body.



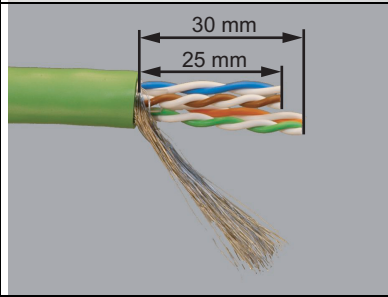
The following table shows the assignment of the power leads.

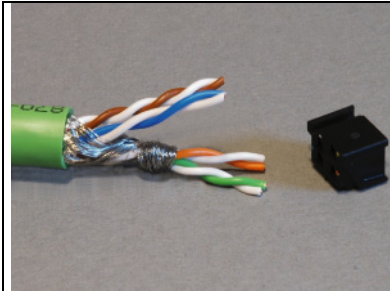
Wire color code (standard)	Brown	Brown	Black	Black
Function	24 V	48 V PoE	Ground	Chassis PoE
Power supply insert module	1	2	3	4

	<p>Press each individual hinge element together with the integrated IDC contact.</p>
	
	<p>Push the housing over the assembled data module and the insulator body until they lock together (there should be an audible click).</p>
	<p>Tighten the cable gland. We recommend an open key with a size of 21 mm.</p>

Fitting the IE FC TP standard cable 4 x 2 GP to an IE IP 67 hybrid connector

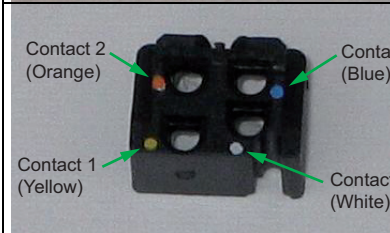
Procedure

	<p>Remove the two inner shells of the universal sealing ring to adapt it to the diameter of the hybrid cable.</p>
	<p>Push the bushing, washer, adapted universal sealing ring and the housing over the cable jacket.</p>
	<p>Remove the following lengths of cable jacket and shield braid:</p> <ul style="list-style-type: none">• 25 mm for the power leads• 30 mm for the data leads <p>To achieve good shielding, the shield braid must be at least 30 mm long.</p>



Arrange the data leads according to the color codes on the splice element. The following table shows the assignment of the data leads.

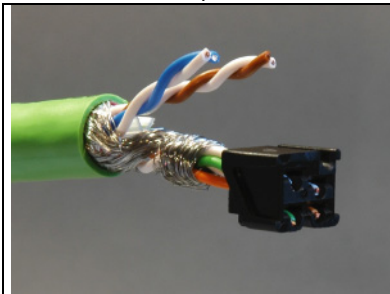
Wind the shield braid around the data leads. As a result, the shielding of the cable has contact to the shield plate of the splice element that will be fitted later.



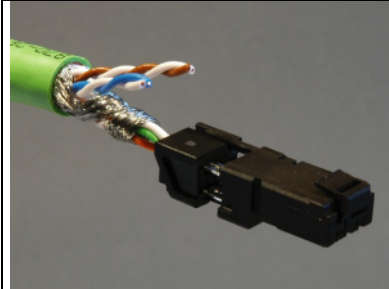
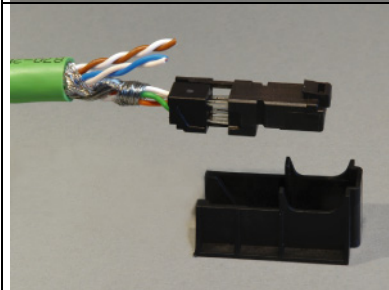
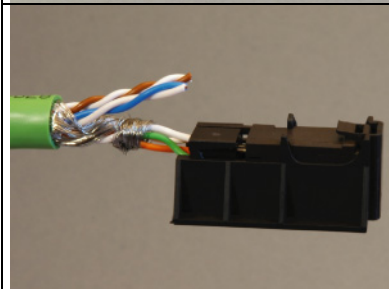
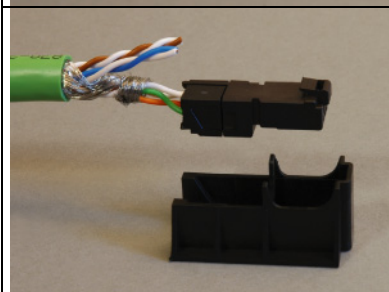
Contact and color assignment of the splice element.

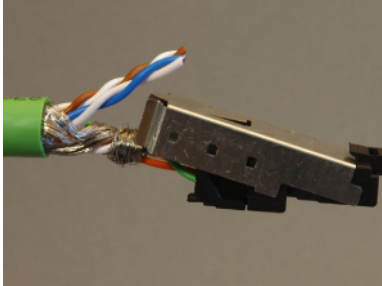
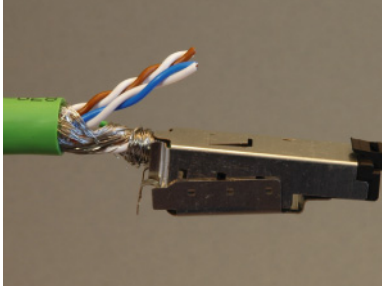
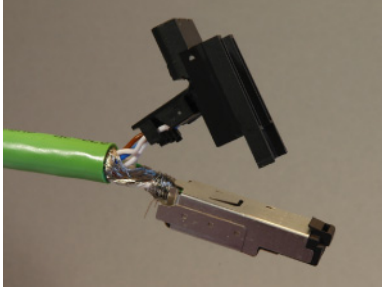
Color coding of the standard cable	White / orange *	Orange	White / green *	Green
Connector color code (Siemens IE)	White	Blue	Yellow	Orange
Siemens IE FC RJ-45 socket (reference)	3	6	1	2

* White wire of the pair.



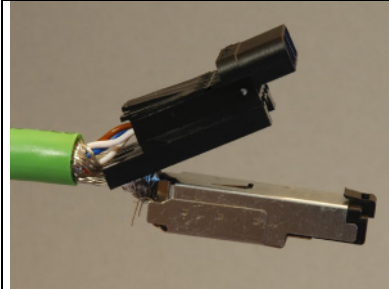
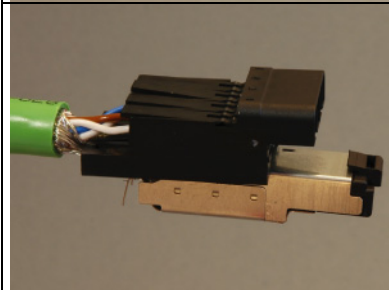


Insert the all the data leads at the same time into the splice element is far as they will go.

	<p>Close the splice element and RJ-45 data module until they lock together.</p>
	<p>Insert the data module and the splice element into the supplied IDC assembly tool.</p>
	<p>Press the data module and the IDC assembly tool together to establish the installation piercing connection.</p>
	<p>Remove the assembled data module from the IDC assembly tool.</p>

	Position the top shield plate and press it over the cable shield.
	Position the lower shield plate and press it and the upper shield plate together until they lock together with an audible "click".
	Arrange the power leads and insert them as far as they will go into the hinge elements of the isolation body. The following table shows the assignment of the power leads.

Wire color code (standard)	White / blue *	Blue	White / brown *	Brown
Function	24 V	48 V PoE	Ground	Chassis PoE
Power supply insert module	1	2	3	4

* White wire of the pair.

	<p>Press each individual hinge element together with the integrated IDC contact.</p> <p>Recommendation: Use a small slotted screwdriver (max. 3.5 mm) as a lever.</p>
	
	<p>Push the housing over the assembled data module and the insulator body until they lock together (there should be an audible click).</p>
	<p>Tighten the cable gland. We recommend an open key with a size of 21 mm.</p>

Pinning of the M12 male connector

Power supply over the M12 connector

The M12 male connector on the front of the SCALANCE W7xx has the following pinning:

Pin	Function
Pin 1	24 V DC
Pin 2	--
Pin 3	Ground
Pin 4	--

Lightning protection, power supply, and grounding

Notes on 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.

A suitable lightning conductor is available in the range of accessories of SIMATIC NET Industrial WLAN:

Lightning protector LP798-1N (order no. 6GK5798-2LP00-2AA6)



⚠ WARNING

Danger due to lightning strikes

Installing this lightning protector between an antenna and a SCALANCE W-700 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 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 12 - 24 V DC and 48 V DC:

12 - 24 V DC: VT AD 24V type no. 918 402

48 V DC:

BXT ML2 BD S48, Part no. 920245

BXT BAS, Part no. 920300 (base)

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

NOTICE
48 V lightning protector When using the 48 V DC lightning protector, the power supply must be fused with 1 A.

Safety extra low voltage



⚠ WARNING

Danger to life from overvoltage, fire hazard

SCALANCE W-700 devices are designed for operation with a directly connectable safety extra-low voltage or with the power supply adapters available as accessories (available only for the SCALANCE W786-xPRO device). Therefore only safety extra-low voltage (SELV) with limited power source (LPS) complying with IEC950/EN60950/VDE0805 may be connected to the power supply terminals (exception: Power supply adapter for 100 - 240 V AC for the SCALANCE W786-xPRO).

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).

The power supply unit to supply the SCALANCE W-700 must comply with NEC Class 2 (requirements of class 2 for power supply units of the "National Electrical Code, table 11 (b)") or SELV with LPS (Limited Power Source) EN 60950-1. If the power supply is designed redundantly (two separate power supplies), both power supplies must meet these requirements.

Exceptions:

- Power supply with PELV (according to VDE 0100-410 or IEC 60364-4-41) is also possible if the generated rated voltage does not exceed the voltage limits 25 V AC or 60 V DC.

Redundant power supply

CAUTION

Setup with redundant power supply (Power over Ethernet + 24 V DC or 48 V DC)

To use a redundant 24 V power supply (or 48 V with SCALANCE W786) and Power over Ethernet (PoE), a separate floating 24 V source (or 48 V source for W786) must be available for each SCALANCE W-700. Otherwise there is no longer isolation of the input voltages of different devices required for the PoE function and functionality may be disturbed.

Grounding

CAUTION

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 W-700 and the ground potential of the antenna.
- Housing of the SCALANCE W-700 and the ground potential of a device connected over Ethernet.
- Housing of the SCALANCE W-700 and the shield contact of the connected Ethernet cable.

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

Interruption of the power supply

CAUTION

Damage to the Ethernet interface

Repeated fast removal and insertion of the Ethernet cable when using Power-over-Ethernet and when there is a redundant power supply can cause damage to the Ethernet interface.

Avoid repeatedly removing and inserting the Ethernet cable when using Power-over-Ethernet and a redundant power supply.

FM warning notice

When operated in potential hazardous areas:

WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR DIVISION 2

WARNING - DO NOT OPEN WHEN ENERGIZED

WARNING - DO NOT DISCONNECT EQUIPMENT WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT

Suitable antenna cables and antennas for SCALANCE W-700

Antenna connector: N-Connect/R-SMA connecting cable

The N-Connect/R-SMA male/male flexible connecting cable is available as an accessory for direct connection of an antenna to a SCALANCE W-700.

Length in m	Order number
1	6XV1875-5CH10
2	6XV1875-5CH20
5	6XV1875-5CH50
10	6XV1875-5CN10

Antenna connector: N-Connect/ N-Connect connecting cable

The N-Connect/N-Connect male/male flexible connecting cable is available as an accessory for connecting an antenna to the lightning protector LP798-1N.

Length in m	Order number
1	6XV1875-5CH10
2	6XV1875-5CH20
5	6XV1875-5CH50
10	6XV1875-5CN10

There is a control cabinet feedthrough available for IWLAN devices located in a control cabinet. You will find detailed information in the catalog IK PI.

Antennas

The following antennas have been approved for use with a SCALANCE W-700:

Type	Properties	Order no.
ANT795-6MN	Omni antenna 2.4 / 5 GHz, ceiling mounted	6GK5795-6MN00-0AA6
ANT792-6MN	Omni antenna 2.4 GHz, wall mounted	6GK5792-6MN00-0AA6
ANT793-6MN	Omni antenna 5 GHz, wall mounted	6GK5793-6MN00-0AA6
ANT792-8DN	Directional antenna 2.4 GHz, wall mounted	6GK5792-8DN00-0AA6

Type	Properties	Order no.
ANT793-8DN	Directional antenna 5 GHz, wall mounted	6GK5793-8DN00-0AA6
ANT795-6DN	Directional antenna 2.4 / 5 GHz, wall mounted	6GK5795-6DN00-0AA6
ANT795-4MR	Omni antenna 2.4 / 5 GHz, mounted directly on a SCALANCE W788- xPRO/RR or W74x- 1PRO/RR	6GK5795-4MR00-0AA6
ANT795-4MS	Omni antenna 2.4 / 5 GHz, mounted directly on a SCALANCE W788- xPRO/RR or W784-1xx or W74x-1PRO/RR or W74x- 1	6GK5795-4MS00-0AA6
ANT792-4DN	RCoax antenna 2.4 GHz	6GK5792-4DN00-0AA6
ANT793-4MN	RCoax antenna 5 GHz	6GK5793-4MN00-0AA6

CAUTION**ANT 795-4MS**

The ANT 795-4MS has degree of protection IP30 and is therefore suitable for a dry environment.

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.

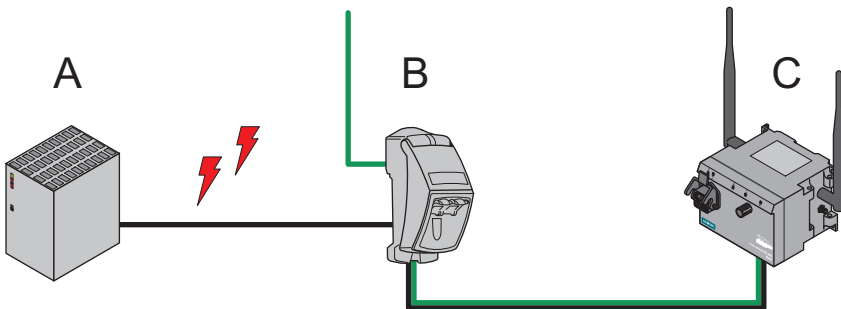


Figure 4-3 Wiring a SCALANCE W788-xPRO/RR with electromagnetic interference between the power supply and modular outlet
A power supply
B FC RJ-45 modular outlet with power insert
C SCALANCE W788-xPRO/RR

Technical specifications

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 (for all countries except Korea)	1 ... 54 Mbps (108 Mbps)
Wireless transmission rate (for Korea)	1 ... 54 Mbps
Supported wireless standards (for all countries except Korea)	802.11a 802.11b 802.11g 802.11h
Supported wireless standards (for Korea)	802.11b 802.11g
Power supply standards supported	802.3af (Power over Ethernet)

Interfaces

Note

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

Power	<ul style="list-style-type: none">• M12 connector (24 V DC, 48 V DC)• Energy contacts in the hybrid connector (24 V DC, 48 V DC)• RJ-45 socket Power over Ethernet (48 V DC) 2 supplies 24 V DC (24 V DC, 48 V DC) safety extra-low voltage (SELV). The following applies to all named power contacts: Power supply cables isolated according to IEEE 802.3af, isolation resistance > 2 Mohms.
Back up	IE IP 67 hybrid connector R-SMA antenna sockets (2 x or 4 x with the 788-2PRO)

Electrical data

Power consumption	< 10 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
Transport/storage temperature	-40°C to 70°C
Degree of protection	Tested to IP65

MTBF information (mean time between failure)

MTBF	67 years
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Transmit power

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

Data rate [Mbps]	P _e [dBm]
6	17
9	17
12	17
18	17
24	17
36	16
48	15
54	13,5

Receiver sensitivity

Table 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 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 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

PNIO - performance data

Even in the planning phase of a plant, it is important to know the reaction time of IO communication and the delay time for data communication in a PROFIBUS, PROFINET IO or Industrial Ethernet network. To provide you with reliable information on typical plants with different topologies, a large number of different configurations have been set up and measured. Based on these measured values, you can do the following:

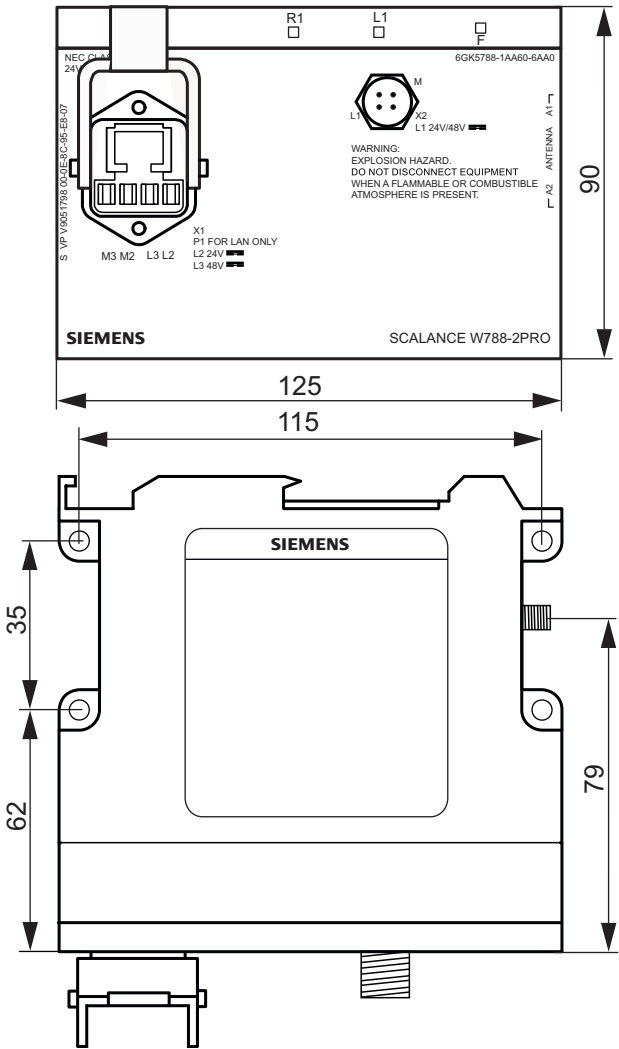
- Design plants ideally in terms of their communication response and
- Compare different plant configurations with each other

You will find the measured values by following the link below:

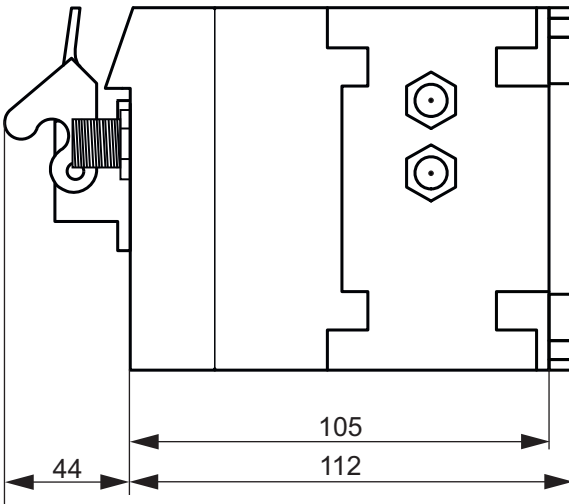
<http://www.siemens.de/automation/pd>

SCALANCE W788 dimension drawing

Front view and top view SCALANCE W788



Side view SCALANCE W788



Technical specifications ANT795-4MR

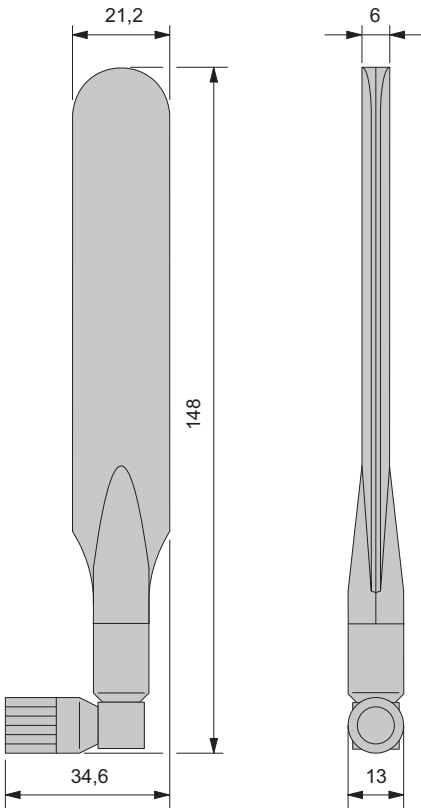
Mechanical characteristics

Connector	R-SMA male for connection to SCALANCE W78x or SCALANCE W74x
Cover material	Polycarbonate
Silicone-free	

Electrical characteristics

Frequency range	2.4 ~ 2.4835 GHz 5.15 ~ 5.35 GHz 5.725 ~ 5.85 GHz
Impedance	50 ohms
Voltage standing wave ratio	≤ 2,0
Return loss	≤ -10 dB
Gain at 2.45 GHz	3 dBi
Gain at 5.25 GHz	5 dBi
Polarization	Vertical
Ambient temperature	- 20 °C.... + 60 °C

Dimension drawing ANT795-4MR



Permitted antennas

Accessories for SCALANCE W-700

Note

When you select an antenna, keep in mind the national approvals for your SCALANCE W7xx.

Characteristics	Type	Frequency / GHz	Antenna gain / dBi	Impedance / Ω	Order No.
Omni	ANT795-6MN	2,4	6	50	6GK5795-6MN00-0AA6
		5	8		
Omni	ANT792-6MN	2,4	6	50	6GK5792-6MN00-0AA6
Omni	ANT793-6MN	5	5	50	6GK5793-6MN00-0AA6
Patch	ANT795-6DN	2,4	9	50	6GK5795-6DN00-0AA6
		5	9		
Directional antenna	ANT792-8DN	2,4	14	50	6GK5792-8DN00-0AA6
Directional antenna	ANT793-8DN	5	18	50	6GK5793-8DN00-0AA6
Helix (for RCoax)	ANT792-4DN	2,4	4	50	6GK5792-4DN00-0AA6
λ 5/8 (for RCoax)	ANT793-4MN	5	6		6GK5793-4MN00-0AA6
RCoax	IWLAN RCoax PE 1/2" 2.4 GHz	2,4	0	50	6XV1875-2A

Characteristics	Type	Frequency / GHz	Antenna gain / dBi	Impedance / Ω	Order No.
RCoax	IWLAN RCoax PE 1/2" 5 GHz	5	0	50	6XV1875-2D

Certification

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 V1.6.1
Electromagnetic compatibility and radio spectrum matters (ERM) -
Electromagnetic compatibility for radio equipment and services - Part 1 : Common technical requirements
- EN 301489-17 V1.2.1
Electromagnetic compatibility and radio spectrum matters (ERM) -
Electromagnetic compatibility for radio equipment and services - Part 17: Specific conditions for 2.4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment
- EN 300328 V1.6.1
Electromagnetic Compatibility and Radio Spectrum Matters (ERM); — Wideband 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 V1.3.1
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.

Type	Number of supported IP nodes	Number of supported MAC nodes	iPCF mode	Certification ID
W788-1PRO	several	several	No	RAP-W1-RJ-E1
W788-2PRO	several	several	No	RAP-W2-RJ-E2
W788-1RR	several	several	Yes	RAP-W1-RJ-E1
W788-2RR	several	several	Yes	RAP-W2-RJ-E2
W744-1PRO	1	1	No	RAP-W1-RJ-E1
W746-1PRO	several	several	No	RAP-W1-RJ-E1
W747-1RR	several	several	Yes	RAP-W1-RJ-E1

Declaration of Conformity

Manufacturer / responsible Dr. Heiner Roehrl

person
Address:

Siemens AG
A&D SC IC
Gleiwitzer Str. 555
90475 Nuernberg
Germany

Declares that the product:

type:

Industrial WLAN Access Point RAP Family

model:

RAP-W1-RJ-E1
RAP-W2-RJ-E2

Intended use

Wireless Communication

Complies with the essential requirements of Article 3 of the R&TTE 1999/5/EC Directive, if used for its intended use and that the following standards has been applied:

1. Safety (Article 3.1.a of the R&TTE Directive)

Applied standard(s)

issue

EN 60950-1 (miniPCI Card)

2006

2. Electromagnetic compatibility (Article 3.1.b of the R&TTE Directive)

Applied standard(s)

issue

EN 301489-1 V1.6.1

2005-09

EN 301489-17 V1.2.1

2002-08

3. efficient use of the radio frequency spectrum (Article 3.2 of the R&TTE Directive)

Applied standard(s)

issue

EN 300 328 V1.6.1

2004-11

EN 301 893 V1.3.1

2003-08

4. Health (Article 3.1a of the R&TTE Directive)

Applied standard(s)

issue

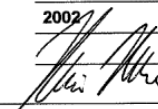
EN 50385

2002

1999/519/EC

Nuernberg,
27. August 2007
(Place and Date)

Dr. Röhrl
(Name and Signature)



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 concrete information on the temperature class, refer to the type plate)

WARNING

When used under hazardous conditions (Zone 2), the SCALANCE W788-xPRO/RR or W74x-1PRO/RR product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.

DO NOT DISCONNECT EQUIPMENT WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.

Note

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

FCC approval

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Notice

Changes or modifications made to this equipment not expressly approved by SIEMENS may void the FCC authorization to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

Notice

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. Professional Installation Notice:

To comply with FCC part 15 rules in the United States, the system must be professionally installed to ensure compliance with the Part 15 certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States. The use of the system in any other combination (such as co-located antennas transmitting the same information) is expressly forbidden.

Note

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

RSS-210 of Industry Canada

"Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device."

"This device has been designed to operate with the antennas listed below, and having a maximum gain of 18 dBi. Antennas not included in this list or having a gain greater than 18 dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms."

"To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication."

"That the device for the band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co-channel mobile satellite systems."

"Users should also be cautioned to take note that high power radars are allocated as primary users (meaning they have priority) of 5250-5350 MHz and 5650-5850 MHz and these radars could cause interference and/or damage to LE-LAN devices."

Note

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

사용자안내문(제 5 조제 1 항제 1 호관련)

기 종 별	사 용 자 안 내 문
A 급 기기 (업무용 방송통신기기)	(업무용 방송통신기기) 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

"당해 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없음"

National approvals SCALANCE W-700


National approvals

The following table lists the countries in which the SCALANCE W700 product is approved. The diamond symbol (◆) identifies all countries for which there was no approval at the time these operating instructions were written.

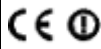
The current status of the approvals can be found on the Internet at the following address:


<http://www.siemens.com/simatic-net/ik-info>


Column	Meaning
Country	Country
Mode	IEEE 802.11 standard and the TPC and / or DFS functionality, where required
CH	Channel
MHz	Frequency
PWR (EIRP)	Maximum permitted effective isotropic radiated power
Use	Permitted use indoors and / or outdoors

Country	Mode	CH	MHz	PWR (EIRP)	Use
Argentina ♦	11b	1	2412	100 mW	Indoor + outdoor
		-	-		
		13	2472		
	11a TPC	56	5280	50 mW	Indoor + outdoor
		60	5300		
		64	5320		
Australia 	11b 11g g-Turbo	1	2412	100 mW	Indoor + outdoor
		-	-		
		13	2472		
	11a TPC	36	5180	200 mW	Indoor only
		-	-		
		64	5320		
		149	5745	1000 mW	Indoor + outdoor
		-	-		
		165	5825		
	11a Turbo TPC	42	5210	50 mW	Indoor only
		50	5250	200 mW	Indoor only
		58	5290		
Bahrain	11b 11g g-Turbo	1	2412	100 mW	Indoor + outdoor
		-	-		
		13	2472		
	11a TPC	36	5180	200 mW	Indoor only
		-	-		
		48	5240		
	11h DFS+TPC	36	5180	200 mW	Indoor only
		-	-		
		64	5320		
		149	5745	1000 mW	Indoor + outdoor
		-	-		
		165	5825		

Country	Mode	CH	MHz	PWR (EIRP)	Use
Brazil ♦	11b 11g 11g-Turbo	1	2412	1000 mW	Indoor + outdoor
		-	-		
		13	2472		
	11a TPC	36	5180	200 mW	Indoor only
		-	-		
		48	5240		
	11h DFS+TPC	36	5180	200 mW	Indoor only
		-	-		
		64	5320	1000 mW	Indoor + outdoor
		149	5745		
Bulgaria	11b 11g g-Turbo	1	2412	100 mW	Indoor + outdoor
		-	-		
		13	2472		
	11h DFS+TPC	36	5180	200 mW	Indoor only
		-	-		
		56	5280	1000 mW	Indoor + outdoor
		100	5500		
Chile	11b	1	2412	100 mW	Indoor only
		-	-		
		13	2472		
	11h DFS+TPC	36	5180	100 mW	Indoor only
		-	-		
		48	5240	100 mW	Indoor only
		52	5260		
		-	-	100 mW	Indoor only
		64	5320		
		149	5745	100 mW	Indoor only
		-	-		
		165	5825		
	11h Turbo	42	5210	100 mW	Indoor only
		50	5250	100 mW	Indoor only
		58	5290		



Country	Mode	CH	MHz	PWR (EIRP)	Use
		152 160	5760 5800	100 mW	Indoor only
China	11b 11g g-Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	149 - 165	5745 - 5825	1000 mW	Indoor + outdoor
Belgium Denmark Germany	11b 11g g-Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
Finland Greece United Kingdom	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
Ireland Iceland Italy Liechtenstein Luxembourg The Netherlands Norway Austria Poland Portugal Romania Sweden Switzerland Slovakia Slovenia Spain Hungary	11h DFS+TPC	36 - 64 100 - 140	5180 - 5320 5500 - 5700	200 mW 1000 mW	Indoor only Indoor + outdoor
					

Country	Mode	CH	MHz	PWR (EIRP)	Use
France 	11b 11g g-Turbo	1	2412	100 mW	Indoor + outdoor
		-	-		
		7	2442		
	11b 11g g-Turbo	8	2447	100 mW	Indoor only
		-	-		
		13	2472		
	11a TPC	36	5180	200 mW	Indoor only
		-	-		
		48	5240		
	11h DFS+TPC	36	5180	200 mW	Indoor only
		-	-		
		64	5320		
Hong Kong	11b 11g g-Turbo	1	2412	100 mW	Indoor + outdoor
		-	-		
		13	2472		
	11a TPC	36	5180	200 mW	Indoor only
		-	-		
		48	5240		
	11h DFS+TPC	36	5180	200 mW	Indoor only
		-	-		
		64	5320		
		100	5500	1000 mW	Indoor + outdoor
		-	-		
		140	5700		
India	11b 11g	1	2412	100 mW	Indoor + outdoor
		-	-		
		13	2472		
	11a TPC	36	5180	200 mW	Indoor only
		-	-		
		64	5320		
		149	5745	200 mW	Indoor only
		-	-		
		165	5825		


Country	Mode	CH	MHz	PWR (EIRP)	Use
Japan 	11b	1	2412	100 mW	Indoor + outdoor
		-	-		
		14	2484		
	11g	1	2412	100 mW	Indoor + outdoor
		-	-		
		13	2472		
	11a TPC	184	4920	200 mW	Indoor + outdoor
		-	-		
		196	4980	200 mW	Indoor + outdoor
		8	5040		
		12	5060		
		16	5080		
		36	5180	200 mW	Indoor only
		-	-		
		48	5240		
Canada	11b 11g	1	2412	200 mW	Indoor + outdoor
		2	2417	1000 mW	Indoor + outdoor
		-	-		
		10	2457		
		11	2462	200 mW	Indoor + outdoor
	11a TPC	36	5180	200 mW	Indoor only
		-	-		
		48	5240	1000 mW	Indoor + outdoor
		149	5745		
		-	-		
		165	5825		
	11a Turbo TPC	42	5210	200 mW	Indoor only
		152	5760	1000 mW	Indoor + outdoor
		160	5800		

Country	Mode	CH	MHz	PWR (EIRP)	Use
Columbia	11b 11g	1	2412	200 mW	Indoor + outdoor
		2 - 10	2417 - 2457	1000 mW	Indoor + outdoor
		11	2462	200 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor
Kuwait	11b 11g g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
Malaysia ♦	11b 11g	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	56 60 64	5280 5300 5320	200 mW	Indoor only
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor
Mexico	11b 11g g-Turbo	1 - 11	2412 - 2462	500 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	50 mW	Indoor only
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor
	11a Turbo TPC	152 160	5760 5800	1000 mW	Indoor + outdoor

Country	Mode	CH	MHz	PWR (EIRP)	Use
Russia ♦	11b 11g	1	2412	100 mW	Indoor + outdoor
		-	-		
		13	2472		
	11a TPC	36	5180	50 mW	Indoor + outdoor
		-	-		
		48	5240		
		52	5260	250 mW	Indoor + outdoor
		-	-		
		64	5320		
		72	5360	1000 mW	Indoor + outdoor
		-	-		
		140	5700		
		149	5745	1000 mW	Indoor + outdoor
		-	-		
		165	5825		
Saudi Arabia	11b 11g g-Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
Singapore	11b 11g g-Turbo	1	2412	100 mW	Indoor + outdoor
		-	-		
		13	2472		
	11h DFS+TPC	36	5180	100 mW	Indoor + outdoor
		-	-		
		64	5320	100 mW	Indoor + outdoor
		149	5745		
		-	-		
		165	5825		
	11h Turbo DFS+TPC	42	5210	100 mW	Indoor + outdoor
		50	5250		
		58	5290		
		152	5760	100 mW	Indoor + outdoor
		160	5800		

Country	Mode	CH	MHz	PWR (EIRP)	Use
South Africa 	11b 11g g-Turbo	1	2412	100 mW	Indoor + outdoor
		- 13	- 2472		
	11a TPC	36	5180	60 mW	Indoor only
		- 48	- 5240		
	11h DFS+TPC	36	5180	200 mW	Indoor only
		- 64	- 5320		
		100	5500	1000 mW	Indoor + outdoor
		- 140	- 5700		
South Korea ♦ 	11b 11g	1	2412	40 mW (RHS power=10 mW/MHz)	Indoor + outdoor
		- 13	- 2472		
	11a	149	5745	200 mW (RHS power=10 mW/MHz)	Indoor + outdoor
		- 161	- 5805		
Taiwan ♦	11b 11g g-Turbo	1	2412	1000 mW	Indoor + outdoor
		- 11	- 2462		
	11a TPC	52	5260	50 mW	Indoor only
		- 68	- 5340		
		149	5745	1000 mW	Indoor + outdoor
		- 165	- 5825		
	11h DFS+TPC	52	5260	50 mW	Indoor only
		- 68	- 5340		
		96	5480	250 mW	Indoor + outdoor
		- 140	- 5700		

Country	Mode	CH	MHz	PWR (EIRP)	Use
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor
Czech Republic	11b 11g g-Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
		36 - 48	5180 - 5240	200 mW	Indoor only
		36 - 64	5180 - 5320	200 mW	Indoor only
	11h DFS+TPC	100 - 140	5500 - 5700	1000 mW	Indoor + outdoor
Turkey	11b 11g g-Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
		36 - 48	5180 - 5240	60 mW	Indoor only
		36 - 64	5180 - 5320	200 mW	Indoor only
	11a TPC				
Ukraine ♦	11b 11g g-Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 64	5180 - 5320	200 mW	Indoor + outdoor
United Arab Emirates	11b 11g g-Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor

Country	Mode	CH	MHz	PWR (EIRP)	Use
United States of America 	11b 11g	1	2412	200 mW	Indoor + outdoor
		2	2417	1000 mW	Indoor + outdoor
		-	-		
		10	2457		
	11a TPC	11	2462	200 mW	Indoor + outdoor
		36	5180	200 mW	Indoor only
		-	-		
		48	5240		
		149	5745	1000 mW	Indoor + outdoor
		-	-		
		165	5825		
	11a Turbo TPC	152	5760	1000 mW	Indoor + outdoor
		160	5800		

The following notice applies only to the SCALANCE W786-2HPW:

NOTICE
Before commissioning the SCALANCE W786-2HPW, check that the Hipath Wireless Controller required for operation is also approved in the country of use.

Siemens AG
Industry Sector
Postfach 48 48
90026 NÜRNBERG