Industrial Wireless Communication

Introduction

Overview

Wireless communications offer multiple new opportunities to the industry for the development of highly flexible and efficient automation solutions. Whether Wireless Remote Networks, RUGGEDCOM WiN, Industrial Wireless LAN or WirelessHART, the Siemens product line for Industrial Wireless Communications is reliable, robust, and secure. The components are used under the toughest indoors and outdoors conditions. Their multiple applications in crane systems, automatic guided vehicle systems, or in remote operation/remote maintenance systems are a testimonial to their exceptional reliability.

Wireless communication options

RUGGEDCOM WiN products to the IEEE 802.16e-2005 (WiMax) standard support longer distances and are specially designed for use in critical locations and under demanding environmental conditions.

For more information about RUGGEDCOM WiN, go to http://www.ruggedcom.com/products/ruggedwireless/.

Further information on Industrial Wireless Telecontrol can be found under the product entries for GSM, GPRS and UMTS modems and routers in the section on Industrial Remote Communication.

More information on WirelessHART can be found under the product entries for WirelessHART as well as in Catalog FI 01 and at http://www.siemens.com/wirelesshart.

Overview

SCALANCE W – wireless communication with Industrial Wireless LAN

The SCALANCE W products provide a combination of reliability, ruggedness and security in a single product:

- For use by industrial and automation customers
- For outdoor use under demanding climatic conditions
- For low-cost integration in the control cabinet or in devices

The Industrial Wireless LAN (IWLAN) technology provides an extension to the IEEE 802.11 standard that is particularly suited to demanding industrial applications with real-time and redundancy requirements. This provides customers with a unique wireless network, both for process-critical data and for uncritical communication. SCALANCE W products distinguish themselves by the reliability of their radio channel and the rugged type of construction with high requirements with respect to mechanical durability for which SIMATIC is known. To protect against unauthorized access, the products have modern standard mechanisms for user identification (authentication) and data encryption, and can at the same time be easily integrated into existing security concepts.

Wireless infrastructure

Instead of copper cables and fiber-optic cables, wireless transmission techniques use radio waves. The propagation characteristics of the electromagnetic waves can differ considerably and depend on the spatial environment with the installed wireless infrastructure.

SCALANCE W modules use techniques such as MIMO, high-quality receivers, and fault-tolerant modulation procedures to improve signal quality and to prevent interruption of wireless communication. Extensions to the IEEE 802.11 standard also permit reliable, wireless transmission from PROFINET, form the basis for wireless safety applications and the transmission of video data with extremely short reply and update data.

Network solution with IWLAN

Mobile end devices, for example, allow a continuous information flow from the management level down to the production level.

The IE/PB Link PN IO with SCALANCE W client modules (e.g. W722) is available for wireless-based connection of PROFIBUS devices.

This means that information can be provided quickly, reliably and easily at the right place and at the right time by wireless.

Ruggedness and industrial suitability

The SCALANCE W products can be exposed to fluctuations in the extended temperature range, or to continuous contact with dust and water. Rugged enclosure and mechanical protection against shock and vibration allow use in harsh industrial environments.

EEC (Enhanced Environmental Conditions) series devices are also specially strengthened (coated printed circuit boards resist condensation, increased temperature range) and can also be used in railway applications. Accessories such as antennas, power supply units and cabling are also part of this concept and are suitable for use in industry.

Power and data are transferred over one cable with Power-over-Ethernet (PoE), saving investment and maintenance costs.

The C-PLUG (configuration plug) swap medium stores engineering and configuration data, making device replacement possible in a short time and without specially trained personnel. This minimizes downtimes and saves training costs.

In addition to the functions of the C-PLUG, the KEY-PLUG swap medium allows additional features to be enabled on SCALANCE W78x/W74x and W77x/W73x.

Reliability of data communication

The international standard IEEE 802.11n makes wireless communication via IWLAN even more robust. The greatest advantage is the use of multiple path propagation (**M**ultiple **I**nput, **M**ultiple **O**utput (MIMO)). This allows the devices parallel use of multiple antennas. A higher data transfer rate is achieved and susceptibility to interference in environments with a lot of reflections is reduced.

SCALANCE W products with IWLAN in accordance with IEEE 802.11n support up to three streams each in both the send and receive directions.

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Industrial Wireless Communication
Industrial Wireless LAN (IWLAN)

Overview (continued)

Redundant network concepts can also be implemented by wireless. Wireless channels are designed redundantly for this purpose, with a failover time of a few milliseconds, so that the application is not influenced by packet repetitions or interference in the radio channel.

No data rate reservation

IEEE 802.11

Time

Client 1
Client 2
Client 3
Client 4
Client 5
Client 6

This means that access by nodes with critical data cannot be predicted.

All nodes access the radio channel without prioritization.

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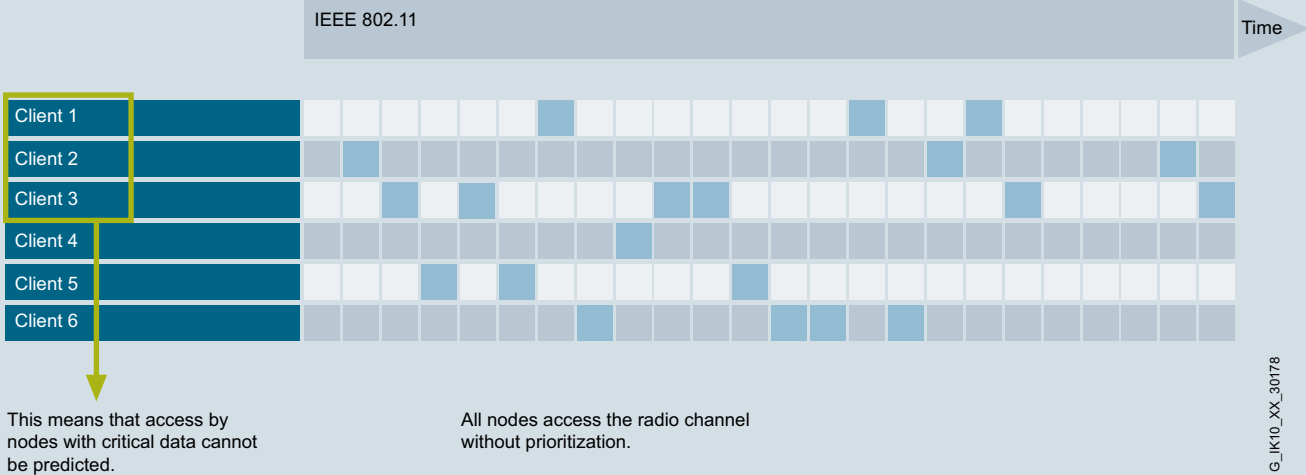
In standard WLAN, access by **all nodes** to the wireless channel is uncoordinated. This means that access by nodes with critical data cannot be predicted.

The iPCF function (supported by device types with iFeatures) permits cyclic data traffic in real time for several PROFINET IO devices connected by wireless. In addition, this allows mobile nodes to be transferred quickly from one wireless field to another (roaming) so that PROFINET IO communication is not interrupted.

Cyclic polling of all nodes within radio coverage

IEEE 802.11

Time

Client 1
Client 2
Client 3
Client 4
Client 5
Client 6

This means that access by all nodes can be predicted.

All nodes may predictably access the radio channel

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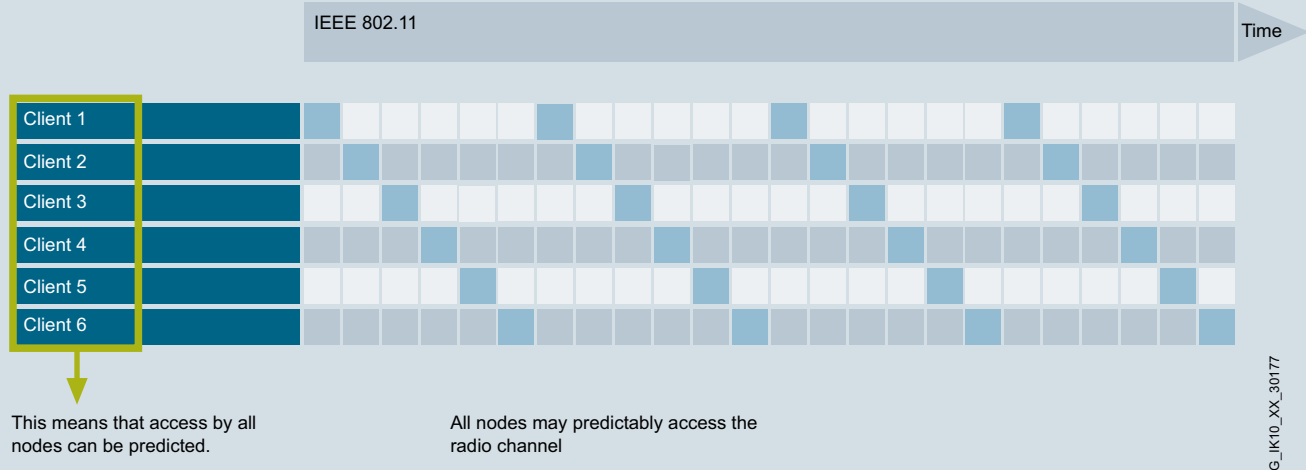
Overview (continued)

Increased data rate

WLAN systems in accordance with IEEE 802.11a/b/g/h use a single channel for sending and receiving data. This achieves a maximum gross data rate of 54 Mbps.

Two channels are used simultaneously with the help of channel bonding. Gross data rates of up to 450 Mbps can be achieved in conjunction with MIMO technology in accordance with IEEE 802.11n.

Communication according to IEEE 802.11n

SCALANCE
W788-1M12

2x 20 MHz channels

SCALANCE
W748-1 M12

max. data rate: 216,7 Mbit/s

Communication according to IEEE 802.11n standard

SCALANCE
W788-1 M12

1x 40 MHz channel

SCALANCE
W748-1 M12

max. data rate: 450 Mbit/s

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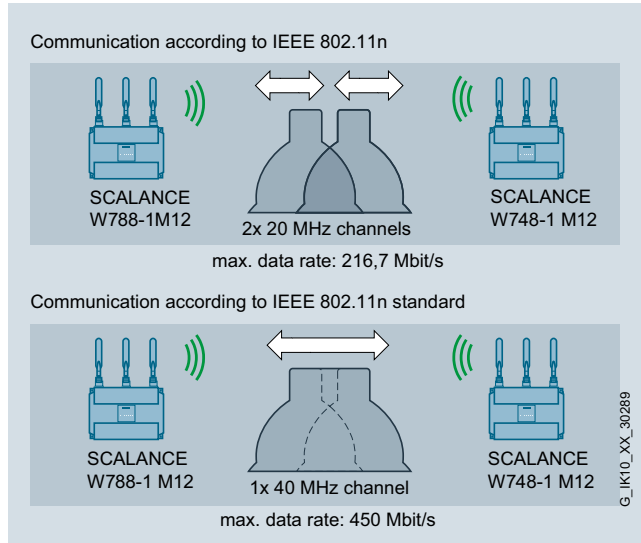
Increased data rate on IWLAN in accordance with IEEE 802.11n with the help of channel bonding

Benefits

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- High level of investment protection, as all products comply with the universally recognized IEEE 802.11 standard and are suitable for 2.4 GHz and 5 GHz
- No wear and tear – saves maintenance and repair costs for connectors, trailing cables, sliding contacts or winding devices
- Predictable data traffic (deterministic response) and defined response times on the wireless link
- Wireless transmission of standard and fail-safe signals with PROFINET and PROFIsafe
- Low-cost installation in hazardous areas of Zone 2
- End-to-end wireless network for data, voice and video beyond corporate divisions thanks to interfacing with the SCALANCE WL**C** IWLAN **c**ontroller (support by SCALANCE W78x**C** device types)
- Expansion of certain SCALANCE W products with additional functions is possible using a KEY-PLUG
- KEY-PLUG/C-PLUG permits simple device replacement if an error occurs

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Industrial Wireless Communication
Industrial Wireless LAN (IWLAN)

Overview
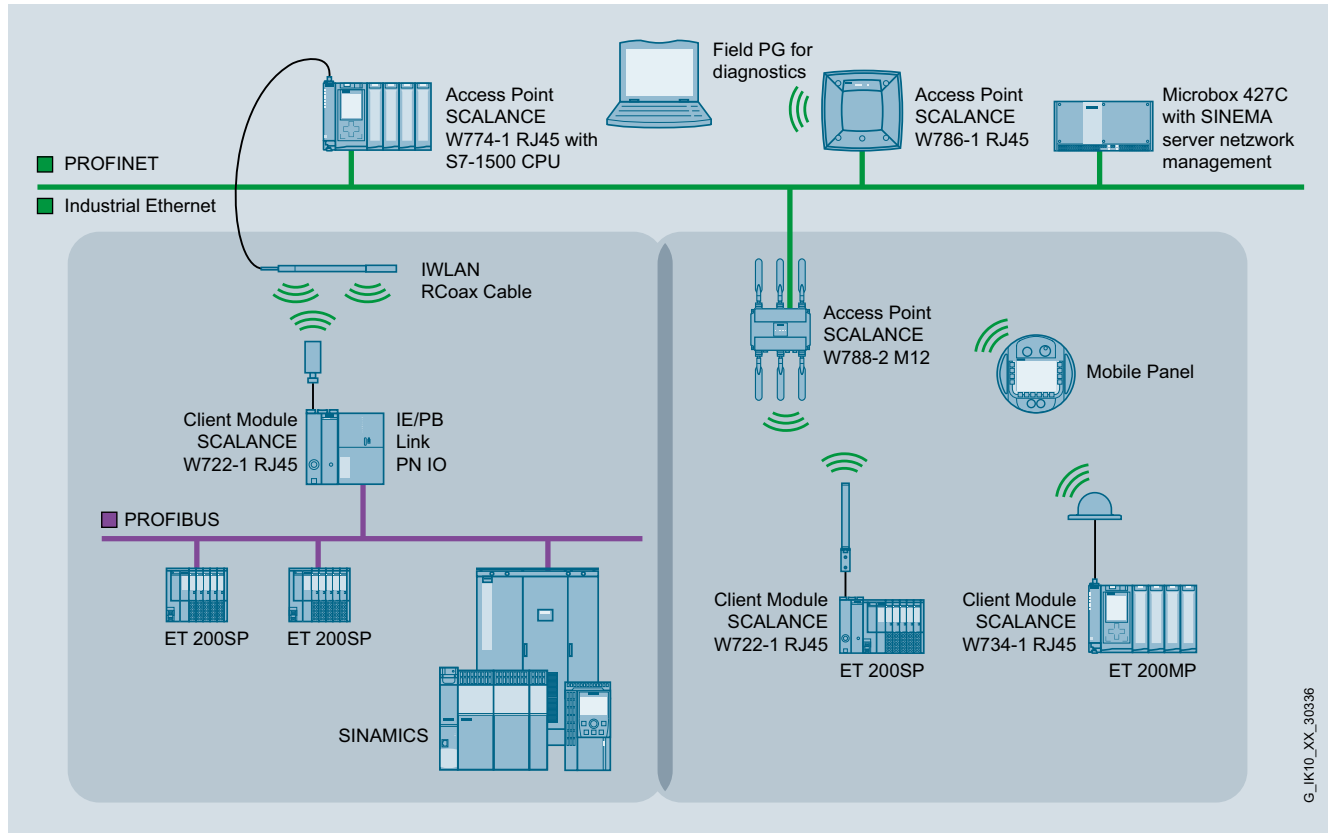
Wireless integration of PROFIBUS segments and PROFINET nodes into an existing Industrial Ethernet network

An existing Ethernet network can be expanded by a wireless network without increased overhead.

This even enables an existing PROFIBUS segment to be connected to an access point.

The wireless link is established to the mobile nodes by connecting a SCALANCE W access point to the Ethernet network. The mobile stations are connected wirelessly, e.g. via the SCALANCE W72x Client Module, to which the mobile station is connected with a cable.

Access to the existing controllers or processes is possible without much additional wiring.

■ Overview (continued)
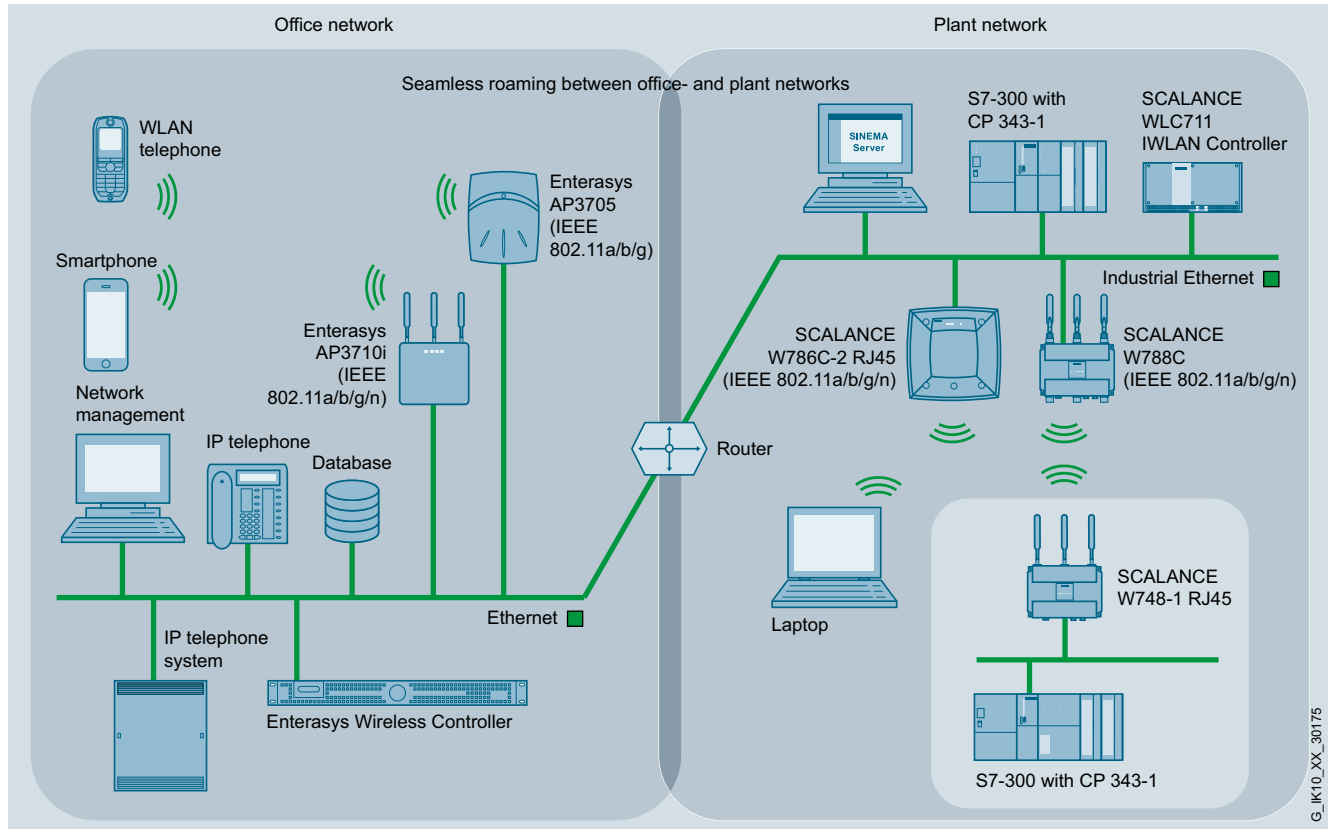
Uninterrupted roaming between the office and automation network by using wireless LAN controllers and Industrial Wireless LAN controllers

By using the SCALANCE WLC Industrial Wireless LAN controller along with controller-based access points, it is possible to establish a single wireless infrastructure for the entire company. This achieves a high level of flexibility, since mobile nodes (e.g. laptop, PDA, WLAN telephone) can move anywhere, roaming seamlessly between the office and automation networks. This allows wireless access to data from any location within the company. Thanks to the use of a centralized security mechanism for each user group (Virtual Network Services VNS), the data is protected against unauthorized access and manipulation.

The SCALANCE W78xC controller-based access points support the WLAN standards IEEE 802.11a/b/g and 802.11n, and they are connected via Gigabit Ethernet to the SCALANCE WLC IWLAN controller.

Operation always requires the SCALANCE WLC711 IWLAN controller that permits the configuration of access points in groups. This significantly increases the manageability of an widespread IWLAN infrastructure. Central management with the IWLAN controller also permits recording of faults/errors as well as monitoring and documentation of statistics.

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Industrial Wireless Communication
Industrial Wireless LAN (IWLAN)

■ **Overview** (continued)
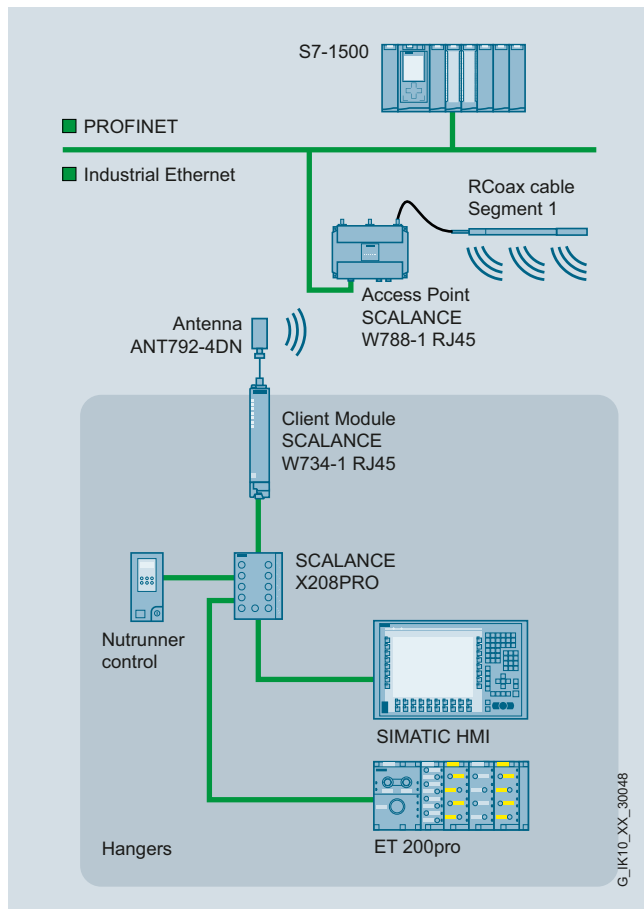
System solution for nutrunner controls with RCoax cable and
SCALANCE W788-1 RJ45

Wireless solutions with RCoax cable are typically used in the
following applications:

- Crane control
- Overhead monorail conveyors
- Storage and retrieval systems
- Automated guided vehicle systems (AGVS)

An example of an application with a suspended monorail is a
nutrunner controller in a car assembly plant.

An RCoax radiating cable is used along the coding rail to estab-
lish wireless data transfer between the monorail and the central
controller. It generates a reliable wireless field and is easy to lay.

The RCoax cable is connected as an antenna to a stationary
SCALANCE W788-1 RJ45 access point with KEY-PLUG W780 i
Features. This means that the same mobile unit can be used for
all applications so that a mobile nutrunner can be used for
several clock cycles resulting in lower investment costs.

Maintenance costs and downtimes are reduced by having
reliable wireless data transmission to mobile communications
partners without any wear and tear.

Downtimes are reduced because if a fault occurs, devices can
be replaced without a programming device or specialist person-
nel by using the KEY-PLUG/ C-PLUG swap medium.

■ Overview (continued)
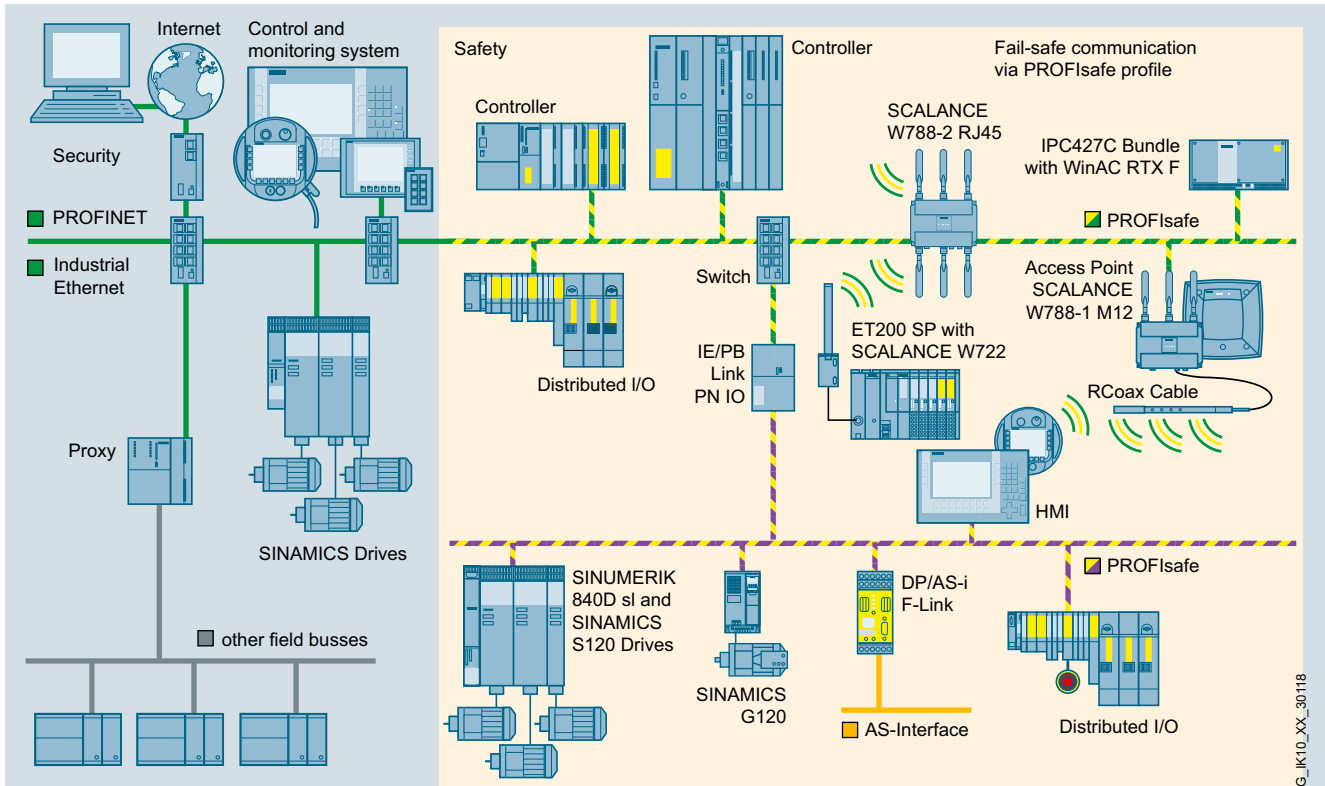
Fail-safe communication with PROFIsafe – via PROFIBUS, PROFINET and even by wireless via Industrial Wireless LAN
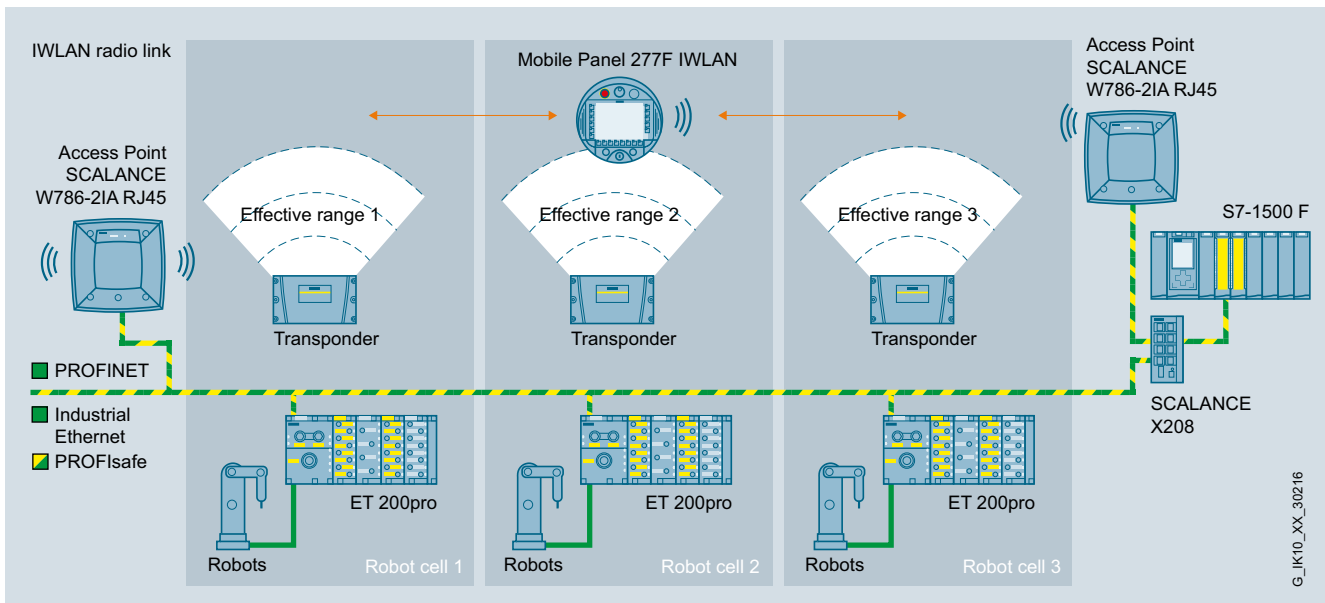
Operation of robots in a safety-related environment

For several years, safety technology has been integrated in standard automation on the basis of SIMATIC S7 controllers, PROFIBUS and PROFIsafe.

This range has been expanded by PROFINET-compliant components, providing a complete product range with fail-safe controllers, fail-safe I/O and a corresponding engineering environment.

PROFIsafe prevents errors such as address corruption, loss, delay, etc. when transmitting messages through continuous numbering of the PROFIsafe data, time monitoring, and authenticity monitoring using passwords and optimized CRC backup.

This means that fail-safe communication is also supported via Industrial Wireless LAN.

Industrial Wireless Communication
Industrial Wireless LAN (IWLAN)

Overview of network components

■ Overview

	Client Modules			Access Points		
	SCALANCE					
	W720	W730	W740	W760	W770	W780
For outdoor use						*
For indoor use			▭			▭
For use in control cabinet	▯	▯	▭	▯	▯	▭
Industrial Wireless LAN Controller	SCALANCE WLC711					

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* also configurable as a client module

SCALANCE W access points, controller access points and clients and IWLAN controllers

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■ Overview (continued)

	IEEE 802.11n MIMO (Input x Output Streams)	IEEE 802.11a/b/g/h	Number of radio interfaces	Internal antennas	Connections for external antennas (R-SMA)	Connections for external antennas (N-Connect)	Quantity of LAN ports	Type of LAN ports	PoE (Power-over-Ethernet) IEEE 802.3at Type 1 (previously 802.3af)	Redundant power supply	Slot for removable storage (PLUG)	Digital Input	Digital Output	Minimum operating temperature (°C)	Maximum operating temperature (°C)	IP protection class	Resistant to condensation	Resistant against salt spray	UV-resistant	For use in Ex zone 2 without housing	For use in Ex zone 2 [1]	Operation with Entereasy WLAN controller	IWLAN client operation possible
SCALANCE W788-1 M12	3x3	•	1			3	1	M12	•	•	•			-20	+60	65					•		•
SCALANCE W788-2 M12	3x3	•	2			6	1	M12	•	•	•			-20	+60	65					•		•
SCALANCE W788-2 M12 EEC	3x3	•	2			6	1	M12	•	•	•			-40	+70	65	•				•		•
SCALANCE W788-1 RJ45	3x3	•	1		3		1	RJ45	•	•	•	•	•	-20	+60	30					•		•
SCALANCE W788-2 RJ45	3x3	•	2		6		1	RJ45	•	•	•	•	•	-20	+60	30					•		•
SCALANCE W786-1 RJ45	3x3	•	1		3		1	RJ45	•	•	•			-40	+60	65	•	•	•	•			•
SCALANCE W786-2 RJ45	3x3	•	2		6		1	RJ45	•	•	•			-40	+60	65	•	•	•	•			•
SCALANCE W786-2IA RJ45	3x3	•	2	6			1	RJ45	•	•	•			-40	+60	65	•	•	•	•			•
SCALANCE W786-2 SFP	3x3	•	2		6		2	SFP			•			-40	+60	65	•	•	•	•			•
SCALANCE W774-1 RJ45	2x2	•	1		2		2	RJ45	•	•	•			-20	+60	30					•		•
SCALANCE W774-1 M12 EEC	2x2	•	1		2		2	M12	•	•	•			-20	+60	30	•				•		•
SCALANCE W761-1 RJ45	1x1	•	1		1		1	RJ45						0	+55	20					•		•
SCALANCE W788C-2 RJ45	3x3	•	2		6		1	RJ45	•	•				-20	+60	30						•	•
SCALANCE W788C-2 M12	3x3	•	2			6	1	M12	•	•				-20	+60	65						•	•
SCALANCE W788C-2 M12 EEC	3x3	•	2			6	1	M12	•	•				-40	+70	65	•					•	•
SCALANCE W786C-2 RJ45	3x3	•	2		6		1	RJ45	•	•				-40	+60	65	•	•	•	•			•
SCALANCE W786C-2IA RJ45	3x3	•	2	6			1	RJ45	•	•				-40	+60	65	•	•	•	•		•	•
SCALANCE W786C-2 SFP	3x3	•	2		6		2	SFP			•			-40	+60	65	•	•	•	•		•	•

● suitable   1) please follow installation instructions

Function overview of SCALANCE W access points according to the IEEE 802.11n standard

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Industrial Wireless Communication
Industrial Wireless LAN (IWLAN)

Overview of network components

■ **Overview** (continued)

	IEEE 802.11n MIMO (Input x Output Streams)	IEEE 802.11a/ b/ g/ h	Number of radio interfaces	Connections for external antennas (R-SMA)	Connections for external antennas (N-Connect)	Quantity of LAN ports	Type of LAN ports	PoE (Power-over-Ethernet) IEEE 802.3at Type 1 (previously 802.3af)	Redundant power supply	Slot for removable storage (PLUG)	Digital input	Digital output	Minimum operating temperature (°C)	Maximum operating temperature (°C)	IP protection class	For use in Ex zone 2 [1]	Number of connectable devices
SCALANCE W748-1 M12	3x3	•	1		3	1	M12	•	•	•			-20	+60	65	•	8
SCALANCE W748-1 RJ45	3x3	•	1	3		1	RJ45	•	•	•	•	•	-20	+60	30	•	8
SCALANCE W734-1 RJ45	2x2	•	1	2		2	RJ45	•	•	•			-20	+60	30	•	8
SCALANCE W722-1 RJ45	1x1	•	1	1		1	RJ45						0	+55	20	•	4
SCALANCE W721-1 RJ45	1x1	•	1	1		1	RJ45						0	+55	20	•	4

• suitable   1) please follow installation instructions

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Function overview of SCALANCE W client modules according to the IEEE 802.11n standard

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Overview

The access points of the SCALANCE W700 product lines are ideally suited for setting up Industrial Wireless LANs (IWLAN) for 2.4 GHz or 5 GHz. They can be used in all applications that require a high degree of operational reliability, even in extremely harsh surroundings.

- High data rates (up to 450 Mbit/s in connection with Channel Bonding) as per IEEE802.11n

- Reliable wireless link by using of MIMO technology (Multiple Input, Multiple Output). For this, SCALANCE W access points use up to three streams for simultaneous sending and receiving.

- SCALANCE W700 Access Points are suitable for any application: for outdoors with high requirements regarding climactic conditions, for installing without a control cabinet indoors, for installing in the control cabinet, and for an extended range of environmental conditions.

- Reliable thanks to a rugged, impact-resistant enclosure, protected from water and dust (up to IP65), resistant to shock, vibration and electromagnetic fields, resistant to condensation thanks to the use of coated PCBs

- Demanding applications with real-time and redundancy requirements, such as PROFINET with PROFIsafe

- Conformant to standards through supporting IEEE802.11; expanded software functions especially for use where increased reliability is required, e.g. cyclic real-time data traffic and very high-speed roaming (iPCF, iPCF-MC)

- Configuration support by means of wizards and online help; easy management via Web server and SNMP

- Configuration and diagnostics using Web based Management, Command Line Interface, and SNMP. Devices and networks can be configured using STEP 7 (TIA Portal). For cyclic monitoring, diagnostics and documentation (reporting) in network mode, the SINEMA Server software is recommended.

- Enabling of further functions using the KEY-PLUG swap medium (iPCF, iPCF-MC, iREF)

- Fast replacement of devices if a fault occurs thanks to use of optional KEY-PLUG/C-PLUG (Configuration Plug) swap medium

Benefits

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- Predictable data traffic (deterministic response) and defined response times on the wireless link

- Reliable wireless link, e.g. by using MIMO technology and monitoring the wireless link

- Cost savings by having only one wireless network both for process-critical data and for non-critical communication

- Future-proof because all products are compatible with the internationally recognized WLAN standard IEEE 802.11n, suitable for license-free 2.4 GHz and 5 GHz frequency bands (ISM bands)

- Implementation of data-intensive applications such as video streaming

- Reduced operating costs, because there is no wear and tear on rotating and moving plant sections

- Cost-effective connection to devices which are remote, difficult to access or installed in hostile environments

- Investment protection because flexible feature expansions (iFeatures) are possible by using the KEY-PLUG

Application

The access points of the SCALANCE W700 product line are designed for both industrial use and for demanding climatic requirements outdoors. Versions for the inexpensive integration in cabinets or in machines are also available. They provide a reliable wireless link, redundancy mechanisms, and fast handover of nodes from one access point to the next (roaming). This allows processes to be monitored and loss of production due to machine downtimes to be avoided.

Industrial Wireless LAN (IWLAN) can also be used in time-critical applications in factory automation (PROFINET IO) or for safety-related signals (PROFIsafe).

Due to their high degree of protection (up to IP65) and extended temperature range from -40 °C to +70 °C, the access points are ideally suited for use outdoors. SCALANCE W products are silicone-free and can therefore also be used in paint shops.

When using the RCoax cable (radiating cable), operation is particularly reliable in conveyor systems and all track applications (e.g. storage and retrieval systems, suspended monorail).

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Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

Application (continued)

Application examples:

- Automated guided vehicle systems and suspended monorails;
prevents wear and offers high flexibility for traffic routing thanks to the wireless transfer of data to the vehicles. It is also possible to transfer PROFIsafe via IWLAN.

- Cranes;
high flexibility due to access to data communication with the moving unit independent of the location

- Mobile control console;
reliable intervention in the process thanks to data communication over IWLAN with mobile units (e.g. Mobile Panel 277(F) IWLAN); the number of operator panels is therefore determined by the number of personnel and no longer by the number of control desks.

- Wireless access to field devices for configuration and testing

- Passenger transportation systems;
transmission in passenger information systems, e.g. high-quality video streams between the control center and buses or trains

- Tunnel application;
reliable wireless link since the devices can handle multiple path propagation better by using the MIMO technology.

- Communication with moving stations (e.g. mobile controls and devices), container logistics, storage and retrieval machines, conveyor systems, conveyor belts, rotating machines, trucks

- Wireless coupling of communication segments and bridging of large distances for fast commissioning and cost-effective networks in applications where cable routing would be extremely expensive (e.g. on public roads, rivers, lakes, train lines)

- Localization of personnel and machines using WLAN tags and localization software from AeroScout

Function

A simple RF field can be established with a single access point (infrastructure mode). The access point provides at least one Industrial Ethernet interface for connection to the wired network. Nodes, such as mobile controllers or a Field PG can move freely within the RF field and exchange data with other nodes via this access point.

If the RF field of a single access point (wireless cell) is insufficient, it can be expanded by further access points. The individual wireless cells must overlap so that moving nodes can be handed over seamlessly from one access point to the next (roaming). This is transparent for the application. The access points must be able to exchange data via Industrial Ethernet or a Wireless Distribution System (WDS).

If the access points are not connected to Industrial Ethernet using a wired connection (e.g. no cable tray available for a data line), the "Wireless Distribution System" mode must be selected. An access point from the SCALANCE W700 product line can communicate via WDS with several other access points that are not connected to the data network by a direct wired connection. Remote directional antennas can be used to achieve ranges of several thousand meters outdoors.

Apart from a reliable radio link, the SCALANCE W700 Access Points are characterized by their support of IT mechanisms:
- IEEE 802.11a/b/g/n for different frequency ranges
- IEEE 802.11e for Wireless Multimedia (WMM)
- IEEE 802.11i for security
- Construction of redundant networks with the Spanning Tree Protocols (RSTP, MSTP)
- Virtual networks (VLAN) for example to logically separate different user groups
- Sending the log entries of the SCALANCE W devices to a Syslog server
- Modern security mechanisms (e.g. network security such as IEEE 802.1x, RADIUS, EAP mechanisms)

Security

A high degree of data security is achieved by means of the WPA2/IEEE 802.11i mechanisms. These define modern procedures that control a regular exchange of the complete 128-bit key as well as performing the access check (authentication) of a node. The Advanced Encryption Standard (AES) is available for data encryption.

On top of this, access to the devices (HTTPS) is encrypted and a secure logon (SSH) is possible. If a security concept in combination with SCALANCE S is required, the security requirements can be increased using Virtual Private Networks (VPN).

■ **Function** (continued)

iFeatures (only in conjunction with KEY-PLUG)

iPCF (industrial Point Coordination Function):
The iPCF mode is a good choice for applications with requirements for real-time and predictable response times (deterministic response), even when mobile nodes are roaming from one access point to the next. This ensures that wireless PROFINET IO is supported and that safety-related signals, e.g. emergency stop, can be linked into the RF field. This means that even video signals from mobile nodes can be transmitted with a high level of quality. The iPCF mechanism expands the IEEE 802.11 standard and must be available on both the client module and the access point. In an RF field in which iPCF is used, no IEEE 802.11-compliant nodes can be operated.

iPCF is recommended for applications where wireless network nodes move along predefined paths (e.g. suspended monorail). RCoax radiating cables or directional antennas must be used for this purpose.

iPCF-MC (iPCF Management Channel)[1]:
iPCF-MC is available as a further development of iPCF. This mode should be used if IWLAN stations that also support iPCF-MC move freely about in the coverage area (especially when using omni-directional antennas) and are to exchange data deterministically. This functionality can only be achieved in connection with access points with two wireless interfaces and the KEY PLUG.

iREF (industrial Range Extension Function):
The range of an individual access point is very important, e.g. for path-based applications. Using iREF, it is now possible to align the various antennas of a wireless interface in different directions. This allows a longer path or a greater area to be covered using a single access point, which reduces the number of channels used and the number of access points.

Note:

These iFeatures cannot be used in parallel.

Diagnostics and management
- Web-based (HTTP/HTTPS) management tool for configuration and diagnostics using a standard browser
- LEDs for signaling operating status and fault/error states
- Signaling of faults by means of SNMP trap or e-mail to a network management tool
- Configuration and diagnostics using Web based Management, Command Line Interface, and SNMP. Devices and networks can be configured using STEP 7 (TIA Portal). For cyclic monitoring, diagnostics and documentation (reporting) in network mode, the SINEMA Server software is recommended.

[1] Available soon

Linking in an automated guided vehicle system using iPCF with the SCALANCE W774-1 RJ45 and KEY-PLUG

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Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

Overview

- Suitable for applications where the access point is to be mounted in the control cabinet

Design

- Rugged aluminum enclosure, shock and vibration-proof, for high mechanical requirements
- Dust protection with IP30 degree of protection
- For use at ambient temperatures from -20 °C to +60 °C
- 3 x R-SMA sockets for the connection of directly mountable and remote antennas (6 x R-SMA sockets for the variants with two wireless modules)
- Antenna placement optimized for the 3x3 MIMO technology; the antennas do not interfere with each other when they are mounted directly on the device
- Suitable for 2.4 GHz and 5 GHz
- 1 x RJ45 connector for 10/100/1 000 Mbit/s with Power-over-Ethernet according to IEEE 802.3at
- 2 x 24 V DC connection for redundant energy supply
- 1 x PLUG compartment for KEY-PLUG/C-PLUG
- Function LEDs for optical signaling of faults/errors and operating statuses
- Digital input for feeding in a signal from a sensor, for example, to an SNMP-based network management system
- Digital output for converting a command received over SNMP into a signal and switching a hardware function
- Mounting: Wall, S7-1500 mounting rail, S7-300 mounting rail, or on 35 mm standard mounting rail

Design and interfaces of the SCALANCE W788-2 RJ45 access points

Product versions

SCALANCE W788-1 RJ45

- A radio card is permanently installed; functional scope can be expanded by using a KEY-PLUG W780 iFeatures

SCALANCE W788-2 RJ45

- Two radio cards are permanently installed; functional scope can be expanded by using a KEY-PLUG W780 iFeatures

▪ Function

SCALANCE W788 RJ45 access points can also be operated as client modules. As an alternative, the SCALANCE W748 RJ45 client modules can be used for this mode.

In conjunction with the SCALANCE W748 RJ45 client modules with degree of protection IP30, an infrastructure can be set up in which extreme temperature differences and protection against dust and water tend to be less important.
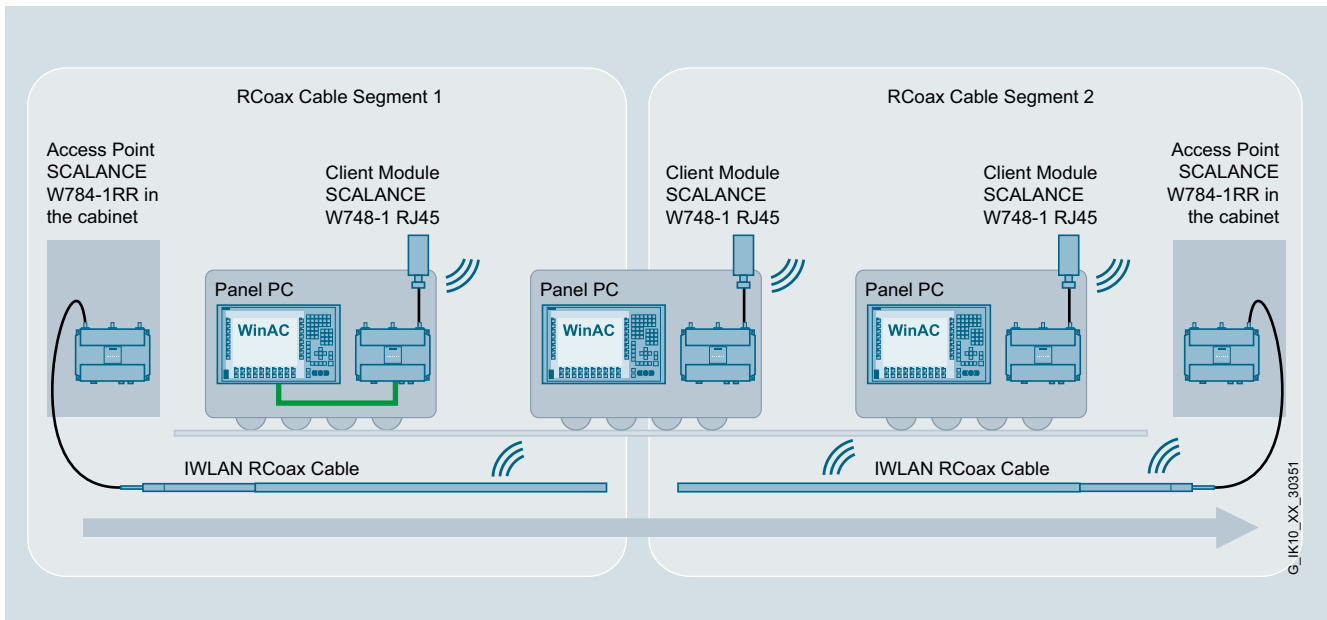
Linking in an automated guided vehicle system using iPCF with the SCALANCE W788-1 RJ45 and KEY-PLUG.
The mobile automated guided vehicles are linked into the IWLAN RF field via the SCALANCE W748-1 RJ45 Ethernet client modules with KEY-PLUG. Both the access points and the client modules are in the control cabinet.

Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

SCALANCE W788 RJ45 for use in control cabinet

Technical specifications

Article No.	6GK5788-1FC00-0AA0 6GK5788-1FC00-0AB0[1]	6GK5788-2FC00-0AA0 6GK5788-2FC00-0AB0[1]
Product-type designation	**SCALANCE W788-1 RJ45**	**SCALANCE W788-2 RJ45**
Transmission rate		
Transmission rate		
• with W-LAN maximum	450 Mbit/s	450 Mbit/s
• with Industrial Ethernet	10 … 1 000 Mbit/s	10 … 1 000 Mbit/s
• note	-	-
Interfaces		
Number of electrical connections		
• for network components and terminal equipment	1	1
• for power supply	1	1
• for redundant power supply	1	1
Design of electrical connection		
• for network components and terminal equipment	RJ45 socket	RJ45 socket
• for power supply	4-pole screw terminal, PoE	4-pole screw terminal, PoE
Number of optical interfaces for optical waveguide at 100 Mbit/s	-	-
Design of optical interface for optical waveguide at 100 Mbit/s	-	-
design of the removable storage C-PLUG	Yes	Yes
Interfaces wireless		
Number of radio cards permanently installed	1	2
Number of internal antennas	-	-
Number of electrical connections for external antenna(s)	3	6
Design of the electrical connection for external antenna(s)	R-SMA (socket)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes	Yes
Signal-Inputs/outputs		
Number of digital inputs	1	1
Number of digital outputs	1	1
Design of electrical connection at the digital inputs/outputs	4-pole screw terminal	4-pole screw terminal
Signal range		
• at digital input	24 V DC, safety extra-low voltage	24 V DC, safety extra-low voltage
• at the digital output	24 V DC /1 A	24 V DC /1 A

[1] Wireless approval in the USA

Technical specifications (continued)

Article No.	6GK5788-1FC00-0AA0 6GK5788-1FC00-0AB0[1]	6GK5788-2FC00-0AA0 6GK5788-2FC00-0AB0[1]
Product-type designation	SCALANCE W788-1 RJ45	SCALANCE W788-2 RJ45
Supply voltage, current consumption, power loss		
Type of supply voltage	DC	DC
Supply voltage		
• 1 from terminal block	19.2 V	19.2 V
• 2 from terminal block	28.8 V	28.8 V
• from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	48 V	48 V
• from Power-over-Ethernet according IEEE802.3at for type 2	50 V	50 V
Current consumed		
• at 24 V with DC typical	0.45 A	0.63 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.22 A	0.22 A
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-	0.3 A
Effective power loss		
• at 24V for DC typical	10.7 W	15 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	-	10.7 W
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-	15 W
Permitted ambient conditions		
Ambient temperature		
• during operating	-20 … +60 °C	-20 … +60 °C
• during storage	-40 … +70 °C	-40 … +70 °C
• during transport	-40 … +70 °C	-40 … +70 °C
Relative humidity at 25 °C without condensation during operating maximum	90 %	90 %
Protection class IP	IP30	IP30
Ambient condition for (standard) operation mode	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.	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.
Design, dimensions and weight		
Width of enclosure without antenna	200 mm	200 mm
Height of enclosure without antenna	158 mm	158 mm
Depth of enclosure without antenna	79 mm	79 mm
Net weight	1.7 kg	1.7 kg
Mounting type wall mounting	Yes	Yes
Wireless frequencies		
Radio frequency		
• for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz	2.41 … 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz	4.9 … 5.8 GHz

[1] Wireless approval in the USA

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Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

SCALANCE W788 RJ45 for use in control cabinet

■ **Technical specifications** (continued)

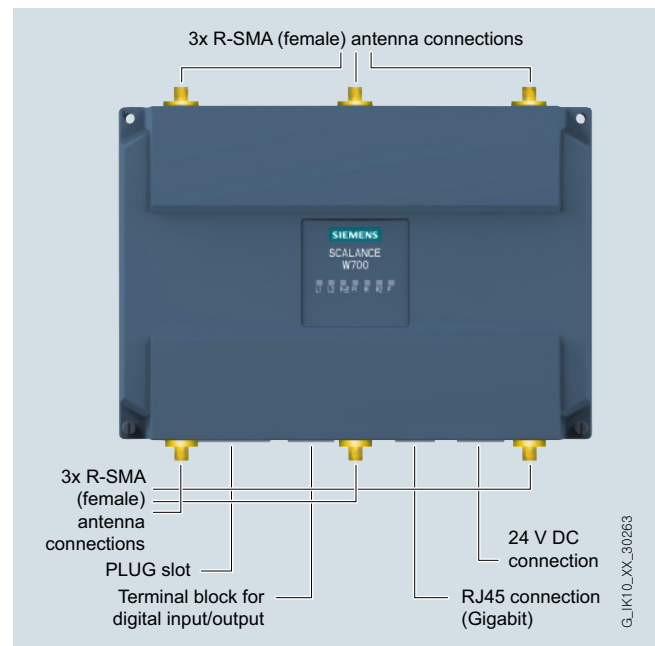| Article No.	6GK5788-1FC00-0AA0 6GK5788-1FC00-0AB0[1]	6GK5788-2FC00-0AA0 6GK5788-2FC00-0AB0[1]
Product-type designation	SCALANCE W788-1 RJ45	SCALANCE W788-2 RJ45
Product properties, functions, components general		
Product function		
• Access Point Mode	Yes	Yes
• Client Mode	Yes	Yes
Number of SSIDs	8	16
Product function		
• iPCF Access Point	Yes	Yes
• iPCF client	Yes	Yes
• iPCF-MC Access Point	in preparation	in preparation
• iPCF-MC client	in preparation	in preparation
Number of iPCF-capable radio modules	1	2
Product functions management, configuration		
Number of manageable IP addresses in client	8	8
Product function		
• CLI	Yes	Yes
• web-based management	Yes	Yes
• MIB support	Yes	Yes
• TRAPs via email	Yes	Yes
• Configuration with STEP 7	in preparation	in preparation
• configuration with STEP 7 in the TIA Portal	in preparation	in preparation
• operation with IWLAN controller	No	No
• operation with Enterasys WLAN controller	No	No
• forced roaming with IWLAN	Yes	Yes
• WDS	Yes	Yes
Protocol is supported		
• Address Resolution Protocol (ARP)	Yes	Yes
• ICMP	Yes	Yes
• Telnet	Yes	Yes
• HTTP	Yes	Yes
• HTTPS	Yes	Yes
• TFTP	Yes	Yes
• SNMP v1	Yes	Yes
• SNMP v2	Yes	Yes
• SNMP v3	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
Identification & maintenance function		
• I&M0 - device-specific information	Yes	Yes
• I&M1 – higher level designation/ location designation	Yes	Yes
Product functions Diagnosis		
Product function		
• PROFINET IO diagnosis	in preparation	in preparation
• localization via Aeroscout	in preparation	in preparation
• SysLog	Yes	Yes
Product functions VLAN		
Product function function VLAN with IWLAN	Yes	Yes
Product functions DHCP		
Product function		
• DHCP client	Yes	Yes
• in Client Mode DHCP server via LAN	No	No

[1] Wireless approval in the USA

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▊ Technical specifications (continued)

Article No.	6GK5788-1FC00-0AA0 6GK5788-1FC00-0AB0[1]	6GK5788-2FC00-0AA0 6GK5788-2FC00-0AB0[1]
Product-type designation	SCALANCE W788-1 RJ45	SCALANCE W788-2 RJ45
Product functions Redundancy		
Protocol is supported STP/RSTP	Yes	Yes
Product functions Security		
Product function		
• ACL - MAC-based	-	-
• Management security, ACL-IP based	Yes	Yes
• IEEE 802.1x (radius)	Yes	Yes
• NAT/NAPT	No	No
• access protection according to IEEE802.11i	Yes	Yes
• WPA/WPA2	Yes	Yes
• TKIP/AES	Yes	Yes
Protocol is supported SSH	Yes	Yes
Product functions Time		
Protocol is supported		
• SNTP	Yes	Yes
• SIMATIC Time	Yes	Yes
Standards, specifications, approvals		
Standard		
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety of CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1	UL 60950-1 CSA C22.2 No. 60950-1
Verification of suitability		
• CE mark	Yes	Yes
• EC declaration of conformity	Yes	Yes
• C-Tick	Yes	Yes
• CCC	No	No
• Railway application in accordance with EN 50155	No	No
• e1 approval	No	No
• E1 approval	No	No
• NEMA4X	No	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes	Yes
Standard for wireless communication		
• IEEE 802.11a	Yes	Yes
• IEEE 802.11b	Yes	Yes
• IEEE 802.11e	Yes	Yes
• IEEE 802.11g	Yes	Yes
• IEEE 802.11h	Yes	Yes
• IEEE 802.11i	Yes	Yes
• IEEE 802.11n	Yes	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories		
Accessories	24 V DC screw terminal and screw terminal for digital input and output included in the scope of delivery	24 V DC screw terminal and screw terminal for digital input and output included in the scope of delivery

[1] Wireless approval in the USA

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Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

SCALANCE W788 RJ45 for use in control cabinet

■ **Ordering data**   Article No.   Article No.

SCALANCE W788 RJ45 access points

IWLAN access points with built-in wireless interfaces; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 450 Mbps; WPA2/AES; Power over Ethernet (PoE), IP30 degree of protection (-20 °C to +60 °C); scope of supply: Mounting hardware, 4-pin screw terminal for 24 V DC; 4-pin screw terminal for digital input and output; manual on CD-ROM; German/English

SCALANCE W788-1 RJ45

IWLAN access point with one integrated wireless interface
- National approvals for operation outside the USA — 6GK5788-1FC00-0AA0
- National approvals for operation within the USA[1] — 6GK5788-1FC00-0AB0

SCALANCE W788-2 RJ45

IWLAN dual access point with two integrated wireless interfaces
- National approvals for operation outside the USA — 6GK5788-2FC00-0AA0
- National approvals for operation within the USA[1] — 6GK5788-2FC00-0AB0

Accessories

KEY-PLUG W780 iFeatures — 6GK5907-8PA00

Swap medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; Can be used in SCALANCE W access points with PLUG compartment

C-PLUG — 6GK1900-0AB00

Swap medium for simple replacement of devices in the event of a fault; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment

DIN rail mounting adapter — 6GK5798-8ML00-0AB3

DIN rail mounting adapter for SCALANCE W788 M12 and SCALANCE W788 RJ45; screw fixing for mounting on a 35 mm DIN rail to EN 50 022; scope of supply: 3 units per pack

IE FC RJ45 Plug 4 x 2

RJ45 plug-in connector for Industrial Ethernet (10/100/1 000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface
- 1 pack = 1 unit — 6GK1901-1BB11-2AA0
- 1 pack = 10 units — 6GK1901-1BB11-2AB0
- 1 pack = 50 units — 6GK1901-1BB11-2AE0

IE FC Standard Cable GP 4x2 — 6XV1878-2A

8-core, shielded TP installation cable for connection to IE FC RJ45 Plug 4x2 and IE M12 Plug PRO 4x2; PROFINET-compliant; with UL approval; sold by the meter; max. length 1 000 m, minimum order 20 m

IE FC Stripping Tool — 6GK1901-1GA00

Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables

Antennas and miscellaneous IWLAN accessories — See Industrial Wireless LAN/ accessories

[1] Please note national approvals under http://www.siemens.com/wireless-approvals

■ **More information**

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at: http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at: http://www.siemens.com/wireless-approvals

Overview

- Particularly suitable for industrial applications without control cabinets

Design

- Rugged aluminum enclosure, shock and vibration-proof, for high mechanical requirements
- High IP65 degree of protection against dust and water jets
- For use at ambient temperatures from -20 °C to +60 °C
- 3 x N-Connect sockets for the connection of directly mountable and remote antennas (6 x N-Connect sockets for the variants with two wireless modules)
- Antenna placement optimized for the 3x3 MIMO technology; the antennas do not interfere with each other when they are mounted directly on the device
- Suitable for 2.4 GHz and 5 GHz
- 1 x M12 connection for 10/100/1 000 Mbit/s with Power-over-Ethernet according to IEEE 802.3at
- 1 x M12 socket for power supply (24 V DC)
- 1 x PLUG compartment (KEY-PLUG/C-PLUG)
- Function LEDs for optical signaling of faults/errors and operating statuses
- Mounting: Wall, S7-1500 mounting rail, S7-300 mounting rail, or on 35 mm standard mounting rail

Design and interfaces of the SCALANCE W788-2 M12 access points

Product versions

SCALANCE W788-1 M12

- A radio card is permanently installed; functional scope can be expanded by using a KEY-PLUG W780 iFeatures

SCALANCE W788-2 M12

- Two radio cards are permanently installed; functional scope can be expanded by using a KEY-PLUG W780 iFeatures

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Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

SCALANCE W788 M12 for indoor use

Function

The devices can be installed at the location that is most favorable for the wireless link. The enclosure and the connectors are resistant to high levels of shock and vibration because all the connectors are screwed. SCALANCE W788 M12 with degree of protection IP65 are ideally suited for environments with widely varying temperatures and where protection against dust and water play an important role. To achieve optimal coverage for special applications, the complete range of SCALANCE W antennas is available.

SCALANCE W788-2 M12 access points can also be operated as client modules. As an alternative, the SCALANCE W748-1 M12 client modules also available with degree of protection IP65 for this mode.
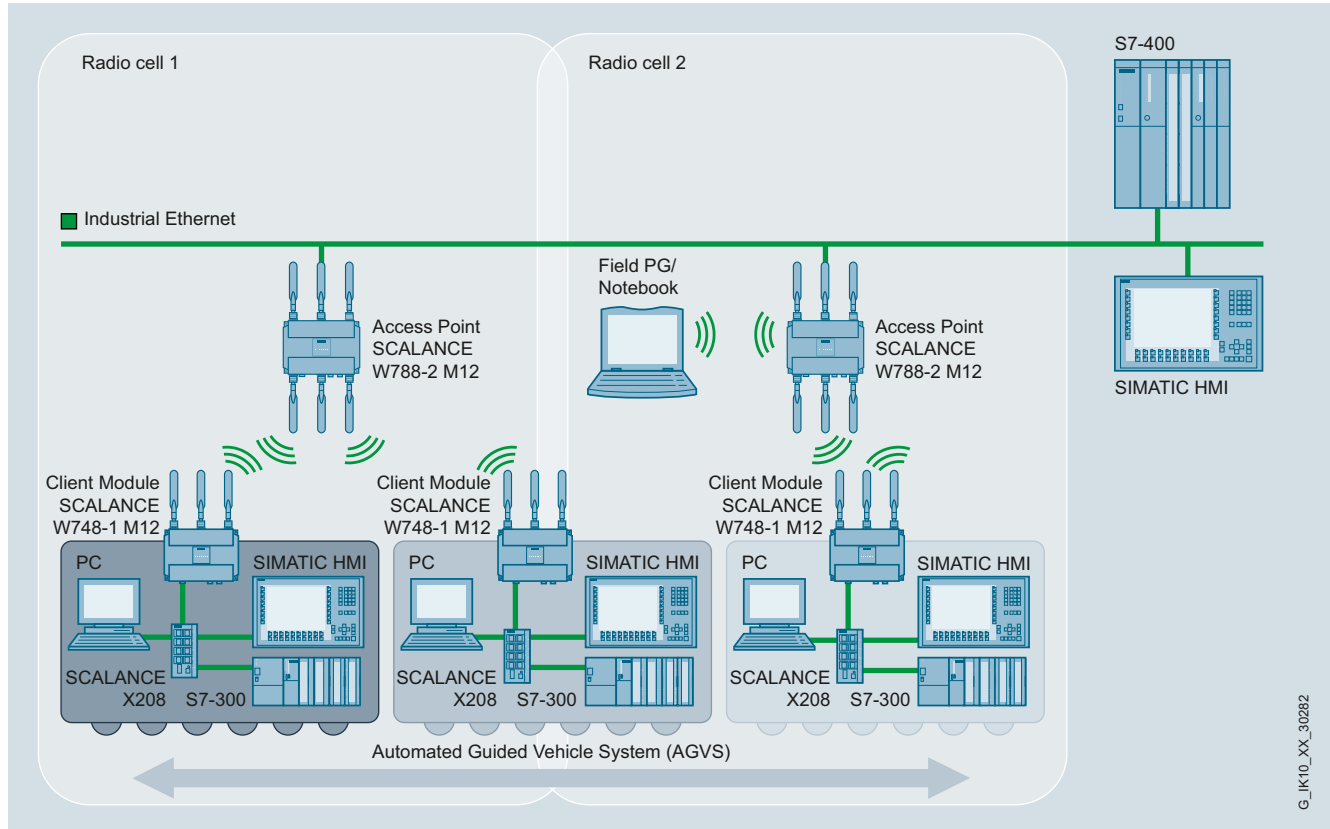
Roaming devices (e.g. Field PG and mobile controller) in a wireless network with two access points

Technical specifications

Article No.	6GK5788-1GD00-0AA0 6GK5788-1GD00-0AB0[1]	6GK5788-2GD00-0AA0 6GK5788-2GD00-0AB0[1]
Product-type designation	SCALANCE W788-1 M12	SCALANCE W788-2 M12
Transmission rate		
Transmission rate		
• with W-LAN maximum	450 Mbit/s	450 Mbit/s
• with Industrial Ethernet	10 … 1 000 Mbit/s	10 … 1 000 Mbit/s
• note	-	-
Interfaces		
Number of electrical connections		
• for network components and terminal equipment	1	1
• for power supply	1	1
• for redundant power supply	1	1
Design of electrical connection		
• for network components and terminal equipment	M12 interface (8-pole, A-coded)	M12 interface (8-pole, A-coded)
• for power supply	M12 interface (4-pole, A-coded)	M12 interface (4-pole, A-coded)
Number of optical interfaces for optical waveguide at 100 Mbit/s	-	-
Design of optical interface for optical waveguide at 100 Mbit/s	-	-
design of the removable storage C-PLUG	Yes	Yes
Interfaces wireless		
Number of radio cards permanently installed	1	2
Number of internal antennas	-	-
Number of electrical connections for external antenna(s)	3	6
Design of the electrical connection for external antenna(s)	N-Connect (socket)	N-Connect (socket)
Product property external antenna can be mounted directly on device	Yes	Yes
Supply voltage, current consumption, power loss		
Type of supply voltage	DC	DC
Supply voltage		
• 1 from M12 Power Connector (A-coded) for redundant power supply	19.2 V	19.2 V
• 2 from M12 Power Connector (A-coded) for redundant power supply	28.8 V	28.8 V
• from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	48 V	48 V
• from Power-over-Ethernet according IEEE802.3at for type 2	50 V	50 V
Current consumed		
• at 24 V with DC typical	0.45 A	0.63 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.22 A	0.22 A
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-	0.3 A
Effective power loss		
• at 24V for DC typical	10.7 W	15 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	-	10.7 W
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-	15 W

[1] Wireless approval in the USA

Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

SCALANCE W788 M12 for indoor use

■ Technical specifications (continued)

Article No.	6GK5788-1GD00-0AA0 6GK5788-1GD00-0AB0[1]	6GK5788-2GD00-0AA0 6GK5788-2GD00-0AB0[1]
Product-type designation	SCALANCE W788-1 M12	SCALANCE W788-2 M12
Permitted ambient conditions		
Ambient temperature • during operating • during storage • during transport	-20 … +60 °C -40 … +70 °C -40 … +70 °C	-20 … +60 °C -40 … +70 °C -40 … +70 °C
Relative humidity at 25 °C without condensation during operating maximum	90 %	90 %
Protection class IP	IP65	IP65
Ambient condition for (standard) operation mode	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.	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.
Design, dimensions and weight		
Width of enclosure without antenna	200 mm	200 mm
Height of enclosure without antenna	176 mm	176 mm
Depth of enclosure without antenna	79 mm	79 mm
Net weight	1.7 kg	1.7 kg
Mounting type wall mounting	Yes	Yes
Wireless frequencies		
Radio frequency • for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz	2.41 … 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz	4.9 … 5.8 GHz
Product properties, functions, components general		
Product function • Access Point Mode • Client Mode	Yes Yes	Yes Yes
Number of SSIDs	8	16
Product function • iPCF Access Point • iPCF client • iPCF-MC Access Point • iPCF-MC client	Yes Yes in preparation in preparation	Yes Yes in preparation in preparation
Number of iPCF-capable radio modules	1	2

[1] Wireless approval in the USA

■ **Technical specifications** (continued)

Article No.	6GK5788-1GD00-0AA0 6GK5788-1GD00-0AB0[1]	6GK5788-2GD00-0AA0 6GK5788-2GD00-0AB0[1]
Product-type designation	**SCALANCE W788-1 M12**	**SCALANCE W788-2 M12**
Product functions management, configuration		
Number of manageable IP addresses in client	8	8
Product function		
• CLI	Yes	Yes
• web-based management	Yes	Yes
• MIB support	Yes	Yes
• TRAPs via email	Yes	Yes
• Configuration with STEP 7	in preparation	in preparation
• configuration with STEP 7 in the TIA Portal	in preparation	in preparation
• operation with IWLAN controller	No	No
• operation with Enterasys WLAN controller	No	No
• forced roaming with IWLAN	Yes	Yes
• WDS	Yes	Yes
Protocol is supported		
• Address Resolution Protocol (ARP)	Yes	Yes
• ICMP	Yes	Yes
• Telnet	Yes	Yes
• HTTP	Yes	Yes
• HTTPS	Yes	Yes
• TFTP	Yes	Yes
• SNMP v1	Yes	Yes
• SNMP v2	Yes	Yes
• SNMP v3	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
Identification & maintenance function		
• I&M0 - device-specific information	Yes	Yes
• I&M1 – higher level designation/ location designation	Yes	Yes
Product functions Diagnosis		
Product function		
• PROFINET IO diagnosis	in preparation	in preparation
• localization via Aeroscout	in preparation	in preparation
• SysLog	Yes	Yes
Product functions VLAN		
Product function function VLAN with IWLAN	Yes	Yes
Product functions DHCP		
Product function		
• DHCP client	Yes	Yes
• in Client Mode DHCP server via LAN	No	No
Product functions Redundancy		
Protocol is supported STP/RSTP	Yes	Yes

[1] Wireless approval in the USA

Industrial Wireless Communication
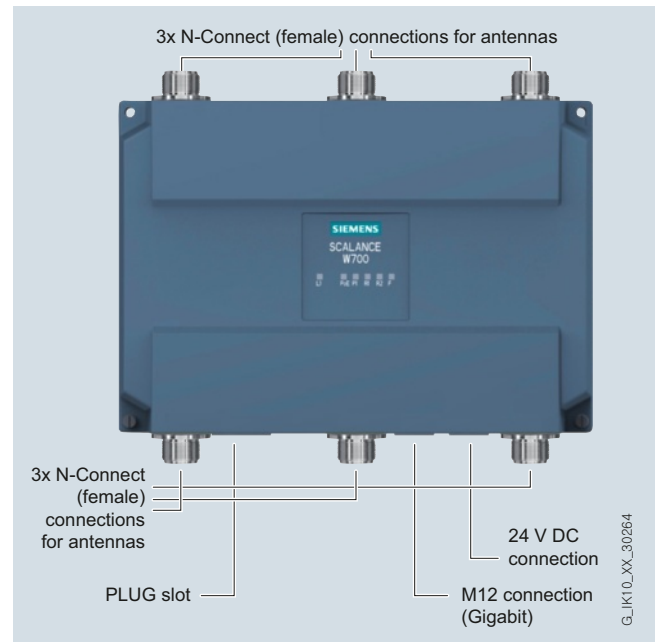## IWLAN – Access Points IEEE 802.11n

SCALANCE W788 M12 for indoor use

Technical specifications (continued)

Article No.	6GK5788-1GD00-0AA0 6GK5788-1GD00-0AB0[1]	6GK5788-2GD00-0AA0 6GK5788-2GD00-0AB0[1]
Product-type designation	SCALANCE W788-1 M12	SCALANCE W788-2 M12
Product functions Security		
Product function		
• ACL - MAC-based	-	-
• Management security, ACL-IP based	Yes	Yes
• IEEE 802.1x (radius)	Yes	Yes
• NAT/NAPT	No	No
• access protection according to IEEE802.11i	Yes	Yes
• WPA/WPA2	Yes	Yes
• TKIP/AES	Yes	Yes
Protocol is supported SSH	Yes	Yes
Product functions Time		
Protocol is supported		
• SNTP	Yes	Yes
• SIMATIC Time	Yes	Yes
Standards, specifications, approvals		
Standard		
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety of CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1	UL 60950-1 CSA C22.2 No. 60950-1
Verification of suitability		
• CE mark	Yes	Yes
• EC declaration of conformity	Yes	Yes
• C-Tick	Yes	Yes
• CCC	No	No
• Railway application in accordance with EN 50155	No	No
• e1 approval		No
• E1 approval	No	No
• NEMA4X	No	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes	Yes
Standard for wireless communication		
• IEEE 802.11a	Yes	Yes
• IEEE 802.11b	Yes	Yes
• IEEE 802.11e	Yes	Yes
• IEEE 802.11g	Yes	Yes
• IEEE 802.11h	Yes	Yes
• IEEE 802.11i	Yes	Yes
• IEEE 802.11n	Yes	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories		
Accessories	-	-

[1] Wireless approval in the USA

Ordering data

	Article No.			Article No.

SCALANCE W788 M12 access points

Accessories

IWLAN access points
with built-in wireless interfaces;
wireless networks
IEEE 802.11a/b/g/h/n at 2.4/5 GHz
up to 450 Mbit/s;
WPA2/AES;
Power over Ethernet (PoE),
IP65 degree of protection
(-20 °C to +60 °C);
scope of delivery:
Mounting hardware;
manual on CD-ROM,
German/English

KEY-PLUG W780 iFeatures — **6GK5907-8PA00**

Swap medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data;
Can be used in SCALANCE W access points with PLUG compartment

C-PLUG — **6GK1900-0AB00**

Swap medium for simple replacement of devices in the event of a fault; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment

SCALANCE W788-1 M12

IWLAN access point with one integrated wireless interface
- National approvals for operation outside the USA — **6GK5788-1GD00-0AA0**
- National approvals for operation within the USA [1] — **6GK5788-1GD00-0AB0**

DIN rail mounting adapter — **6GK5798-8ML00-0AB3**

DIN rail mounting adapter for SCALANCE W788 M12 and SCALANCE W788 RJ45;
screw fixing for mounting on a 35 mm DIN rail to EN 50 022;
scope of supply: 3 units per pack

SCALANCE W788-2 M12

IWLAN dual access point with two integrated wireless interfaces
- National approvals for operation outside the USA — **6GK5788-2GD00-0AA0**
- National approvals for operation within the USA [1] — **6GK5788-2GD00-0AB0**

IE FC M12 Plug PRO 4 x 2

M12 plug-in connector suitable for on-site assembly (X-coded, IP65/IP67), metal enclosure, insulation displacement fast connection method, for SCALANCE W
- 1 unit — **6GK1901-0DB30-6AA0**
- 8 units — **6GK1901-0DB30-6AA8**

IE FC Standard Cable GP 4 x 2 — **6XV1878-2A**

8-core, shielded TP installation cable for connection to
IE FC RJ45 Plug 4 x 2 and
IE M12 Plug PRO 4 x 2;
PROFINET-compatible;
with UL approval;
sold by the meter;
max. length 1 000 m,
minimum order quantity 20 m

IE FC Stripping Tool — **6GK1901-1GA00**

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

Power M12 Cable Connector PRO — **6GK1907-0DC10-6AA3**

Terminal socket for connection of SCALANCE W700 for 24 V DC supply voltage; 4-pole, A-coded, with assembly instructions, 3 units

Power Cable 2 x 0.75 — **6XV1812-8A**

Connecting cable for Power M12 Cable Connector PRO,
sold by the meter

Antennas and miscellaneous IWLAN accessories — See Industrial Wireless LAN/ accessories

[1] Please note national approvals under
http://www.siemens.com/wireless-approvals

More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at:
http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at:
http://www.siemens.com/wireless-approvals

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Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

SCALANCE W788 M12 EEC for enhanced environmental conditions

Overview

- Suitable for use in the industry and automation area, but especially in the railroad environment

Design

- Rugged aluminum enclosure, shock and vibration-proof, for high mechanical requirements
- Special coating of the printed circuit boards (conformal coating)
- Resistant to condensation
- Railway approval in accordance with EN 50155 and NEMA TS2
- High IP65 degree of protection against dust and water jets
- For use at ambient temperatures from -40 °C to +70 °C
- 6 x N-Connect sockets for the connection of direct mountable and remote antennas
- Antenna placement optimized for the 3x3 MIMO technology; the antennas do not interfere with each other when they are mounted directly on the device
- Suitable for 2.4 GHz and 5 GHz
- 1 x M12 connection for 10/100/1 000 Mbit/s with Power-over-Ethernet according to IEEE 802.3at
- 1 x M12 socket for power supply (24 V DC)
- 1 x C-PLUG compartment (KEY-PLUG/C-PLUG)
- Function LEDs for optical signaling of faults/errors and operating statuses
- Mounting: Wall, S7-1500 mounting rail, S7-300 mounting rail, or on 35 mm standard mounting rail
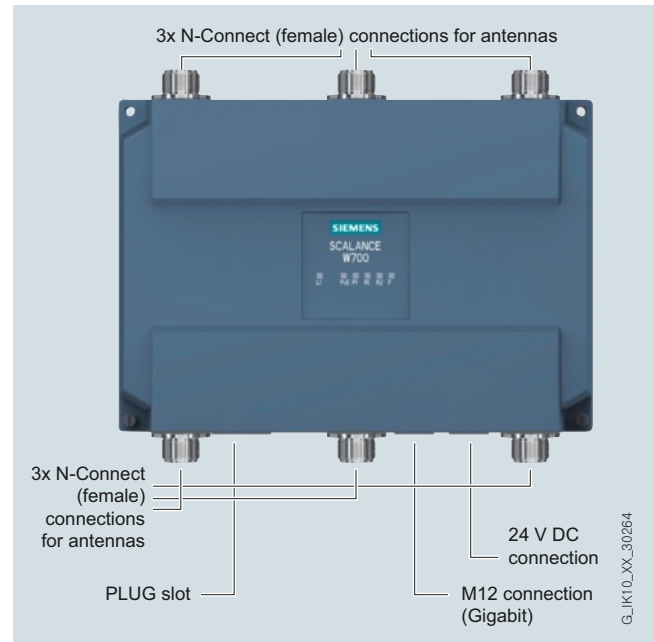
Design and interfaces of the SCALANCE W788-2 M12 EEC access points

Product version

SCALANCE W788-2 M12 EEC

- Two radio cards are permanently installed; functional scope can be expanded by using a KEY-PLUG W780 iFeatures

Function

The SCALANCE W788 M12 EEC (Extended Environmental Conditions) are designed for use in railway applications. The devices satisfy EN 50155, the approval for railway applications, and can thus be used for rail traffic. The devices also have an extended temperature range from -40 °C to +70 °C. Combined with the railway-approved antennas, which are connected via the N-Connect antenna connections (female), these products can establish a reliable IWLAN wireless infrastructure outdoors.

The devices can be installed at the location that is most favorable for the wireless link. The enclosure and the connectors are resistant to high levels of shock and vibration because all the connectors are screwed. Thanks to Conformal Coating and IP65 degree of protection, SCALANCE W788 M12 EEC is ideally suited for environments with widely varying temperatures and where protection against dust and water play an important role. To achieve optimal coverage for special applications, the complete range of SCALANCE W antennas is available. Some antennas even have railway certification.

SCALANCE W788-2 M12 EEC access points can also be operated as client modules.
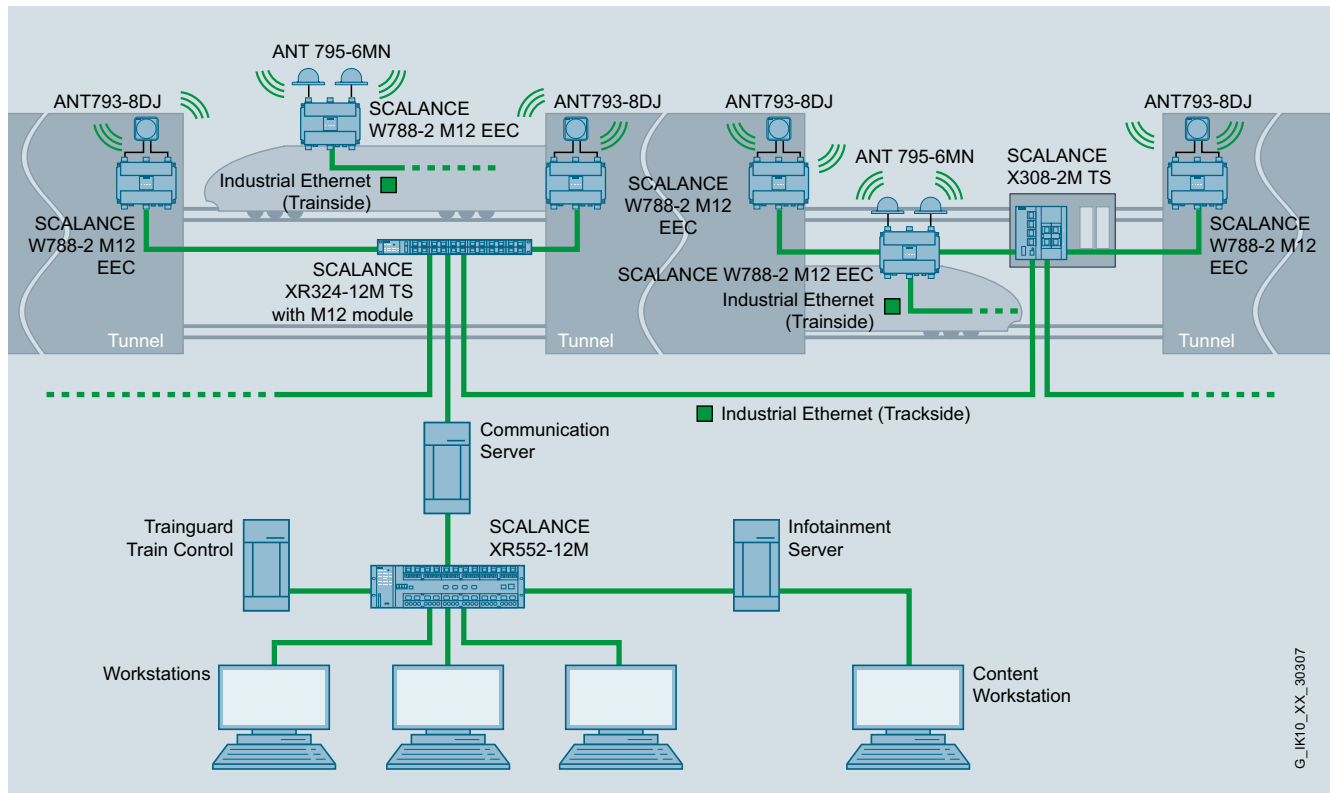
Data transmission on trains using the SCALANCE W788 M12 EEC access points with railway certification

Provided that a delay (several 100 ms) caused by roaming in accordance with IEEE 802.11 is tolerated by all communication stations when switching the radio cells, the communication continues uninterrupted.

For real-time requirements, the SCALANCE W788 M12 EEC can be equipped with KEY-PLUG functionality for activating iFeatures.

Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

SCALANCE W788 M12 EEC for enhanced environmental conditions

■ **Technical specifications**

Article No.	6GK5788-2GD00-0TA0 6GK5788-2GD00-0TB0[1]
Product-type designation	**SCALANCE W788-2 M12 EEC**
Transmission rate	
Transmission rate • with W-LAN maximum • with Industrial Ethernet • note	 450 Mbit/s 10 … 1 000 Mbit/s -
Interfaces	
Number of electrical connections • for network components and terminal equipment • for power supply • for redundant power supply	 1 1 1
Design of the electrical connection • for network components and terminal equipment • for power supply	 M12 interface (8-pole, X-coded), PoE M12 interface (4-pole, A-coded)
Number of optical interfaces for optical waveguide at 100 Mbit/s	-
Design of optical interface for optical waveguide at 100 Mbit/s	-
Design of the removable storage C-PLUG	Yes
Interfaces wireless	
Number of radio cards permanently installed	2
Number of internal antennas	-
Number of electrical connections for external antenna(s)	6
Design of the electrical connection for external antenna(s)	N-Connect (socket)
Product property external antenna can be mounted directly on device	Yes
Supply voltage, current consumption, power loss	
Type of supply voltage	DC

Supply voltage
• 1 from M12 Power Connector
  (A-coded) for redundant power
  supply
• 2 from M12 Power Connector
  (A-coded) for redundant power
  supply
• from Power-over-Ethernet
  according IEEE802.3at for type 1
  and IEEE802.3af
• from Power-over-Ethernet
  according IEEE802.3at for type 2
	
	19.2 V
	
	28.8 V
	
	48 V
	
	50 V

Current consumed
• at 24 V with DC typical
• with Power-over-Ethernet
  according to IEEE802.3at for type 1
  and IEEE802.3af typical
• with Power-over-Ethernet according
  to IEEE802.3at for type 2 typical
	
	0.63 A
	0.22 A
	
	0.3 A

Effective power loss
• at 24V for DC typical
• with Power-over-Ethernet
  according to IEEE802.3at for type 1
  and IEEE802.3af typical
• with Power-over-Ethernet according
  to IEEE802.3at for type 2 typical
	
	15 W
	10.7 W
	
	15 W

Article No.	6GK5788-2GD00-0TA0 6GK5788-2GD00-0TB0[1]
Product-type designation	**SCALANCE W788-2 M12 EEC**
Permitted ambient conditions	
Ambient temperature • during operating • during storage • during transport	 -20 … +60 °C -40 … +70 °C -40 … +70 °C
Relative humidity at 25 °C without condensation during operating maximum	90 %
Protection class IP	IP65
Ambient condition for (standard) operation mode	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 IP54 in compliance with EN 60529.
Design, dimensions and weight	
Width of enclosure without antenna	200 mm
Height of enclosure without antenna	176 mm
Depth of enclosure without antenna	79 mm
Net weight	1.7 kg
Mounting type wall mounting	Yes
Wireless frequencies	

Radio frequency
• for WLAN in 2.4 GHz
  frequency band
• for WLAN in 5 GHz
  frequency band
	
	2.41 … 2.48 GHz
	
	4.9 … 5.8 GHz

Product properties, functions, components general	
Product function • Access Point Mode • Client Mode	 Yes Yes
Number of SSIDs	16
Product function • iPCF Access Point • iPCF client • iPCF-MC Access Point • iPCF-MC client	 Yes Yes in preparation in preparation
Number of iPCF-capable radio modules	0

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■ Technical specifications (continued)

Article No.	6GK5788-2GD00-0TA0 6GK5788-2GD00-0TB0[1)]
Product-type designation	SCALANCE W788-2 M12 EEC
Product functions management, configuration	
Number of manageable IP addresses in client	8
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	in preparation
• configuration with STEP 7 in the TIA Portal	in preparation
• operation with IWLAN controller	No
• operation with Enterasys WLAN controller	No
• forced roaming with IWLAN	Yes
• WDS	Yes
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher level designation/location designation	Yes
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	in preparation
• localization via Aeroscout	in preparation
• SysLog	Yes
Product functions VLAN	
Product function function VLAN with IWLAN	Yes
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
Product functions Redundancy	
Protocol is supported STP/RSTP	Yes

Article No.	6GK5788-2GD00-0TA0 6GK5788-2GD00-0TB0[1)]
Product-type designation	SCALANCE W788-2 M12 EEC
Product functions Security	
Product function	
• ACL - MAC-based	-
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported SSH	Yes
Product functions Time	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes
Standards, specifications, approvals	
Standard	
• for hazardous zone	-
• for safety of CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
Verification of suitability	
• CE mark	Yes
• EC declaration of conformity	Yes
• C-Tick	Yes
• CCC	-
• Railway application in accordance with EN 50155	Yes
• e1 approval	No
• E1 approval	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals

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[1)] Wireless approval in the USA

Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

**SCALANCE W788 M12 EEC for enhanced environmental conditions**

■ Ordering data

	Article No.		Article No.

SCALANCE W788 M12 EEC access points

IWLAN access points
with built-in wireless interfaces;
wireless networks
IEEE 802.11a/b/g/h/n at 2.4/5 GHz
up to 450 Mbit/s;
railway approval in accordance
with EN 50155 / NEMA TS2;
conformal coating;
WPA2/AES; Power over Ethernet
(PoE), IP65 degree of protection;
scope of supply:
Mounting hardware; manual
on CD-ROM,
German/English

SCALANCE W788-2 M12 EEC

IWLAN dual access point with two
integrated wireless interfaces
- National approvals for operation
  outside the USA — **6GK5788-2GD00-0TA0**
- National approvals for operation
  within the USA [1] — **6GK5788-2GD00-0TB0**

Accessories

KEY-PLUG W780 iFeatures — 6GK5907-8PA00

Swap medium for enabling addi-
tional iFeatures, for simple device
replacement if a fault occurs and for
storage of configuration data;
Can be used in SCALANCE W
access points with PLUG compart-
ment

C-PLUG — 6GK1900-0AB00

Swap medium for simple replace-
ment of devices in the event
of a fault;
for storing configuration data;
can be used in SIMATIC NET prod-
ucts with PLUG compartment

DIN rail mounting adapter — 6GK5798-8ML00-0AB3

DIN rail mounting adapter for
SCALANCE W788 M12 and
SCALANCE W788 RJ45;
screw fixing for mounting on a
35 mm DIN rail to EN 50 022;
scope of supply: 3 units per pack

IE FC M12 Plug PRO 4 x 2

M12 plug-in connector suitable
for on-site assembly (X-coded,
IP65/IP67), metal enclosure,
insulation displacement fast con-
nection method, for SCALANCE W
- 1 unit — **6GK1901-0DB30-6AA0**
- 8 units — **6GK1901-0DB30-6AA8**

IE FC Standard Cable GP 4 x 2 — 6XV1878-2A

8-core, shielded TP installation
cable for connection to
IE FC RJ45 Plug 4 x 2 and
IE M12 Plug PRO 4 x 2;
PROFINET-compatible;
with UL approval;
sold by the meter;
max. length 1 000 m,
minimum order quantity 20 m

IE FC Stripping Tool — 6GK1901-1GA00

Preadjusted stripping tool for fast
stripping of the Industrial Ethernet
FC cables

Power M12 Cable Connector PRO — 6GK1907-0DC10-6AA3

Terminal socket for connection of
SCALANCE W700 for 24 V DC
supply voltage;
4-pole, A-coded, with assembly
instructions, 3 units

Power Cable 2 x 0.75 — 6XV1812-8A

Connecting cable for Power M12
Cable Connector PRO,
sold by the meter

*Antennas and miscellaneous
IWLAN accessories*
See Industrial Wireless LAN/
accessories

[1] Please note national approvals under
http://www.siemens.com/wireless-approvals

■ More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA
Selection Tool is available at:
http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at:
http://www.siemens.com/wireless-approvals

Overview

- Particularly well-suited to applications with high climatic requirements when installed outdoors and in areas accessible to the public

Design

- Rugged, impact-resistant plastic enclosure, shock and vibration-proof for demanding mechanical requirements
- High IP65 degree of protection against dust and water jets
- For use at ambient temperatures from -40 °C to +60 °C
- Resistant to condensation
- Resistant to UV radiation and saltwater spray
- Design for use outdoors
- 3 x R-SMA sockets for the connection of remote antennas (6 x R-SMA sockets or six internal antennas for the variants with two wireless modules)
- Suitable for 2.4 GHz and 5 GHz
- 1 x RJ45 connector for 10/100/1 000 Mbit/s and Power-over-Ethernet according to IEEE 802.3at
- 1 x 24 V DC connector, optional operation with 12 to 24 V DC or 100 to 240 V AC with power supply that can be integrated in the device
- 1 x PLUG compartment (KEY-PLUG/C-PLUG)
- Function LEDs for optical signaling of faults/errors and operating statuses
- Resistant to destruction through connections within the device
- Mounting: Wall or, with optional mounting set, on S7 mounting rail, 35 mm standard mounting rail, or on a pole
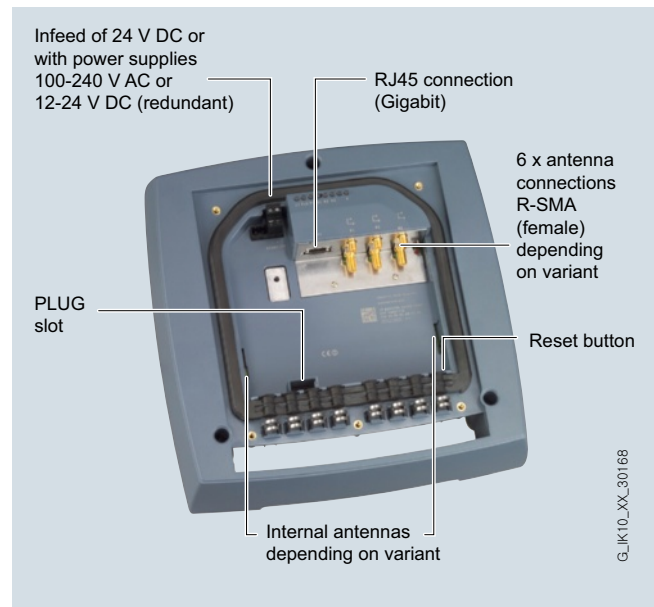
Design and interfaces of the SCALANCE W786 access points

Product versions

SCALANCE W786-1 RJ45

- A radio card is permanently installed; functional scope can be expanded by using a KEY-PLUG W780 iFeatures

SCALANCE W786-2 RJ45

- Two radio cards are permanently installed; functional scope can be expanded by using a KEY-PLUG W780 iFeatures

SCALANCE W786-2IA RJ45

- Two radio cards are permanently installed in the device; six internal antennas; functional scope can be expanded by using a KEY-PLUG W780 iFeatures

Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

SCALANCE W786 RJ45 for outdoor use

■ Function

In the case of access points with two wireless modules, one module implements communication of the access points with each other. The radio link for the stations, e.g. a mobile crane system, is established by the second wireless module. Wireless coverage of larger areas can therefore be provided with the same device.

In the case of SCALANCE W786, this only concerns access points which can, however, be configured as client modules through Web-based management. Then, depending on the selected variant, a maximum of one radio module will be available as a client.
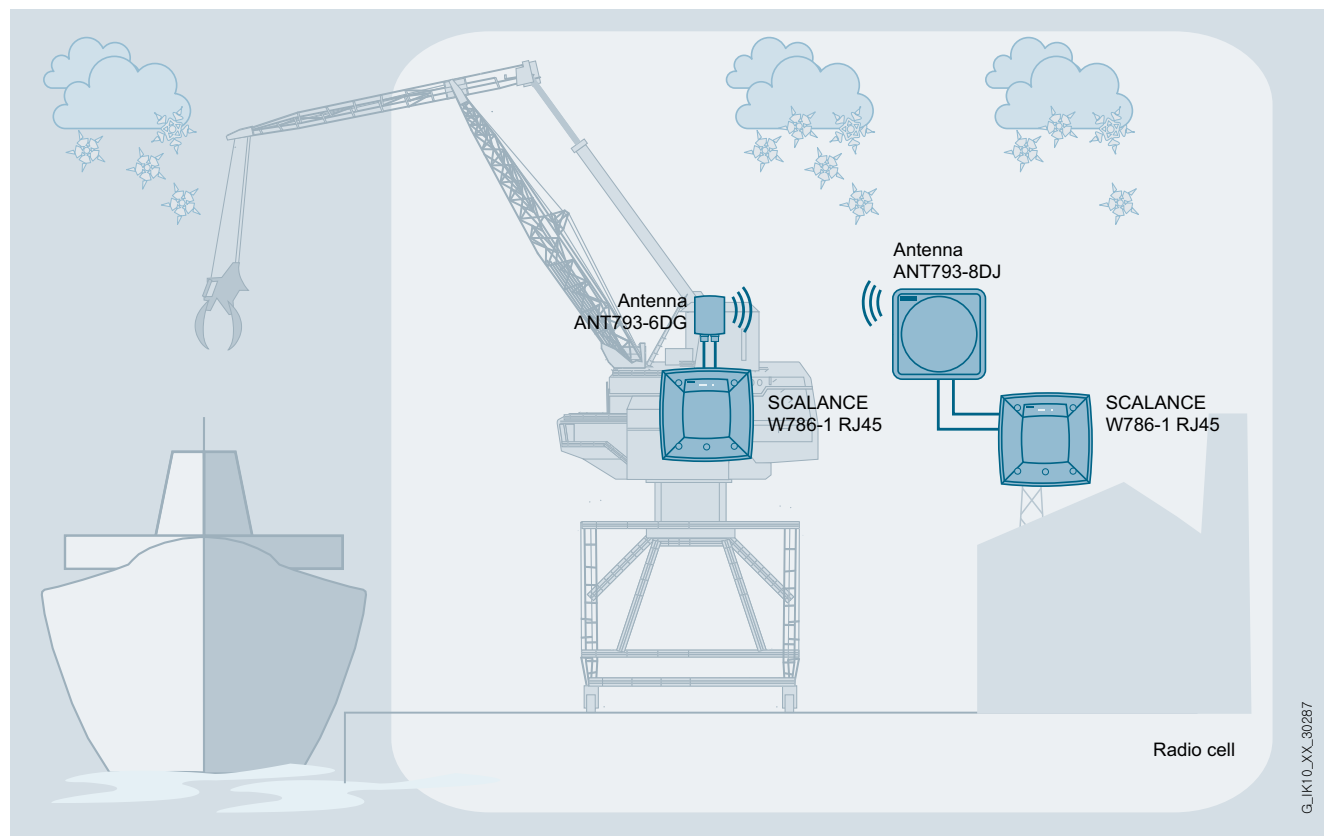
Use of the SCALANCE W786 product line in areas subject to demanding climatic requirements

Technical specifications

Article No.	6GK5786-1FC00-0AA0 6GK5786-1FC00-0AB0[1]	6GK5786-2HC00-0AA0 6GK5786-2HC00-0AB0[1]	6GK5786-2FC00-0AA0 6GK5786-2FC00-0AB0[1]
Product-type designation	SCALANCE W786-1 RJ45	SCALANCE W786-2IA RJ45	SCALANCE W786-2 RJ45
Transmission rate			
Transmission rate			
• with W-LAN maximum	450 Mbit/s	450 Mbit/s	450 Mbit/s
• with Industrial Ethernet	10 … 1 000 Mbit/s	10 … 1 000 Mbit/s	10 … 1 000 Mbit/s
• note	-	-	-
Interfaces			
Number of electrical connections			
• for network components and terminal equipment	1	1	1
• for power supply	1	1	1
• for redundant power supply	1	1	1
Design of electrical connection			
• for network components and terminal equipment	RJ45 socket	RJ45 socket	RJ45 socket
• for power supply	2-pole connector (24 V DC) or optionally available power supply adapter (4-pole 24 V DC or 3-pole 110 to 230 V AC)	2-pole connector (24 V DC) or optionally available power supply adapter (4-pole 24 V DC or 3-pole 110 to 230 V AC)	2-pole connector (24 V DC) or optionally available power supply adapter (4-pole 24 V DC or 3-pole 110 to 230 V AC)
Number of optical interfaces for optical waveguide at 100 Mbit/s	-	-	-
Design of optical interface for optical waveguide at 100 Mbit/s	-	-	-
Number of optical interfaces for optical waveguide at 1 000 Mbit/s	-	-	-
Design of optical interface for optical waveguide at 1 000 Mbit/s	-	-	-
design of the removable storage C-PLUG	Yes	Yes	Yes
Interfaces wireless			
Number of radio cards permanently installed	1	2	2
Number of internal antennas	-	6	-
Number of electrical connections for external antenna(s)	3	-	6
Design of the electrical connection for external antenna(s)	R-SMA (socket)	-	R-SMA (socket)
Product property external antenna can be mounted directly on device	No	-	No

[1] Wireless approval in the USA

Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

SCALANCE W786 RJ45 for outdoor use

◼ **Technical specifications** (continued)

Article No. Product-type designation	6GK5786-1FC00-0AA0 6GK5786-1FC00-0AB0[1] SCALANCE W786-1 RJ45	6GK5786-2HC00-0AA0 6GK5786-2HC00-0AB0[1] SCALANCE W786-2IA RJ45	6GK5786-2FC00-0AA0 6GK5786-2FC00-0AB0[1] SCALANCE W786-2 RJ45
Supply voltage, current consumption, power loss			
Type of supply voltage	DC	DC	DC
Supply voltage			
• 1 from terminal block	19.2 V	19.2 V	19.2 V
• 2 from terminal block	28.8 V	28.8 V	28.8 V
• from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	48 V	48 V	48 V
• from Power-over-Ethernet according IEEE802.3at for type 2	50 V	50 V	50 V
• from optional integratable power supply			
- with AC	100 … 240 V	100 … 240 V	100 … 240 V
- with DC	12 … 24 V	12 … 24 V	12 … 24 V
Current consumed			
• at 24 V with DC typical	0.45 A	0.63 A	0.63 A
• at 230 V with AC typical	0.05 A	0.07 A	0.07 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.22 A	0.22 A	0.22 A
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-	-	-
Effective power loss			
• at 24V for DC typical	10.7 W	15 W	15 W
• at 230 V with AC typical	10.7 W	15 W	15 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	10.7 W	15 W	10.7 W
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-	-	-
Permitted ambient conditions			
Ambient temperature			
• during operating	-40 … +60 °C	-40 … +60 °C	-40 … +60 °C
• during storage	-40 … +85 °C	-40 … +85 °C	-40 … +85 °C
• during transport	-40 … +85 °C	-40 … +85 °C	-40 … +85 °C
Relative humidity at 25 °C without condensation during operating maximum	100 %	100 %	100 %
Protection class IP	IP65	IP65	IP65
Ambient condition for (standard) operation mode	When using the power supply 100 to 240 V AC, an operating temperature of -40 °C to +60 °C is permissible	When using the power supply 100 to 240 V AC, an operating temperature of -40 °C to +60 °C is permissible	When using the power supply 100 to 240 V AC, an operating temperature of -40 °C to +60 °C is permissible
Design, dimensions and weight			
Width of enclosure without antenna	251 mm	251 mm	251 mm
Height of enclosure without antenna	251 mm	251 mm	251 mm
Depth of enclosure without antenna	72 mm	72 mm	72 mm
Net weight	2.24 kg	2.24 kg	2.24 kg
Mounting type wall mounting	Yes	Yes	Yes
Mounting type	For mast mounting, 35 mm DIN rail mounting and S7-300 rail mounting, an additional support plate is required	For mast mounting, 35 mm DIN rail mounting and S7-300 rail mounting, an additional support plate is required	For mast mounting, 35 mm DIN rail mounting and S7-300 rail mounting, an additional support plate is required
Wireless frequencies			
Radio frequency			
• for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz	2.41 … 2.48 GHz	2.41 … 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz	4.9 … 5.8 GHz	4.9 … 5.8 GHz

[1] Wireless approval in the USA

▪ **Technical specifications** (continued)

Article No.	6GK5786-1FC00-0AA0 6GK5786-1FC00-0AB0[1]	6GK5786-2HC00-0AA0 6GK5786-2HC00-0AB0[1]	6GK5786-2FC00-0AA0 6GK5786-2FC00-0AB0[1]
Product-type designation	SCALANCE W786-1 RJ45	SCALANCE W786-2IA RJ45	SCALANCE W786-2 RJ45
Product properties, functions, components general			
Product function			
• Access Point Mode	Yes	Yes	Yes
• Client Mode	Yes	Yes	Yes
Number of SSIDs	8	16	16
Product function			
• iPCF Access Point	Yes	Yes	Yes
• iPCF client	Yes	Yes	Yes
• iPCF-MC Access Point	in preparation	in preparation	in preparation
• iPCF-MC client	in preparation	in preparation	in preparation
Number of iPCF-capable radio modules	1	2	2
Product functions management, configuration			
Number of manageable IP addresses in client	8	8	8
Product function			
• CLI	Yes	Yes	Yes
• web-based management	Yes	Yes	Yes
• MIB support	Yes	Yes	Yes
• TRAPs via email	Yes	Yes	Yes
• Configuration with STEP 7	in preparation	in preparation	in preparation
• configuration with STEP 7 in the TIA Portal	in preparation	in preparation	in preparation
• operation with IWLAN controller	No	No	No
• operation with Enterasys WLAN controller	No	No	No
• forced roaming with IWLAN	Yes	Yes	Yes
• WDS	Yes	Yes	Yes
Protocol is supported			
• Address Resolution Protocol (ARP)	Yes	Yes	Yes
• ICMP	Yes	Yes	Yes
• Telnet	Yes	Yes	Yes
• HTTP	Yes	Yes	Yes
• HTTPS	Yes	Yes	Yes
• TFTP	Yes	Yes	Yes
• SNMP v1	Yes	Yes	Yes
• SNMP v2	Yes	Yes	Yes
• SNMP v3	Yes	Yes	Yes
• DCP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
Identification & maintenance function			
• I&M0 - device-specific information	Yes	Yes	Yes
• I&M1 – higher level designation/ location designation	Yes	Yes	Yes
Product functions Diagnosis			
Product function			
• PROFINET IO diagnosis	in preparation	in preparation	in preparation
• localization via Aeroscout	in preparation	in preparation	in preparation
• SysLog	Yes	Yes	Yes
Product functions VLAN			
Product function function VLAN with IWLAN	Yes	Yes	Yes
Product functions DHCP			
Product function			
• DHCP client	Yes	Yes	Yes
• in Client Mode DHCP server via LAN	No	No	No

[1] Wireless approval in the USA

Industrial Wireless Communication
## IWLAN – Access Points IEEE 802.11n

SCALANCE W786 RJ45 for outdoor use

Technical specifications (continued)

Article No.	6GK5786-1FC00-0AA0 6GK5786-1FC00-0AB0[1]	6GK5786-2HC00-0AA0 6GK5786-2HC00-0AB0[1]	6GK5786-2FC00-0AA0 6GK5786-2FC00-0AB0[1]
Product-type designation	SCALANCE W786-1 RJ45	SCALANCE W786-2IA RJ45	SCALANCE W786-2 RJ45
Product functions Redundancy			
Protocol is supported STP/RSTP	Yes	Yes	Yes
Product functions Security			
Product function			
• ACL - MAC-based	-	-	-
• Management security, ACL-IP based	-	Yes	Yes
• IEEE 802.1x (radius)	Yes	Yes	Yes
• NAT/NAPT	No	No	No
• access protection according to IEEE802.11i	Yes	Yes	Yes
• WPA/WPA2	Yes	Yes	Yes
• TKIP/AES	Yes	Yes	Yes
Protocol is supported SSH	Yes	Yes	Yes
Product functions Time			
Protocol is supported			
• SNTP	Yes	Yes	Yes
• SIMATIC Time	Yes	Yes	Yes
Standards, specifications, approvals			
Standard			
• for EMC from FM	-	-	-
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety of CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1	UL 60950-1 CSA C22.2 No. 60950-1	UL 60950-1 CSA C22.2 No. 60950-1
• for hazardous area of CSA and UL	-	-	-
Verification of suitability			
• CE mark	Yes	Yes	Yes
• EC declaration of conformity	Yes	Yes	Yes
• C-Tick	Yes	Yes	Yes
• CCC	No	No	No
• Railway application in accordance with EN 50155	No	No	No
• e1 approval	No	No	No
• E1 approval	No	No	No
• NEMA4X	Yes	Yes	Yes

• Power-over-Ethernet
  according IEEE802.3at for type 1
  and IEEE802.3af
	Yes	Yes	Yes

• Power-over-Ethernet according to IEEE802.3at for type 2	Yes	Yes	Yes
Standard for wireless communication			
• IEEE 802.11a	Yes	Yes	Yes
• IEEE 802.11b	Yes	Yes	Yes
• IEEE 802.11e	Yes	Yes	Yes
• IEEE 802.11g	Yes	Yes	Yes
• IEEE 802.11h	Yes	Yes	Yes
• IEEE 802.11i	Yes	Yes	Yes
• IEEE 802.11n	Yes	Yes	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals	You will find the current list of countries at: www.siemens.com/wireless-approvals	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories			
Accessories	24 V DC screw terminal included in scope of delivery	24 V DC screw terminal included in scope of delivery	24 V DC screw terminal included in scope of delivery

[1] Wireless approval in the USA

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Ordering data

	Article No.		Article No.
SCALANCE W786 access points		**Accessories**	

SCALANCE W786 access points

IWLAN access points with built-in wireless interfaces; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 450 Mbps; WPA2/AES; Power over Ethernet (PoE), IP65 degree of protection (-40 °C to +60 °C); scope of delivery: Mounting hardware, 2-pin screw terminal for 24 V DC; manual on CD-ROM; German/English

SCALANCE W786-1 RJ45

IWLAN access points with one integrated wireless interface and RJ45 connector

- Connections for three external antennas
  - National approvals for operation outside the USA — **6GK5786-1FC00-0AA0**
  - National approvals for operation within the USA [1] — **6GK5786-1FC00-0AB0**

SCALANCE W786-2 RJ45

IWLAN access points with two integrated wireless interfaces and RJ45 connection

- Six connections for external antennas
  - National approvals for operation outside the USA — **6GK5786-2FC00-0AA0**
  - National approvals for operation within the USA [1] — **6GK5786-2FC00-0AB0**

SCALANCE W786-2IA RJ45

IWLAN access points with two integrated wireless interfaces and RJ45 connection

- Six internal antennas
  - National approvals for operation outside the USA — **6GK5786-2HC00-0AA0**
  - National approvals for operation within the USA [1] — **6GK5786-2HC00-0AB0**

Accessories

KEY-PLUG W780 iFeatures — **6GK5907-8PA00**

Swap medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; Can be used in SCALANCE W access points with PLUG compartment

C-PLUG — **6GK1900-0AB00**

Swap medium for simple replacement of devices in the event of a fault; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment

Power supply PS791-2DC — **6GK5791-2DC00-0AA0**

24 V DC power supply for installation in SCALANCE W786 products; operating instructions in German/English

Power supply PS791-2AC — **6GK5791-2AC00-0AA0**

110 V AC to 230 V AC power supply for installation in the SCALANCE W786 products; operating instructions in German/English

MS1 mounting set — **6GK5798-8MG00-0AA0**

Mounting set for fixing SCALANCE W786 products to an S7-300 mounting rail or a 35 mm standard DIN rail

IE FC RJ45 Plug 4 x 2

RJ45 plug connector for Industrial Ethernet (10/100/1 000 Mbit/s) with a sturdy metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit — **6GK1901-1BB11-2AA0**
- 1 pack = 10 units — **6GK1901-1BB11-2AB0**
- 1 pack = 50 units — **6GK1901-1BB11-2AE0**

IE FC Standard Cable GP 4 x 2 — **6XV1878-2A**

8-core, shielded TP installation cable for connection to IE FC RJ45 Plug 4 x 2 and IE M12 Plug PRO 4 x 2; PROFINET-compatible; with UL approval; sold by the meter; max. length 1 000 m, minimum order quantity 20 m

IE FC Stripping Tool — **6GK1901-1GA00**

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

Antennas and miscellaneous IWLAN accessories — See Industrial Wireless LAN/accessories

[1] Please note national approvals under http://www.siemens.com/wireless-approvals

More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at: http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at: http://www.siemens.com/wireless-approvals

Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

Overview

- Particularly well-suited to applications with high climatic requirements when installed outdoors and in areas accessible to the public

Design

- Rugged, impact-resistant plastic enclosure, shock and vibration-proof for demanding mechanical requirements
- Two slots for SFP plug-in transceivers (optical 2-port switch)
- High IP65 degree of protection against dust and water jets
- For use at ambient temperatures from -40 °C to +60 °C (depending on the SFP plug-in transceiver used)
- Resistant to condensation
- Resistant to UV radiation and saltwater spray
- Design for use outdoors
- 6 x R-SMA sockets for the connection of remote antennas
- 1 x 24 V DC connector, optional operation with 12 to 24 V DC or 100 to 240 V AC with power supply that can be integrated in the device
- 1 x PLUG compartment (KEY-PLUG/C-PLUG)
- Function LEDs for optical signaling of faults/errors and operating statuses
- Mounting: Wall or, with optional mounting set, on S7 mounting rail, 35 mm standard mounting rail, or on a pole

Design and interfaces of the SCALANCE W786-2 SFP access points

Product versions

SCALANCE W786-2 SFP
- Two wireless cards permanently installed in the device; can be expanded to establish wireless connections with KEY-PLUG W780 iFeatures

Function

In the case of access points with two wireless modules, one module implements communication of the access points with each other. The radio link for the stations, e.g. a mobile crane system, is established by the second wireless module. Wireless coverage of larger areas can therefore be provided with the same device.

If the minimum length of standard Ethernet cables is insufficient due to the large distance of the access points from the wired network, SCALANCE W786-2 SFP with SFP plug-in transceivers can be used. Depending on the optical plug-in transceivers used, ranges of up to 70 km can then be achieved.

In the case of SCALANCE W786, this only concerns access points which can, however, be configured as client modules through Web-based management. Then, depending on the selected variant, a maximum of one radio module will be available as a client.
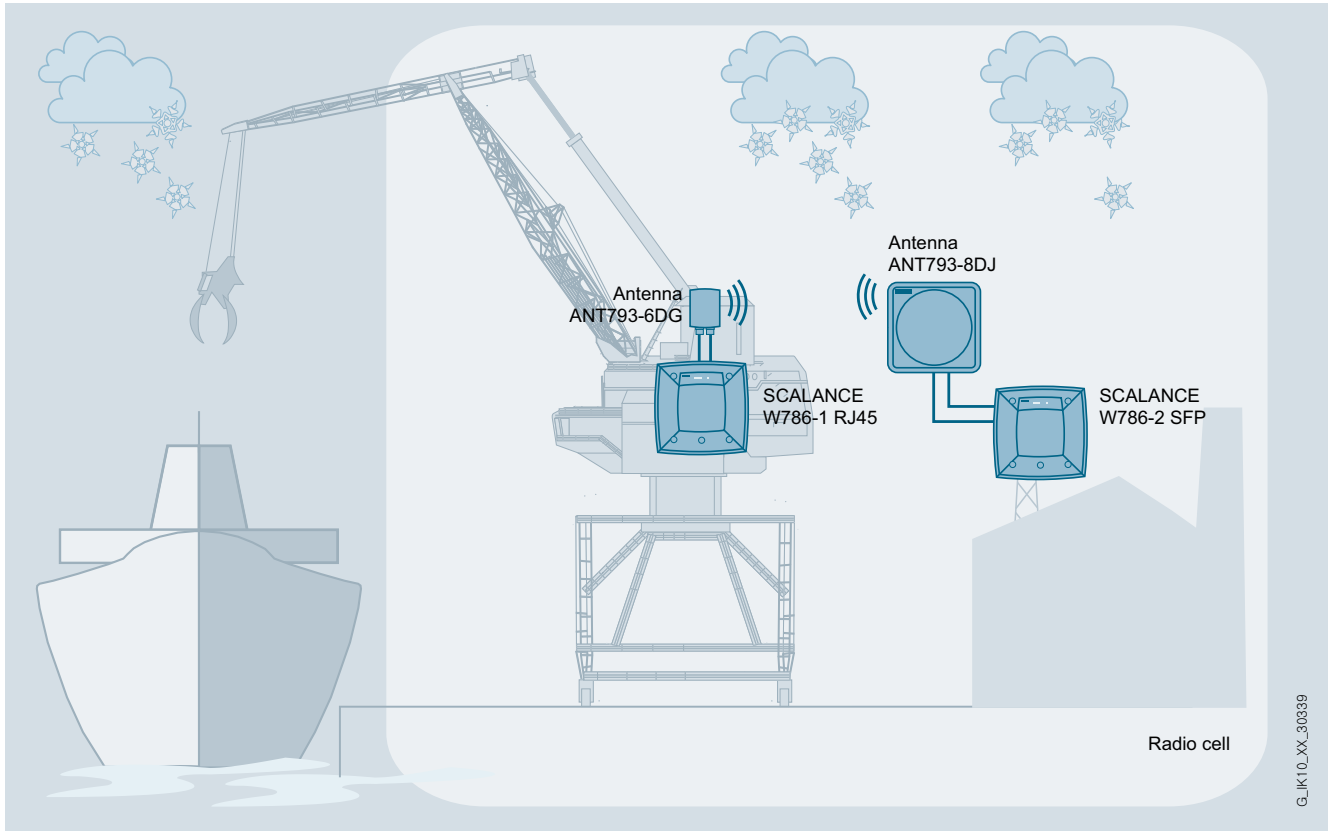
Use of the SCALANCE W786-2 SFP product line in areas subject to demanding climatic requirements

Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

SCALANCE W786 SFP for outdoor use

■ Technical specifications

Article No.	6GK5786-2FE00-0AA0
Product-type designation	SCALANCE W786-2 SFP
Transmission rate	
Transfer rate	
• with W-LAN maximum	450 Mbit/s
• with Industrial Ethernet	1 000 Mbit/s
• note	-
Interfaces	
Number of electrical connections	
• for network components and terminal equipment	-
• for power supply	1
• for redundant power supply	0
Design of the electrical connection	
• for network components and terminal equipment	-
• for power supply	2-pole connector (24 V DC) or optionally available power supply adapter (4-pole 24 V DC or 3-pole 110 to 230 V AC)
Number of optical interfaces for optical waveguide at 100 Mbit/s	2
Design of optical interface for optical waveguide at 100 Mbit/s	SFP slot
Number of optical interfaces for optical waveguide at 1 000 Mbit/s	2
Design of optical interface for optical waveguide at 1 000 Mbit/s	SFP slot
design of the removable storage C-PLUG	Yes
Interfaces wireless	
Number of radio cards permanently installed	2
Number of internal antennas	-
Number of electrical connections for external antenna(s)	6
Design of the electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	No
Supply voltage, current consumption, power loss	
Type of supply voltage	DC
Supply voltage	
• 1 from terminal block	19.2 V
• 2 from terminal block	28.8 V
• from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	-
• from Power-over-Ethernet according IEEE802.3at for type 2	-
• from optional integratable power supply	
- with AC	100 … 240 V
- with DC	12 … 24 V

Article No.	6GK5786-2FE00-0AA0
Product-type designation	SCALANCE W786-2 SFP
Current consumed	
• at 24 V with DC typical	-
• at 230 V with AC typical	-
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	-
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-
Effective power loss	
• at 24V for DC typical	-
• at 230 V with AC typical	-
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	-
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-
Permitted ambient conditions	
Ambient temperature	
• during operating	-40 … +60 °C
• during storage	-40 … +85 °C
• during transport	-40 … +85 °C
Relative humidity at 25 °C without condensation during operating maximum	100 %
Protection class IP	IP65
Ambient condition for (standard) operation mode	When using the power supply 100 to 240 V AC, an operating temperature of -40 °C to +60 °C is permissible
Design, dimensions and weight	
Width of enclosure without antenna	251 mm
Height of enclosure without antenna	251 mm
Depth of enclosure without antenna	72 mm
Net weight	2.24 kg
Mounting type wall mounting	Yes
Mounting type	For mast mounting, 35 mm DIN rail mounting and S7-300 rail mounting, an additional support plate is required
Wireless frequencies	
Radio frequency	
• for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz
Product properties, functions, components general	
Product function	
• Access Point Mode	Yes
• Client Mode	Yes
Number of SSIDs	16
Product function	
• iPCF Access Point	Yes
• iPCF client	Yes
• iPCF-MC Access Point	in preparation
• iPCF-MC client	in preparation
Number of iPCF-capable radio modules	2

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Technical specifications (continued)

Article No.	6GK5786-2FE00-0AA0
Product-type designation	**SCALANCE W786-2 SFP**
Product functions management, configuration	
Number of manageable IP addresses in client	8
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	in preparation
• configuration with STEP 7 in the TIA Portal	in preparation
• operation with IWLAN controller	No
• operation with Enterasys WLAN controller	No
• forced roaming with IWLAN	Yes
• WDS	Yes
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher level designation/location designation	Yes
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	in preparation
• localization via Aeroscout	in preparation
• SysLog	Yes
Product functions VLAN	
Product function function VLAN with IWLAN	Yes
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
Product functions Redundancy	
Protocol is supported STP/RSTP	Yes
Product functions Security	
Product function	
• ACL - MAC-based	-
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported SSH	Yes

Article No.	6GK5786-2FE00-0AA0
Product-type designation	**SCALANCE W786-2 SFP**
Product functions Time	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes
Standards, specifications, approvals	
Standard	
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety of CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
Verification of suitability	
• CE mark	Yes
• EC declaration of conformity	Yes
• C-Tick	Yes
• CCC	-
• Railway application in accordance with EN 50155	No
• e1 approval	
• E1 approval	No
• NEMA4X	Yes
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories	
Accessories	24 V DC screw terminal included in scope of delivery

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Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

SCALANCE W786 SFP for outdoor use

Ordering data	Article No.
SCALANCE W786 access points	
IWLAN access points with built-in wireless interfaces; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 450 Mbit/s; WPA2/AES; Power over Ethernet (PoE), IP65 degree of protection (-40 °C to +60 °C); scope of delivery: Mounting hardware, 2-pin screw terminal for 24 V DC; manual on CD-ROM; German/English	
SCALANCE W786-2 SFP	
IWLAN access points with two integrated wireless interfaces and RJ45 connection	
• Six external antennas	
- National approvals for operation outside the USA	**6GK5786-2FE00-0AA0**
- National approvals for operation within the USA [1]	**6GK5786-2FE00-0AB0**
Accessories	
KEY-PLUG W780 iFeatures	**6GK5907-8PA00**
Swap medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; Can be used in SCALANCE W access points with PLUG compartment	
C-PLUG	**6GK1900-0AB00**
Swap medium for simple replacement of devices in the event of a fault; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment	
Power supply PS791-2DC	**6GK5791-2DC00-0AA0**
24 V DC power supply for installation in SCALANCE W786 products; operating instructions in German/English	
Power supply PS791-2AC	**6GK5791-2AC00-0AA0**
110 V AC to 230 V AC power supply for installation in the SCALANCE W786 products; operating instructions in German/English	
MS1 mounting set	**6GK5798-8MG00-0AA0**
Mounting set for fixing SCALANCE W786 products onto an S7-300 mounting rail or a 35 mm standard DIN rail	
Antennas and miscellaneous IWLAN accessories	See Industrial Wireless LAN/ accessories
SFP plug-in transceiver	
SFP992-1 Gigabit, multimode, 750 m	**6GK5992-1AL00-8AA0**
SFP992-1LD Gigabit, singlemode, 10 km	**6GK5992-1AM00-8AA0**
SFP992-1LH Gigabit, singlemode, 40 km	**6GK5992-1AN00-8AA0**
SFP992-1LH+ Gigabit, singlemode, 70 km	**6GK5992-1AP00-8AA0**
Fiber-optic cables	see Glass fiber-optic cables

[1] Please note national approvals under
http://www.siemens.com/wireless-approvals

More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at:
http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at:
http://www.siemens.com/wireless-approvals

Overview
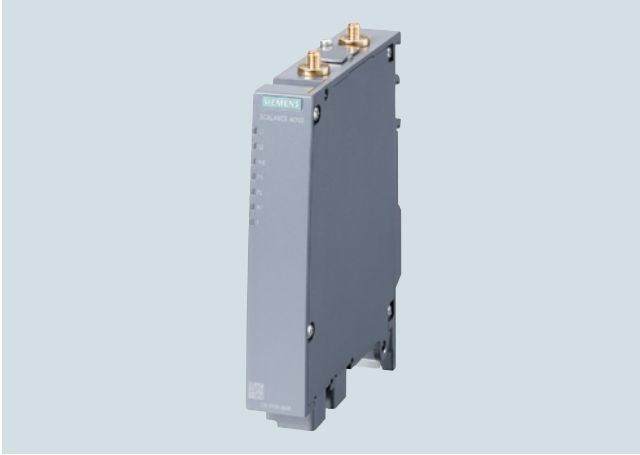
- Access points in SIMATIC design suitable for applications where the device is to be mounted in the control cabinet

Design

- Low-profile, compact aluminum enclosure, shock and vibration-proof for high mechanical requirements
- Implementation of simple and cost-effective wireless machine networking
- Support of the 2.4 and 5 GHz frequency band
- IP30 protection
- For use at ambient temperatures from -20 °C to +60 °C
- 2 x R-SMA sockets for the connection of direct mountable and remote antennas
- Antenna placement optimized for the 2x2 MIMO technology; the antennas do not interfere with each other when they are mounted directly on the device
- 2 x RJ45 connector for 10/100 Mbit/s, of which one connector has Power-over-Ethernet compliant with IEEE 802.3at
- 2 x 24 V DC connection for redundant energy supply
- 1 x PLUG compartment for KEY-PLUG/C-PLUG
- Function LEDs for optical signaling of faults/errors and operating statuses
- Mounting: Wall, S7-1500 mounting rail, S7-300 mounting rail, or on 35 mm standard mounting rail
- SIMATIC design matches existing components in the control cabinet (e.g. S7-1500, …)
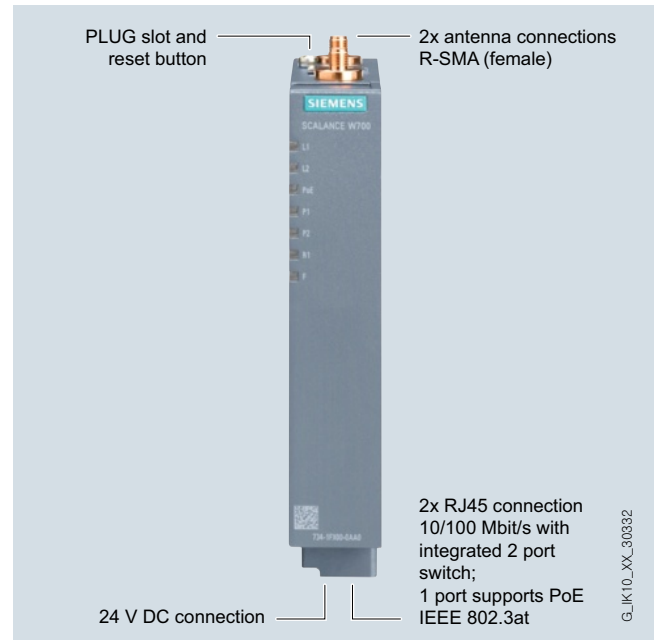
Design and interfaces of the SCALANCE W774 RJ45 access points

Product versions

SCALANCE W774-1 RJ45

- A radio card is permanently installed; functional scope can be expanded by using a KEY-PLUG W780 iFeatures

Industrial Wireless Communication

IWLAN – Access Points IEEE 802.11n

■ **Function**
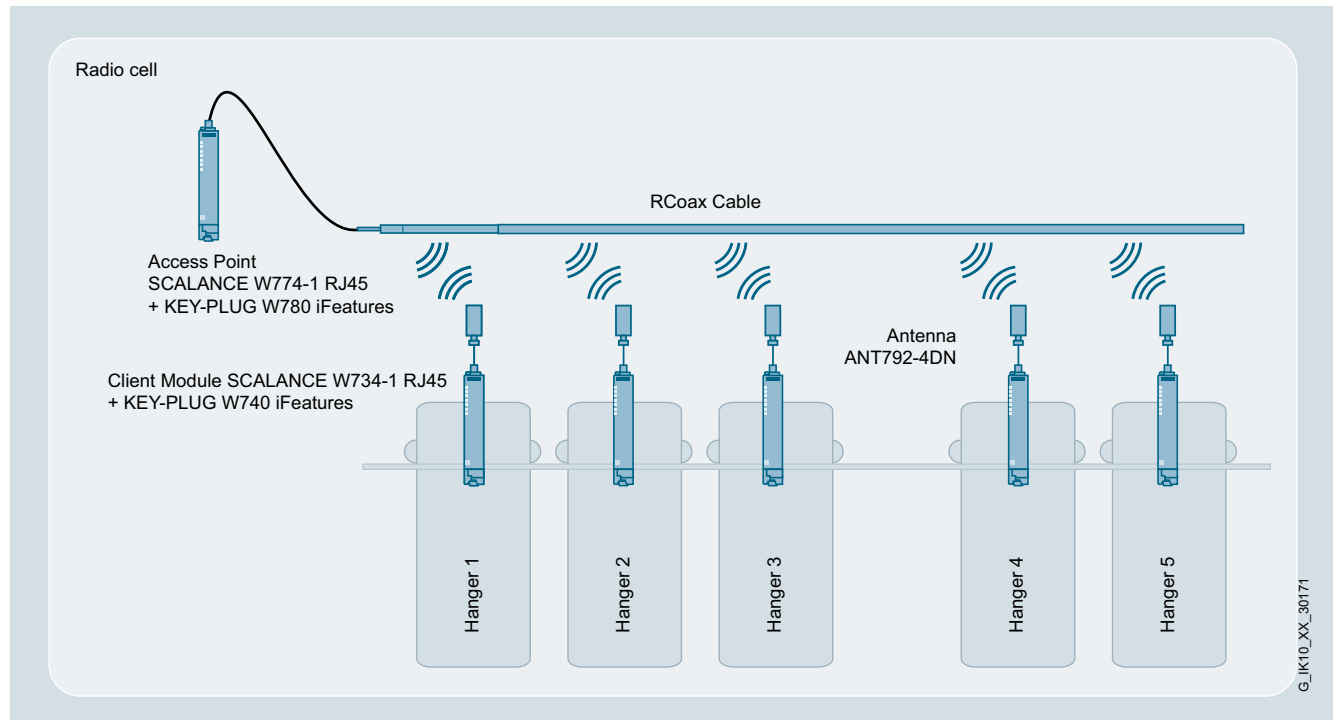
Integration of an automated guided vehicle system using iPCF with SCALANCE W774-1 RJ45 and KEY-PLUG W780 iFeatures

■ Technical specifications

Article No.	6GK5774-1FX00-0AA0 6GK5774-1FX00-0AB0[1]
Product-type designation	**SCALANCE W774-1 RJ45**
Transmission rate	
Transmission rate	
• with W-LAN maximum	300 Mbit/s
• with Industrial Ethernet	10 … 100 Mbit/s
• note	-
Interfaces	
Number of electrical connections	
• for network components and terminal equipment	2
• for power supply	1
• for redundant power supply	1
Design of the electrical connection	
• for network components and terminal equipment	RJ45 socket
• for power supply	4-pole screw terminal, PoE
Number of optical interfaces for optical waveguide at 100 Mbit/s	-
Design of optical interface for optical waveguide at 100 Mbit/s	-
design of the removable storage C-PLUG	Yes
Interfaces wireless	
Number of radio cards permanently installed	1
Number of internal antennas	-
Number of electrical connections for external antenna(s)	2
Design of the electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes
Signal-Inputs/outputs	
Number of digital inputs	-
Number of digital outputs	-
Design of electrical connection at the digital inputs/outputs	-
Signal range	
• at digital input	-
• at the digital output	-

Article No.	6GK5774-1FX00-0AA0 6GK5774-1FX00-0AB0[1]
Product-type designation	**SCALANCE W774-1 RJ45**
Supply voltage, current consumption, power loss	
Type of supply voltage	DC
Supply voltage	
• 1 from terminal block	19.2 V
• 2 from terminal block	28.8 V
• from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	48 V
• from Power-over-Ethernet according IEEE802.3at for type 2	-
Current consumed	
• at 24 V with DC typical	0.25 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.125 A
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-
Effective power loss	
• at 24V for DC typical	6 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	6 W
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-
Permitted ambient conditions	
Ambient temperature	
• during operating	-20 … +60 °C
• during storage	-40 … +85 °C
• during transport	-40 … +85 °C
Relative humidity at 25 °C without condensation during operating maximum	97 %
Protection class IP	IP30
Ambient condition for (standard) operation mode	When used under hazardous conditions (Zone 2), the SCALANCE W774-1 RJ45 or W734-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP54 in compliance with EN 60529.
Design, dimensions and weight	
Width of enclosure without antenna	26 mm
Height of enclosure without antenna	147 mm
Depth of enclosure without antenna	127 mm
Net weight	0.52 kg
Mounting type wall mounting	Yes
Mounting type	Wall mounting only if flat mounted
Wireless frequencies	
Radio frequency	
• for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz

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Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

SCALANCE W774 RJ45 for use in control cabinet

■ **Technical specifications** (continued)

Article No.	6GK5774-1FX00-0AA0 6GK5774-1FX00-0AB0[1]
Product-type designation	SCALANCE W774-1 RJ45
Product properties, functions, components general	
Product function	
• Access Point Mode	Yes
• Client Mode	Yes
Number of SSIDs	4
Product function	
• iPCF Access Point	in preparation
• iPCF client	in preparation
• iPCF-MC Access Point	-
• iPCF-MC client	in preparation
Number of iPCF-capable radio modules	1
Product functions management, configuration	
Number of manageable IP addresses in client	8
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	in preparation
• configuration with STEP 7 in the TIA Portal	in preparation
• operation with IWLAN controller	-
• operation with Enterasys WLAN controller	-
• forced roaming with IWLAN	No
• WDS	Yes
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher level designation/ location designation	Yes
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	in preparation
• localization via Aeroscout	in preparation
• SysLog	Yes
Product functions VLAN	
Product function function VLAN with IWLAN	Yes

Article No.	6GK5774-1FX00-0AA0 6GK5774-1FX00-0AB0[1]
Product-type designation	SCALANCE W774-1 RJ45
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
Product functions Redundancy	
Protocol is supported STP/RSTP	-
Product functions Security	
Product function	
• ACL - MAC-based	No
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported SSH	Yes
Product functions Time	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes
Standards, specifications, approvals	
Standard	
• for EMC from FM	-
• for hazardous zone	in preparation
• for safety of CSA and UL	-
• for hazardous area of CSA and UL	-
Verification of suitability	
• CE mark	Yes
• EC declaration of conformity	Yes
• C-Tick	Yes
• CCC	-
• Railway application in accordance with EN 50155	-
• e1 approval	
• E1 approval	-
• NEMA4X	-
• Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories	
Accessories	24 V DC screw terminal included in scope of delivery

[1] Wireless approval in the USA

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■ Ordering data	Article No.
SCALANCE W774 access points	
IWLAN access points with built-in wireless interface for establishing wireless connections with iFeatures; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 300 Mbit/s; WPA2/AES; integrated 2-port switch; Power over Ethernet (PoE), IP30 degree of protection (-20 °C to +60 °C); scope of delivery: Mounting hardware, 4-pin screw terminal for 24V DC; manual on CD-ROM; German/English	
SCALANCE W774-1 RJ45	
IWLAN Access Point with one built-in wireless interface	
• National approvals for operation outside the USA	**6GK5774-1FX00-0AA0**
• National approvals for operation within the USA [1]	**6GK5774-1FX00-0AB0**
Accessories	
KEY-PLUG W780 iFeatures	**6GK5907-8PA00**
Swap medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; can be used in SCALANCE W access points with PLUG compartment	
C-PLUG	**6GK1900-0AB00**
Swap medium for simple replacement of devices if a fault occurs; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment	
IE FC RJ45 Plug 180 2 x 2	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC Standard Cable GP 2 x 2	**6XV1840-2AH10**
4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. quantity 1 000 m, minimum order 20 m	
IE FC Stripping Tool	**6GK1901-1GA00**
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
Antennas and miscellaneous IWLAN accessories	See Industrial Wireless LAN/accessories

[1] Please note national approvals under
http://www.siemens.com/wireless-approvals

■ **More information**

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at:

http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at:
http://www.siemens.com/wireless-approvals

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Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

■ Overview

- Suitable for use in industrial and automation applications in general, but especially in railway applications where the device is to be mounted in the control cabinet

■ Design

- Low-profile, compact aluminum enclosure, shock and vibration-proof for high mechanical requirements
- Special coating of the printed circuit boards (conformal coating)
- Resistant to condensation
- Railroad approval in accordance with EN 50155
- IP30 degree of protection
- For use at ambient temperatures from -20 °C to +60 °C
- Support of the 2.4 and 5 GHz frequency band
- 2 x R-SMA sockets for the connection of direct mountable and remote antennas
- Antenna placement optimized for the 2x2 MIMO technology; the antennas do not interfere with each other when they are mounted directly on the device
- 2 x M12 connection for 10/100 Mbit/s, of which one connection with Power-over-Ethernet according to IEEE 802.3at
- 1 x M12 socket for power supply (24 V DC)
- 1 x PLUG compartment (KEY-PLUG/C-PLUG)
- Function LEDs for optical signaling of faults/errors and operating statuses
- Mounting: Wall, S7-1500 mounting rail, S7-300 mounting rail, or on 35 mm standard mounting rail
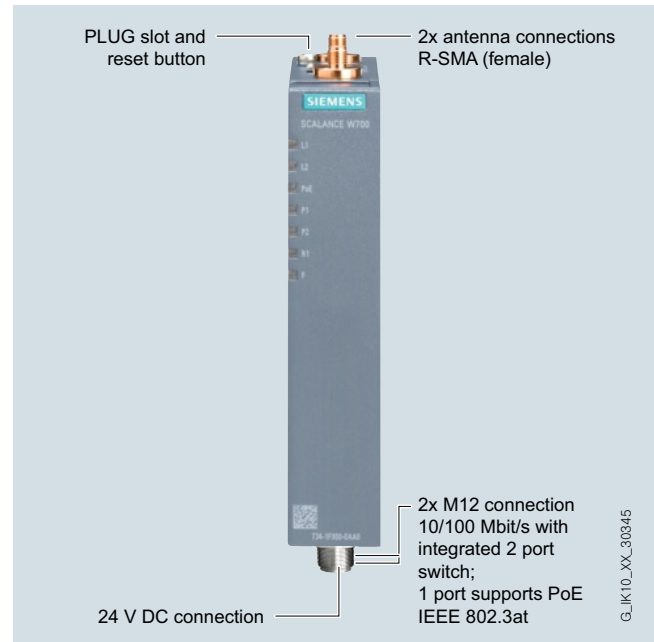
Design and interfaces of the SCALANCE W774 M12 EEC access points

Product version

SCALANCE W774-1 M12 EEC

- A radio card is permanently installed; functional scope can be expanded by using a KEY-PLUG W780 iFeatures

SCALANCE W774 M12 EEC for enhanced environmental conditions

■ Function

The SCALANCE W774 M12 EEC (Extended Environmental Conditions) are designed for use in railway applications. The devices satisfy EN 50155, the approval for railway applications, and can thus be used for rail traffic. Combined with the antennas approved for railway applications, which are connected via R-SMA antenna connectors (female), these products can set up a reliable IWLAN wireless infrastructure.

The devices can be installed at the location that is most favorable for the wireless link. The enclosure and the connectors are resistant to high levels of shock and vibration because all the connectors are screwed or locked. The SCALANCE W774 M12 EEC is well suited to environments in which a compact design plays a large role. Through its coated printed-circuit boards (Conformal Coating), the module is resistant to condensation caused by use in environments with large temperature variations.

SCALANCE W774-1 M12 EEC access points can also be operated as client modules.

Provided that a delay (several 100 ms) caused by roaming in accordance with IEEE 802.11 is tolerated by all communication stations when switching the radio cells, the communication continues uninterrupted.

For real-time requirements, the SCALANCE W774-1 M12 EEC can be equipped with KEY-PLUG functionality for activating iFeatures.
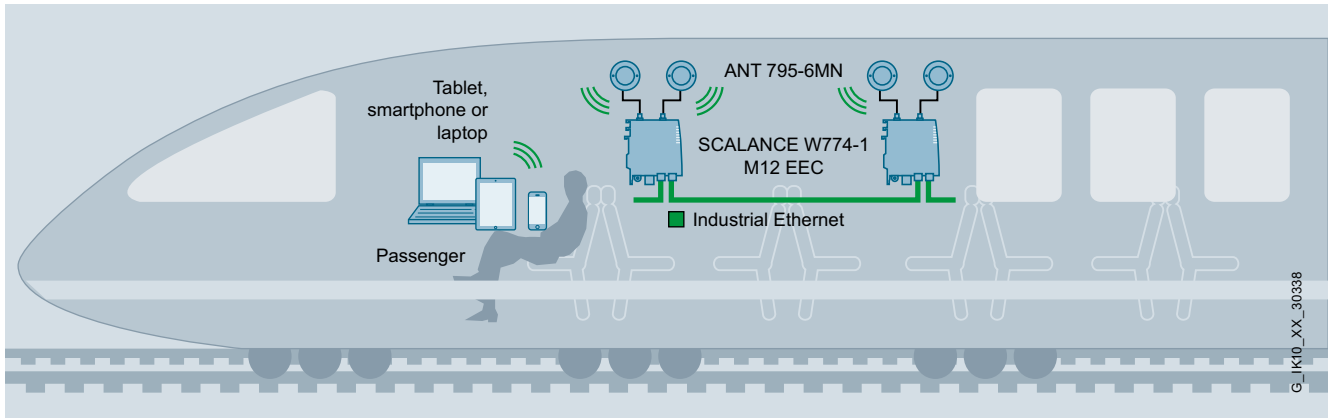
Data transfer in trains with SCALANCE W774-1 M12 EEC

Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

SCALANCE W774 M12 EEC for enhanced environmental conditions

▪ Technical specifications

Article No.	6GK5774-1FY00-0TA0 6GK5774-1FY00-0TB0[1]		Article No.	6GK5774-1FY00-0TA0 6GK5774-1FY00-0TB0[1]
Product-type designation	**SCALANCE W774-1 M12 EEC**		**Product-type designation**	**SCALANCE W774-1 M12 EEC**
Transmission rate			Effective power loss	
Transmission rate			• at 24V for DC typical	-
• with W-LAN maximum	300 Mbit/s		• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	-
• with Industrial Ethernet	10 … 100 Mbit/s		• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-
• note	-			
Interfaces			**Permitted ambient conditions**	
Number of electrical connections			Ambient temperature	
• for network components and terminal equipment	2		• during operating	-20 ... +60 °C
• for power supply	1		• during storage	-40 ... +85 °C
• for redundant power supply	1		• during transport	-40 ... +85 °C
Design of electrical connection			Relative humidity at 25 °C without condensation during operating maximum	100 %
• for network components and terminal equipment	M12 interface (4-pole, D-coded), PoE		Protection class IP	
• for power supply	M12 interface (4-pole, A-coded)		Ambient condition for (standard) operation mode	When used under hazardous conditions (Zone 2), the SCALANCE W774-1 M12 EEC product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP54 in compliance with EN 60529.
Number of optical interfaces for optical waveguide at 100 Mbit/s	-			
Design of optical interface for optical waveguide at 100 Mbit/s	-			
design of the removable storage C-PLUG	Yes		**Design, dimensions and weight**	
Interfaces wireless			Width of enclosure without antenna	26 mm
Number of radio cards permanently installed	1		Height of enclosure without antenna	147 mm
Number of internal antennas	-		Depth of enclosure without antenna	127 mm
Number of electrical connections for external antenna(s)	2		Net weight	
Design of the electrical connection for external antenna(s)	R-SMA (socket)		Mounting type wall mounting	Yes
Product property external antenna can be mounted directly on device	Yes		Mounting type	Wall mounting only if flat mounted
Signal-Inputs/outputs			**Wireless frequencies**	
Number of digital inputs	-		Radio frequency	
Number of digital outputs	-		• for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz
Design of electrical connection at the digital inputs/outputs	-		• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz
Signal range			**Product properties, functions, components general**	
• at digital input	-		Product function	
• at the digital output	-		• Access Point Mode	Yes
Supply voltage, current consumption, power loss			• Client Mode	Yes
Type of supply voltage	DC		Number of SSIDs	4
Supply voltage			Product function	
• 1 from terminal block	19.2 V		• iPCF Access Point	in preparation
• 2 from terminal block	28.8 V		• iPCF client	in preparation
• from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	48 V		• iPCF-MC Access Point	-
• from Power-over-Ethernet according IEEE802.3at for type 2	-		• iPCF-MC client	in preparation
Current consumed			Number of iPCF-capable radio modules	1
• at 24 V with DC typical	-			
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	-			
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-			

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Technical specifications (continued)

Article No.	6GK5774-1FY00-0TA0 6GK5774-1FY00-0TB0[1]
Product-type designation	SCALANCE W774-1 M12 EEC
Product functions management, configuration	
Number of manageable IP addresses in client	8
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	in preparation
• configuration with STEP 7 in the TIA Portal	in preparation
• operation with IWLAN controller	-
• operation with Enterasys WLAN controller	-
• forced roaming with IWLAN	No
• WDS	Yes
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher level designation/location designation	Yes
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	in preparation
• localization via Aeroscout	in preparation
• SysLog	Yes
Product functions VLAN	
Product function function VLAN with IWLAN	Yes
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
Product functions Redundancy	
Protocol is supported STP/RSTP	Yes
Product functions Security	
Product function	
• ACL - MAC-based	No
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported SSH	Yes

Article No.	6GK5774-1FY00-0TA0 6GK5774-1FY00-0TB0[1]
Product-type designation	SCALANCE W774-1 M12 EEC
Product functions Time	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes
Standards, specifications, approvals	
Standard	
• for EMC from FM	in preparation
• for hazardous zone	in preparation
• for safety of CSA and UL	in preparation
• for hazardous area of CSA and UL	
Verification of suitability	
• CE mark	Yes
• EC declaration of conformity	Yes
• C-Tick	Yes
• CCC	-
• Railway application in accordance with EN 50155	in preparation
• e1 approval	
• E1 approval	-
• NEMA4X	-
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories	
Accessories	-

[1] Wireless approval in the USA

Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

**SCALANCE W774 M12 EEC for enhanced environmental conditions**

Ordering data	Article No.
SCALANCE W774 M12 EEC Access Points	
IWLAN Access Points with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 300 Mbit/s; railway approval in accordance with EN 50155; conformal coating; WPA2/AES; Power over Ethernet (PoE), IP20 degree of protection; scope of delivery: Mounting hardware; manual on CD-ROM, German/English	
SCALANCE W774-1 M12 EEC	
IWLAN Access Point with one integrated wireless interface	
• National approvals for operation outside the USA	**6GK5774-1FY00-0TA0**
• National approvals for operation within the USA [1]	**6GK5774-1FY00-0TB0**
Accessories	
KEY-PLUG W780 iFeatures	**6GK5907-8PA00**
Swap medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; Can be used in SCALANCE W access points with PLUG compartment	
C-PLUG	**6GK1900-0AB00**
Swap medium for simple replacement of devices in the event of a fault; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment	
IE FC M12 Plug PRO 2 x 2	
M12 plug-in connector (D-coded, IP65/IP67) that can be assembled in the field, metal enclosure, FastConnect connection method, for SCALANCE W774-1 M12 EEC	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB30-6AA8**
IE FC Standard Cable GP 2 x 2 / Type A	**6XV1840-2AH10**
4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1 000 m, minimum order 20 m	
IE FC Stripping Tool	**6GK1901-1GA00**
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
Power M12 Cable Connector PRO	**6GK1907-0DC10-6AA3**
Terminal socket for connection of SCALANCE W700 for 24 V DC supply voltage; 4-pole, A-coded, with assembly instructions, 3 units	
Power Cable 2 x 0.75	**6XV1812-8A**
Connecting cable for Power M12 Cable Connector PRO, sold by the meter	
Antennas and miscellaneous IWLAN accessories	See Industrial Wireless LAN/ accessories

[1] Please note national approvals under http://www.siemens.com/wireless-approvals

More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at:
http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at:
http://www.siemens.com/wireless-approvals

6

Overview

- Low-cost Access Point, suitable for applications where the device is to be mounted in the control cabinet

Design

- Compact design for space-saving installation in control cabinets or boxes on a standard mounting rail
- Implementation of simple and cost-effective wireless machine networking
- Support of the 2.4 and 5 GHz frequency band
- Degree of protection IP20
- For use at ambient temperatures from 0 °C to +55 °C
- 1 x R-SMA socket for the connection of a remote antenna
- 1 x RJ45 port for 10/100 Mbit/s
- 1 x 24 V DC connection
- Function LEDs for optical signaling of faults/errors and operating statuses
- SIMATIC design matches existing components in the control cabinet (e.g. ET 200SP, etc.)
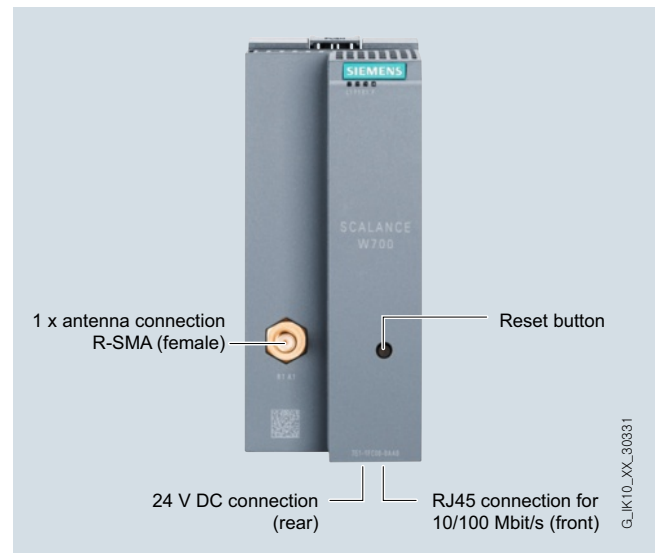
Design and interfaces of the SCALANCE W761 RJ45 access points

Product versions

SCALANCE W761-1 RJ45

- A wireless card permanently installed in the device

Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

■ **Integration**

Storage and retrieval machines in high-bay warehouses automated with SCALANCE W721-1 RJ45, W761-1 RJ45 and RCoax

6

▍ Technical specifications

Article no.	6GK5761-1FC00-0AA0 6GK5761-1FC00-0AB0[1)]
Product-type designation	**SCALANCE W761-1 RJ45**
Transmission rate	
Transmission rate • with W-LAN maximum • for Industrial Ethernet	150 Mbit/s 10 … 100 Mbit/s
Interfaces	
Number of electrical connections • for network components and terminal equipment • for power supply • for redundant power supply	1 1 0
Design of electrical connection • for network components and terminal equipment • for power supply	RJ45 socket 3-pole screw terminal
Number of optical interfaces for optical waveguide at 100 Mbit/s	-
Design of optical interface for optical waveguide at 100 Mbit/s	-
design of the removable storage C-PLUG	No
Interfaces wireless	
Number of radio cards permanently installed	1
Number of internal antennas	-
Number of electrical connections for external antenna(s)	1
Design of the electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes
Supply voltage, current consumption, power loss	
Type of supply voltage	DC
Supply voltage • 1 from terminal block • 2 from terminal block • from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af • from Power-over-Ethernet according IEEE802.3at for type 2	19.2 V 28.8 V - -
Current consumed • at 24 V with DC typical • with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical • with Power-over-Ethernet according to IEEE802.3at for type 2 typical	0.15 A - -
Effective power loss • at 24V for DC typical • with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical • with Power-over-Ethernet according to IEEE802.3at for type 2 typical	3.6 W - -

Article no.	6GK5761-1FC00-0AA0 6GK5761-1FC00-0AB0[1)]
Product-type designation	**SCALANCE W761-1 RJ45**
Permitted ambient conditions	
Ambient temperature • during operating • during storage • during transport	0 … 55 °C -40 … +85 °C -40 … +85 °C
Relative humidity at 25 °C without condensation during operating maximum	95 %
Protection class IP	IP20
Ambient condition for (standard) operation mode	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP54 in compliance with EN 60529.
Design, dimensions and weight	
Width of enclosure without antenna	50 mm
Height of enclosure without antenna	114 mm
Depth of enclosure without antenna	74 mm
Net weight	0.13 kg
Mounting type wall mounting	No
Wireless frequencies	
Radio frequency • for WLAN in 2.4 GHz frequency band • for WLAN in 5 GHz frequency band	2.41 … 2.48 GHz 4.9 … 5.8 GHz
Product properties, functions, components general	
Product function • Access Point Mode • Client Mode	Yes Yes
Number of SSIDs	1
Product function • iPCF Access Point • iPCF client • iPCF-MC Access Point • iPCF-MC client	No No No No
Number of iPCF-capable radio modules	0

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Industrial Wireless Communication
IWLAN – Access Points IEEE 802.11n

SCALANCE W761 RJ45 for the Control Cabinet

■ **Technical specifications** (continued)

Article no.	6GK5761-1FC00-0AA0 6GK5761-1FC00-0AB0[1]
Product-type designation	**SCALANCE W761-1 RJ45**
Product functions management, configuration	
Number of manageable IP addresses in client	4
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	in preparation
• configuration with STEP 7 in the TIA Portal	in preparation
• operation with IWLAN controller	-
• operation with Enterasys WLAN controller	-
• forced roaming with IWLAN	No
• WDS	Yes
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher level designation/ location designation	Yes
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	in preparation
• localization via Aeroscout	No
• SysLog	Yes
Product functions VLAN	
Product function function VLAN with IWLAN	Yes
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
Product functions Redundancy	
Protocol is supported STP/RSTP	-

Article no.	6GK5761-1FC00-0AA0 6GK5761-1FC00-0AB0[1]
Product-type designation	**SCALANCE W761-1 RJ45**
Product functions Security	
Product function	
• ACL - MAC-based	No
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported SSH	Yes
Product functions Time	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes
Standards, specifications, approvals	
Standard	
• for EMC from FM	-
• for hazardous zone	in preparation
• for safety of CSA and UL	-
• for hazardous area of CSA and UL	-
Verification of suitability	
• CE mark	Yes
• EC declaration of conformity	Yes
• C-Tick	Yes
• CCC	-
• Railway application in accordance with EN 50155	-
• e1 approval	
• E1 approval	-
• NEMA4X	-
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories	
Accessories	24 V DC screw terminal included in scope of delivery

[1] Wireless approval in the USA

Ordering data	Article No.
SCALANCE W761 Access Points	
IWLAN Access Point with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbit/s; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of delivery: Mounting hardware, 3-pin screw terminal for 24V DC; manual on CD-ROM; German/English	
SCALANCE W761-1 RJ45	
IWLAN Access Point with one built-in wireless interface	
• National approvals for operation outside the USA	**6GK5761-1FC00-0AA0**
• National approvals for operation within the USA [1]	**6GK5761-1FC00-0AB0**
Accessories	
IE FC RJ45 Plug 180 2 x 2	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC Standard Cable GP 2 x 2	**6XV1840-2AH10**
4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. quantity 1 000 m, minimum order 20 m	
IE FC stripping tool	**6GK1901-1GA00**
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
Antennas and miscellaneous IWLAN accessories	See Industrial Wireless LAN/ accessories

[1] Please note national approvals under
http://www.siemens.com/wireless-approvals

More information

Selection tools:

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Wireless approvals:

Current approvals can be found on the Internet at:
http://www.siemens.com/wireless-approvals

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Industrial Wireless Communication
IWLAN – Controller and Controller Access Points IEEE 802.11n

Overview

Overview

The network infrastructures in the industrial and office areas are coming ever-closer together. This applies also in the area of wireless communication, causing a constant increase in the number of access points and WLAN clients to be managed. If such networks are established with a large number of stand-alone access points, with each one having to be configured separately, this results in huge costs for initial configuration and operation.

Central wireless LAN controllers enable low-cost, user-friendly and secure operation of large WLAN infrastructures here. Management of the WLAN clients connected to such WLANs is significantly simplified thanks to their division into user groups with different security policies.

The SCALANCE WLC711 IWLAN Controller is a device for centralized management (configuration, diagnostics, firmware updates, access control, security settings, coordination) of a wireless LAN in the industrial environment.

- Fast establishment of a new WLAN or expansion of an existing WLAN with the help of the SCALANCE W786C and SCALANCE W788C controller-based access points
- Parallel operation of different services (e.g. communication between programmable controllers, Internet access, Voice-over-IP telephony and video transmission) on the same controller-based WLAN infrastructure without requiring additional SSIDs for this purpose.
- Seamless transition between production WLAN and corporate WLAN
- Simplified commissioning as well as increased reliability and security thanks to the central management functions of the IWLAN controller in comparison to a WLAN comprising stand-alone access points that have to be configured individually

Benefits

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- Reduced commissioning overhead and operation of larger IWLAN installations (up to 48 access points or 96 access points in redundant mode) thanks to configuring from a central location
- Investment protection thanks to seamless integration into existing IWLAN installations or into an existing corporate WLAN
- Saving on redundant infrastructures (e.g. separate network for Internet access and voice transmission) thanks to multiple use of the same infrastructure for different services
- Avoidance of a single point of failure thanks to optional parallel operation of two controllers; the WLAN remains functional even if the controller(s) fail(s)
- Increased reliability when operating the IWLAN through complete, coordinated portfolio of IWLAN Controller SCALANCE WLC711, industrial access points and SCALANCE W client modules, as well as the suitable accessories (antennas, connecting cables, power supplies)
- Flexible configuration of networks thanks to the use of an integrated wireless mesh solution
- Dynamic Radio Management supports the optimal alignment of the entire WLAN network
- In the controller-based WLAN, the bandwidth or the assignment of the access points can be automatically influenced by the IWLAN Controller SCALANCE WLC711 depending on the requirements. This ensures optimal utilization of the WLAN by the IWLAN client modules.

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■ **Application**

Company-wide WLAN based on Extreme Networks (Enterasys) Wireless Controller and SCALANCE WLC711 IWLAN controller

The SCALANCE WLC711 IWLAN controller is the optimum solution for IWLAN installations with up to 48 access points (in redundant mode even up to 96 access points). By using SCALANCE W access points and client modules, different applications in the industrial environment or a comparable environment can communicate via a centrally managed IWLAN. SCALANCE W access points for controller operation are available for use both outdoors and for cabinet-free use in an industrial environment (e.g. on the shop floor).

The SCALANCE WLC711 IWLAN controller can be integrated in the corporate WLAN and allows the implementation of a WLAN throughout the office, outdoor and industrial areas. This allows use of mobile WLAN phones, laptops, smart phones and tablets in the same wireless network, while complying with security policies for different user groups, and guaranteeing defined quality of service (QoS) for different devices.

Industrial Wireless Communication
IWLAN – Controller and Controller Access Points IEEE 802.11n

Overview

■ Application (continued)

Application examples

With the SCALANCE WLC711 IWLAN controller, the benefits of a controller solution, long-familiar in corporate networks, now also become available for typical industrial and industry-related applications:

- Plant-wide wireless infrastructures in factory automation and process automation, e.g. for mobile operator control or logistics applications
- Industry-related applications, e.g. container terminals, road or underground rail tunnels, where IWLAN is required for transmitting visualization, video, and voice data
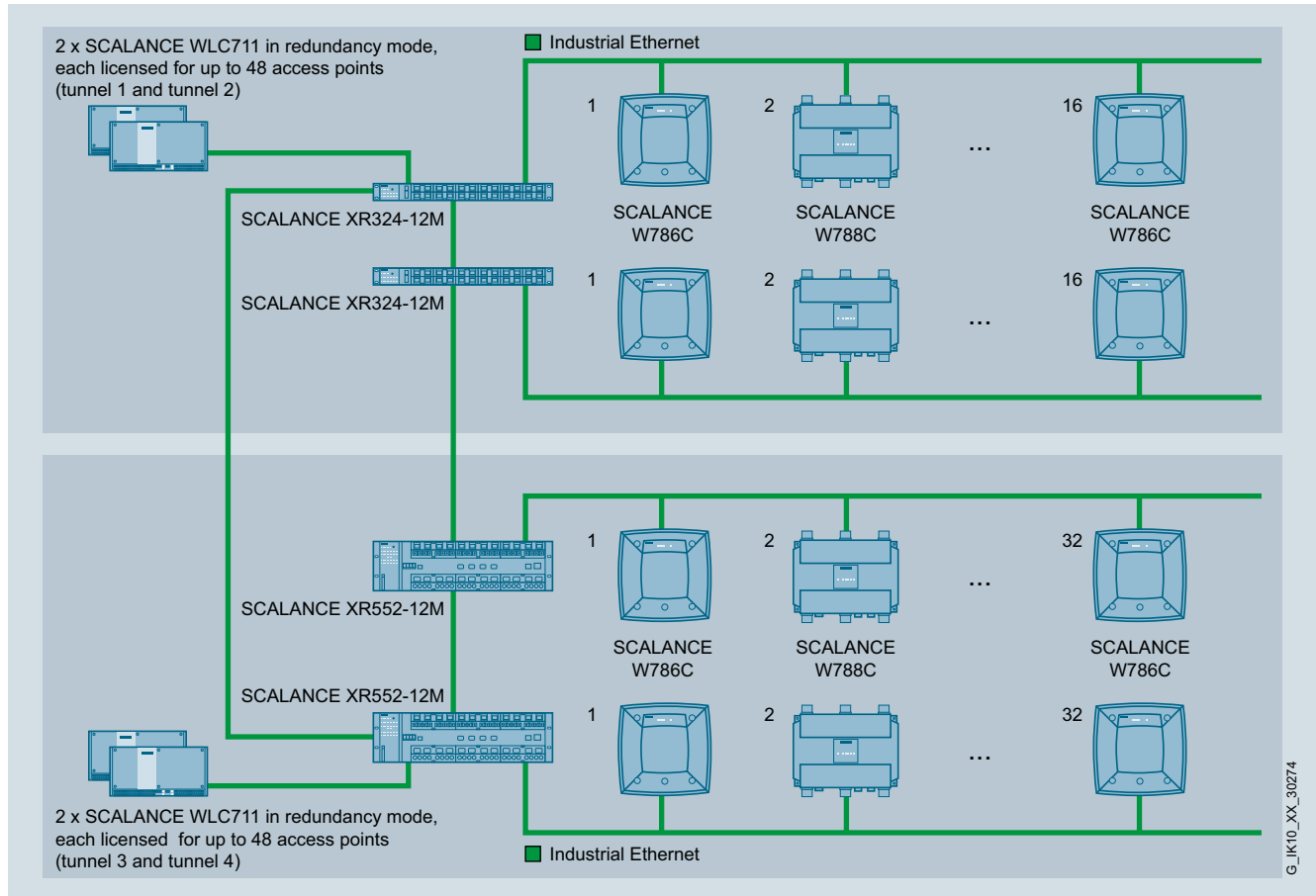
SCALANCE WLC711 IWLAN controller in redundancy mode

■ Function

Fundamental principles of the controller-based Industrial Wireless LAN

The SCALANCE WLC711 IWLAN controller enables centralized management of an Industrial Wireless LAN. It automatically detects new access points, establishes a connection to them, and manages and coordinates access points and clients. Thanks to the Layer 3 architecture, access points located in different Layer 2 subnets can also be managed. This function allows wireless expansion of an existing Ethernet network without having to make changes to the existing network topology.

With the IWLAN controller, the IWLAN wireless infrastructure can be divided into logical, service-based networks (**V**irtual **N**etwork **S**ervices). Different services, security requirements and access criteria can thus be reliably managed, and different user groups such as administrators, commissioning engineers, or visitors can use the same wireless network.

In the same way, different applications such as Voice-over-IP (VoIP), video and Internet access can use the same infrastructure. The result is optimal capacity utilization of the IWLAN network.

If applications with high reliability and availability requirements are to communicate wirelessly, either two IWLAN controllers can be operated redundantly or the access points can be set up redundantly (overlapping of the radio links due to two wireless cards in the device).

In applications where cable connections are not possible or are only possible with difficulty, the controller-based access points can be reliably integrated into the network even without a cable connection. Thanks to the mesh algorithms, the access points can resume communication in the event of a network error.

The controller-based access points of the SCALANCE W780C series can only be used with the SCALANCE WLC711 IWLAN controller and can only be configured using this IWLAN controller.

The IWLAN controller connects, manages and coordinates all access point and clients such that the WLAN environment appears like several IP subnets with central management. The individual connections are additionally managed here, and the stations can therefore move securely and reliably throughout the entire radio network.

Diagnostics and management functions

As well as centralized management and wireless network configuration, the SCALANCE WLC711 IWLAN controller also offers error recording, wireless network monitoring, and documentation of network statistics.

■ More information

Supplementary WLAN solutions for office environments can be found on the Internet at:
http://www.extremenetworks.com

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Industrial Wireless Communication
IWLAN – Controller and Controller Access Points IEEE 802.11n

SCALANCE WLC711 industrial wireless LAN controller

■ **Overview**

- Support for up to 48 access points in standard operation
- Support for up to 96 access points in redundant mode with two IWLAN controllers
- Supplied with license for 16 access points; expandable with license for 48 access points in standard mode
- Simultaneous support for up to 512 WLAN clients
- Support for up to 8 VNS segments
- Automatic detection of new access points
- Support for the SCALANCE W780C controller-based access points (IEEE 802.11a/b/g/n)

■ **Application**
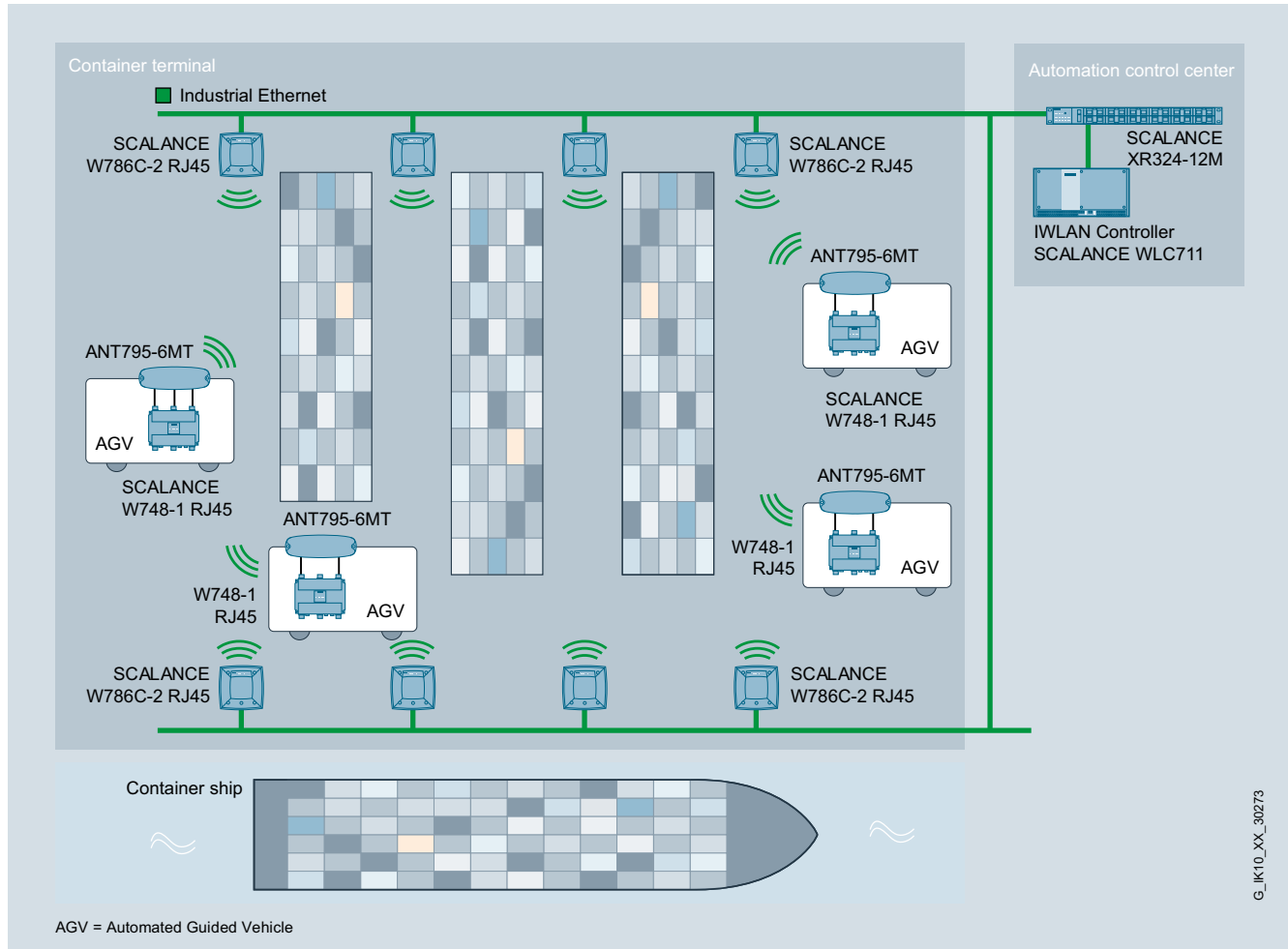
Controller-based IWLAN for applications with a large number of access points, e.g. in a container terminal

■ Design

- 24 DC power supply
- Enclosure in the design of the SIMATIC Microbox IPC, in degree or protection IP20 for installation in the control cabinet
- Two 10/100/1 000 Mbit/s electrical RJ45 ports
- DIN rail and wall mounting possible
- Ambient temperature in operation 5 °C to 40 °C

Product versions

SCALANCE WLC711 IWLAN controller

- IWLAN controller licensed for the connection of up to 16 SCALANCE W780C controller-based access points

License key WLC-700

- Capacity upgrade for SCALANCE WLC711 for supporting up to 16 SCALANCE W780C controller-based access points for a total of up to 48 controller-based access points.

■ Technical specifications

Article No.	6GK5711-0XC00-1AA0 6GK5711-0XC00-1AB0[1] 6GK5711-0XC00-1AD0[2]
Product-type designation	**SCALANCE WLC711 (RoW)**
Product description	Supports SCALANCE W786C, W788C, W786-2HPW access points
Acceptability for application	Basic license for 16 access points pre-installed, expandable with 1 capacity upgrade license key WLC-700
Transmission rate	
Transmission rate with Industrial Ethernet	10 … 1 000 Mbit/s
Interfaces	
Number of electrical connections	
• for network components and terminal equipment	2
• for power supply	1
Design of electrical connection	
• for network components and terminal equipment	RJ45 socket
• for power supply	2-pole screw terminal
Supply voltage, current consumption, power loss	
Type of supply voltage	DC
Supply voltage 1 from terminal block	24 V
Consumed current at 24 V with DC typical	4 A
Active power loss at 24V for DC typical	20 W
Permitted ambient conditions	
Ambient temperature	
• during operating	5 … 40 °C
• during storage	-40 … +60 °C
• during transport	-40 … +60 °C
Relative humidity at 25 °C without condensation during operating maximum	95 %
Protection class IP	IP20
Ambient condition for (standard) operation mode	-

[1] Wireless approval in the USA

[2] Wireless approval in the JAPAN

Article No.	6GK5711-0XC00-1AA0 6GK5711-0XC00-1AB0[1] 6GK5711-0XC00-1AD0[2]
Product-type designation	**SCALANCE WLC711 (RoW)**
Design, dimensions and weight	
Width	262 mm
Height	142 mm
Depth	47 mm
Net weight	2 kg
Mounting type	
• 35 mm DIN rail mounting	
• wall mounting	Yes
Mounting type	Wall mounting using the supplied mounting brackets
Product functions management, configuration	
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• WDS	Yes
Protocol is supported	
• Address Resolution Protocol (ARP)	No
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• SNMP v1	-
• SNMP v2	Yes
• SNMP v3	Yes
• DCP	No
• LLDP	No
Product functions Diagnosis	
Product function SysLog	Yes
Product functions VLAN	
Product function function VLAN with IWLAN	Yes
Product functions DHCP	
Product function	
• DHCP client	No
• in Client Mode DHCP server via LAN	-

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Industrial Wireless Communication
IWLAN – Controller and Controller Access Points IEEE 802.11n

SCALANCE WLC711 industrial wireless LAN controller

■ **Technical specifications** (continued)

Article No.	6GK5711-0XC00-1AA0 6GK5711-0XC00-1AB0[1] 6GK5711-0XC00-1AD0[2]
Product-type designation	**SCALANCE WLC711 (RoW)**
Product functions Security	
Product function	
• ACL - MAC-based	-
• Management security, ACL-IP based	-
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported SSH	Yes
Product functions Time	
Protocol is supported	
• NTP	Yes
• SNTP	No
• SIMATIC Time	No
Product functions IWLAN controller	
Number of supported access points	
• in standard mode with one IWLAN controller	32
• in redundancy mode with two IWLAN controllers	64
Number of supported WLAN clients per IWLAN controller	512
Number of VNS segments per IWLAN controller	8
Product function	
• of the IWLAN controller	If delivered with basic license, 16 access points can operated in standard mode and 32 access points can operate in redundant mode. A capacity upgrade permits 32 access points in standard mode and 64 access points in redundant mode.
• Pre-standard (CAPWAP)	Yes
• integrated VLAN-VNS	Yes
• auto-detection of new access points	Yes
• CDR/RADIUS accounting	Yes
• Dynamic Radio Management	Yes
• VoIP QoS mapping (DSCP/TCP-on-WMM)	Yes
• VoIP roaming between IP subnets	Yes
• VoIP roaming between several IWLAN controllers	Yes
Load distribution function	DRM (Dynamic Radio/ RF Manage- ment), Packet Fairness, Flexible Client Access (Airtime Fairness), Load Balancing, Band-Steering
Backup function for IWLAN controller	Redundancy mode with two IWLAN controllers (with capacity upgrade for both controllers, both controllers can be operated with 32 access points each. If one controller fails, the remaining controller can handle 64 access points.)
Switching function	Traffic bridged at controller/traffic bridged locally at wireless access point
Design of interface for public network access	Internal captive portal (web redirection)

[1] Wireless approval in the USA
[2] Wireless approval in the JAPAN

Article No.	6GK5711-0XC00-1AA0 6GK5711-0XC00-1AB0[1] 6GK5711-0XC00-1AD0[2]
Product-type designation	**SCALANCE WLC711 (RoW)**
Standards, specifications, approvals	
Standard	
• for EMC from FM	-
• for hazardous zone	-
• for safety of CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1, UL 508 CAN/CSA C22.2 No. 142
• for hazardous area of CSA and UL	-
Verification of suitability	
• CE mark	Yes
• EC declaration of conformity	Yes
• C-Tick	Yes
• CCC	-
• Railway application in accordance with EN 50155	No
• e1 approval	
• E1 approval	No
• NEMA4X	No

• Power-over-Ethernet according
  IEEE802.3at for type 1 and
  IEEE802.3af
	No

• Power-over-Ethernet according to IEEE802.3at for type 2	No
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories	
Accessories	24 V DC screw terminal and 2 mounting brackets included in the scope of delivery

■ Ordering data

	Article No.
SCALANCE WLC711 IWLAN controller	
IWLAN controller licensed for the connection of up to 16 SCALANCE W78xC controller-based access points	
• National approvals for operation outside North America, Canada, and Japan (RoW)	**6GK5711-0XC00-1AA0**
• National approvals for operation in North America, including Canada (NAM)[1]	**6GK5711-0XC00-1AB0**
• National approvals for operation in Japan (JP)[1]	**6GK5711-0XC00-1AD0**
License key WLC700 Capacity upgrade for SCALANCE WLC711 for support of up to 48 SCALANCE W78xC controller-based access points	**6GK5907-1SB00**
Accessories	
IE TP Cord RJ45/RJ45	
TP cable 4 x 2 with 2 RJ45 connectors	
• 0.5 m	**6XV1870-3QE50**
• 1 m	**6XV1870-3QH10**
• 2 m	**6XV1870-3QH20**
• 6 m	**6XV1870-3QH60**
• 10 m	**6XV1870-3QN10**
LOGO!Power 24 V/4 A Stabilized power supply; Input: 100 … 240 V AC, output: 24 V DC/4 A	**6EP1332-1SH52**

[1] Please note national approvals under
http://www.siemens.com/wireless-approvals

■ More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at:
http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at:
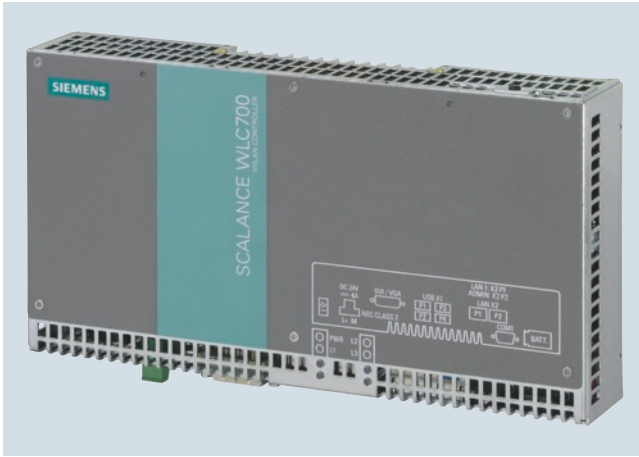http://www.siemens.com/wireless-approvals

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Industrial Wireless Communication
IWLAN – Controller and Controller Access Points IEEE 802.11n

SCALANCE W788 RJ45 controller access points for use in control cabinet

Overview

- SCALANCE W788C-2 RJ45 controller-based access points can only be operated on the SCALANCE WLC711 IWLAN Controller
- Suitable for applications where the access point is to be mounted in the control cabinet

Design

- Rugged aluminum enclosure, shock and vibration-proof, for high mechanical requirements
- Dust protection with IP30 degree of protection
- For use at ambient temperatures from -20 °C to +60 °C
- 6 x R-SMA sockets for the connection of direct mountable and remote antennas
- Antenna placement optimized for the 3x3 MIMO technology; the antennas do not interfere with each other when they are mounted directly on the device
- Suitable for 2.4 GHz and 5 GHz
- 1 x RJ45 connector for 10/100/1 000 Mbit/s with Power-over-Ethernet according to IEEE 802.3at
- 2 x 24 V DC connection for redundant energy supply
- Function LEDs for optical signaling of faults and operating states
- Mounting: Wall, S7-1500 mounting rail, S7-300 mounting rail, or on 35 mm standard mounting rail

Design and interfaces of the SCALANCE W788C-2 RJ45 controller-based access points

Product versions

SCALANCE W788C-2 RJ45 (controller-based)

- Two wireless cards permanently installed in the device

Industrial Wireless Communication
IWLAN – Controller and Controller Access Points IEEE 802.11n

■ **Technical specifications**

Article No.	6GK5788-2FC00-1AA0
Product-type designation	SCALANCE W788C-2 RJ45
Transmission rate	
Transmission rate	
• with W-LAN maximum	450 Mbit/s
• with Industrial Ethernet	10 … 1 000 Mbit/s
• note	-
Interfaces	
Number of electrical connections	
• for network components and terminal equipment	1
• for power supply	1
• for redundant power supply	1
Design of electrical connection	
• for network components and terminal equipment	RJ45 socket
• for power supply	4-pole screw terminal, PoE
Number of optical interfaces for optical waveguide at 100 Mbit/s	-
Design of optical interface for optical waveguide at 100 Mbit/s	-
Design of the removable storage C-PLUG	No
Interfaces wireless	
Number of radio cards permanently installed	2
Number of internal antennas	-
Number of electrical connections for external antenna(s)	6
Design of the electrical connection for external antenna(s)	N-Connect (socket)
Product property external antenna can be mounted directly on device	Yes

Article No.	6GK5788-2FC00-1AA0
Product-type designation	SCALANCE W788C-2 RJ45
Supply voltage, current consumption, power loss	
Type of supply voltage	DC
Supply voltage	
• 1 from terminal block	19.2 V
• 2 from terminal block	28.8 V
• from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	48 V
• from Power-over-Ethernet according IEEE802.3at for type 2	50 V
Current consumed	
• at 24 V with DC typical	0.63 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.22 A
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	0.3 A
Effective power loss	
• at 24V for DC typical	15 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	10.7 W
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	15 W
Permitted ambient conditions	
Ambient temperature	
• during operating	-20 … +60 °C
• during storage	-40 … +70 °C
• during transport	-40 … +70 °C
Relative humidity at 25 °C without condensation during operating maximum	90 %
Protection class IP	IP30
Ambient condition for (standard) operation mode	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 IP54 in compliance with EN 60529.

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Industrial Wireless Communication
IWLAN – Controller and Controller Access Points IEEE 802.11n

SCALANCE W788 RJ45 controller access points for use in control cabinet

■ **Technical specifications** (continued)

Article No.	6GK5788-2FC00-1AA0
Product-type designation	**SCALANCE W788C-2 RJ45**
Design, dimensions and weight	
Width of enclosure without antenna	200 mm
Height of enclosure without antenna	158 mm
Depth of enclosure without antenna	79 mm
Net weight	1.7 kg
Mounting type wall mounting	Yes
Wireless frequencies	
Radio frequency	
• for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz
Product properties, functions, components general	
Product function	
• Access Point Mode	Yes
• Client Mode	No
Number of SSIDs	16
Product functions management, configuration	
Product function	
• operation with IWLAN controller	Yes
• operation with Enterasys WLAN controller	Yes

Article No.	6GK5788-2FC00-1AA0
Product-type designation	**SCALANCE W788C-2 RJ45**
Standards, specifications, approvals	
Standard	
• for EMC from FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety of CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
Verification of suitability	
• CE mark	Yes
• EC declaration of conformity	Yes
• C-Tick	Yes
• CCC	No
• Railway application in accordance with EN 50155	No
• e1 approval	No
• E1 approval	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories	
Accessories	24 V DC screw terminal and screw terminal for digital input and output included in the scope of delivery

Ordering data	Article No.
SCALANCE W788C RJ45 Controller access points	
IWLAN access points for operating with the SCALANCE WLC IWLAN Controller; with two built-in wireless interfaces; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 450 Mbit/s; WPA2/AES; Power over Ethernet (PoE), IP30 degree of protection (-20 °C to +60 °C); scope of delivery: Mounting hardware; manual on CD-ROM, German/English	
• **SCALANCE W788C-2 RJ45** with R-SMA female connections for six external antennas	**6GK5788-2FC00-1AA0**
Accessories	
DIN rail mounting adapter	**6GK5798-8ML00-0AB3**
DIN rail mounting adapter for SCALANCE W788 M12 and SCALANCE W788 RJ45; screw fixing for mounting on a 35 mm DIN rail to EN 50 022; scope of supply: 3 units per pack	
IE FC RJ45 Plug 4 x 2	
RJ45 plug connector for Industrial Ethernet (10/100/1 000 Mbit/s) with a sturdy metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB11-2AA0**
• 1 pack = 10 units	**6GK1901-1BB11-2AB0**
• 1 pack = 50 units	**6GK1901-1BB11-2AE0**
IE FC Standard Cable GP 4 x 2	**6XV1878-2A**
8-core, shielded TP installation cable for connection to IE FC RJ45 Plug 4 x 2 and IE M12 Plug PRO 4 x 2; PROFINET-compatible; with UL approval; sold by the meter; max. length 1 000 m, minimum order quantity 20 m	
IE FC Stripping Tool	**6GK1901-1GA00**
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
Antennas and miscellaneous IWLAN accessories	See Industrial Wireless LAN/ accessories

More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at:
http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at:
http://www.siemens.com/wireless-approvals

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Industrial Wireless Communication
IWLAN – Controller and Controller Access Points IEEE 802.11n

SCALANCE W788C M12 controller access points for indoor use
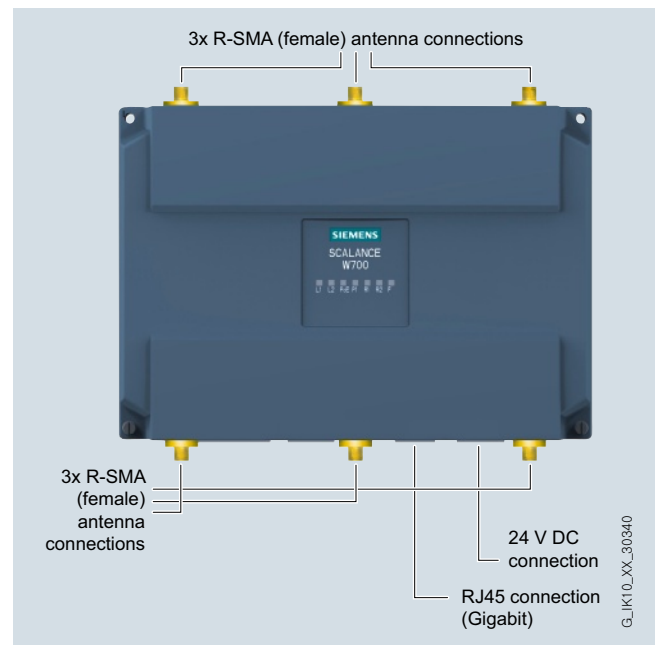
Overview

- SCALANCE W788C-2 M12 controller-based access points can only be operated on the SCALANCE WLC IWLAN Controller
- Particularly suitable for industrial applications without control cabinets

Design

- Rugged aluminum enclosure, shock and vibration-proof, for high mechanical requirements
- High IP65 degree of protection against dust and water jets
- For use at ambient temperatures from -20 °C to +60 °C
- 6 x N-Connect sockets for the connection of direct mountable and remote antennas
- Antenna placement optimized for the 3x3 MIMO technology; the antennas do not interfere with each other when they are mounted directly on the device
- Suitable for 2.4 GHz and 5 GHz
- 1 x M12 connection for 10/100/1 000 Mbit/s with Power-over-Ethernet according to IEEE 802.3at
- 1 x M12 socket for power supply (24 V DC)
- Function LEDs for optical signaling of faults and operating states
- Mounting: Wall, S7-1500 mounting rail, S7-300 mounting rail, or on 35 mm standard mounting rail

Design and interfaces of the SCALANCE W788C-2 M12 controller-based access points

Product versions

SCALANCE W788C-2 M12 (controller-based)

- Two wireless cards permanently installed in the device

■ **Technical specifications**

Article No.	6GK5788-2GD00-1AA0
Product-type designation	**SCALANCE W788C-2 M12**
Transmission rate	
Transmission rate	
• with W-LAN maximum	450 Mbit/s
• with Industrial Ethernet	10 … 1 000 Mbit/s
• note	-
Interfaces	
Number of electrical connections	
• for network components and terminal equipment	1
• for power supply	1
• for redundant power supply	1
Design of electrical connection	
• for network components and terminal equipment	M12 interface (8-pole, X-coded) PoE
• for power supply	M12 interface (4-pole, A-coded) PoE
Number of optical interfaces for optical waveguide at 100 Mbit/s	-
Design of optical interface for optical waveguide at 100 Mbit/s	-
design of the removable storage C-PLUG	No
Interfaces wireless	
Number of radio cards permanently installed	2
Number of internal antennas	-
Number of electrical connections for external antenna(s)	6
Design of the electrical connection for external antenna(s)	N-Connect (socket)
Product property external antenna can be mounted directly on device	Yes

Article No.	6GK5788-2GD00-1AA0
Product-type designation	**SCALANCE W788C-2 M12**
Supply voltage, current consumption, power loss	
Type of supply voltage	DC
Supply voltage	
• 1 from M12 Power Connector (A-coded) for redundant power supply	19.2 V
• 2 from M12 Power Connector (A-coded) for redundant power supply	28.8 V
• from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	48 V
• from Power-over-Ethernet according IEEE802.3at for type 2	50 V
Current consumed	
• at 24 V with DC typical	0.63 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.22 A
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	0.3 A
Effective power loss	
• at 24V for DC typical	15 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	10.7 W
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	15 W
Permitted ambient conditions	
Ambient temperature	
• during operating	-20 … +60 °C
• during storage	-40 … +70 °C
• during transport	-40 … +70 °C
Relative humidity at 25 °C without condensation during operating maximum	90 %
Protection class IP	IP65
Ambient condition for (standard) operation mode	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 IP54 in compliance with EN 60529.

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Industrial Wireless Communication
IWLAN – Controller and Controller Access Points IEEE 802.11n

SCALANCE W788C M12 controller access points for indoor use

■ Technical specifications (continued)

Article No.	6GK5788-2GD00-1AA0
Product-type designation	**SCALANCE W788C-2 M12**
Design, dimensions and weight	
Width of enclosure without antenna	200 mm
Height of enclosure without antenna	176 mm
Depth of enclosure without antenna	79 mm
Net weight	1.7 kg
Mounting type wall mounting	Yes
Wireless frequencies	
Radio frequency	
• for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz
Product properties, functions, components general	
Product function	
• Access Point Mode	Yes
• Client Mode	No
Number of SSIDs	16
Product functions management, configuration	
Product function	
• operation with IWLAN controller	Yes
• operation with Enterasys WLAN controller	Yes

Article No.	6GK5788-2GD00-1AA0
Product-type designation	**SCALANCE W788C-2 M12**
Standards, specifications, approvals	
Standard	
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety of CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
Verification of suitability	
• CE mark	Yes
• EC declaration of conformity	Yes
• C-Tick	Yes
• Railway application in accordance with EN 50155	No
• e1 approval	No
• E1 approval	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories	
Accessories	-

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■ Ordering data

	Article No.
SCALANCE W788C M12 Controller Access Points	
IWLAN access points for operating with the SCALANCE WLC IWLAN Controller; with two built-in wireless interfaces; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 450 Mbit/s; WPA2/AES; Power over Ethernet (PoE), IP65 degree of protection (-20 °C to +60 °C); scope of delivery: Mounting hardware; manual on CD-ROM, German/English	
• **SCALANCE W788C-2 M12** with N-Connect female connections for six external antennas	**6GK5788-2GD00-1AA0**
Accessories	
IE FC M12 Plug PRO 4 x 2	
M12 plug-in connector suitable for on-site assembly (X-coded, IP65/IP67), metal enclosure, insulation/displacement fast connection method, for SCALANCE W	
• 1 unit	**6GK1901-0DB30-6AA0**
• 8 units	**6GK1901-0DB30-6AA8**
DIN rail mounting adapter	**6GK5798-8ML00-0AB3**
DIN rail mounting adapter for SCALANCE W788 M12 and SCALANCE W788 RJ45; screw fixing for mounting on a 35 mm DIN rail to EN 50 022; scope of supply: 3 units per pack	
IE FC Standard Cable GP 4 x 2	**6XV1878-2A**
8-core, shielded TP installation cable for connection to IE FC RJ45 Plug 4 x 2 and IE M12 Plug PRO 4 x 2; PROFINET-compatible; with UL approval; sold by the meter; max. length 1 000 m, minimum order quantity 20 m	
IE FC Flexible Cable GP 4 x 2	**6XV1878-2B**
8-core, shielded TP installation cable for connection to IE FC RJ45 Plug 4 x 2 and IE M12 Plug PRO 4 x 2 for occasional movement; PROFINET-compliant; with UL approval; sold by the meter; max. length 1 000 m, minimum order 20 m	
IE FC Stripping Tool	**6GK1901-1GA00**
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
Power M12 Cable Connector PRO	**6GK1907-0DC10-6AA3**
Terminal socket for connection of SCALANCE W700 for 24 V DC supply voltage; 4-pole, A-coded, with assembly instructions, 3 units	
Power Cable 2 x 0.75	**6XV1812-8A**
Connecting cable for Power M12 Cable Connector PRO, sold by the meter	
Antennas and miscellaneous IWLAN accessories	See Industrial Wireless LAN/ accessories

■ More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at:
http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at:
http://www.siemens.com/wireless-approvals

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Industrial Wireless Communication
IWLAN – Controller and Controller Access Points IEEE 802.11n

SCALANCE W788C M12 EEC for enhanced environmental conditions

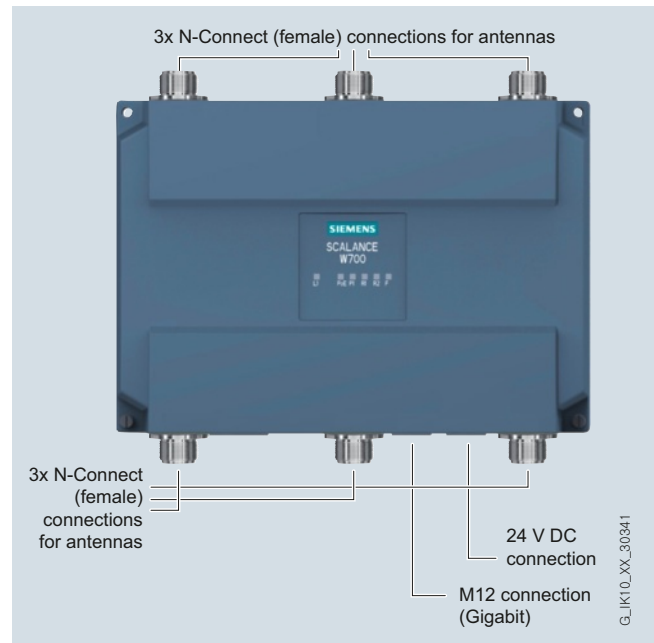### Overview

- SCALANCE W788C-2 M12 controller-based access points can only be operated on the SCALANCE WLC711 IWLAN Controller
- Suitable for use in the industry and automation area, but especially in the rail transport environment

Design

- Rugged aluminum enclosure, shock and vibration-proof, for high mechanical requirements
- Special coating of the printed circuit boards (conformal coating)
- Resistant to condensation
- Railroad approval in accordance with EN 50155
- High IP65 degree of protection against dust and water jets
- For use at ambient temperatures from -40 °C to +70 °C
- 6 x N-Connect sockets for the connection of direct mountable and remote antennas
- Antenna placement optimized for the 3x3 MIMO technology; the antennas do not interfere with each other when they are mounted directly on the device
- 1 x M12 connection for 10/100/1 000 Mbit/s with Power-over-Ethernet according to IEEE 802.3at
- 1 x M12 socket for power supply (24 V DC)
- Function LEDs for optical signaling of faults/errors and operating statuses
- Mounting: Wall, S7-1500 mounting rail, S7-300 mounting rail, or on 35 mm standard mounting rail

Design and interfaces of the SCALANCE W788C-2 M12 EEC controller-based access points

Product version

SCALANCE W788C-2 M12 EEC (controller-based)

- Two wireless cards permanently installed in the device; six connections for external antennas

■ **Integration**

Data transfer on trains using SCALANCE Controller-based access points

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Industrial Wireless Communication

IWLAN – Controller and Controller Access Points IEEE 802.11n

SCALANCE W788C M12 EEC for enhanced environmental conditions

Technical specifications

Article No.	6GK5788-2GD00-1TA0
Product-type designation	**SCALANCE W788C-2 M12 EEC**
Transmission rate	
Transmission rate	
• with W-LAN maximum	450 Mbit/s
• with Industrial Ethernet	10 … 1 000 Mbit/s
• note	-
Interfaces	
Number of electrical connections	
• for network components and terminal equipment	1
• for power supply	1
• for redundant power supply	1
Design of the electrical connection	
• for network components and terminal equipment	M12 interface (8-pole, X-coded) PoE
• for power supply	M12 interface (4-pole, A-coded)
Number of optical interfaces for optical waveguide at 100 Mbit/s	-
Design of optical interface for optical waveguide at 100 Mbit/s	-
Design of the removable storage C-PLUG	No
Interfaces wireless	
Number of radio cards permanently installed	2
Number of internal antennas	-
Number of electrical connections for external antenna(s)	6
Design of the electrical connection for external antenna(s)	N-Connect (socket)
Product property external antenna can be mounted directly on device	Yes

Article No.	6GK5788-2GD00-1TA0
Product-type designation	**SCALANCE W788C-2 M12 EEC**
Supply voltage, current consumption, power loss	
Type of supply voltage	DC
Supply voltage	
• 1 from M12 Power Connector (A-coded) for redundant power supply	19.2 V
• 2 from M12 Power Connector (A-coded) for redundant power supply	28.8 V
• from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	48 V
• from Power-over-Ethernet according IEEE802.3at for type 2	50 V
Current consumed	
• at 24 V with DC typical	0.63 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.22 A
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	0.3 A
Effective power loss	
• at 24V for DC typical	15 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	10.7 W
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	15 W

■ **Technical specifications** (continued)

Article No.	6GK5788-2GD00-1TA0
Product-type designation	SCALANCE W788C-2 M12 EEC
Permitted ambient conditions	
Ambient temperature	
• during operating	-20 … +60 °C
• during storage	-40 … +70 °C
• during transport	-40 … +70 °C
Relative humidity at 25 °C without condensation during operating maximum	90 %
Protection class IP	IP65
Ambient condition for (standard) operation mode	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.
Design, dimensions and weight	
Width of enclosure without antenna	200 mm
Height of enclosure without antenna	176 mm
Depth of enclosure without antenna	79 mm
Net weight	1.7 kg
Mounting type wall mounting	Yes
Wireless frequencies	
Radio frequency	
• for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz
Product properties, functions, components general	
Product function	
• Access Point Mode	Yes
• Client Mode	No
Number of SSIDs	16

Article No.	6GK5788-2GD00-1TA0
Product-type designation	SCALANCE W788C-2 M12 EEC
Product functions management, configuration	
• operation with IWLAN controller	Yes
• operation with Enterasys WLAN controller	Yes
Standards, specifications, approvals	
Standard	
• for EMC from FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	-
• for safety of CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
Verification of suitability	
• CE mark	Yes
• EC declaration of conformity	Yes
• C-Tick	Yes
• CCC	-
• Railway application in accordance with EN 50155	Yes
• e1 approval	No
• E1 approval	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories	
Accessories	-

Industrial Wireless Communication
IWLAN – Controller and Controller Access Points IEEE 802.11n

SCALANCE W788C M12 EEC for enhanced environmental conditions

Ordering data	Article No.
SCALANCE W788C M12 EEC Controller Access Points	
IWLAN access points for operation with the SCALANCE WLC IWLAN controller; with built-in wireless interfaces; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 450 Mbit/s; railroad approval in accordance with EN 50155; conformal coating; WPA2/AES; Power over Ethernet (PoE), IP65 degree of protection; scope of supply: Mounting hardware; manual on CD-ROM, German/English	
• **SCALANCE W788C-2 M12 EEC** with N-Connect female connections for six external antennas	**6GK5788-2GD00-1TA0**
Accessories	
IE FC M12 Plug PRO 4 x 2	
M12 plug-in connector suitable for on-site assembly (X-coded, IP65/IP67), metal enclosure, insulation displacement fast connection method, for SCALANCE W	
• 1 unit	**6GK1901-0DB30-6AA0**
• 2 units	**6GK1901-0DB30-6AA8**
DIN rail mounting adapter	**6GK5798-8ML00-0AB3**
DIN rail mounting adapter for SCALANCE W788 M12 and SCALANCE W788 RJ45; screw fixing for mounting on a 35 mm DIN rail to EN 50 022; scope of supply: 3 units per pack	
IE FC standard cable GP 4 x 2	**6XV1878-2A**
8-core, shielded TP installation cable for connection to IE FC RJ45 Plug 4 x 2 and IE M12 Plug PRO 4 x 2; PROFINET-compliant; with UL approval; sold by the meter; max. length 1 000 m, minimum order quantity 20 m	
IE FC flexible cable GP 4 x 2	**6XV1878-2B**
8-core, shielded TP installation cable for connection to IE FC RJ45 Plug 4 x 2 and IE M12 Plug PRO 4 x 2 for occasional movement; PROFINET-compliant; with UL approval; sold by the meter; max. length 1 000 m, minimum order 20 m	
IE FC Stripping Tool	**6GK1901-1GA00**
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
Power M12 cable connector PRO	**6GK1907-0DC10-6AA3**
Terminal socket for connection of SCALANCE W700 for 24 V DC supply voltage; 4-pole, A-coded, with assembly instructions, 3 units	
Power Cable 2 x 0.75	**6XV1812-8A**
Connecting cable for Power M12 cable connector PRO, sold by the meter	
Antennas and miscellaneous IWLAN accessories	See Industrial Wireless LAN/ accessories

More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at: http://www.siemens.com/tia-selection-tool

Wireless approvals:

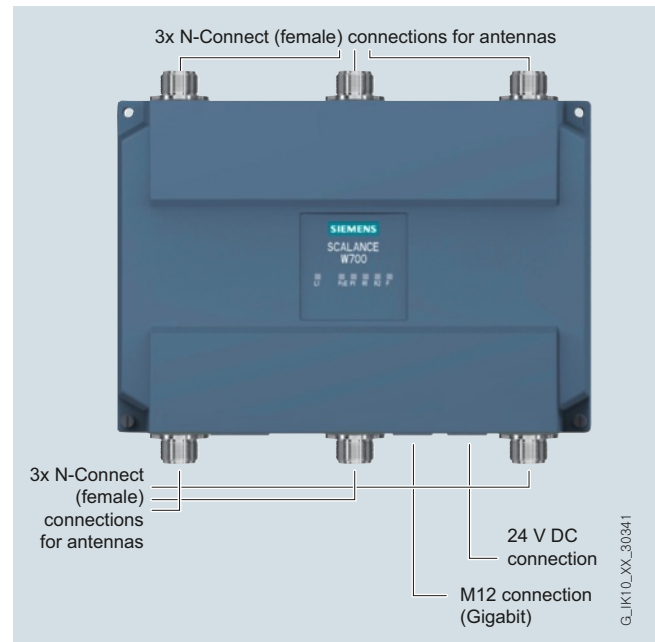Current approvals can be found on the Internet at: http://www.siemens.com/wireless-approvals

Overview

- SCALANCE W786C-2 controller-based access points can only be operated on the SCALANCE WLC IWLAN Controller
- Particularly well-suited to applications with demanding climatic requirements when installed outdoors and in areas accessible to the public

Design

- Rugged, impact-resistant plastic enclosure, shock and vibration-proof for demanding mechanical requirements
- High IP65 degree of protection against dust and water jets
- For use at ambient temperatures from -40 °C to +60 °C
- Resistant to condensation
- Resistant to UV radiation and saltwater spray
- Design for use outdoors
- 6 x R-SMA sockets for the connection of remote antennas
- Suitable for 2.4 GHz and 5 GHz
- 1 x RJ45 connector for 10/100/1 000 Mbit/s and Power-over-Ethernet according to IEEE 802.3at
- 1 x 24 V DC connector, optional operation with 12 to 24 V DC or 100 to 240 V AC with power supply that can be integrated in the device
- Function LEDs for optical signaling of faults and operating states
- Mounting: Wall or, with optional mounting set, on S7 mounting rail, 35 mm standard mounting rail, or on a pole

Design and interfaces of the SCALANCE W786C-2 controller-based access points

Product versions

SCALANCE W786C-2 RJ45 (controller-based)

- Two wireless cards permanently installed in the device; six connections for external antennas
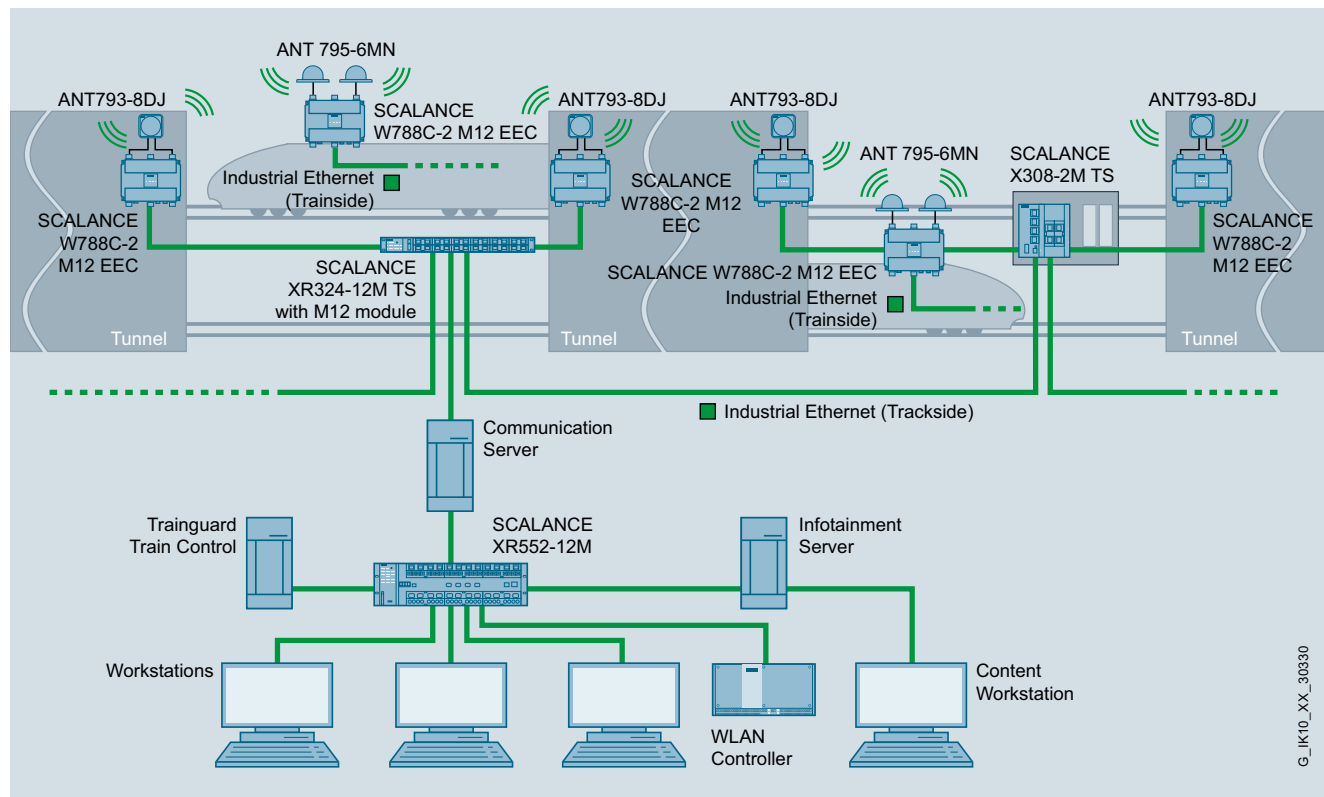
SCALANCE W786C-2IA RJ45 (controller-based)

- Two wireless cards permanently installed in the device; six internal antennas

Industrial Wireless Communication
IWLAN – Controller and Controller Access Points IEEE 802.11n

SCALANCE W786 RJ45 controller access points for outdoor use

■ **Technical specifications**

Article No.	6GK5786-2HC00-1AA0	6GK5 786-2FC00-1AA0
Product-type designation	**SCALANCE W786C-2IA RJ45**	**SCALANCE W786C-2 RJ45**
Transmission rate		
Transmission rate		
• with W-LAN maximum	450 Mbit/s	450 Mbit/s
• with Industrial Ethernet	10 … 1 000 Mbit/s	10 … 1 000 Mbit/s
• note	-	-
Interfaces		
Number of electrical connections		
• for network components and terminal equipment	1	1
• for power supply	1	1
• for redundant power supply	1	1
Design of electrical connection		
• for network components and terminal equipment	RJ45 socket	RJ45 socket
• for power supply	2-pole connector (24 V DC) or optionally available power supply adapter (4-pole 24 V DC or 3-pole 110 to 230 V AC)	2-pole connector (24 V DC) or optionally available power supply adapter (4-pole 24 V DC or 3-pole 110 to 230 V AC)
Number of optical interfaces for optical waveguide at 100 Mbit/s	-	-
Design of optical interface for optical waveguide at 100 Mbit/s	-	-
Number of optical interfaces for optical waveguide at 1 000 Mbit/s	-	-
Design of optical interface for optical waveguide at 1 000 Mbit/s	-	-
Design of the removable storage C-PLUG	No	No
Interfaces wireless		
Number of radio cards permanently installed	2	2
Number of internal antennas	6	-
Number of electrical connections for external antenna(s)	-	6
Design of the electrical connection for external antenna(s)	-	R-SMA (socket)
Product property external antenna can be mounted directly on device	-	No
Supply voltage, current consumption, power loss		
Type of supply voltage	DC	DC
Supply voltage		
• 1 from terminal block	19.2 V	19.2 V
• 2 from terminal block	28.8 V	28.8 V
• from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	48 V	48 V
• from Power-over-Ethernet according IEEE802.3at for type 2	50 V	50 V
• from optional integratable power supply		
- with AC	100 … 240 V	100 … 240 V
- with DC	12 … 24 V	12 … 24 V
Current consumed		
• at 24 V with DC typical	0.63 A	0.63 A
• at 230 V with AC typical	0.07 A	0.07 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.22 A	0.22 A
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-	-

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■ Technical specifications (continued)

Article No.	6GK5786-2HC00-1AA0	6GK5 786-2FC00-1AA0
Product-type designation	**SCALANCE W786C-2IA RJ45**	**SCALANCE W786C-2 RJ45**
Effective power loss		
• at 24V for DC typical	15 W	15 W
• at 230 V with AC typical	15 W	15 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	15 W	10.7 W
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-	-
Permitted ambient conditions		
Ambient temperature		
• during operating	-40 … +60 °C	-40 … +60 °C
• during storage	-40 … +85 °C	-40 … +85 °C
• during transport	-40 … +85 °C	-40 … +85 °C
Relative humidity at 25 °C without condensation during operating maximum	100 %	100 %
Protection class IP	IP65	IP65
Ambient condition for (standard) operation mode	When using the power supply 100 to 240 V AC, an operating temperature of -40 °C to +60 °C is permissible	When using the power supply 100 to 240 V AC, an operating temperature of -40 °C to +60 °C is permissible
Design, dimensions and weight		
Width of enclosure without antenna	251 mm	251 mm
Height of enclosure without antenna	251 mm	251 mm
Depth of enclosure without antenna	72 mm	72 mm
Net weight	2.24 kg	2.24 kg
Mounting type wall mounting	Yes	Yes
Mounting type	For mast mounting, 35 mm DIN rail mounting and S7-300 rail mounting, an additional support plate is required	For mast mounting, 35 mm DIN rail mounting and S7-300 rail mounting, an additional support plate is required
Wireless frequencies		
Radio frequency		
• for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz	2.41 … 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz	4.9 … 5.8 GHz
Product properties, functions, components general		
Product function		
• Access Point Mode	Yes	Yes
• Client Mode	No	No
Number of SSIDs	16	16
Product functions management, configuration		
Product function		
• operation with IWLAN controller	Yes	Yes
• operation with Enterasys WLAN controller	Yes	Yes

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Industrial Wireless Communication
IWLAN – Controller and Controller Access Points IEEE 802.11n

SCALANCE W786 RJ45 controller access points for outdoor use

Technical specifications (continued)

Article No.	6GK5786-2HC00-1AA0	6GK5 786-2FC00-1AA0
Product-type designation	**SCALANCE W786C-2IA RJ45**	**SCALANCE W786C-2 RJ45**
Standards, specifications, approvals		
Standard		
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety of CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1	UL 60950-1 CSA C22.2 No. 60950-1
Verification of suitability		
• CE mark	Yes	Yes
• EC declaration of conformity	Yes	Yes
• C-Tick	Yes	Yes
• CCC	No	No
• Railway application in accordance with EN 50155	No	No
• e1 approval		
• E1 approval	No	No
• NEMA4X	Yes	Yes
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes	Yes
Standard for wireless communication		
• IEEE 802.11a	Yes	Yes
• IEEE 802.11b	Yes	Yes
• IEEE 802.11g	Yes	Yes
• IEEE 802.11h	Yes	Yes
• IEEE 802.11n	Yes	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories		
Accessories	24 V DC screw terminal included in scope of delivery	24 V DC screw terminal included in scope of delivery

Ordering data	Article No.
SCALANCE W786C Controller access points	
IWLAN access points for operating with the SCALANCE WLC IWLAN Controller; with two built-in wireless interfaces; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 450 Mbit/s; WPA2/AES; Power over Ethernet (PoE), IP65 degree of protection (-40 °C to +60 °C); scope of delivery: Mounting hardware, 2-pin screw terminal for 24 V DC; manual on CD-ROM; German/English	
• **SCALANCE W786C-2IA RJ45** with six internal antennas	**6GK5786-2HC00-1AA0**
• **SCALANCE W786C-2 RJ45** with R-SMA female connections for six external antennas	**6GK5786-2FC00-1AA0**
Accessories	
Power supply PS791-2DC	**6GK5791-2DC00-0AA0**
12 to 24 V DC power supply for installation in SCALANCE W786C-2 products; operating instructions in German/English	
Power supply PS791-2AC	**6GK5791-2AC00-0AA0**
110 to 230 V DC power supply for installation in SCALANCE W786C-2 products; operating instructions in German/English	
MS1 mounting set	**6GK5798-8MG00-0AA0**
Mounting set for fixing the SCALANCE W786C-2 products onto an S7-300 mounting rail or a 35 mm standard mounting rail	
IE FC RJ-45 Plug 4 x 2	
RJ45 plug connector for Industrial Ethernet (10/100/1 000 Mbit/s) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB11-2AA0**
• 1 pack = 10 units	**6GK1901-1BB11-2AB0**
• 1 pack = 50 units	**6GK1901-1BB11-2AE0**
IE FC Standard Cable GP 4 x 2	**6XV1878-2A**
8-core, shielded TP installation cable for connection to IE FC RJ45 Plug 4 x 2 and IE M12 Plug PRO 4 x 2; PROFINET-compatible; with UL approval; sold by the meter; max. length 1 000 m, minimum order quantity 20 m	
IE FC Stripping Tool	**6GK1901-1GA00**
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
Antennas and miscellaneous IWLAN accessories	See Industrial Wireless LAN/ accessories

More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at:
http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at:
http://www.siemens.com/wireless-approvals

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Industrial Wireless Communication
IWLAN – Controller and Controller Access Points IEEE 802.11n

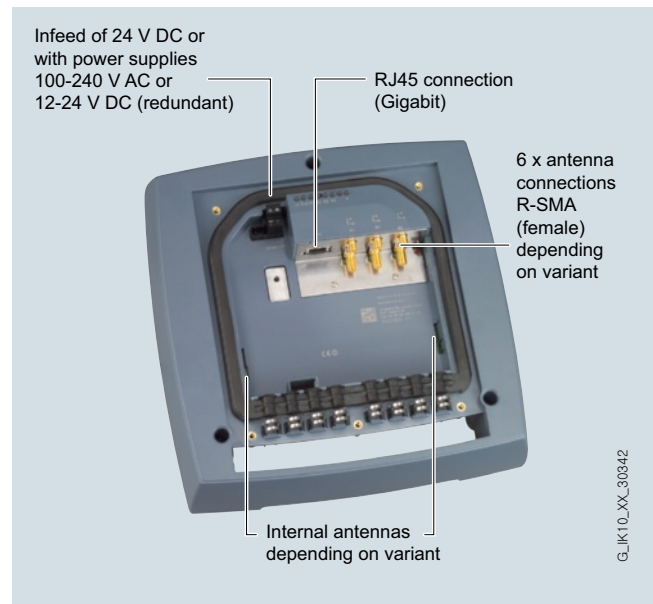### SCALANCE W786C SFP controller access points for outdoor use

■ **Overview**

- SCALANCE W786C-2 SFP controller-based access points can only be operated on the SCALANCE WLC711 IWLAN Controller
- Particularly well-suited to applications with demanding climatic requirements when installed outdoors and in areas accessible to the public

■ **Design**

- Rugged, impact-resistant plastic enclosure, shock and vibration-proof for demanding mechanical requirements
- Two slots for SFP plug-in transceivers (optical 2-port switch)
- High IP65 degree of protection against dust and water jets
- For use at ambient temperatures from -40 °C to +60 °C (depending on the SFP plug-in transceiver used)
- Resistant to condensation
- Resistant to UV radiation and saltwater spray
- Design for use outdoors
- 6 x R-SMA sockets for the connection of remote antennas
- 1 x 24 V DC connector, optional operation with 12 to 24 V DC or 100 to 240 V AC with power supply that can be integrated in the device
- Function LEDs for optical signaling of faults/errors and operating statuses
- Mounting: Wall or, with optional mounting set, on S7 mounting rail, 35 mm standard mounting rail, or on a pole

Design and interfaces of the SCALANCE W786C-2 controller-based access points

Product versions

SCALANCE W786C-2 SFP (controller-based)

- Two wireless cards permanently installed in the device; six connections for external antennas

■ Technical specifications

Article No.	6GK5786-2FE00-1AA0
Product-type designation	**SCALANCE W786C-2 SFP**
Transmission rate	
Transfer rate	
• with W-LAN maximum	450 Mbit/s
• with Industrial Ethernet	1 000 Mbit/s
• note	-
Interfaces	
Number of electrical connections	
• for network components and terminal equipment	-
• for power supply	1
• for redundant power supply	0
Design of the electrical connection	
• for network components and terminal equipment	-
• for power supply	2-pole connector (24 V DC) or optionally available power supply adapter (4-pole 24 V DC or 3-pole 110 to 230 V AC)
Number of optical interfaces for optical waveguide at 100 Mbit/s	2
Design of optical interface for optical waveguide at 100 Mbit/s	SFP slot
Number of optical interfaces for optical waveguide at 1000 Mbit/s	2
Design of optical interface for optical waveguide at 1000 Mbit/s	SFP slot
Design of the removable storage C-PLUG	No
Interfaces wireless	
Number of radio cards permanently installed	2
Number of internal antennas	-
Number of electrical connections for external antenna(s)	6
Design of the electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	No

Article No.	6GK5786-2FE00-1AA0
Product-type designation	**SCALANCE W786C-2 SFP**
Supply voltage, current consumption, power loss	
Type of supply voltage	DC
Supply voltage	
• 1 from terminal block	19.2 V
• 2 from terminal block	28.8 V
• from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	-
• from Power-over-Ethernet according IEEE802.3at for type 2	-
• from optional integratable power supply	
- with AC	100 … 240 V
- with DC	12 … 24 V
Current consumed	
• at 24 V with DC typical	-
• at 230 V with AC typical	-
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	-
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-
Effective power loss	
• at 24V for DC typical	-
• at 230 V with AC typical	-
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	-
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-

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Industrial Wireless Communication
IWLAN – Controller and Controller Access Points IEEE 802.11n

SCALANCE W786C SFP controller access points for outdoor use

■ Technical specifications (continued)

Article No.	6GK5786-2FE00-1AA0
Product-type designation	SCALANCE W786C-2 SFP
Permitted ambient conditions	
Ambient temperature	
• during operating	-40 … +60 °C
• during storage	-40 … +85 °C
• during transport	-40 … +85 °C
Relative humidity at 25 °C without condensation during operating maximum	100 %
Protection class IP	IP65
Ambient condition for (standard) operation mode	When using the power supply 100 to 240 V AC, an operating temperature of -40 °C to +60 °C is permissible
Design, dimensions and weight	
Width of enclosure without antenna	251 mm
Height of enclosure without antenna	251 mm
Depth of enclosure without antenna	72 mm
Net weight	2.24 kg
Mounting type wall mounting	Yes
Mounting type	For mast mounting, 35 mm DIN rail mounting and S7-300 rail mounting, an additional support plate is required
Wireless frequencies	
Radio frequency	
• for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz
Product properties, functions, components general	
Product function	
• Access Point Mode	Yes
• Client Mode	No
Number of SSIDs	16
Product functions management, configuration	
Product function	
• operation with IWLAN controller	Yes
• operation with Enterasys WLAN controller	Yes

Article No.	6GK5786-2FE00-1AA0
Product-type designation	SCALANCE W786C-2 SFP
Standards, specifications, approvals	
Standard	
• for EMC from FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety of CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
Verification of suitability	
• CE mark	Yes
• EC declaration of conformity	Yes
• C-Tick	Yes
• CCC	No
• Railway application in accordance with EN 50155	No
• e1 approval	
• E1 approval	No
• NEMA4X	Yes
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories	
Accessories	24 V DC screw terminal included in scope of delivery

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◼ Ordering data	Article No.
SCALANCE W786C-2 SFP controller access points	
IWLAN access points for operating with the SCALANCE WLC IWLAN Controller; with two built-in wireless interfaces and one integral 2-port switch (SFP slots); wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 450 Mbit/s; WPA2/AES; IP65 degree of protection (-40 °C to +60 °C); scope of delivery: Mounting hardware, 2-pin screw terminal for 24 V DC; manual on CD-ROM; German/English	
• **SCALANCE W786C-2 SFP** with six internal antennas	**6GK5786-2FE00-1AA0**
Accessories	
Power supply PS791-2DC	**6GK5791-2DC00-0AA0**
12 to 24 V DC power supply for installation in SCALANCE W786C-2 products; operating instructions in German/English	
Power supply PS791-2AC	**6GK5791-2AC00-0AA0**
110 to 230 V DC power supply for installation in SCALANCE W786C-2 products; operating instructions in German/English	
MS1 mounting set	**6GK5798-8MG00-0AA0**
Mounting set for fixing the SCALANCE W786C-2 products onto an S7-300 mounting rail or a 35 mm standard mounting rail	
Antennas and miscellaneous IWLAN accessories	See Industrial Wireless LAN/ accessories
SFP plug-in transceiver	
SFP992-1	**6GK5992-1AL00-8AA0**
Gigabit, multimode, 750 m	
SFP992-1LD	**6GK5992-1AM00-8AA0**
Gigabit, singlemode, 10 km	
SFP992-1LH	**6GK5992-1AN00-8AA0**
Gigabit, singlemode, 40 km	
SFP992-1LH+	**6GK5992-1AP00-8AA0**
Gigabit, singlemode, 70 km	
Fiber-optic cables	See glass fiber-optic cables

◼ **More information**

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at:

http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at:
http://www.siemens.com/wireless-approvals

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Industrial Wireless Communication
IWLAN – Client Modules IEEE 802.11n

Overview

The client modules from the SCALANCE W700 product lines are optimal for integrating Industrial Ethernet stations into Industrial Wireless LANs (IWLANs) for 2.4 GHz and 5 GHz.

- High data rates (up to 450 Mbit/s in connection with Channel Bonding) as per IEEE802.11n
- Reliable wireless link by using of MIMO technology (Multiple Input, Multiple Output). For this, SCALANCE W Client Modules use up to three streams for simultaneous sending and receiving.
- SCALANCE W700 Client Modules are suitable for any application: for installation indoors without a control cabinet and for installation in a control cabinet
- Reliable thanks to a rugged enclosure, protected from water and dust (up to IP65), resistant to shock, vibration and electromagnetic fields
- Demanding applications with real-time and redundancy requirements, such as PROFINET with PROFIsafe
- Conformant to standards through supporting IEEE802.11; expanded software functions especially for use where increased reliability is required, e.g. cyclic real-time data traffic and very high-speed roaming (iPCF, iPCF-MC)
- Configuration support by means of wizards and online help; easy management via Web server and SNMP
- Configuration and diagnostics using Web based Management, Command Line Interface, and SNMP. Devices and networks can be configured using STEP 7 (TIA Portal). For cyclic monitoring, diagnostics and documentation (reporting) in network mode, the SINEMA Server software is recommended.
- Enabling of further functions using the KEY-PLUG swap medium (iPCF, iPCF-MC)
- Fast replacement of devices if a fault occurs thanks to use of optional KEY-PLUG/C-PLUG (Configuration Plug) swap medium

Benefits

g e t Designed for Industry

- Predictable data traffic (deterministic response) and defined response times on the wireless link
- Reliable wireless link, e.g. by using MIMO technology and monitoring the wireless link
- Cost savings due to one single wireless network both for process-critical data and for non-critical communication
- Future-proof because all products are compatible with the internationally recognized WLAN standard IEEE 802.11, suitable for license-free 2.4 GHz and 5 GHz frequency bands (ISM bands)
- Implementation of data-intensive applications such as video streaming
- Reduced operating costs, because there is no wear and tear on rotating and moving plant sections
- Cost-effective connection to devices which are remote, difficult to access or installed in hostile environments
- Investment protection because flexible feature expansions (iFeatures) are possible by using the KEY-PLUG

Application

The client modules of the SCALANCE W700 product line are designed for indoor and outdoor industrial applications as well as for low-cost integration in control cabinets or mobile machines. They provide a reliable wireless link with fast handover from one access point to the next (roaming). This allows processes to be monitored and loss of production due to machine downtimes to be avoided. Industrial Wireless LAN (IWLAN) can also be used in time-critical applications in factory automation (PROFINET IO) or for safety-related signals (PROFIsafe).

SCALANCE W products are silicone-free and can therefore also be used in paint shops. The client modules with high IP65 degree of protection and extended temperature range from -20 to +60 °C are especially suitable for industrial applications.

The client modules are especially suitable for use in automated guided vehicle systems or suspended monorails.

When using the RCoax cable (radiating cable), operation is particularly reliable in conveyor systems and all track applications (e.g. storage and retrieval systems, suspended monorail).

Application examples:

- Automated guided vehicle systems and suspended monorails;
  prevents wear and offers high flexibility for traffic routing thanks to the wireless transfer of data to the vehicles. It is also possible to transfer PROFIsafe via IWLAN.
- Cranes;
  high flexibility due to access to data communication with the moving unit independent of the location
- Tunnel application;
  reliable wireless link since the devices can handle multiple path propagation better by using the MIMO technology
- Communication with moving stations (e.g. mobile controls and devices), container logistics, storage and retrieval machines, conveyor systems, conveyor belts, rotating machines, trucks
- Wireless coupling of communication segments and bridging of large distances for fast commissioning and cost-effective networks in applications where cable routing would be extremely expensive (e.g. on public roads, rivers, lakes, train lines)

Function

SCALANCE W700 client modules make it possible for a node with an Industrial Ethernet interface (e.g. a controller) to move seamlessly and with no wear and tear in an Industrial Wireless LAN RF field. The node logs on in the RF field via the client module and can exchange information with the entire data network. If the client module moves, for example, on an automated guided vehicle system, it is automatically and transparently handed over from one access point to the next (roaming).

This is possible over distances of up to 30 m indoors (approx. 100 m outdoors). Additional directional antennas can be used outdoors to achieve ranges of several thousand meters.

Apart from a reliable wireless link, a major feature of the SCALANCE W700 client modules is their support of IT mechanisms:

- IEEE 802.11a/b/g/n for different frequency ranges
- IEEE802.11e for wireless multimedia (WMM)
- IEEE802.11i for security
- Sending the log entries of the SCALANCE W devices to a Syslog server
- Modern security mechanisms (e.g. network security such as IEEE 802.1x, RADIUS, EAP mechanisms)

Security

A high degree of data security is achieved by means of the WPA2/IEEE 802.11i mechanisms. These define modern procedures that control a regular exchange of the complete 128-bit key as well as performing the access check (authentication) of a node. The Advanced Encryption Standard (AES) is available for data encryption.

On top of this, access to the devices (HTTPS) is encrypted and a secure logon (SSH) is possible. If a security concept in combination with SCALANCE S is required, the security requirements can be increased using Virtual Private Networks (VPN).

Functional scope

Depending on the product version, the SCALANCE W700 client modules can manage the wireless connection for up to eight connected devices with Ethernet interface. It is possible for mobile units with a small Ethernet network (up to eight devices) to be linked into an IWLAN RF field.

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Industrial Wireless Communication
IWLAN – Client Modules IEEE 802.11n

Overview

■ **Function** (continued)

iFeatures *(only in conjunction with KEY-PLUG or SCALANCE W722-1 RJ45))*

iPCF (industrial Point Coordination Function):
The iPCF mode is a good choice for applications with requirements for real-time and predictable response times (deterministic response), even when mobile nodes are roaming from one access point to the next. This ensures that wireless PROFINET IO is supported and that safety-related signals, e.g. emergency stop, can be linked into the RF field.

The iPCF mechanism expands the IEEE 802.11 standard and must be available on both the client module and the access point. In an RF field in which iPCF is used, no IEEE 802.11-compliant nodes can be operated.

iPCF is recommended for applications where wireless network nodes move along predefined paths (e.g. suspended monorail). RCoax radiating cables or directional antennas must be used for this purpose.

Linking in an automated guided vehicle system using iPCF with the SCALANCE W722-1 RJ45

iPCF-MC (iPCF Management Channel) [1]*:*
iPCF-MC is available as a further development of iPCF. This mode should be used if IWLAN stations that also support iPCF-MC move freely about in the coverage area (especially when using omni-directional antennas) and are to exchange data deterministically. This functionality can only be achieved in connection with access points with two wireless interfaces and the KEY PLUG.

Note:

These iFeatures cannot be used in parallel.

[1] Available soon

Diagnostics and management
• Web-based (HTTP/HTTPS) management tool for configuration and diagnostics using a standard browser
• LEDs for signaling operating status and fault/error states
• Signaling of faults by means of SNMP trap or e-mail to a network management tool
• Configuration and diagnostics using Web based Management, Command Line Interface, and SNMP. Devices and networks can be configured using STEP 7 (TIA Portal). For cyclic monitoring, diagnostics and documentation (reporting) in network mode, the SINEMA Server software is recommended.

Overview

- Suitable for applications where the client module is to be mounted in the control cabinet

Design

- Rugged aluminum enclosure, shock and vibration-proof, for high mechanical requirements
- Dust protection with IP30 degree of protection
- For use at ambient temperatures from -20 °C to +60 °C
- 3 x R-SMA sockets for the connection of directly mountable and remote antennas (6 x R-SMA sockets for the variants with two wireless modules)
- Antenna placement optimized for the 3x3 MIMO technology; the antennas do not interfere with each other when they are mounted directly on the device
- 1 x RJ45 connector for 10/100/1 000 Mbit/s with Power-over-Ethernet according to IEEE 802.3at
- 2 x 24 V DC connection for redundant energy supply
- 1 x PLUG compartment for KEY-PLUG/C-PLUG
- Function LEDs for optical signaling of faults/errors and operating statuses
- Digital input for feeding in a signal from a sensor, for example, to an SNMP-based network management system
- Digital output for converting a command received over SNMP into a signal and switching a hardware function
- Mounting: Wall, S7-1500 mounting rail, S7-300 mounting rail, or on 35 mm standard mounting rail
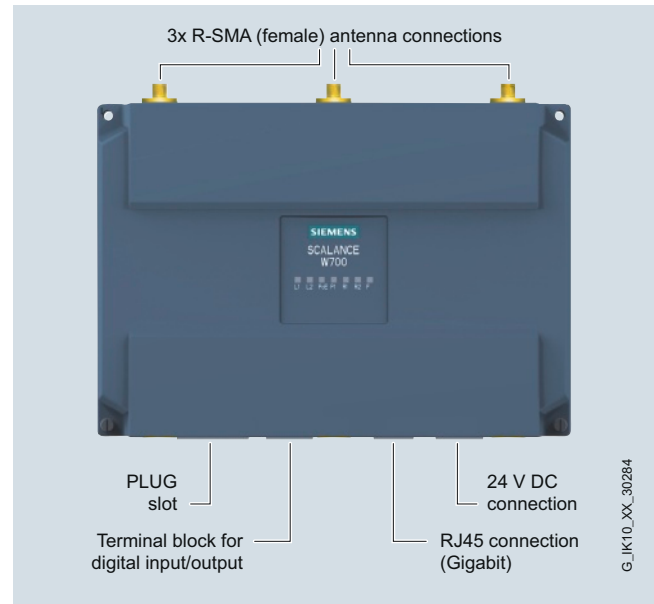
Design and interfaces of the SCALANCE W748-1 RJ45 client modules

Product versions

SCALANCE W748-1 RJ45

- A radio card is permanently installed; functional scope can be expanded by using a KEY-PLUG W780 iFeatures

Industrial Wireless Communication
IWLAN – Client Modules IEEE 802.11n

SCALANCE W748 RJ45 for use in control cabinet

Function
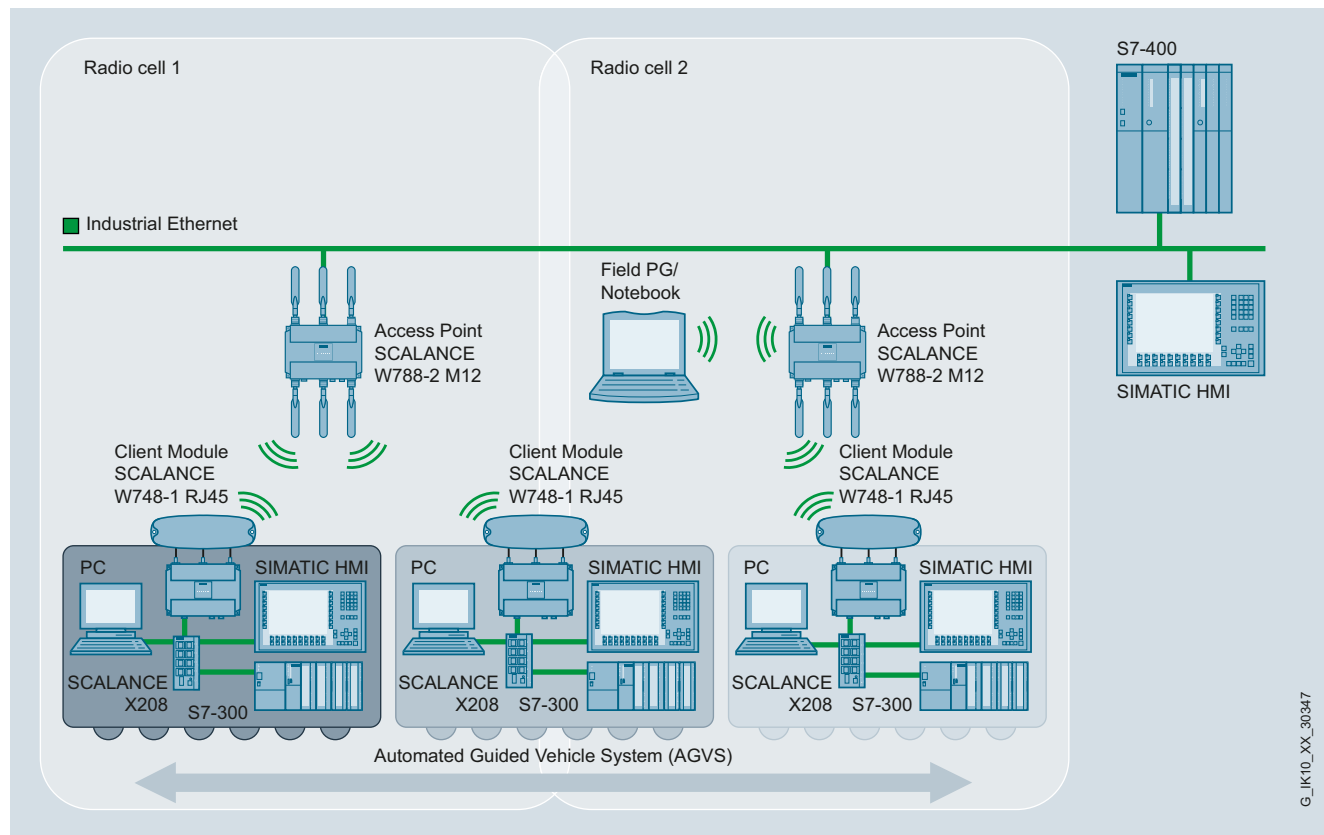
Mobile controls in an automated guided vehicle system

The controllers log on via the Ethernet client modules W748-1 RJ45 in the RF field and can move around freely there. This, for example, makes it possible to operate an automated guided vehicle system.

Technical specifications

Article No.	6GK5748-1FC00-0AA0 6GK5748-1FC00-0AB0[1]
Product-type designation	SCALANCE W748-1 RJ45
Transmission rate	
Transmission rate	
• with W-LAN maximum	450 Mbit/s
• with Industrial Ethernet	10 … 1 000 Mbit/s
• note	-
Interfaces	
Number of electrical connections	
• for network components	1
• and terminal equipment	
• for power supply	1
• for redundant power supply	1
Design of electrical connection	
• for network components and terminal equipment	RJ45 socket
• for power supply	4-pole screw terminal, PoE
Design of the removable storage C-PLUG	Yes
Interfaces wireless	
Number of radio cards permanently installed	1
Number of internal antennas	-
Number of electrical connections for external antenna(s)	3
Design of the electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes
Signal-Inputs/outputs	
Number of digital inputs	1
Number of digital outputs	1
Design of electrical connection at the digital inputs/outputs	4-pole screw terminal
Signal range	
• at digital input	24 V DC, safety extra-low voltage
• at the digital output	24 V DC /1 A
Supply voltage, current consumption, power loss	
Type of supply voltage	DC
Supply voltage	
• 1 from terminal block	19.2 V
• 2 from terminal block	28.8 V
• from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	48 V
• from Power-over-Ethernet according IEEE802.3at for type 2	50 V
Current consumed	
• at 24 V with DC typical	0.45 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.22 A
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	0.21 A

[1] Wireless approval in the USA

Article No.	6GK5748-1FC00-0AA0 6GK5748-1FC00-0AB0[1]
Product-type designation	SCALANCE W748-1 RJ45
Effective power loss	
• at 24V for DC typical	10.7 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	10.7 W
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	10.7 W
Permitted ambient conditions	
Ambient temperature	
• during operating	-20 … +60 °C
• during storage	-40 … +70 °C
• during transport	-40 … +70 °C
Relative humidity at 25 °C without condensation during operating maximum	90 %
Protection class IP	IP30
Ambient condition for (standard) operation mode	When used under hazardous conditions (Zone 2), the product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP54 in compliance with EN 60529.
Design, dimensions and weight	
Width of enclosure without antenna	200 mm
Height of enclosure without antenna	158 mm
Depth of enclosure without antenna	79 mm
Net weight	1.7 kg
Mounting type wall mounting	Yes
Mounting type	S7-300 rail mounting
Wireless frequencies	
Radio frequency	
• for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz
Product properties, functions, components general	
Product function	
• Access Point Mode	No
• Client Mode	Yes
Number of SSIDs	-
Product function	
• iPCF Access Point	-
• iPCF client	Yes
• iPCF-MC Access Point	-
• iPCF-MC client	in preparation
Number of iPCF-capable radio modules	1

Industrial Wireless Communication
IWLAN – Client Modules IEEE 802.11n

SCALANCE W748 RJ45 for use in control cabinet

Technical specifications (continued)

Article No.	6GK5748-1FC00-0AA0 6GK5748-1FC00-0AB0[1]
Product-type designation	**SCALANCE W748-1 RJ45**
Product functions management, configuration	
Number of manageable IP addresses in client	8
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	in preparation
• configuration with STEP 7 in the TIA Portal	in preparation
• operation with IWLAN controller	-
• operation with Enterasys WLAN controller	-
• forced roaming with IWLAN	No
• WDS	No
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher level designation/location designation	Yes
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	in preparation
• localization via Aeroscout	-
• SysLog	Yes
Product functions VLAN	
Product function function VLAN with IWLAN	No
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
Product functions Redundancy	
Protocol is supported STP/RSTP	-

[1] Wireless approval in the USA

Article No.	6GK5748-1FC00-0AA0 6GK5748-1FC00-0AB0[1]
Product-type designation	**SCALANCE W748-1 RJ45**
Product functions Security	
Product function	
• ACL - MAC-based	-
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported SSH	Yes
Product functions Time	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes
Standards, specifications, approvals	
Standard	
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety of CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
Verification of suitability	
• CE mark	Yes
• EC declaration of conformity	Yes
• C-Tick	Yes
• CCC	No
• Railway application in accordance with EN 50155	No
• e1 approval	No
• E1 approval	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories	
Accessories	24 V DC screw terminal and screw terminal for digital input and output included in the scope of delivery

Ordering data

	Article No.		Article No.
SCALANCE W748 client modules		**Accessories**	
IWLAN Ethernet client modules with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 450 Mbps; WPA2/AES; Power over Ethernet (PoE), IP30 degree of protection (-20 °C to +60 °C); scope of supply: Mounting hardware, 4-pin screw terminal for 24 V DC; 4-pin screw terminal for digital input and output; manual on CD-ROM; German/English		**KEY-PLUG W740 iFeatures** Swap medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; Can be used in SCALANCE W client modules with PLUG compartment	6GK5907-4PA00
SCALANCE W748-1 RJ45		**C-PLUG** Swap medium for simple replacement of devices if a fault occurs; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment	6GK1900-0AB00
For managing the wireless connection of <u>up to eight</u> linked devices with Industrial Ethernet connection; degree of protection IP30		**DIN rail mounting adapter** DIN rail mounting adapter for SCALANCE W788 M12 and SCALANCE W788 RJ45; screw fixing for mounting on a 35 mm DIN rail to EN 50 022; scope of supply: 3 units per pack	6GK5798-8ML00-0AB3
• National approvals for operation outside the USA	6GK5748-1FC00-0AA0	**IE FC RJ45 Plug 4 x 2**	
• National approvals for operation within the USA[1]	6GK5748-1FC00-0AB0	RJ45 plug-in connector for Industrial Ethernet (10/100/1 000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
		• 1 pack = 1 unit	6GK1901-1BB11-2AA0
		• 1 pack = 10 units	6GK1901-1BB11-2AB0
		• 1 pack = 50 units	6GK1901-1BB11-2AE0
		IE FC Standard Cable GP 4 x 2	6XV1878-2A
		8-core, shielded TP installation cable for connection to IE FC RJ45 Plug 4 x 2 and IE M12 Plug PRO 4 x 2; PROFINET-compliant; with UL approval; <u>sold by the meter</u>; max. length 1 000 m, minimum order quantity 20 m	
		IE FC Stripping Tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00
		Antennas and miscellaneous IWLAN accessories	See Industrial Wireless LAN/ accessories

[1] Please note national approvals under
http://www.siemens.com/wireless-approvals

More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at:
http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at:
http://www.siemens.com/wireless-approvals

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Industrial Wireless Communication
IWLAN – Client Modules IEEE 802.11n

SCALANCE W748 M12 for indoor use

■ Overview

- Particularly suitable for industrial applications without control cabinets

■ Design

- Rugged aluminum enclosure, shock and vibration-proof, for high mechanical requirements
- High IP65 degree of protection against dust and water jets
- For use at ambient temperatures from -20 °C to +60 °C
- 3 x N-Connect sockets for the connection of directly mountable and remote antennas (6 x N-Connect sockets for the variants with two wireless modules)
- Antenna placement optimized for the 3x3 MIMO technology; the antennas do not interfere with each other when they are mounted directly on the device
- 1 x M12 connection for 10/100/1 000 Mbit/s with Power-over-Ethernet according to IEEE 802.3at
- 1 x M12 socket for power supply (24 V DC)
- 1 x PLUG slot (for KEY-PLUG/C-PLUG)
- Function LEDs for optical signaling of faults/errors and operating statuses
- Mounting: Wall, S7-1500 mounting rail, S7-300 mounting rail, or on 35 mm standard mounting rail
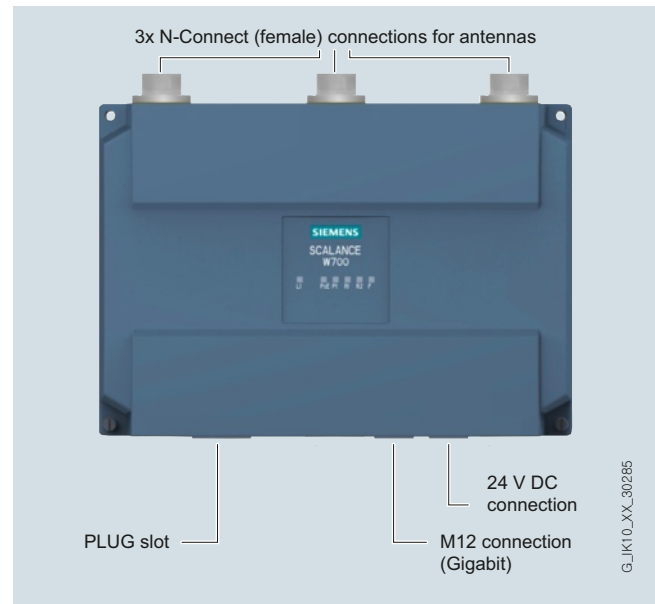
Design and interfaces of the SCALANCE W748-1 M12 client modules

***Product versions***

SCALANCE W748-1 M12

- A radio card is permanently installed; functional scope can be expanded by using a KEY-PLUG W780 iFeatures

■ **Function**
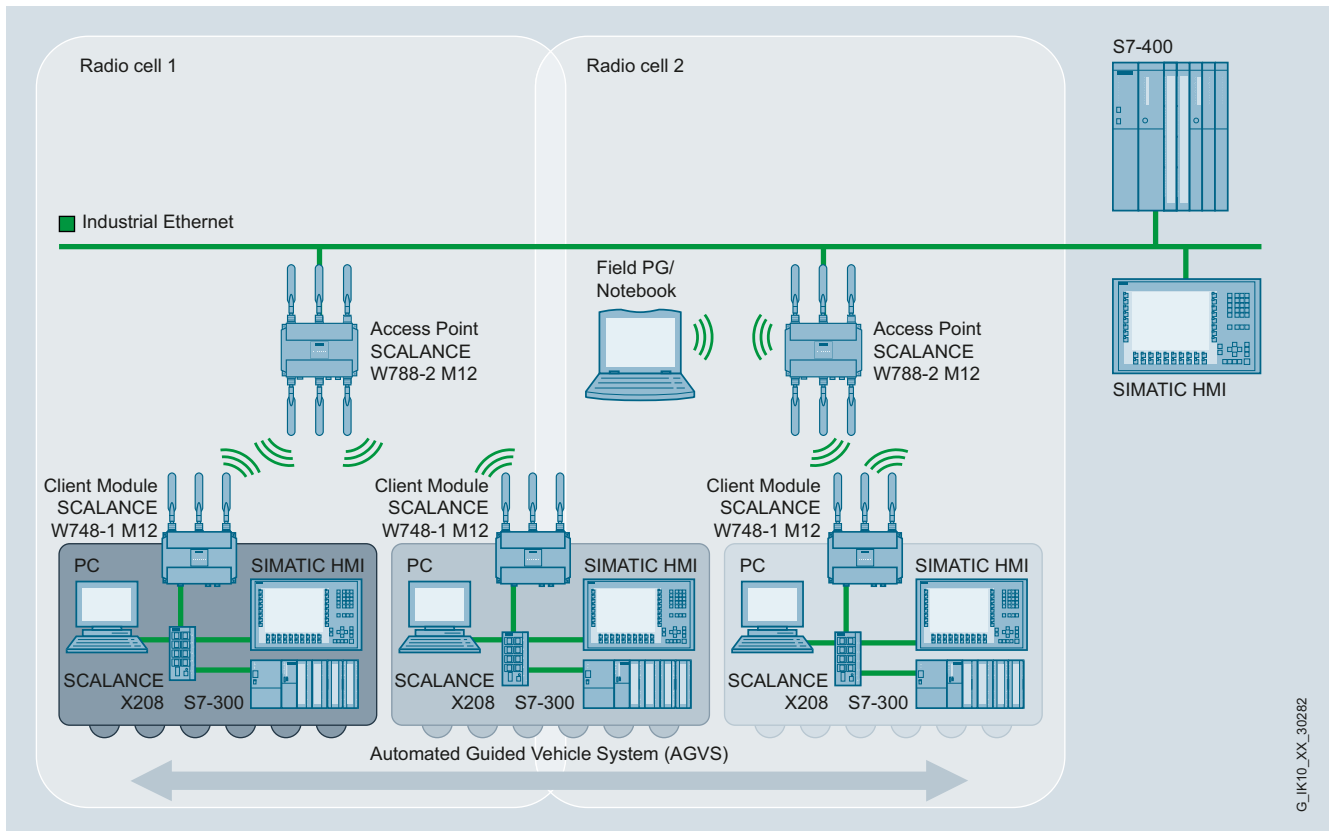
Mobile controls in an automated guided vehicle system

The controllers log on in the RF field via the Ethernet client modules W748-1 M12, which are mounted directly on the vehicle, and can move around freely within this field. This, for example, makes it possible to operate an automated guided vehicle system.

Industrial Wireless Communication
IWLAN – Client Modules IEEE 802.11n

SCALANCE W748 M12 for indoor use

■ Technical specifications

Article No.	6GK5748-1GD00-0AA0 6GK5748-1GD00-0AB0[1]
Product-type designation	**SCALANCE W748-1 M12**
Transmission rate	
Transmission rate	
• with W-LAN maximum	450 Mbit/s
• with Industrial Ethernet	10 … 1 000 Mbit/s
• note	-
Interfaces	
Number of electrical connections	
• for network components and terminal equipment	1
• for power supply	1
• for redundant power supply	1
Design of electrical connection	
• for network components and terminal equipment	M12 interface (8-pole, A-coded), PoE
• for power supply	M12 interface (4-pole, A-coded), PoE
Number of optical interfaces for optical waveguide at 100 Mbit/s	-
Design of optical interface for optical waveguide at 100 Mbit/s	-
Design of the removable storage C-PLUG	Yes
Interfaces wireless	
Number of radio cards permanently installed	1
Number of internal antennas	-
Number of electrical connections for external antenna(s)	3
Design of the electrical connection for external antenna(s)	N-Connect (socket)
Product property external antenna can be mounted directly on device	Yes
Supply voltage, current consumption, power loss	
Type of supply voltage	DC
Supply voltage	
• 1 from M12 Power Connector (A-coded) for redundant power supply	19.2 V
• 2 from M12 Power Connector (A-coded) for redundant power supply	28.8 V
• from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	48 V
• from Power-over-Ethernet according IEEE802.3at for type 2	50 V
Current consumed	
• at 24 V with DC typical	0.45 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.22 A
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	0.21 A
Active power loss	
• at 24V for DC typical	10.7 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	10.7 W
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	10.7 W

Article No.	6GK5748-1GD00-0AA0 6GK5748-1GD00-0AB0[1]
Product-type designation	**SCALANCE W748-1 M12**
Permitted ambient conditions	
Ambient temperature	
• during operating	-20 … +60 °C
• during storage	-40 … +70 °C
• during transport	-40 … +70 °C
Relative humidity at 25 °C without condensation during operating maximum	100 %
Protection class IP	IP65
Ambient condition for (standard) operation mode	When used under hazardous conditions (Zone 2), the product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP54 in compliance with EN 60529.
Design, dimensions and weight	
Width of enclosure without antenna	200 mm
Height of enclosure without antenna	176 mm
Depth of enclosure without antenna	79 mm
Net weight	1.7 kg
Mounting type wall mounting	Yes
Mounting type	S7-300 rail mounting
Wireless frequencies	
Radio frequency	
• for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz
Product properties, functions, components general	
Product function	
• Access Point Mode	No
• Client Mode	Yes
Number of SSIDs	1
Product function	
• iPCF Access Point	-
• iPCF client	Yes
• iPCF-MC Access Point	-
• iPCF-MC client	in preparation
Number of iPCF-capable radio modules	1

[1] Wireless approval in the USA

■ Technical specifications (continued)

Article No.	6GK5748-1GD00-0AA0 6GK5748-1GD00-0AB0[1]
Product-type designation	SCALANCE W748-1 M12
Product functions management, configuration	
Number of manageable IP addresses in client	8
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	in preparation
• configuration with STEP 7 in the TIA Portal	in preparation
• operation with IWLAN controller	-
• operation with Enterasys WLAN controller	-
• forced roaming with IWLAN	No
• WDS	No
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher level designation/ location designation	Yes
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	in preparation
• localization via Aeroscout	-
• SysLog	Yes
Product functions VLAN	
Product function function VLAN with IWLAN	No
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No
Product functions Redundancy	
Protocol is supported STP/RSTP	-
Product functions Security	
Product function	
• ACL - MAC-based	-
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported SSH	Yes

[1] Wireless approval in the USA

Article No.	6GK5748-1GD00-0AA0 6GK5748-1GD00-0AB0[1]
Product-type designation	SCALANCE W748-1 M12
Product functions Time	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes
Standards, specifications, approvals	
Standard	
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety of CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
Verification of suitability	
• CE mark	Yes
• EC declaration of conformity	Yes
• C-Tick	Yes
• CCC	No
• Railway application in accordance with EN 50155	No
• e1 approval	No
• E1 approval	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories	
Accessories	-

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Industrial Wireless Communication
IWLAN – Client Modules IEEE 802.11n

SCALANCE W748 M12 for indoor use

■ Ordering data

	Article No.		Article No.
SCALANCE W748 client modules		*Accessories*	
IWLAN Ethernet client modules with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 450 Mbps; WPA2/AES; Power over Ethernet (PoE), IP65 degree of protection (-20 °C to +60 °C); scope of supply: Mounting hardware; manual on CD-ROM, German/English		**KEY-PLUG W740 iFeatures** Swap medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; Can be used in SCALANCE W client modules with PLUG compartment	6GK5907-4PA00
		C-PLUG Swap medium for simple replacement of devices in the event of a fault; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment	6GK1900-0AB00
SCALANCE W748-1 M12 For managing the wireless connection of up to eight linked devices with Industrial Ethernet connection		**DIN rail mounting adapter** DIN rail mounting adapter for SCALANCE W788 M12 and SCALANCE W788 RJ45; screw fixing for mounting on a 35 mm DIN rail to EN 50 022; scope of supply: 3 units per pack	6GK5798-8ML00-0AB3
• National approvals for operation outside the USA	6GK5748-1GD00-0AA0		
• National approvals • for operation within the USA [1]	6GK5748-1GD00-0AB0	**IE FC M12 Plug PRO 4 x 2** M12 plug-in connector suitable for on-site assembly (X-coded, IP65/IP67), metal enclosure, insulation displacement fast connection method, for SCALANCE W	
		• 1 unit	6GK1901-0DB30-6AA0
		• 8 units	6GK1901-0DB30-6AA8
		IE FC Standard Cable GP 4 x 2	6XV1878-2A
		8-core, shielded TP installation cable for connection to IE FC RJ45 Plug 4 x 2 and IE M12 Plug PRO 4 x 2; PROFINET-compliant; with UL approval; sold by the meter; max. length 1 000 m, minimum order quantity 20 m	
		IE FC Stripping Tool Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	6GK1901-1GA00
		Power M12 Cable Connector PRO Terminal socket for connection of SCALANCE W700 for 24 V DC supply voltage; 4-pole, A-coded, with assembly instructions, 3 units	6GK1 907-0DC10-6AA3
		Power Cable 2 x 0.75 Connecting cable for Power M12 Cable Connector PRO, sold by the meter	6XV1 812-8A
		Antennas and miscellaneous IWLAN accessories	See Industrial Wireless LAN/ accessories

[1] Please note national approvals under
http://www.siemens.com/wireless-approvals

■ More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at:
http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at:
http://www.siemens.com/wireless-approvals

6

Overview
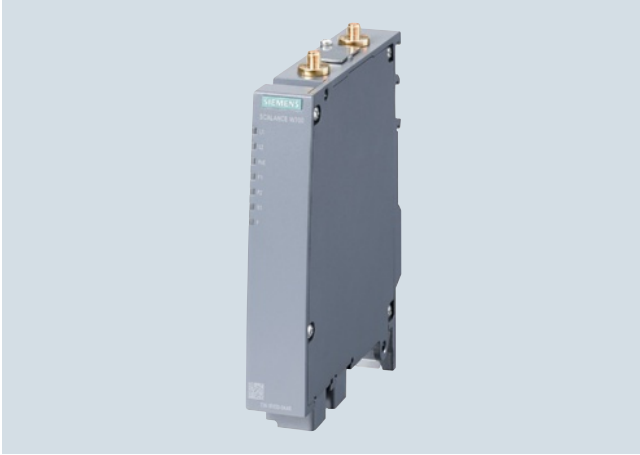
- Client modules in SIMATIC design suitable for applications where the device is to be mounted in the control cabinet

SIMATIC ET 200MP station with SCALANCE W734 RJ45

Design

- Low-profile, compact aluminum enclosure, shock and vibration-proof for high mechanical requirements
- Implementation of simple and cost-effective wireless machine networking
- Support of the 2.4 and 5 GHz frequency band
- IP30 degree of protection
- For use at ambient temperatures from -20 °C to +60 °C
- 2 x R-SMA sockets for the connection of direct mountable and remote antennas
- Antenna placement optimized for the 2x2 MIMO technology; the antennas do not interfere with each other when they are mounted directly on the device
- 2 x RJ45 connector for 10/100 Mbit/s, of which one connector has Power-over-Ethernet compliant with IEEE 802.3at
- 2 x 24 V DC connection for redundant energy supply
- 1 x PLUG compartment for KEY-PLUG/C-PLUG
- Function LEDs for optical signaling of faults/errors and operating statuses
- Mounting: Wall, S7-1500 mounting rail, S7-300 mounting rail, or on 35 mm standard mounting rail
- SIMATIC design matches existing components in the control cabinet (e.g. ET 200MP, etc.)

Design and interfaces of the SCALANCE W734 RJ45 client modules

Product versions

SCALANCE W734-1 RJ45

- A radio card is permanently installed; functional scope can be expanded by using a KEY-PLUG W740 iFeatures

Industrial Wireless Communication

IWLAN – Client Modules IEEE 802.11n

SCALANCE W734 RJ45 for use in control cabinet

▮ Function

Radio cell

RCoax Cable

Access Point
SCALANCE W774-1 RJ45
+ KEY-PLUG W780 iFeatures

Client Module SCALANCE W734-1 RJ45
+ KEY-PLUG W740 iFeatures

Antenna
ANT792-4DN

Hanger 1

Hanger 2

Hanger 3

Hanger 4

Hanger 5

G_IK10_XX_30171
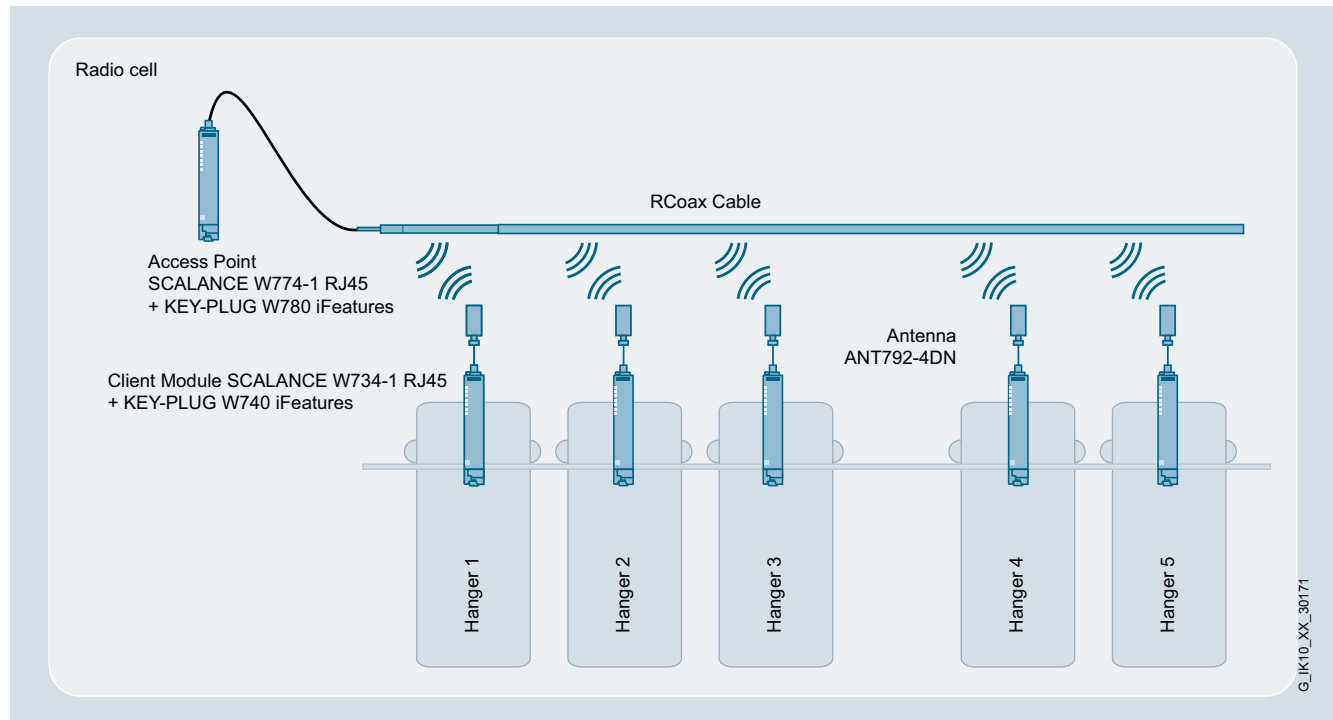
Use of the SCALANCE W734-1 RJ45 in a suspended monorail

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Technical specifications

Article No.	6GK5734-1FX00-0AA0 6GK5734-1FX00-0AB0[1]
Product-type designation	SCALANCE W734-1 RJ45
Transmission rate	
Transmission rate	
• with W-LAN maximum	300 Mbit/s
• with Industrial Ethernet	10 … 100 Mbit/s
• note	-
Interfaces	
Number of electrical connections	
• for network components and terminal equipment	2
• for power supply	1
• for redundant power supply	1
Design of the electrical connection	
• for network components and terminal equipment	RJ45 socket
• for power supply	4-pole screw terminal, PoE
Number of optical interfaces for optical waveguide at 100 Mbit/s	-
Design of optical interface for optical waveguide at 100 Mbit/s	-
Design of the removable storage C-PLUG	Yes
Interfaces wireless	
Number of radio cards permanently installed	1
Number of internal antennas	-
Number of electrical connections for external antenna(s)	2
Design of the electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes
Supply voltage, current consumption, power loss	
Type of supply voltage	DC
Supply voltage	
• 1 from terminal block	19.2 V
• 2 from terminal block	28.8 V
• from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	48 V
• from Power-over-Ethernet according IEEE802.3at for type 2	-
Current consumed	
• at 24 V with DC typical	0.25 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.125 A
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-
Effective power loss	
• at 24V for DC typical	6 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	6 W
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-

[1] Wireless approval in the USA

Article No.	6GK5734-1FX00-0AA0 6GK5734-1FX00-0AB0[1]
Product-type designation	SCALANCE W734-1 RJ45
Permitted ambient conditions	
Ambient temperature	
• during operating	-20 … +60 °C
• during storage	-40 … +85 °C
• during transport	-40 … +85 °C
Relative humidity at 25 °C without condensation during operating maximum	97 %
Protection class IP	IP30
Ambient condition for (standard) operation mode	When used under hazardous conditions (Zone 2), the SCALANCE W774-1 RJ45 or W734-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP5 in compliance with EN 60529.
Design, dimensions and weight	
Width of enclosure without antenna	26 mm
Height of enclosure without antenna	147 mm
Depth of enclosure without antenna	127 mm
Net weight	0.52 kg
Mounting type wall mounting	Yes
Mounting type	Wall mounting only if flat mounted
Wireless frequencies	
Radio frequency	
• for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz
Product properties, functions, components general	
Product function	
• Access Point Mode	No
• Client Mode	Yes
Number of SSIDs	-
Product function	
• iPCF Access Point	-
• iPCF client	Yes
• iPCF-MC Access Point	-
• iPCF-MC client	Yes
Number of iPCF-capable radio modules	1

Industrial Wireless Communication
IWLAN – Client Modules IEEE 802.11n

SCALANCE W734 RJ45 for use in control cabinet

■ **Technical specifications** (continued)

Article No.	6GK5734-1FX00-0AA0 6GK5734-1FX00-0AB0[1]
Product-type designation	**SCALANCE W734-1 RJ45**
Product functions management, configuration	
Number of manageable IP addresses in client	8
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	in preparation
• configuration with STEP 7 in the TIA Portal	in preparation
• operation with IWLAN controller	-
• operation with Enterasys WLAN controller	-
• forced roaming with IWLAN	No
• WDS	No
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher level designation/location designation	Yes
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	in preparation
• localization via Aeroscout	No
• SysLog	Yes
Product functions VLAN	
Product function function VLAN with IWLAN	No
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No

Article No.	6GK5734-1FX00-0AA0 6GK5734-1FX00-0AB0[1]
Product-type designation	**SCALANCE W734-1 RJ45**
Product functions Security	
Product function	
• ACL - MAC-based	No
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported SSH	Yes
Product functions Time	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes
Standards, specifications, approvals	
Standard	
• for hazardous zone	in preparation
• for safety of CSA and UL	-
Verification of suitability	
• CE mark	Yes
• EC declaration of conformity	Yes
• C-Tick	Yes
• CCC	-
• Railway application in accordance with EN 50155	-
• e1 approval	
• E1 approval	-
• NEMA4X	-
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories	
Accessories	24 V DC screw terminal included in scope of delivery

[1] Wireless approval in the USA

Ordering data	Article No.
SCALANCE W734 Client Modules	
IWLAN Ethernet client modules with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 300 Mbit/s; WPA2/AES; integrated 2-port switch; Power over Ethernet (PoE), IP30 degree of protection (-20 °C to +60 °C); scope of delivery: Mounting hardware, 4-pin screw terminal for 24V DC; manual on CD-ROM; German/English	
SCALANCE W734-1 RJ45	
for managing the wireless connection of up to eight linked devices with Industrial Ethernet connection	
• National approvals for operation outside the USA	6GK5734-1FX00-0AA0
• National approvals for operation within the USA [1]	6GK5734-1FX00-0AB0
Accessories	
KEY-PLUG W740 iFeatures	6GK5907-4PA00
Swap medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; can be used in SCALANCE W client modules with PLUG compartment	
C-PLUG	6GK1900-0AB00
Swap medium for simple replacement of devices if a fault occurs; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment	
IE FC RJ45 Plug 180 2 x 2	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	6GK1901-1BB10-2AA0
• 1 pack = 10 units	6GK1901-1BB10-2AB0
• 1 pack = 50 units	6GK1901-1BB10-2AE0
IE FC Standard Cable GP 2 x 2	6XV1840-2AH10
4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval Sold by the meter max. quantity 1 000 m minimum order 20 m	
IE FC Stripping Tool	6GK1901-1GA00
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
Antennas and miscellaneous IWLAN accessories	See Industrial Wireless LAN/accessories

[1] Please note national approvals under
http://www.siemens.com/wireless approvals

More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at:
http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at:
http://www.siemens.com/wireless-approvals

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Industrial Wireless Communication
IWLAN – Client Modules IEEE 802.11n

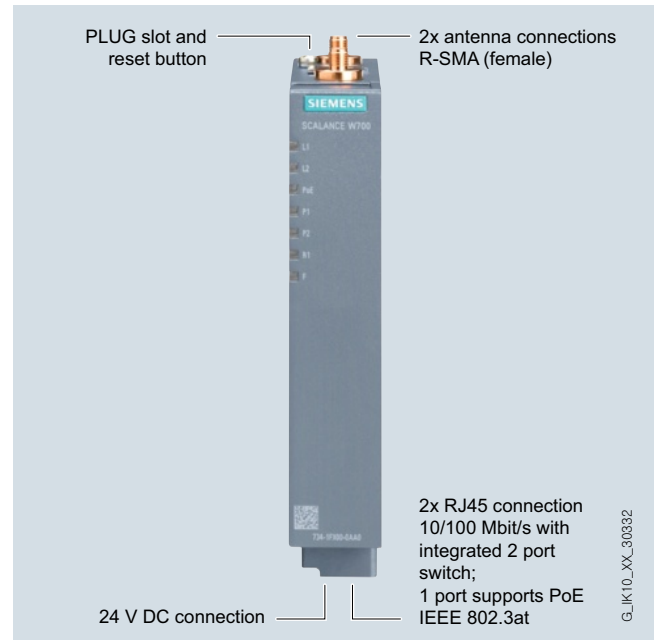**SCALANCE W722 RJ45 for use in control cabinet**

Overview

- Low-cost Client Module, suitable for applications where the device is to be mounted in the control cabinet
- Equipped with iFeatures
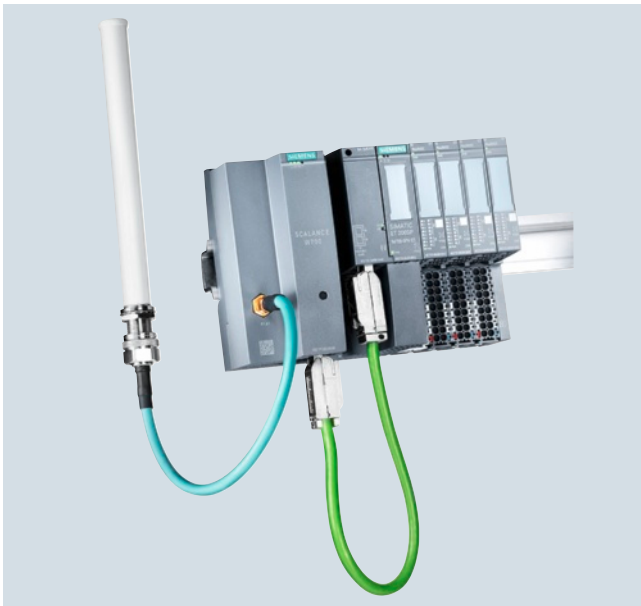
SIMATIC ET 200SP station with SCALANCE W722 RJ45

Design

- Compact design for space-saving installation in control cabinets or boxes on a standard mounting rail
- Implementation of simple and cost-effective wireless machine networking
- Support of the 2.4 and 5 GHz frequency band
- Degree of protection IP20
- For use at ambient temperatures from 0 °C to +55 °C
- 1 x R-SMA socket for the connection of a remote antenna
- 1 x RJ45 port for 10/100 Mbit/s
- 1 x 24 V DC connection
- Function LEDs for optical signaling of faults/errors and operating statuses
- SIMATIC design matches existing components in the control cabinet (e.g. ET 200SP, etc.)

1 x antenna connection R-SMA (female)

Reset button

24 V DC connection (rear)

RJ45 connection for 10/100 Mbit/s (front)
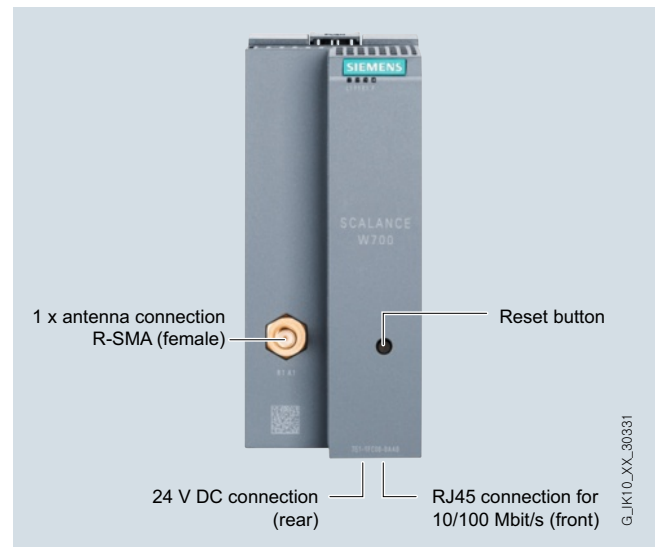
Design and interfaces of the SCALANCE W722 RJ45 client modules

Product versions

SCALANCE W722-1 RJ45

- A wireless card permanently installed in the device; suitable for establishing wireless connections with iFeatures

■ Function
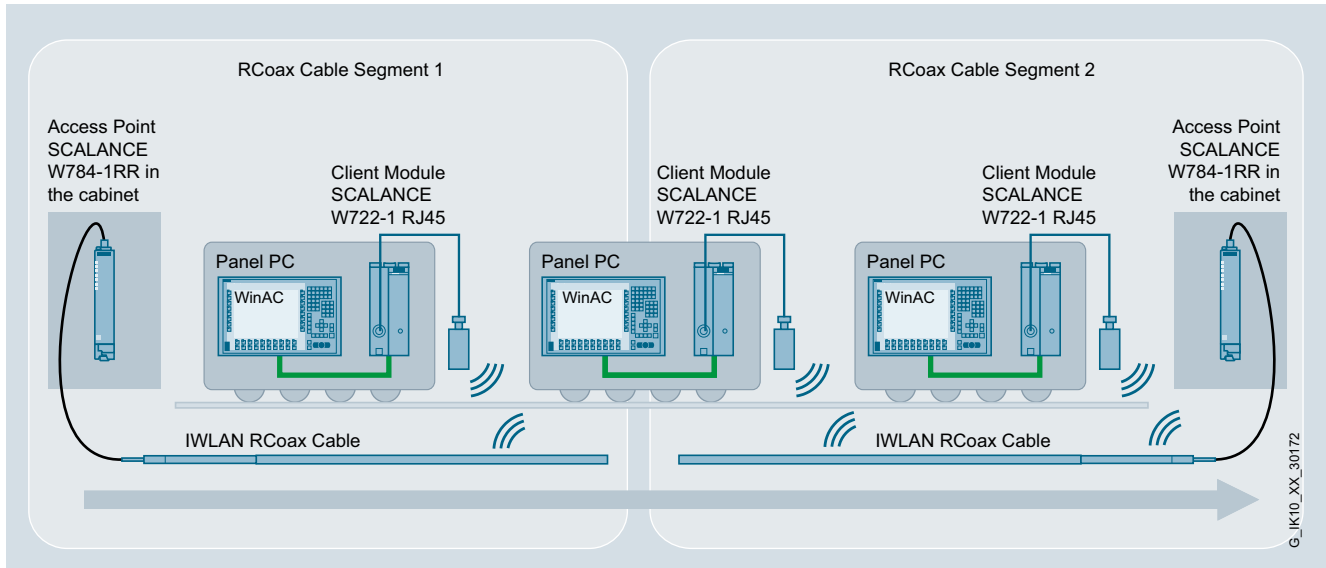
Integration of an automated guided vehicle system using iPCF with the SCALANCE W722-1 RJ45

■ Technical specifications

Article No.	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0[1]
Product-type designation	SCALANCE W722-1 RJ45
Transmission rate	
Transmission rate • with W-LAN maximum • with Industrial Ethernet • note	 150 Mbit/s 10 … 100 Mbit/s -
Interfaces	
Number of electrical connections • for network components and terminal equipment • for power supply • for redundant power supply	 1 1 0
Design of the electrical connection • for network components and terminal equipment • for power supply	 RJ45 socket 3-pole screw terminal
Number of optical interfaces for optical waveguide at 100 Mbit/s	-
Design of optical interface for optical waveguide at 100 Mbit/s	-
Design of the removable storage C-PLUG	No
Interfaces wireless	
Number of radio cards permanently installed	1
Number of internal antennas	-
Number of electrical connections for external antenna(s)	1
Design of the electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes

[1] Wireless approval in the USA

Article No.	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0[1]
Product-type designation	SCALANCE W722-1 RJ45
Supply voltage, current consumption, power loss	
Type of supply voltage	DC

Supply voltage
• 1 from terminal block
• 2 from terminal block
• from Power-over-Ethernet
  according IEEE802.3at for type 1
  and IEEE802.3af
• from Power-over-Ethernet
  according IEEE802.3at for type 2
	
	19.2 V
	28.8 V
	-
	
	-

Current consumed
• at 24 V with DC typical
• with Power-over-Ethernet
  according to IEEE802.3at for type 1
  and IEEE802.3af typical
• with Power-over-Ethernet
  according to IEEE802.3at for type 2
  typical
	
	0.15 A
	-
	
	-

Effective power loss
• at 24V for DC typical
• with Power-over-Ethernet
  according to IEEE802.3at for type 1
  and IEEE802.3af typical
• with Power-over-Ethernet
  according to IEEE802.3at for type 2
  typical
	
	3.6 W
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Industrial Wireless Communication
IWLAN – Client Modules IEEE 802.11n

SCALANCE W722 RJ45 for use in control cabinet

■ **Technical specifications** (continued)

Article No.	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0[1]
Product-type designation	**SCALANCE W722-1 RJ45**
Permitted ambient conditions	
Ambient temperature	
• during operating	0 … 55 °C
• during storage	-40 … +85 °C
• during transport	-40 … +85 °C
Relative humidity at 25 °C without condensation during operating maximum	95 %
Protection class IP	IP20
Ambient condition for (standard) operation mode	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP54 in compliance with EN 60529.
Design, dimensions and weight	
Width of enclosure without antenna	50 mm
Height of enclosure without antenna	114 mm
Depth of enclosure without antenna	74 mm
Net weight	0.13 kg
Mounting type wall mounting	No
Wireless frequencies	
Radio frequency	
• for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz
Product properties, functions, components general	
Product function	
• Access Point Mode	No
• Client Mode	Yes
Number of SSIDs	-
Product function	
• iPCF Access Point	-
• iPCF client	Yes
• iPCF-MC Access Point	-
• iPCF-MC client	Yes
Number of iPCF-capable radio modules	1

Article No.	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0[1]
Product-type designation	**SCALANCE W722-1 RJ45**
Product functions management, configuration	
Number of manageable IP addresses in client	4
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	in preparation
• configuration with STEP 7 in the TIA Portal	in preparation
• operation with IWLAN controller	-
• operation with Enterasys WLAN controller	-
• forced roaming with IWLAN	No
• WDS	No
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	No
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher level designation/location designation	Yes
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	No
• Link Check	No
• connection monitoring IP-Alive	No
• localization via Aeroscout	No
• SysLog	Yes
Product functions VLAN	
Product function function VLAN with IWLAN	No
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No

Technical specifications (continued)

Article No.	6GK5722-1FC00-0AA0 6GK5722-1FC00-0AB0[1]
Product-type designation	SCALANCE W722-1 RJ45
Product functions Security	
Product function	
• ACL - MAC-based	No
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported SSH	Yes
Product functions Time	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes
Standards, specifications, approvals	
Standard	
• for hazardous zone	in preparation
• for safety of CSA and UL	-
Verification of suitability	
• CE mark	Yes
• EC declaration of conformity	Yes
• C-Tick	Yes
• CCC	-
• Railway application in accordance with EN 50155	-
• e1 approval	
• E1 approval	-
• NEMA4X	-
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories	
Accessories	24 V DC screw terminal included in scope of delivery

[1] Wireless approval in the USA

Ordering data

SCALANCE W722 Client Modules

IWLAN Ethernet Client Modules with iFeatures support and built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbit/s; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of delivery: Mounting hardware, 3-pin screw terminal for 24V DC; manual on CD-ROM; German/English

SCALANCE W722-1 RJ45

for administration of the wireless connection with iFeatures from a connected device with Industrial Ethernet connection
• National approvals for operation outside the USA — **6GK5722-1FC00-0AA0**
• National approvals for operation within the USA [1] — **6GK5722-1FC00-0AB0**

Accessories

IE FC RJ45 Plug 180 2 x 2

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface
• 1 pack = 1 unit — **6GK1901-1BB10-2AA0**
• 1 pack = 10 units — **6GK1901-1BB10-2AB0**
• 1 pack = 50 units — **6GK1901-1BB10-2AE0**

IE FC Standard Cable GP 2 x 2 — **6XV1840-2AH10**

4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval Sold by the meter max. quantity 1 000 m minimum order 20 m

IE FC Stripping Tool — **6GK1901-1GA00**

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

Antennas and miscellaneous IWLAN accessories — See Industrial Wireless LAN/ accessories

[1] Please note national approvals under http://www.siemens.com/wireless-approvals

More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at: http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at: http://www.siemens.com/wireless-approvals

Industrial Wireless Communication
IWLAN – Client Modules IEEE 802.11n

**SCALANCE W721 RJ45 for use in control cabinet**

Overview

- Low-cost Client Module, suitable for applications where the device is to be mounted in the control cabinet

Design

- Compact design for space-saving installation in control cabinets or boxes on a standard mounting rail
- Implementation of simple and cost-effective wireless machine networking
- Support of the 2.4 and 5 GHz frequency band
- Degree of protection IP20
- For use at ambient temperatures from 0 °C to +55 °C
- 1 x R-SMA socket for the connection of a remote antenna
- 1 x RJ45 port for 10/100 Mbit/s
- 1 x 24 V DC connection
- Function LEDs for optical signaling of faults/errors and operating statuses
- SIMATIC design matches existing components in the control cabinet (e.g. ET 200SP, etc.)

Design and interfaces of the SCALANCE W721 RJ45 client modules

### Product versions

SCALANCE W721-1 RJ45

- A wireless card permanently installed in the device;

■ **Integration**
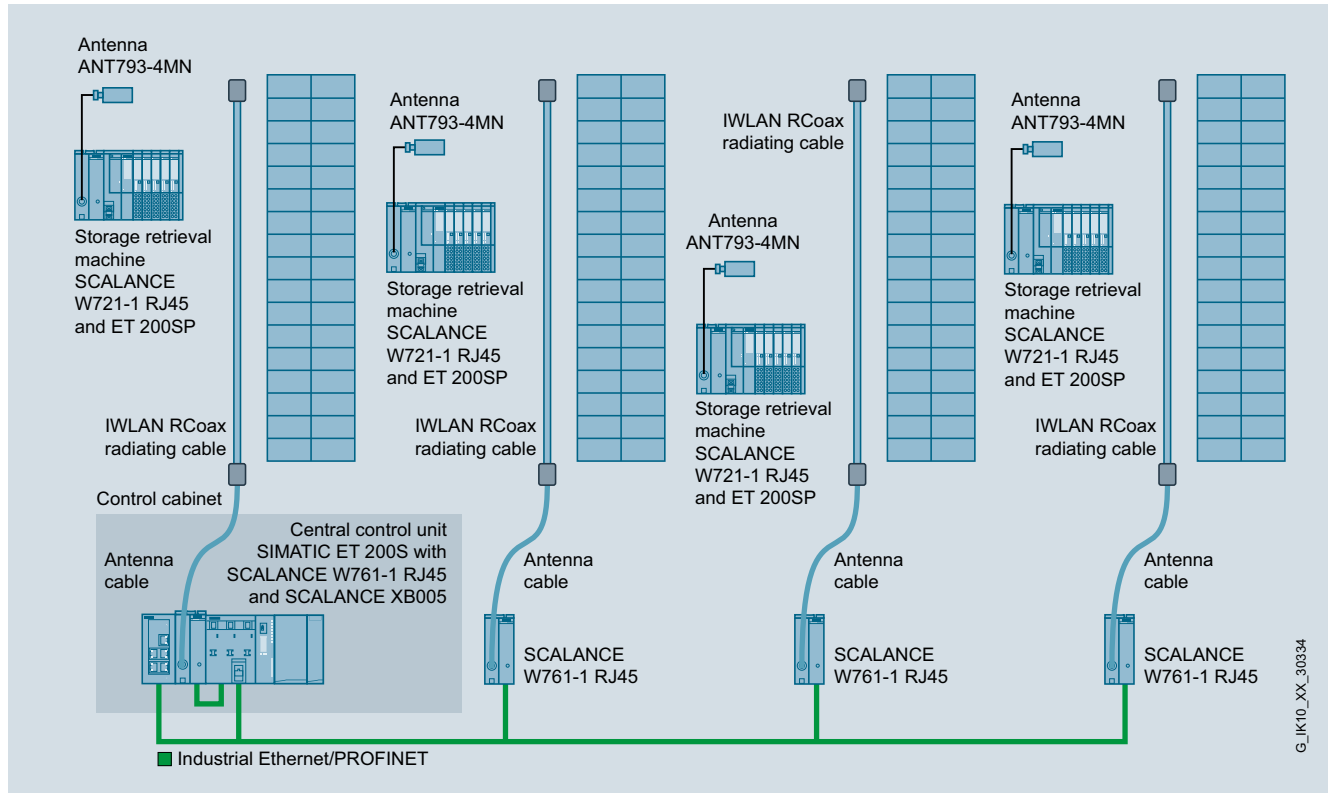
Storage and retrieval systems in high-bay warehouses automated with SCALANCE W721-1 RJ45, W761-1 RJ45 and RCoax

■ **Technical specifications**

Article No.	6GK5721-1FC00-0AA0 6GK5721-1FC00-0AB0[1]
Product-type designation	SCALANCE W721-1 RJ45
Transmission rate	
Transmission rate • with W-LAN maximum • with Industrial Ethernet • note	 150 Mbit/s 10 … 100 Mbit/s -
Interfaces	
Number of electrical connections • for network components and terminal equipment • for power supply • for redundant power supply	 1 1 0
Design of the electrical connection • for network components and terminal equipment • for power supply	 RJ45 socket 3-pole screw terminal
Number of optical interfaces for optical waveguide at 100 Mbit/s	-
Design of optical interface for optical waveguide at 100 Mbit/s	-
Design of the removable storage C-PLUG	No

Article No.	6GK5721-1FC00-0AA0 6GK5721-1FC00-0AB0[1]
Product-type designation	SCALANCE W721-1 RJ45
Interfaces wireless	
Number of radio cards permanently installed	1
Number of internal antennas	-
Number of electrical connections for external antenna(s)	1
Design of the electrical connection for external antenna(s)	R-SMA (socket)
Product property external antenna can be mounted directly on device	Yes

[1] Wireless approval in the USA

Industrial Wireless Communication
IWLAN – Client Modules IEEE 802.11n

SCALANCE W721 RJ45 for use in control cabinet

■ Technical specifications (continued)

Article No.	6GK5721-1FC00-0AA0 6GK5721-1FC00-0AB0[1]
Product-type designation	SCALANCE W721-1 RJ45
Supply voltage, current consumption, power loss	
Type of supply voltage	DC
Supply voltage	
• 1 from terminal block	19.2 V
• 2 from terminal block	28.8 V
• from Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	-
• from Power-over-Ethernet according IEEE802.3at for type 2	-
Current consumed	
• at 24 V with DC typical	0.15 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	-
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-
Effective power loss	
• at 24V for DC typical	3.6 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	-
• with Power-over-Ethernet according to IEEE802.3at for type 2 typical	-
Permitted ambient conditions	
Ambient temperature	
• during operating	0 … 55 °C
• during storage	-40 … +85 °C
• during transport	-40 … +85 °C
Relative humidity at 25 °C without condensation during operating maximum	95 %
Protection class IP	IP20
Ambient condition for (standard) operation mode	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP54 in compliance with EN 60529.
Design, dimensions and weight	
Width of enclosure without antenna	50 mm
Height of enclosure without antenna	114 mm
Depth of enclosure without antenna	74 mm
Net weight	0.13 kg
Mounting type wall mounting	No
Wireless frequencies	
Radio frequency	
• for WLAN in 2.4 GHz frequency band	2.41 … 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 … 5.8 GHz

Article No.	6GK5721-1FC00-0AA0 6GK5721-1FC00-0AB0[1]
Product-type designation	SCALANCE W721-1 RJ45
Product properties, functions, components general	
Product function	
• Access Point Mode	No
• Client Mode	Yes
Number of SSIDs	-
Product function	
• iPCF Access Point	-
• iPCF client	-
• iPCF-MC Access Point	-
• iPCF-MC client	-
Number of iPCF-capable radio modules	-
Product functions management, configuration	
Number of manageable IP addresses in client	4
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	in preparation
• configuration with STEP 7 in the TIA Portal	in preparation
• operation with IWLAN controller	-
• operation with Enterasys WLAN controller	-
• forced roaming with IWLAN	No
• WDS	No
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	No
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher level designation/ location designation	Yes
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	No
• localization via Aeroscout	No
• SysLog	Yes
Product functions VLAN	
Product function function VLAN with IWLAN	No
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	No

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Technical specifications (continued)

Article No.	6GK5721-1FC00-0AA0 6GK5721-1FC00-0AB0[1]
Product-type designation	**SCALANCE W721-1 RJ45**
Product functions Security	
Product function	
• ACL - MAC-based	No
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported SSH	Yes
Product functions Time	
Protocol is supported	
• SNTP	Yes
• SIMATIC Time	Yes
Standards, specifications, approvals	
Standard	
• for hazardous zone	in preparation
• for safety of CSA and UL	-
Verification of suitability	
• CE mark	Yes
• EC declaration of conformity	Yes
• C-Tick	Yes
• CCC	-
• Railway application in accordance with EN 50155	-
• e1 approval	
• E1 approval	-
• NEMA4X	-
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Accessories	
Accessories	24 V DC screw terminal included in scope of delivery

[1] Wireless approval in the USA

Ordering data   Article No.

SCALANCE W721 Client Modules

IWLAN Ethernet Client Modules with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbit/s; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of delivery: Mounting hardware, 3-pin screw terminal for 24V DC; manual on CD-ROM; German/English

SCALANCE W721-1 RJ45

For administration of the wireless connection from a connected device with Industrial Ethernet connection

• National approvals for operation outside the USA	**6GK5721-1FC00-0AA0**
• National approvals for operation within the USA [1]	**6GK5721-1FC00-0AB0**

Accessories

IE FC RJ45 Plug 180 2 x 2

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**

IE FC Standard Cable GP 2 x 2	**6XV1840-2AH10**

4-core, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. quantity 1 000 m, minimum order 20 m

IE FC Stripping Tool	**6GK1901-1GA00**

Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables

Antennas and miscellaneous IWLAN accessories	See Industrial Wireless LAN/ accessories

[1] Please note national approvals under
http://www.siemens.com/wireless-approvals

More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at:
http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at:
http://www.siemens.com/wireless-approvals

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Industrial Wireless Communication
IWLAN – Accessories

IWLAN antennas

■ Overview

Remote antennas increase the reliability of wireless links by optimizing the receiving and emission of signals.

- Use in Industrial Wireless LAN (IWLAN) and WLAN in accordance with IEEE 802.11 at 2.4 GHz and 5 GHz with transmission rates of up to 450 Mbit/s
- Coordinated range of antennas for the most diverse applications both indoors and outdoors
- Antennas with two (dual-slant) or three (MIMO) connections for increased data throughput and increased reliability of the wireless connection thanks to selective use of multiple path propagation
- Suitable for use in hazardous areas (Zone 2); no special approvals necessary

■ Benefits

g e t **get** Designed for Industry

- Investment protection thanks to compliance with the globally recognized standard IEEE 802.11 and – depending on the version – suitability for 2.4 GHz and/or 5 GHz
- Cost-effective connection to devices in remote, difficult-to-access, or hostile environments
- Establishment of a reliable IWLAN wireless infrastructure through the use of remote antennas, even if the access points and client modules are installed in the cabinet, for example

■ Application

Separate antennas optimize the transmission and receiving conditions and support the use of IWLAN products in a number of industrial applications.
With sector antennas, for example, conveyor lines or corridors can be specifically covered with radio links, or strongly directional antennas can be used to implement point-to-point connections over distances of up to several 1 000 meters.

Alternatively, an omnidirectional antenna concentrates the radio field around the antenna in the shape of a disc, which enhances the quality of the connection.

Antennas with two or three connections enable transmission of the two to three streams usual with IEEE 802.11n, using just one antenna. They are available both with omnidirectional and directional characteristics.

Application examples:

Omnidirectional antennas

- Coverage of an area which has at its center a pole for mounting the antenna
- Installation of the antenna on the roof in the case of automated guided vehicle systems for reliable data exchange with the vehicles
- Wide-area coverage of a production cell or robot station

Sector antennas

- Selective coverage of warehouse/high-bay warehouse aisles with the help of a wide-angle antenna prevents interference with neighboring wireless fields

Directional antennas

- Communication between buildings over long distances with the help of an antenna with narrow opening angle and high gain

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■ **Design**

Type of antenna	Frequency range (GHz)	Antennas	SCALANCE W780/W740	SCALANCE W770/W730	SCALANCE W760/W720
omnidirectional	2.4	ANT792-6MN	●	●	●
omnidirectional	2.4 and 5	ANT795-4MA	●	●	●
omnidirectional	2.4 and 5	ANT795-4MC	●		
omnidirectional	2.4 and 5	ANT795-4MD	●		
omnidirectional	2.4 and 5	ANT795-6MN	●	●	●
omnidirectional	2.4 and 5	ANT795-6MT	●		
omnidirectional	5	ANT793-6MN	●	●	●
Sector	2.4 and 5	ANT795-6DC	●	●	
Sector	5	ANT793-6DG	●	●	
Sector	5	ANT793-6DT	●		

Omnidirectional and sector antennas

Type of antenna	Frequency range (GHz)	Antennas	SCALANCE W780/W740	SCALANCE W770/W730	SCALANCE W760/W720
directional	2.4	ANT792-8DN	●		
directional	5	ANT793-8DP	●		
directional	5	ANT793-8DJ	●		
directional	5	ANT793-8DK	●		
RCoax	2.4	RCoax radiating cables 2.4 GHz	●	●	●
RCoax	2.4	ANT792-4DN	●	●	●
RCoax	5	RCoax radiating cables 5 GHz	●	●	●
RCoax	5	ANT793-4MN	●	●	●

IWLAN directional antennas and RCoax radiating cable

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Industrial Wireless Communication
IWLAN – Accessories

IWLAN antennas

■ **Function**

Separate antennas are used to optimize the radio field for the application. In industrial applications, this permits a reliable radio link.

Antennas with multiple connections (dual or MIMO antennas)

Antennas with two connections combine two individual antennas, at 90° to each other, in a single antenna enclosure. With these antennas, two data streams can be transferred simultaneously thanks to the two different polarization levels. Depending on the alignment of the polarization levels, these antennas are referred to as dual-slant (rotated through +/-45°) or vertical-horizontal.

Antennas with three connections contain three individual emitters that can be combined in a single enclosure, either on different polarization levels (0°, +/-45°) or at a suitable distance from each other. The MIMO antennas can transmit or receive three data streams simultaneously using multiple path propagation.

Transmission of several data streams results in increased data throughput and simultaneously a more reliable data transfer.

Directional effect

The suitable antenna is selected first by means of the wireless field characteristic. A distinction is made between omnidirectional antennas and directional antennas.

Omnidirectional antennas
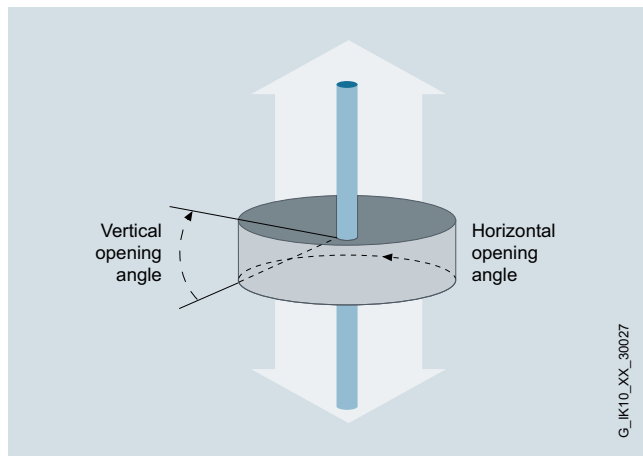
Omnidirectional antenna

With omnidirectional antennas, the radio field is emitted in every direction surrounding the antenna (horizontal opening angle: 360°), but it weakens as the distance increases. There is a concentration in the vertical direction which creates passive amplification of the radio field. Many omnidirectional antennas have extremely weak radiation directly below the antenna due to their type of construction. This property can be seen in the associated antenna diagram.

ANT795-4Mx

With these omnidirectional antennas, the radio field is concentrated at 2.4 GHz and 5 GHz in the vertical plane of the antenna. All antennas of this type have an opening angle of 30° in the vertical direction and an antenna gain of 3/5 dBi. They are directly mounted on the R-SMA or N connector of the SCALANCE W enclosure.

ANT795-4MA, ANT795-4MC and ANT795-4MD

The ANT795-4MC and ANT 795-4MD antennas can be rotated around only one axis, they have N-Connect connectors and degree of protection IP65 and are used with the SCALANCE W788 M12 Access Points and the SCALANCE W748 M12 Client Modules.

The ANT795-4MA antenna features an additional joint, an R-SMA connector, and degree of protection IP30. It is therefore optimally suitable for the SCALANCE W788 RJ45, W770 and W760 Access Points and the SCALANCE W748 RJ45, W730 and W720 Client Modules.

ANT792-6MN, ANT793-6MN

With these omnidirectional antennas, the radio field is concentrated at 2.4 GHz (ANT792-6MN) and 5 GHz (ANT793-6MN) in the vertical plane of the antenna. The antennas have a gain of 6 dBi and 5 dBi respectively.

N-Connect is used as the connection plug and can be connected to SCALANCE W over an antenna connection cable from the range of IWLAN cabling. Both antennas are supplied with a mounting aid (metal bracket) that supports wall or mast mounting. The antennas are therefore ideally suited, for example, to providing radio coverage for a place that has a mast at its center on which they can be mounted.

ANT795-6MN, antenna mounting tool for ANT795-6MN

With this omnidirectional antenna, the radio field is concentrated at 2.4 GHz and 5 GHz in the vertical plane of the antenna. The antenna has a gain of 6 dBi and 8 dBi respectively.

N-Connect is used as connection plug. The antenna can be connected to SCALANCE W over an antenna connection cable from the IWLAN cabling systems range. The antenna characteristic is such that good transmission properties also exist directly above and below the antenna. It is designed for mounting on a control cabinet or roof, but it can also be mounted under a roof, so it is suitable, for example, for the mobile units of an automated guided vehicle system. If it needs to be installed on a ceiling under a roof, the optional antenna mounting tool for ANT795-6MN is used.

ANT795-6MT

This antenna is an omnidirectional MIMO antenna with three QMA connections. The wireless field is concentrated at 2.4 GHz and 5 GHz in the vertical plane of the antenna. The antenna has a gain of 6 dBi.

The antenna characteristic is such that good transmission properties also exist directly above and below the antenna. It is designed for mounting on a roof or (together with the supplied mounting bracket) under a ceiling, and it is thus suitable, for example, for the mobile units of automated guided vehicle systems.

The ANT795-6MT is connected to the SCALANCE W-780/W740 Access Points via QMA/N-Connect male/female IWLAN adapter cables and the IWLAN flexible antenna connection cables in the relevant length and connector version.

■ **Function** (continued)

Directional antennas
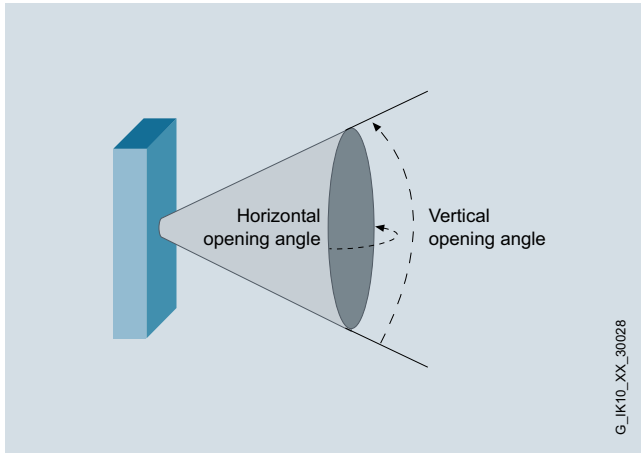
Directional antenna

With directional antennas, the radio field is emitted both in the horizontal and vertical plane in the range of the opening angle. It is concentrated in these areas and generates passive amplification. Based on the opening angle, directional antennas are divided into sector or wide-angle antennas (opening angle > approx. 30°) and strongly directional antennas.
Directional antennas are ideally suited to wall or mast mounting. The supplied mounting aid is used for a targeted adjustment. N-Connect is generally used as connection plug. The antenna can be connected to SCALANCE W over an antenna connection cable from the IWLAN cabling systems range.

ANT795-6DC, ANT793-6DG and ANT793-6DT

The radio field can be aligned at 2.4 GHz and 5 GHz using these sector antennas. Each has an antenna gain of 9 dBi.

Thanks to their characteristics, they are suitable, for example, for providing wireless coverage for an area in front of a wall.

The ANT795-6DC antenna is suitable for both frequency bands 2.4 and 5 GHz. It has an N-Connect connection. Together with a SCALANCE W780 or W770, two or three antennas of this type can also be used for covering multiple sectors.

ANT793-6DG is a dual-slant antenna with two N-Connect connections for the 5 GHz frequency band.

ANT793-6DT is a MIMO antenna with three QMA connections for the 5 GHz band.

The ANT795-6DT is connected to the SCALANCE W-780/W740 Access Points via QMA/N-Connect male/female IWLAN adapter cables and the IWLAN flexible antenna connection cables in the relevant length and connector version.

ANT792-8DN, ANT793-8DP, ANT 793-8DJ and ANT793-8DK

These strongly directional antennas enable genuine amplification of the radio field. The radio field is concentrated in a narrow cone due to the narrow opening angle. High passive gains and long ranges are therefore achieved.

Due to the high passive gain, the antennas are ideally suited to bridging large distances.

The ANT792-8DN antenna is suitable for the 2.4 GHz frequency band and has an antenna gain of 14 dBi.

ANT793-8DP is an antenna with a high gain (13.5 dBi) in a compact enclosure. It is suitable for the frequency band from 4.9 to 5.35 GHz and therefore preferably for applications in Japan.

ANT793-8DJ (18 dBi) and ANT793-8DK (23 dBi) are strongly directional antennas with vertical-horizontal polarization. They each have two N-Connect connections.

The antenna name indicates the properties of the IWLAN antennas

Industrial Wireless Communication
IWLAN – Accessories

■ Function (continued)

Antennas especially for use with RCoax radiating cables

These antennas have been specially developed for use with the RCoax radiating cable. They are preferably used in environments in which nodes move within limited areas or exclusively along predefined paths. Typical applications are suspended monorails or high-bay racking systems where the antenna is within the near field of the radiating cable.

ANT793-4MN

With this omni-directional antenna, the radio field is concentrated at 5 GHz in the vertical plane of the antenna. The antenna has a gain of 6 dBi at 5.2 GHz and 5 dBi at 5.7 GHz. The polarization of the antenna is vertical (λ5/8 characteristic). N-Connect is used as connection plug. The antenna can be connected to SCALANCE W by means of an antenna connection cable from the IWLAN cabling systems range.

ANT792-4DN

The radio field is aligned at 2.4 GHz for this antenna. The antenna has a gain of 4 dBi. The polarization of the antenna is circular, i.e. the receive path of the signals of both polarizations is amplified equally well. Signal strength fluctuations are weaker at 2.4 GHz.

N-Connect is used as connection plug. The antenna can be connected to SCALANCE W by means of an antenna connection cable from the IWLAN cabling systems range.

■ Integration
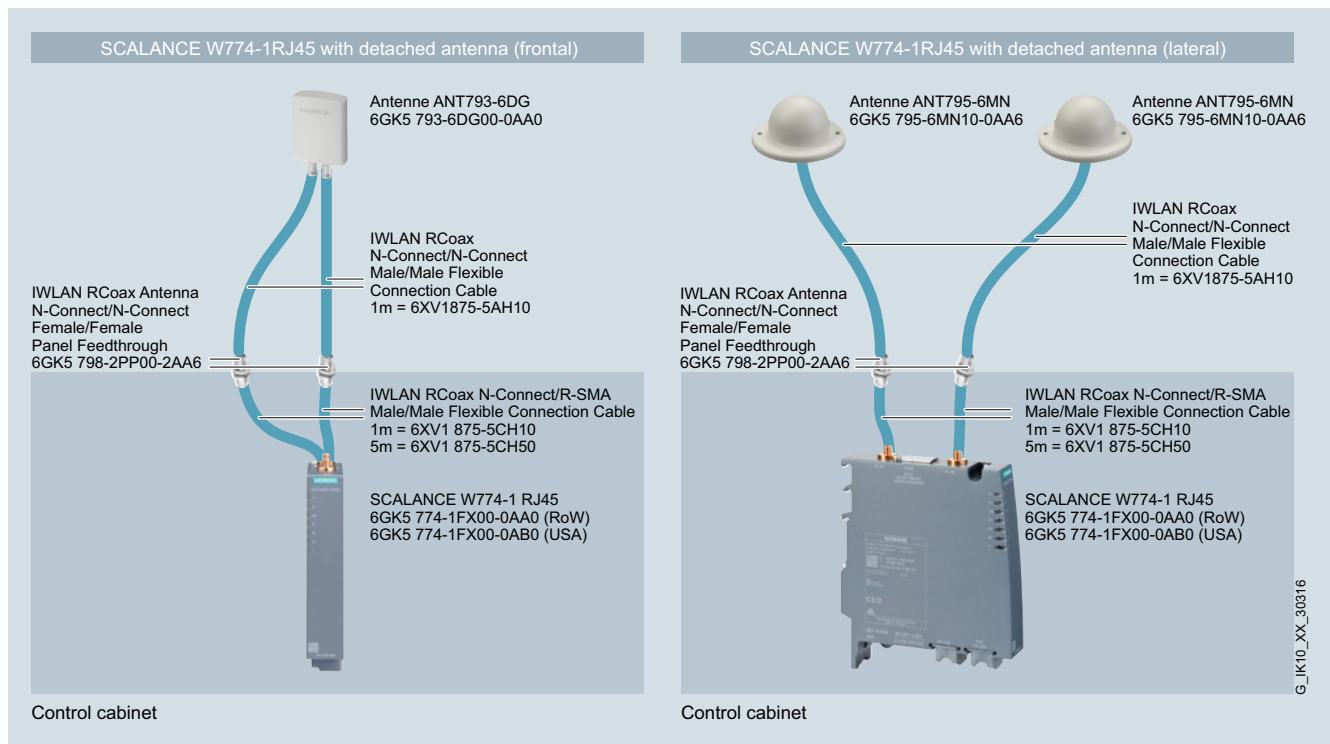
W774-1 RJ45 with remote antennas

■ **Integration** (continued)

Antenna ANT793-6MN connected to SCALANCE W761-1 RJ45 (frontal)

Antenne ANT793-6MN
6GK5 793-6MN00-0AA6

IWLAN RCoax
N-Connect/N-Connect
Male/Male Flexible
Connection Cable
1m = 6XV1875-5AH10

IWLAN RCoax Antenna
N-Connect/N-Connect
Female/Female
Panel Feedthrough
6GK5 798-2PP00-2AA6

IWLAN RCoax N-Connect/R-SMA
Male/Male Flexible Connection Cable
1m = 6XV1 875-5CH10
5m = 6XV1 875-5CH50

SCALANCE W761-1 RJ45
6GK5761-1FC00-0AA0 (RoW)
6GK5761-1FC00-0AB0 (USA)

Control cabinet

G_IK10_XX_30314

MIMO antenna ANT795-6MT connected to SCALANCE W788-2 M12
with N-Connect ports

SCALANCE W

IWLAN Antenna
ANT795-6MT
6GK5 795-6MT00-0AA0

QMA/N-Connect
Male/Female
Flexible Connection Cable
6XV1 875-5JH10
(Scope of delivery: 3 items)

IWLAN N-Connect/
N-Connect Male/Male
Flexible Connection Cable
2 m = 6XV1 875-5AH20
(Scope of delivery: 1 items)

Lightning protector
6GK5 798-2LP10-2AA6
(Scope of delivery: 1 items)

SCALANCE W788-2 M12
6GK5 788-2GD00-0AA0

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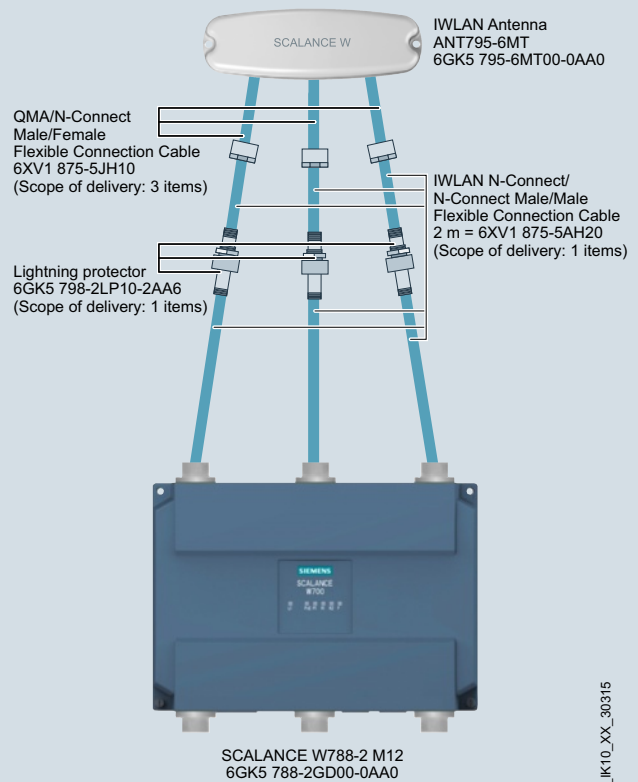
SCALANCE W761-1 RJ45 and SCALANCE W788-2 M12 with remote antennas

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Industrial Wireless Communication
IWLAN – Accessories

IWLAN antennas

■ **Integration** (continued)

Dual Slant antenna ANT793-6DG connected to SCALANCE W788-2 RJ45 with R-SMA ports	Dual Slant antenna ANT793-6DG connected to SCALANCE W788-2 M12 with N-Connect ports
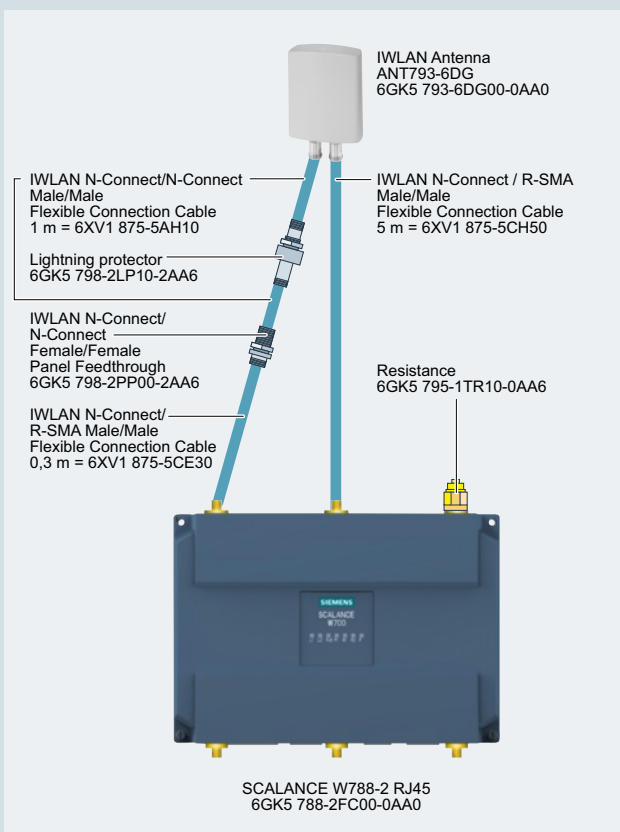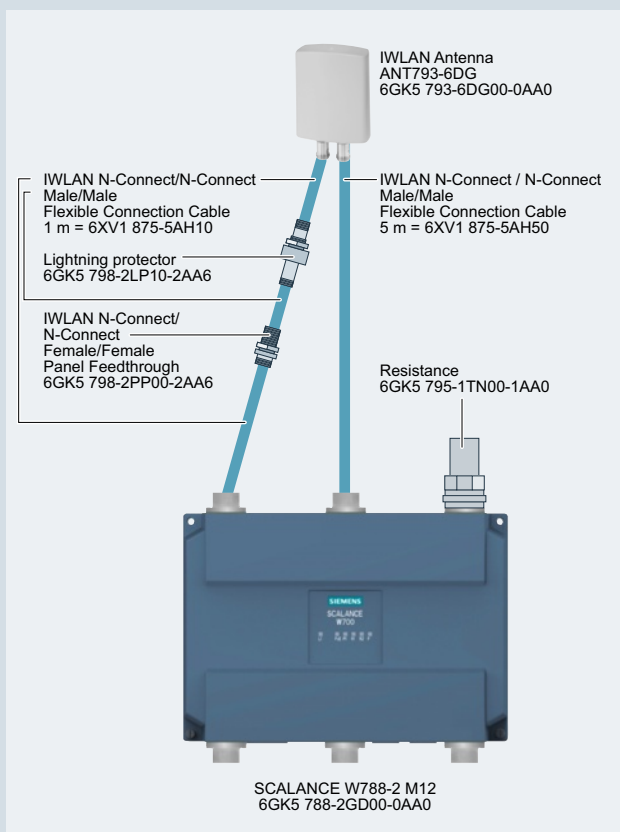
SCALANCE W788-1 RJ45 access points with dual slant antenna and SCALANCE W788-1 M12 with N-Connect connection

All antennas can be used with an N-Connect female connector.

Technical specifications

Article No.	6GK5795-4MC00-0AA3	6GK5795-4MD00-0AA3	6GK5795-4MA00-0AA3
Product-type designation	Antenna ANT795-4MC	Antenna ANT795-4MD	Antenna ANT795-4MA
Wireless frequencies			
Radio frequency			
• for WLAN in 2.4 GHz frequency band	2.4 … 2.4835 GHz	2.4 … 2.4835 GHz	2.4 … 2.4835 GHz
• for WLAN in 5 GHz frequency band 1	5.15 … 5.35 GHz	5.15 … 5.35 GHz	5.15 … 5.35 GHz
• for WLAN in 5 GHz frequency band 2	5.725 … 5.85 GHz	5.725 … 5.85 GHz	5.725 … 5.85 GHz
Electrical data			
Impedance	50 Ω	50 Ω	50 Ω
Polarization	linear vertical	linear vertical	linear vertical
Radiation characteristic	omnidirectional	omnidirectional	omnidirectional
Antenna gain compared to spherical radiator with linear radiation	-	-	-
Antenna gain compared to spherical radiator with circular radiation	-	-	-
Antenna gain compared to spherical radiator of the WLAN antenna in the 2.4 GHz frequency band	3 dB	3 dB	3 dB
Antenna gain compared to spherical radiator of the WLAN antenna in the 5 GHz frequency band	5 dB	5 dB	5 dB
Standing wave ratio VSWR maximum	2	2	2
Beam angle of antenna			
• in the 2.4 GHz frequency band			
- horizontal	360°	360°	360°
- vertical	-	-	-
• in the 5 GHz frequency band			
- horizontal	360°	360°	360°
- vertical	-	-	-
Opening angle Note	-	-	-
Number of electrical connections of antenna	1	1	1
Design of electrical connection of antenna	N connector	N connector	R-SMA connector
Angle of inclination downward maximum	0°	0°	0°
Crosstalk attenuation between the antenna connections	-	-	-
Front-to-back ratio	-	-	-
Transmit power maximum	-	-	-
Transmit power Note	-	-	-
Range with clear line of sight without disturbance	-	-	-
Range Note	-	-	-
Permitted ambient conditions			
Ambient temperature			
• during operating	-20 … +65 °C	-20 … +65 °C	-20 … +65 °C
• during storage	-20 … +65 °C	-20 … +65 °C	-20 … +65 °C
• during transport	-20 … +65 °C	-20 … +65 °C	-20 … +65 °C
• during installation	-	-	-
Protection class IP	IP65	IP65	IP30
Wind load maximum	-	-	-
Wind load Note	-	-	-

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Industrial Wireless Communication
IWLAN – Accessories

Technical specifications (continued)

Article No.	6GK5795-4MC00-0AA3	6GK5795-4MD00-0AA3	6GK5795-4MA00-0AA3
Product-type designation	Antenna ANT795-4MC	Antenna ANT795-4MD	Antenna ANT795-4MA
Design, dimensions and weight			
Width	35 mm	35 mm	35 mm
Height	160 mm	160 mm	160 mm
Depth	13 mm	13 mm	13 mm
Diameter	-	-	-
Net weight	26 g	26 g	26 g
Mounting type			
• mast mounting	No	No	No
• wall mounting	No	No	No
• roof mounting	No	No	No
Mounting type/ directly on the device	Yes	Yes	Yes
Product properties, functions, components general			
Product feature silicon-free	Yes	Yes	Yes
Material of outer shell	Polycarbonate	Polycarbonate	Polycarbonate
Standards, specifications, approvals			
Standard for hazardous zone	-	-	-
Verification of suitability	-	-	-
• RoHS conformity	-	-	-
• Railway application in accordance with EN 50124-1	-	-	-
• Railway application in accordance with EN 50155	-	-	-
• fire protection in accordance with EN 45545-2	-	-	-
• UL approval	-	-	-
- note	-	-	-
Wireless approval	Current national approvals can be found on the Internet under www.siemens.com/wireless-approvals	Current national approvals can be found on the Internet under www.siemens.com/wireless-approvals	Current national approvals can be found on the Internet under www.siemens.com/wireless-approvals

Article No.	6GK5792-6MN00-0AA6	6GK5793-6MN00-0AA6	6GK5795-6MN10-0AA6	6GK5795-6MT00-0AA0
Product-type designation	Antenna ANT792-6MN	Antenna ANT793-6MN	Antenna ANT795-6MN	Antenna ANT795-6MT
Wireless frequencies				
Radio frequency				
• for WLAN in 2.4 GHz frequency band	2.4 … 2.5 GHz	-	2.4 … 2.7 GHz	2.4 … 2.69 GHz
• for WLAN in 5 GHz frequency band 1	-	5.15 … 5.875 GHz	3.4 … 3.7 GHz	5.15 … 5.35 GHz
• for WLAN in 5 GHz frequency band 2	-	-	4.9 … 5.935 GHz	5.47 … 5.935 GHz
Electrical data				
Impedance	50 Ω	50 Ω	50 Ω	50 Ω
Polarization	linear vertical	linear vertical	linear vertical	3 ports: linear vertical
Radiation characteristic	omnidirectional	omnidirectional	omnidirectional	omnidirectional
Antenna gain compared to spherical radiator with linear radiation	-	-	-	-
Antenna gain compared to spherical radiator with circular radiation	-	-	-	-
Antenna gain compared to spherical radiator of the WLAN antenna in the 2.4 GHz frequency band	6 dB	-	6 dB	5 dB
Antenna gain compared to spherical radiator of the WLAN antenna in the 5 GHz frequency band	-	5 dB	8 dB	7 dB
Standing wave ratio VSWR maximum	1.8	1.5	1.8	1.5

■ **Technical specifications** (continued)

Article No.	6GK5792-6MN00-0AA6	6GK5793-6MN00-0AA6	6GK5795-6MN10-0AA6	6GK5795-6MT00-0AA0
Product-type designation	Antenna ANT792-6MN	Antenna ANT793-6MN	Antenna ANT795-6MN	Antenna ANT795-6MT
Beam angle of antenna				
• in the 2.4 GHz frequency band				
- horizontal	360°	-	360°	360°
- vertical	30°	-	-	-
• in the 5 GHz frequency band				
- horizontal	-	360°	150°	360°
- vertical	-	25°	-	-
Opening angle Note	-	-	Note the antenna diagram regarding horizontal beam angle	-
Number of electrical connections of antenna				
Design of electrical connection of antenna				
Angle of inclination downward maximum	0°	0°	0°	0°
Crosstalk attenuation between the antenna connections	-	-	-	20 dB
Front-to-back ratio	-	-	-	-
Transmit power maximum	25 W	6 W	75 W	10 W
Transmit power Note	-	at 25° ambient temperature	at 25° ambient temperature	at 25° ambient temperature
Range with clear line of sight without disturbance	200 m	200 m	200 m	-
Range Note	Note: The range can be considerably less, depending on spatial factors, the wireless standard used, the data rate, and the antennas at the other end	Note: The range can be considerably less, depending on spatial factors, the wireless standard used, the data rate, and the antennas at the other end	Note: The range can be considerably less, depending on spatial factors, the wireless standard used, the data rate, and the antennas at the other end	-
Permitted ambient conditions				
Ambient temperature				
• during operating	-40 … +80 °C	-45 … +70 °C	-40 … +80 °C	-40 … +85 °C
• during storage	-40 … +80 °C	-45 … +70 °C	-40 … +80 °C	-40 … +85 °C
• during transport	-40 … +80 °C	-45 … +70 °C	-40 … +80 °C	-40 … +85 °C
• during installation	-	-	-	-
Protection class IP	IP65	IP65	IP65	IP65
Wind load maximum	3 N	3.9 N	10 N	-
Wind load Note	at 160 km/h	at 160 km/h	at 160 km/h	-
Design, dimensions and weight				
Width	50 mm	16 mm	86 mm	282 mm
Height	40 mm	160 mm	43 mm	32 mm
Depth	370 mm	16 mm	86 mm	92 mm
Diameter	-	-	-	-
Net weight	300 g	300 g	300 g	320 g
Mounting type	-	-	-	-
• mast mounting	Yes	Yes	No	No
• wall mounting	Yes	Yes	Yes	Yes
• roof mounting	No	No	Yes	Yes
Mounting type/ directly on the device	No	No	No	No
Product properties, functions, components general				
Product feature silicon-free	Yes	Yes	Yes	Yes
Material of outer shell	Glass fiber	Polypropylene	Polycarbonate	Polycarbonate

Industrial Wireless Communication
IWLAN – Accessories

IWLAN antennas

Technical specifications (continued)

Article No.	6GK5792-6MN00-0AA6	6GK5793-6MN00-0AA6	6GK5795-6MN10-0AA6	6GK5795-6MT00-0AA0
Product-type designation	Antenna ANT792-6MN	Antenna ANT793-6MN	Antenna ANT795-6MN	Antenna ANT795-6MT
Standards, specifications, approvals				
Standard for hazardous zone	-	-	-	-
Verification of suitability	-	-	Railway application in accordance with NF-F-16-101, NF-F-16-102	-
• RoHS conformity	Yes	Yes	Yes	Yes
• Railway application in accordance with EN 50124-1	-	-	Yes	-
• Railway application in accordance with EN 50155	-	-	Yes	-
• fire protection in accordance with EN 45545-2	-	-	-	-
• UL approval	-	-	-	-
- note	-	-	-	-
Wireless approval	Current national approvals can be found on the Internet under www.siemens.com/ wireless-approvals	Current national approvals can be found on the Internet under www.siemens.com/ wireless-approvals	Current national approvals can be found on the Internet under www.siemens.com/ wireless-approvals	Current national approvals can be found on the Internet under www.siemens.com/ wireless-approvals

Article No.	6GK5795-6DC00-0AA0	6GK5793-6DG00-0AA0	6GK5793-6DT00-0AA0
Product-type designation	Antenna ANT795-6DC	Antenna ANT793-6DG	Antenna ANT793-6DT
Wireless frequencies			
Radio frequency			
• for WLAN in 2.4 GHz frequency band	2.4 … 2.5 GHz	-	-
• for WLAN in 5 GHz frequency band 1	5.15 … 5.875 GHz	5.15 … 5.875 GHz	5.15 … 5.875 GHz
• for WLAN in 5 GHz frequency band 2	-	-	-
Electrical data			
Impedance	50 Ω	50 Ω	50 Ω
Polarization	linear vertical	dual linear +/- 45° slant	3 ports: vertical, +/- 45° slant
Radiation characteristic	directional	directional	directional
Antenna gain compared to spherical radiator with linear radiation	-	-	-
Antenna gain compared to spherical radiator with circular radiation	-	-	-
Antenna gain compared to spherical radiator of the WLAN antenna in the 2.4 GHz frequency band	9 dB	-	-
Antenna gain compared to spherical radiator of the WLAN antenna in the 5 GHz frequency band	9 dB	9 dB	8 dB
Standing wave ratio VSWR maximum	2	2	1.7
Beam angle of antenna • in the 2.4 GHz frequency band	75 … 55°	-	-
Beam angle of antenna in the 5 GHz frequency band horizontal	55°	70°	65°
Beam angle of antenna in the 5 GHz frequency band vertical	55°	60°	65°
Opening angle Note	-	-	-
Number of electrical connections of antenna	1	2	3
Design of electrical connection of antenna	N connector	N connector	QMA connector
Angle of inclination downward max.	0°	0°	0°
Crosstalk attenuation between the antenna connections	25 dB	20 dB	17 dB
Front-to-back ratio	15 dB	20 dB	-
Transmit power maximum	10 W	10 W	2 W
Transmit power Note	at 25° ambient temperature	at 25° ambient temperature	at 25° ambient temperature
Range with clear line of sight without disturbance	-	-	-
Range Note	-	-	-

■ **Technical specifications** (continued)

Article No.	6GK5795-6DC00-0AA0	6GK5793-6DG00-0AA0	6GK5793-6DT00-0AA0
Product-type designation	**Antenna ANT795-6DC**	**Antenna ANT793-6DG**	**Antenna ANT793-6DT**
Permitted ambient conditions			
Ambient temperature			
• during operating	-40 … +80 °C	-40 … +80 °C	-40 … +85 °C
• during storage	-40 … +80 °C	-40 … +80 °C	-40 … +85 °C
• during transport	-40 … +80 °C	-40 … +80 °C	-40 … +85 °C
• during installation	-	-	-
Protection class IP	IP67	IP67	IP67
Wind load maximum	15 N	15 N	15 N
Wind load Note	at 160 km/h	frontal at 160 km/h	frontal at 160 km/h
Design, dimensions and weight			
Width	80 mm	80 mm	80 mm
Height	101 mm	101 mm	101 mm
Depth	35 mm	35 mm	35 mm
Diameter	-	-	-
Net weight	110 g	110 g	270 g
Mounting type	-	-	-
• mast mounting	Yes	Yes	Yes
• wall mounting	Yes	Yes	Yes
• roof mounting	No	No	No
Mounting type/ directly on the device	No	No	No
Product properties, functions, components general			
Product feature silicon-free	-	-	-
Material of outer shell	Lexan EXL 9330	Lexan EXL 9330	Lexan EXL 9330
Standards, specifications, approvals			
Standard for hazardous zone	-	-	-
Verification of suitability	-	-	-
• RoHS conformity	Yes	Yes	Yes
• Railway application in accordance with EN 50124-1	-	-	-
• Railway application in accordance with EN 50155	-	Yes	-
• fire protection in accordance with EN 45545-2	-	Yes	-
• UL approval	-	-	-
- note	-	-	UL94-V0, UL746C F1
Wireless approval	Current national approvals can be found on the Internet under www.siemens.com/wireless-approvals	Current national approvals can be found on the Internet under www.siemens.com/wireless-approvals	Current national approvals can be found on the Internet under www.siemens.com/wireless-approvals

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IWLAN antennas

■ **Technical specifications** (continued)

Article No.	6GK5792-8DN00-0AA6	6GK5793-8DJ00-0AA0	6GK5793-8DK00-0AA0	6GK5793-8DP00-0AA0
Product-type designation	Antenna ANT792-8DN	Antenna ANT793-6DJ	Antenna ANT793-6DK	Antenna ANT793-8DP
Wireless frequencies				
Radio frequency				
• for WLAN in 2.4 GHz frequency band	2.4 … 2.7 GHz	-	-	-
• for WLAN in 5 GHz frequency band 1	-	5.25 … 5.875 GHz	5.15 … 5.875 GHz	4.9 … 5.35 GHz
• for WLAN in 5 GHz frequency band 2	-	-	-	-
Electrical data				
Impedance	50 Ω	50 Ω	50 Ω	50 Ω
Polarization	linear vertical	dual linear vertical-horizontal	dual linear vertical-horizontal	linear vertical
Radiation characteristic	directional	directional	directional	directional
Antenna gain compared to spherical radiator with linear radiation	-	-	-	-
Antenna gain compared to spherical radiator with circular radiation	-	-	-	-
Antenna gain compared to spherical radiator of the WLAN antenna in the 2.4 GHz frequency band	14 dB	-	-	-
Antenna gain compared to spherical radiator of the WLAN antenna in the 5 GHz frequency band	-	18 dB	23 dB	13.5 dB
Standing wave ratio VSWR maximum	1.5	1.7	1.7	1.5
Beam angle of antenna				
• in the 2.4 GHz frequency band				
- horizontal	35°	-	-	-
- vertical	30°	-	-	-
• in the 5 GHz frequency band				
- horizontal	-	17°	9°	40°
- vertical	-	17°	9°	35°
Opening angle Note	-	-	-	-
Number of electrical connections of antenna	1	2	2	1
Design of electrical connection of antenna	N connector	N connector	N connector	N connector
Angle of inclination downward maximum	0°	0°	0°	0°
Crosstalk attenuation between the antenna connections	-	30 dB	40 dB	-
Front-to-back ratio	20 dB	30 dB	35 dB	20 dB
Transmit power				
• maximum	75 W	6 W	6 W	10 W
• Note	at 25° ambient temperature	at 25° ambient temperature	at 25° ambient temperature	at 25° ambient temperature
Range with clear line of sight without disturbance	1 000 m	-	-	-
Range Note	Note: The range can be considerably less, depending on spatial factors, the wireless standard used, the data rate, and the antennas at the other end	-	-	-
Permitted ambient conditions				
Ambient temperature				
• during operating	-40 … +80 °C	-45 … +70 °C	-45 … +70 °C	-40 … +80 °C
• during storage	-40 … +80 °C	-45 … +70 °C	-45 … +70 °C	-40 … +80 °C
• during transport	-40 … +80 °C	-45 … +70 °C	-45 … +70 °C	-40 … +80 °C
• during installation	-	-	-	-
Protection class IP	IP23	IP67	IP67	IP67
Wind load maximum	57 N	104 N	389 N	15 N
Wind load Note	at 160 km/h	frontal at 220 km/h	frontal at 220 km/h	frontal at 160 km/h

■ Technical specifications (continued)

Article No.	6GK5792-8DN00-0AA6	6GK5793-8DJ00-0AA0	6GK5793-8DK00-0AA0	6GK5793-8DP00-0AA0
Product-type designation	Antenna ANT792-8DN	Antenna ANT793-6DJ	Antenna ANT793-6DK	Antenna ANT793-8DP
Design, dimensions and weight				
Width	200 mm	190 mm	371 mm	80 mm
Height	200 mm	190 mm	371 mm	101 mm
Depth	43 mm	30.5 mm	40 mm	35 mm
Diameter	-	-	-	-
Net weight	500 g	700 g	2.5 kg	110 g
Mounting type	-	-	-	-
• mast mounting	Yes	Yes	Yes	Yes
• wall mounting	Yes	Yes	Yes	Yes
• roof mounting	No	No	No	No
Mounting type/ directly on the device	No	No	No	No
Product properties, functions, components general				
Product feature silicon-free	Yes	-	-	-
Material of outer shell	ASA	Polycarbonate / aluminum	Polycarbonate	Lexan EXL 9330
Standards, specifications, approvals				
Standard for hazardous zone	-	-	-	-
Verification of suitability	-	-	-	-
• RoHS conformity	Yes	Yes	Yes	Yes
• Railway application in accordance with EN 50124-1	-	-	-	-
• Railway application • in accordance with EN 50155	-	-	-	-
• fire protection • in accordance with EN 45545-2	-	-	-	-
• UL approval	-	-	-	-
- note	-	-	-	UL94-V0
Wireless approval	Current national approvals can be found on the Internet under www.siemens.com/wireless-approvals	Current national approvals can be found on the Internet under www.siemens.com/wireless-approvals	Current national approvals can be found on the Internet under www.siemens.com/wireless-approvals	Current national approvals can be found on the Internet under www.siemens.com/wireless-approvals

Article No.	6GK5792-4DN00-0AA6	6GK5793-4MN00-0AA6
Product-type designation	RCoax antenna ANT792-4DN	RCoax antenna ANT793-4MN
Wireless frequencies		
Radio frequency		
• for WLAN in 2.4 GHz frequency band	2.4 … 2.4835 GHz	-
• for WLAN in 5 GHz frequency band 1	-	5.15 … 5.85 GHz
• for WLAN • in 5 GHz frequency band 2	-	-
Electrical data		
Impedance	50 Ω	50 Ω
Polarization	circular, clockwise	vertical (lambda 5/8 characteristic)
Radiation characteristic	directional	omnidirectional
Antenna gain compared to spherical radiator with linear radiation	-	-
Antenna gain compared to spherical radiator with circular radiation	-	-
Antenna gain compared to spherical radiator of the WLAN antenna in the 2.4 GHz frequency band	4 dB	-
Antenna gain compared to spherical radiator of the WLAN antenna in the 5 GHz frequency band	-	6 dB
Standing wave ratio VSWR maximum	1.8	2

Industrial Wireless Communication
IWLAN – Accessories

IWLAN antennas

◼ **Technical specifications** (continued)

Article No.	6GK5792-4DN00-0AA6	6GK5793-4MN00-0AA6
Product-type designation	RCoax antenna ANT792-4DN	RCoax antenna ANT793-4MN
Beam angle of antenna		
• in the 2.4 GHz frequency band		
- horizontal	90°	-
- vertical	-	-
• in the 5 GHz frequency band		
- horizontal	-	360°
- vertical	-	40°
Opening angle Note	-	-
Number of electrical connections of antenna	1	1
Design of electrical connection of antenna	N connector	N connector
Angle of inclination downward maximum	0°	0°
Crosstalk attenuation between the antenna connections	-	-
Front-to-back ratio	2.5 dB	-
Transmit power maximum	1 W	1 W
Transmit power Note	-	-
Range with clear line of sight without disturbance	-	-
Range Note	-	-
Permitted ambient conditions		
Ambient temperature		
• during operating	-40 … +70 °C	-40 … +70 °C
• during storage	-40 … +70 °C	-40 … +70 °C
• during transport	-40 … +70 °C	-40 … +70 °C
• during installation	-	-
Protection class IP	IP65	IP65
Wind load maximum	-	-
Wind load Note	-	-
Design, dimensions and weight		
Width	-	-
Height	78.7 mm	78.7 mm
Depth	-	-
Diameter	30 mm	30 mm
Net weight	114 g	65 g
Product properties, functions, components general		
Product feature silicon-free	Yes	Yes
Material of outer shell	Polycarbonate	Polycarbonate
Standards, specifications, approvals		
Standard for hazardous zone	-	-
Verification of suitability	-	-
• RoHS conformity	-	-
• Railway application in accordance with EN 50124-1	-	-
• Railway application in accordance with EN 50155	-	Yes
• fire protection in accordance with EN 45545-2	-	Yes
• UL approval	-	-
- note	-	UL94-V1
Wireless approval	Current national approvals can be found on the Internet under www.siemens.com/wireless-approvals	Current national approvals can be found on the Internet under www.siemens.com/wireless-approvals

Ordering data

	Article No.		Article No.

Antennas with omnidirectional characteristics;

National approvals,
compact instructions on paper,
German/English

For mounting directly onto
SCALANCE W

Antenna gain incl. connector 3/5 dBi,
2.4/5 GHz;

- **ANT795-4MC antenna;** — 6GK5795-4MC00-0AA3
  IP65 (-20 to +65 °C),
  straight connection,
  N-Connect male,
  scope of delivery: 1 antenna

- **ANT795-4MD antenna;** — 6GK5795-4MD00-0AA3
  IP65 (-20 to +65 °C),
  connection with fixed 90° angle,
  N-Connect male,
  scope of delivery: 1 antenna

- **ANT795-4MA antenna;** — 6GK5 795-4MA00-0AA3
  IP30 (-20 to +65 °C);
  radial rotation possible
- with additional joint; R-SMA male
  Scope of delivery: 1 antenna

Wall or mast mounting

- **ANT792-6MN antenna** — 6GK5792-6MN00-0AA6
  Antenna gain incl. N-Connect
  connector 6 dBi, 2.4 GHz;
  IP65 (-40 to +80°C),
  with terminating resistor
  1 x TI795-1R;
  incl. mounting hardware

- **ANT793-6MN antenna** — 6GK5793-6MN00-0AA6
  Antenna gain incl. N-Connect
  connector 5 dBi,
  5 GHz; IP65 (-45 to +70 °C),
  with terminating resistor
  1 x TI795-1R;
- incl. mounting hardware

For mounting on a roof

- **ANT795-6MN antenna** — 6GK5795-6MN10-0AA6
  Antenna gain incl. N-Connect
  connector 6/8 dBi, 2.4/5 GHz;
  IP65 (-40 to +80 °C),
  with terminating resistor
  1 x TI795-1R

- **ANT795-6MT antenna** — 6GK5795-6MT00-0AA0
  MIMO antenna with 3 QMA sockets,
  antenna gain 6 dBi, 2.4/5 GHz;
  (-40 to +85 °C),
  incl. mounting bracket

- **Antenna mounting tool** — 6GK5795-6MN01-0AA6
  (ANT795-6MN)
  Mounting aid for installing ANT795-
  6MN below a roof

Directional antennas;

including mounting hardware
for wall or mast mounting

Sector antennas

- **ANT795-6DC antenna** — 6GK5795-6DC00-0AA0
  Antenna gain
  incl. N-Connect connector 9/9 dBi,
  2.4/5 GHz, -40 to +80 °C

- **ANT793-6DG antenna** — 6GK5793-6DG00-0AA0
  Dual-slant; antenna gain
- incl. two N-Connect connectors
  9 dBi, 5 GHz, -40 to +80 °C

- **ANT793-6DT antenna** — 6GK5793-6DT00-0AA0
  MIMO antenna with 3 QMA sockets;
  antenna gain 9 dBi, 5 GHz,
  -40 to +85 °C

Strongly directional antennas

- **ANT793-8DN antenna** — 6GK5793-8DP00-0AA0
  Antenna gain 13.5 dBi
  incl. N-Connect connector, 4.9 GHz,
  -40 to +85 °C, preferably for use in
  Japan

- **ANT792-8DN antenna** — 6GK5792-8DN00-0AA6
  Antenna gain incl. N-Connect
  connector 14 dBi, 2.4 GHz;
  -40 to +80 °C;
  with terminating resistor
  1 x TI795-1R

- **ANT793-8DJ antenna** — 6GK5793-8DJ00-0AA0
  Vertically-horizontally polarized
  antenna;
  antenna gain incl. two N-Connect
  connectors 18 dBi, 5 GHz;
  -45 to +70 °C

- **ANT793-8DK antenna** — 6GK5793-8DK00-0AA0
  Vertically-horizontally polarized
  antenna;
  antenna gain incl. two N-Connect
  connectors 23 dBi, 5 GHz;
  -45 to +70 °C

Antennas for RCoax systems

- **ANT792-4DN antenna** — 6GK5792-4DN00-0AA6
  Circularly polarized RCoax helix
  antenna for RCoax systems;
  N-Connect female connection;
  antenna gain at 2.4 GHz 4 dBi

- **ANT793-4MN antenna** — 6GK5793-4MN00-0AA6
  Vertically polarized RCoax 5/8
  antenna for RCoax systems;
  N-Connect female connection;
  antenna gain at 5.2 GHz/5.7 GHz
  6/5 dBi

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More information

Selection tools:

To assist in the selection of industrial Ethernet components,
the TIA Selection Tool is available at:
http://www.siemens.com/tia-selection-tool

Cabling range:

You can order components supplementary to the SIMATIC NET
cabling range from your local contact. Technical advice on this
subject is available from:

J. Hertlein
I IA SC CI PRM 4
Phone +49 (911) 750-4465
E-mail: juergen.hertlein@siemens.com

Industrial Wireless Communication
IWLAN – Accessories

IWLAN RCoax cables

■ Overview

The RCoax cables are radiating cables that function as special antennas for the SCALANCE W Access Points in environments with complex radio coverage. Its design means that a defined, cone-shaped radio field is generated along the RCoax cable. The radiating cables are therefore perfectly suitable for use in all types of applications with track-bound vehicles.

• Rugged coaxial cable which can be easily installed
• Two cables for use in the frequency bands 2.4 GHz and 5 GHz
• Connection as external antenna to SCALANCE W700 Access Points
• Connection of mobile nodes via SCALANCE W700 Client Modules using an antenna aligned to the RCoax
• Suitable for use in hazardous areas (Zone 2); no special approvals necessary

■ Benefits

get   Designed for Industry

• Reliable coverage in areas problematic for radio
• Avoidance of greater than desired WLAN expansion by means of defined emission of the radio waves
• Cost savings thanks to direct substitution of sliding contacts, trailing cables, and data light barriers
• Highly flexible laying

■ Design

The RCoax cables were specially designed for the frequency band around 2.4 GHz or 5 GHz respectively.
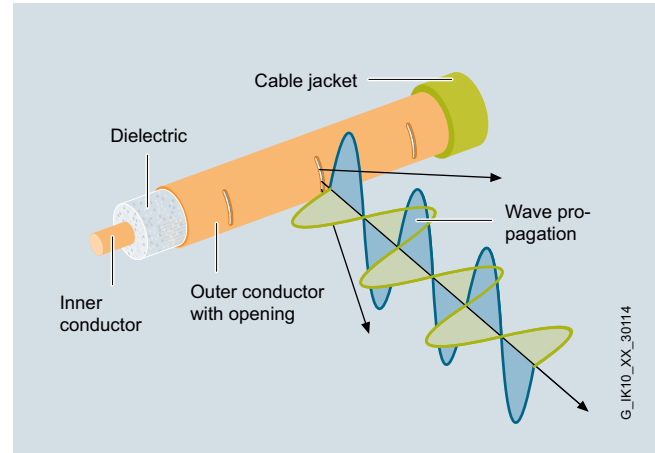
Openings are present in the outer conductor of the coaxial cable which permit the penetration and emission of radio waves. A defined radio field is then developed around the RCoax cables. Longitudinal damping and extraction loss are in a balanced relationship, which permits a long segment length of RCoax cable per SCALANCE W700 Access Point and an appropriate distance from the mobile station (SCALANCE W700) to the RCoax cable.

Coordinated accessories are available for assembly:
• IWLAN RCoax cable clip 1/2"
• IWLAN RCoax spacer 85 mm
• IWLAN RCoax threaded washer M6

■ Application

- Areas with demanding conditions for wireless coverage (e.g. in tunnels, channels and elevator shafts) where "unlimited" mobility is not of decisive importance, but where a mechanically wear-free and thus maintenance-free solution is required to ensure reliable data transmission: this is made possible by the defined radio field along the RCoax cable.
- The RCoax cables offer a wear-free and reliable wireless link, particularly for conveyor systems and all types of rail-mounted vehicle (suspended monorails, AGV systems).

- Suspended monorail
- Automated guided vehicle systems (AGVS)
- Cranes
- Stacker cranes
- Transfer lines
- Tool-changing trolleys
- Tunnels
- Lifts

Application examples
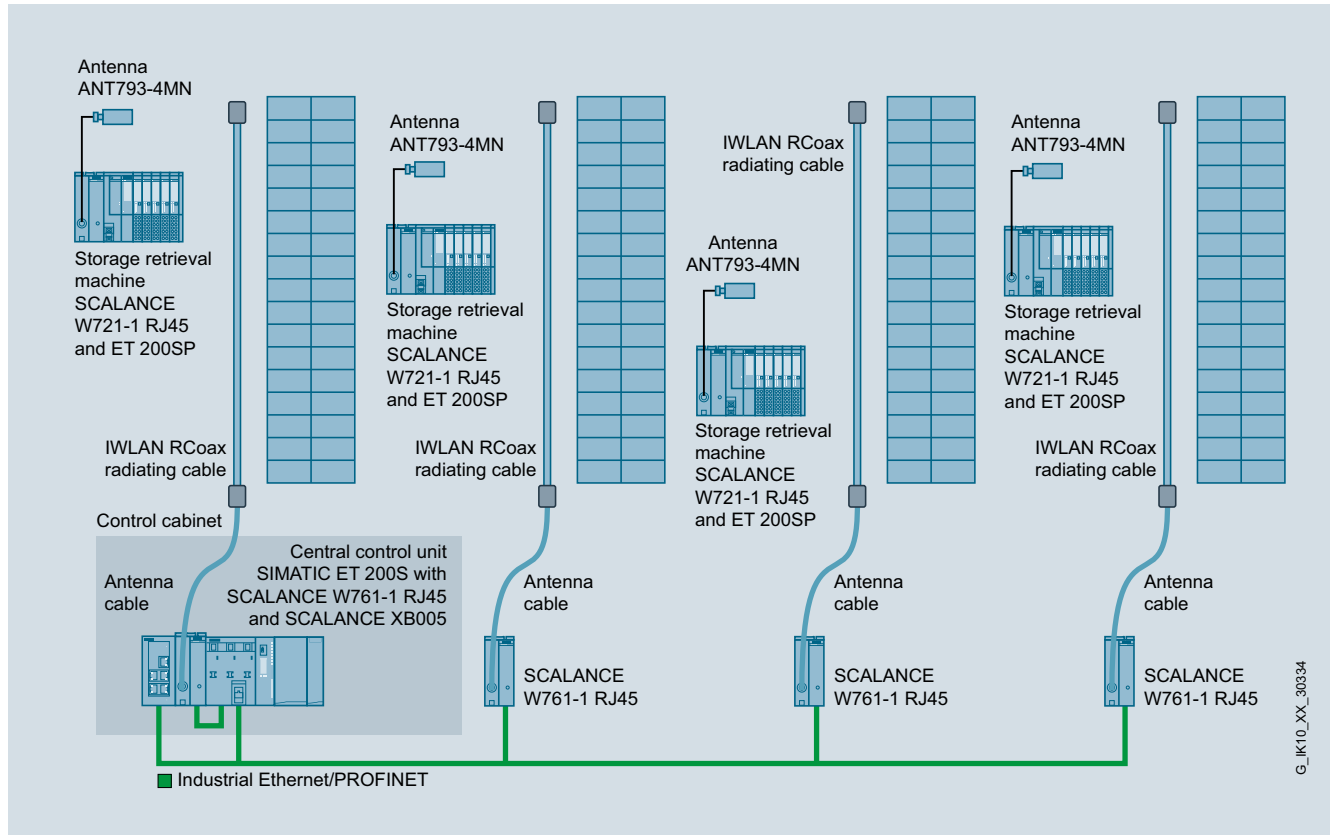
Storage and retrieval systems in high-bay warehouses automated with SCALANCE W721-1 RJ45, W761-1 RJ45 and RCoax

Industrial Wireless Communication

IWLAN – Accessories

IWLAN RCoax cables

Integration

IWLAN RCoax N-Connect
Female N-Connector
6GK5 798-0CN00-0AA0

IWLAN RCoax Cable
2,4 GHz = 6XV1 875-2A
5 GHz = 6XV1 875-2D

IWLAN RCoax N-Connect
Female N-Connector
6GK5 798-0CN00-0AA0

IWLAN RCoax N-Connect
Male Termination Impedance 50 Ohm
6GK5 795-1TN00-1AA0

SIMATIC NET IWLAN RCOAX CABLE

Access Point SCALANCE W788-1 M12

Client Module SCALANCE W722-1 RJ45

IWLAN RCoax N-Connect
Male/Male Flexible Connection Cable
1 m = 6XV1875-5AH10
5 m = 6XV1875-5AH50

IWLAN Antenna
ANT792-4DN / ANT793-4MN
2 GHz = 6GK5 792-4DN00-0AA6
5 GHz = 6GK5 793-4MN00-0AA6

IWLAN
Termination impedance TI795-1N
6GK5795-1TN00-1AA0

IWLAN RCoax N-Connect/R-SMA
Male/Male Flexible Connection Cable
1 m = 6XV1875-5CH10
5 m = 6XV1875-5CH50

G_IK10_XX_30344

Connection example for an IWLAN RCoax system with connection to Industrial Ethernet

Technical specifications

Article No.	6XV1875-2A	6XV1875-2D
Product-type designation	**IWLAN RCoax Cable 2 GHz**	**IWLAN RCoax Cable 5 GHz**
Suitability for installation	Suspended monorails, cranes, stacker cranes, or similar	Suspended monorails, cranes, stacker cranes, or similar
Wireless frequencies		
Radio frequency		
• for WLAN in 2.4 GHz frequency band	2.4 … 2.485 GHz	-
• for WLAN in 5 GHz frequency band 1	-	5.15 … 5.85 GHz
• for WLAN in 5 GHz frequency band 2	-	-
Electrical data		
Impedance	50 Ω	50 Ω
Damping ratio per length		
• at 2.4 GHz		
- with cable mounted 10 mm above concrete at 20 °C	0.15 dB/m	-
- with cable mounted 15 mm above the aluminum rail at 20 °C	0.17 dB/m	-
• at 5.15 GHz		
- with cable mounted 10 mm above concrete at 20 °C	-	0.23 dB/m
- with cable mounted 15 mm above the aluminum rail at 20 °C	-	0.24 dB/m
• at 5.85 GHz		
- with cable mounted 10 mm above concrete at 20 °C	-	0.24 dB/m
- with cable mounted 15 mm above the aluminum rail at 20 °C	-	0.27 dB/m
Damping ratio per length note	-	-
Coupling attenuation		
• at 2.4 GHz at 20 °C	35 dB	-
• at 5.15 GHz at 20 °C	-	42 dB
• at 5.85 GHz at 20 °C	-	40 dB
• note	c(50) for distance of 10 cm between antenna and cable	c(50) for distance of 10 cm between antenna and cable
Capacitance per length	76 pF/m	76 pF/m
DC resistance per length		
• of inner conductor at 20 °C	1.48 Ω/km	1.48 Ω/km
• of coaxial outer conductor at 20 °C	2.8 Ω/km	2.8 Ω/km
Relative speed	88 %	88 %
Mechanical data		
Outer diameter		
• of the inner conductor	4.8 mm	4.8 mm
• of dielectric	12.4 mm	12.4 mm
• of the cable sheath	15.5 mm	15.5 mm
Thickness of the cable sheath	1.3 mm	1.3 mm
Material		
• of the cable sheath	Halogen-free polyolefine AM3	Halogen-free polyolefine AM3
• of inner conductor	Copper clad aluminum	Copper clad aluminum
• of dielectric	Polyethylene foam	Polyethylene foam
• of coaxial outer conductor	Overlapping copper foil with the slot groups bonded to cable jacket	Overlapping copper foil with the slot groups bonded to cable jacket
Color of the cable sheath	pastel turquoise	pastel turquoise
Bending radius		
• with single bend minimum permissible	200 mm	200 mm
• with multiple bends minimum permissible	-	-
Number of bending cycles	1	1
• Note	-	-
Traction stress maximum	1 100 N	1 100 N
Weight per length	0.232 kg/m	0.232 kg/m
Mounting distance recommended	0.5 m	0.5 m

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IWLAN RCoax cables

■ Technical specifications (continued)

Article No.	6XV1875-2A	6XV1875-2D
Product-type designation	IWLAN RCoax Cable 2 GHz	IWLAN RCoax Cable 5 GHz
Permitted ambient conditions		
Ambient temperature		
• during operating	-40 … +85 °C	-40 … +85 °C
• during storage	-70 … +85 °C	-70 … +85 °C
• during installation	-25 … +60 °C	-25 … +60 °C
Protection class IP	-	-
Product properties, functions, components general		
Product feature silicon-free	-	-
Standards, specifications, approvals		
Verification of suitability		
• RoHS conformity	-	-
• UL approval	Yes	Yes
- note	-	-
Wireless approval	Current national approvals can be found on the Internet under www.siemens.com/wireless-approvals	Current national approvals can be found on the Internet under www.siemens.com/wireless-approvals
Standard		
• for behavior in fire: corrosive gas emission	IEC 60754-2	IEC 60754-2
• for behavior in fire: smoke emission	IEC 60332-1 and IEC 60332-3 Cat. C	IEC 60332-1 and IEC 60332-3 Cat. C
• for behavior in fire: flame resistance	IEC 61034	IEC 61034

■ Ordering data

	Article No.		Article No.
IWLAN RCoax cables Radiating cable for complex radio environments as special antenna for SCALANCE W Access Points; for extended temperature range (-40 °C to + 85 °C); <u>sold by the meter</u> minimum order quantity 20 m • 2.4 GHz • 5 GHz	 **6XV1875-2A** **6XV1875-2D**	**RCoax N-Connect male/male Coupler** RF coupling for connecting an RCoax antenna to an RCoax cable; two N-Connect male connectors	**6GK5798-0CP00-1AA0**
Accessories		**IWLAN RCoax cable clip 1/2"** Cable holder for RCoax cable • 10 items • 100 items	 **6GK5798-8MB00-0AC1** **6GK5798-8MB00-0AM1**
IWLAN RCoax N-Connect stripping tool Stripping tool for fast stripping of RCoax cable on site	**6GK1901-1PH00**		
RCoax N-Connect female N-connector Plug connector for assembly on site; connection unit of RCoax cable for connection of further components, N-female connection.	**6GK5798-0CN00-0AA0**	**IWLAN RCoax threaded washer M6** Threaded washer M6 for RCoax cable clip 1/2", for assembly with M6 threaded bolts • 10 items • 100 items	 **6GK5798-8MC00-0AC1** **6GK5798-8MC00-0AM1**
		IWLAN RCoax spacer 85 mm Spacer 85 mm for RCoax cable clip 1/2" • 10 items • 100 items	 **6GK5798-8MD00-0AC1** **6GK5798-8MD00-0AM1**

■ More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at:
http://www.siemens.com/tia-selection-tool

Wireless approvals:

Current approvals can be found on the Internet at:
http://www.siemens.com/wireless-approvals

Overview
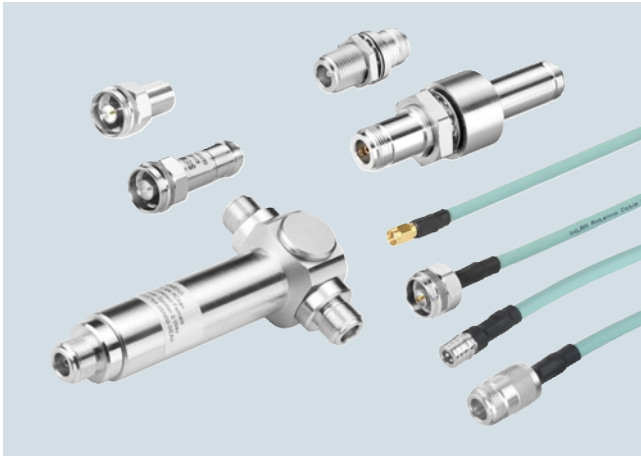
A comprehensive, coordinated range of coaxial accessories is offered for flexible combination and installation of the individual IWLAN components indoors and outdoors.

This range encompasses connecting cables as well as diverse connectors, lightning protection elements, a power splitter and an attenuator.

Benefits

get Designed for Industry

- Flexible use thanks to extensive, coordinated range
- Operation also outdoors with extended temperature range and protection against water and dust thanks to degree of protection IP65
- Components are suitable for use with SCALANCE W700 including national approvals

Application

RCoax/antenna connecting cables

- The flexible IWLAN RCoax/antenna connecting cables are required for connecting RCoax segments or antennas with active devices.
- The cables offer low attenuation so that the quality of the radio signal is only reduced to a minimal extent.
- All antenna cables are flame-resistant, chemical-resistant and silicone-free.

Terminating resistors

- Terminating resistors are required for wireless termination of unused antenna connections at the access points and clients.
- RCoax segments must be terminated at the end with a terminating resistor.

Lightning protection elements

- When separate antennas are used outdoors, there is a risk of lightning strikes.
- A lightning protector can be used to prevent damage.

Cabinet feedthroughs

Together with the antenna connecting cables, the cabinet feedthroughs enable simple connection of remote antennas to the active components located in the control cabinet/box.

Attenuator

The 10 dB attenuator is always used when the transmitted power has to be reduced both in the send and receive directions. Typical application areas include short RCoax segments or directional wireless links, which are to be limited in extent.

Power splitter

- With the help of the power splitter, the transmission power of an access point is divided between two RCoax or antenna segments.
- This enables wireless coverage in two areas using just one access point.

Product versions

RCoax/antenna connecting cables

- Pre-assembled cable lengths (0.3 m to 10 m)
- Different connector types and combinations (N-Connect, R-SMA, SMA, QMA)

Terminating resistors

- TI795-1R: Terminating resistor 50 ohms for R-SMA antenna sockets
- TI795-1N: Terminating resistor 50 ohms for N-Connect antenna sockets or RCoax segments

Lightning protection elements

- LP798-2N: Maintenance-free lightning protection element for N-Connect connections
  - Quarter-wave system (lambda-quarter) for the frequency range 2 to 6 GHz
  - Represents a short-circuit for DC voltages so that all types of overvoltage can be reliably diverted
  - Not suitable for DC infeed via the antenna cable
- LP798-1N: Lightning protection element for N-Connect connections
  - With gas discharge arrester for the frequency range 0 to 6 GHz for N-Connect connections
  - Suitable for DC infeed via the antenna cable

Cabinet feedthroughs

- N-Connect female/SMA female with fastening flange for panel thicknesses up to 5.5 mm
- N-Connect female/N-Connect female without flange for panel thicknesses up to 4.5 mm
  - Can also be used to connect two antenna connecting cables

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IWLAN cabling technology

Technical specifications

Article No.	6XV1875-5AH10	6XV1875-5AH20	6XV1875-5AH50	6XV1875-5AN10
Product-type designation	IWLAN RCoax/Antenna Connection Cable N-Connect Male/ Male	IWLAN RCoax/Antenna Connection Cable N-Connect Male/ Male	IWLAN RCoax/Antenna Connection Cable N-Connect Male/ Male	IWLAN RCoax/Antenna Connection Cable N-Connect Male/ Male
Acceptability for application	Flexible connecting cable for connecting an antenna or RCoax cable to an access point/client	Flexible connecting cable for connecting an antenna or RCoax cable to an access point/client	Flexible connecting cable for connecting an antenna or RCoax cable to an access point/client	Flexible connecting cable for connecting an antenna or RCoax cable to an access point/client
Cable length	1 m	2 m	5 m	10 m
Electrical data				
Number of electrical connections	2	2	2	2
Design of the electrical connection	N-Connect/N-Connect male/male	N-Connect/N-Connect male/male	N-Connect/N-Connect male/male	N-Connect/N-Connect male/male
Transmission frequency	0 … 6 GHz	0 … 6 GHz	0 … 6 GHz	0 … 6 GHz
Attenuation per length				
• at 2.4 GHz typical	0.53 dB/m	0.53 dB/m	0.53 dB/m	0.53 dB/m
• at 5.2 GHz typical	0.83 dB/m	0.83 dB/m	0.83 dB/m	0.83 dB/m
• at 5.85 GHz typical	0.89 dB/m	0.89 dB/m	0.89 dB/m	0.89 dB/m
Return loss minimum	23 dB	23 dB	23 dB	23 dB
Impedance Nominal value	50 Ω	50 Ω	50 Ω	50 Ω
Capacity per length at 1 kHz	82 pF/m	82 pF/m	82 pF/m	82 pF/m
Relative speed	82 %	82 %	82 %	82 %
Mechanical data				
Design of shield	Braided shield made of tin-plated copper wires	Braided shield made of tin-plated copper wires	Braided shield made of tin-plated copper wires	Braided shield made of tin-plated copper wires
Outer diameter				
• of the inner conductor	1.4 mm	1.4 mm	1.4 mm	1.4 mm
• of dielectric	3.8 mm	3.8 mm	3.8 mm	3.8 mm
• of the cable sheath	6.3 mm	6.3 mm	6.3 mm	6.3 mm
Symmetrical tolerance of outer diameter of cable sheath	0.2 mm	0.2 mm	0.2 mm	0.2 mm
Thickness of the cable sheath	0.76 mm	0.76 mm	0.76 mm	0.76 mm
Material				
• of inner conductor	Cu	Cu	Cu	Cu
• of dielectric	polyethylene foam	polyethylene foam	polyethylene foam	polyethylene foam
• of the cable sheath	FRNC	FRNC	FRNC	FRNC
Color of the cable sheath	Pastel turquoise	Pastel turquoise	Pastel turquoise	Pastel turquoise
Bending radius				
• with single bend minimum permissible	32 mm	32 mm	32 mm	32 mm
• with multiple bends minimum permissible	45 mm	45 mm	45 mm	45 mm
Traction stress maximum	80 N	80 N	80 N	80 N
Weight per length	75 kg/km	75 kg/km	75 kg/km	75 kg/km
Permitted ambient conditions				
Ambient temperature				
• during operating	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C
• during storage	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C
• during transport	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C
• during installation	-25 … +80 °C	-25 … +80 °C	-25 … +80 °C	-25 … +80 °C
Protection class IP	IP68	IP68	IP68	IP68
Protection class IP note	when plugged in	when plugged in	when plugged in	when plugged in
Burning behaviour	UL 1685 (Vertical tray) and UL 1581, Sec. 1090 (H)	UL 1685 (Vertical tray) and UL 1581, Sec. 1090 (H)	UL 1685 (Vertical tray) and UL 1581, Sec. 1090 (H)	UL 1685 (Vertical tray) and UL 1581, Sec. 1090 (H)
Chemical resistance to mineral oil	Conditional resistance	Conditional resistance	Conditional resistance	Conditional resistance
Radiological resistance to UV radiation	Resistant	Resistant	Resistant	Resistant

▪ Technical specifications (continued)

Article No.	6XV1875-5AH10	6XV1875-5AH20	6XV1875-5AH50	6XV1875-5AN10
Product-type designation	IWLAN RCoax/Antenna Connection Cable N-Connect Male/ Male	IWLAN RCoax/Antenna Connection Cable N-Connect Male/ Male	IWLAN RCoax/Antenna Connection Cable N-Connect Male/ Male	IWLAN RCoax/Antenna Connection Cable N-Connect Male/ Male
Product properties, functions, components general				
Product feature				
• halogen-free	Yes	Yes	Yes	Yes
• silicon-free	Yes	Yes	Yes	Yes
Standards, specifications, approvals				
Verification of suitability				
• UL-registration	-	-	-	-
• RoHS conformity	Yes	Yes	Yes	Yes

Article No.	6XV1875-5CE30	6XV1875-5CH10	6XV1875-5CH20	6XV1875-5CH50	6XV1875-5CN10
Product-type designation	IWLAN RCoax/ Antenna Connection Cable N-Connect RSMA Male/Male	IWLAN RCoax/ Antenna Connection Cable N-Connect/ RSMA Male/ Male	IWLAN RCoax/ Antenna Connection Cable N-Connect/ RSMA Male/ Male	IWLAN RCoax/ Antenna Connection Cable N-Connect/ RSMA Male/ Male	IWLAN RCoax/ Antenna Connection Cable N-Connect/ RSMA Male/ Male
Acceptability for application	Flexible connecting cable for connecting an antenna or RCoax cable to an access point/client	Flexible connecting cable for connecting an antenna or RCoax cable to an access point/client	Flexible connecting cable for connecting an antenna or RCoax cable to an access point/client	Flexible connecting cable for connecting an antenna or RCoax cable to an access point/client	Flexible connecting cable for connecting an antenna or RCoax cable to an access point/client
Cable length	0.3 m	1 m	2 m	5 m	10 m
Electrical data					
Number of electrical connections	2	2	2	2	2
Design of the electrical connection	N-Connect/RSMA male/male	N-Connect/RSMA male/male	N-Connect/RSMA male/male	N-Connect/RSMA male/male	N-Connect/RSMA male/male
Transmission frequency	0 … 6 GHz	0 … 6 GHz	0 … 6GHz	0 … 6 GHz	0 … 6 GHz
Attenuation per length					
• at 2.4 GHz typical	0.53 dB/m	0.53 dB/m	0.53 dB/m	0.53 dB/m	0.53 dB/m
• at 5.2 GHz typical	0.83 dB/m	0.83 dB/m	0.83 dB/m	0.83 dB/m	0.83 dB/m
• at 5.85 GHz typical	0.89 dB/m	0.89 dB/m	0.89 dB/m	0.89 dB/m	0.89 dB/m
Return loss minimum	23 dB	23 dB	23 dB	23 dB	23 dB
Impedance Nominal value	50 Ω	50 Ω	50 Ω	50 Ω	50 Ω
Capacity per length at 1 kHz	82 pF/m	82 pF/m	82 pF/m	82 pF/m	82 pF/m
Relative speed	82 %	82 %	82 %	82 %	82 %
Mechanical data					
Design of shield	Braided shield made of tin-plated copper wires	Braided shield made of tin-plated copper wires	Braided shield made of tin-plated copper wires	Braided shield made of tin-plated copper wires	Braided shield made of tin-plated copper wires
Outer diameter					
• of the inner conductor	1.4 mm	1.4 mm	1.4 mm	1.4 mm	1.4 mm
• of dielectric	3.8 mm	3.8 mm	3.8 mm	3.8 mm	3.8 mm
• of the cable sheath	6.3 mm	6.3 mm	6.3 mm	6.3 mm	6.3 mm
Symmetrical tolerance of outer diameter of cable sheath	0.2 mm	0.2 mm	0.2 mm	0.2 mm	0.2 mm
Thickness of the cable sheath	0.76 mm	0.76 mm	0.76 mm	0.76 mm	0.76 mm
Material					
• of inner conductor	Cu	Cu	Cu	Cu	Cu
• of dielectric	polyethylene foam	polyethylene foam	polyethylene foam	polyethylene foam	polyethylene foam
• of the cable sheath	FRNC	FRNC	FRNC	FRNC	FRNC
Color of the cable sheath	Pastel turquoise	Pastel turquoise	Pastel turquoise	Pastel turquoise	Pastel turquoise

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IWLAN cabling technology

■ Technical specifications (continued)

Article No.	6XV1875-5CE30	6XV1875-5CH10	6XV1875-5CH20	6XV1875-5CH50	6XV1875-5CN10
Product-type designation	IWLAN RCoax/ Antenna Connection Cable N-Connect RSMA Male/Male	IWLAN RCoax/ Antenna Connection Cable N-Connect/ RSMA Male/ Male	IWLAN RCoax/ Antenna Connection Cable N-Connect/ RSMA Male/ Male	IWLAN RCoax/ Antenna Connection Cable N-Connect/ RSMA Male/ Male	IWLAN RCoax/ Antenna Connection Cable N-Connect/ RSMA Male/ Male
Bending radius					
• with single bend minimum permissible	32 mm	32 mm	32 mm	32 mm	32 mm
• with multiple bends minimum permissible	45 mm	45 mm	45 mm	45 mm	45 mm
Traction stress maximum	80 N	80 N	80 N	80 N	80 N
Weight per length	75 kg/km	75 kg/km	75 kg/km	75 kg/km	75 kg/km
Permitted ambient conditions					
Ambient temperature					
• during operating	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C
• during storage	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C
• during transport	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C
• during installation	-25 … +80 °C	-25 … +80 °C	-25 … +80 °C	-25 … +80 °C	-25 … +80 °C
Protection class IP	IP68	IP68	IP68	IP68	IP68
Protection class IP note	when plugged in	when plugged in	when plugged in	when plugged in	when plugged in
Burning behaviour	UL 1685 (Vertical tray) and UL 1581, Sec. 1090 (H)	UL 1685 (Vertical tray) and UL 1581, Sec. 1090 (H)	UL 1685 (Vertical tray) and UL 1581, Sec. 1090 (H)	UL 1685 (Vertical tray) and UL 1581, Sec. 1090 (H)	UL 1685 (Vertical tray) and UL 1581, Sec. 1090 (H)
Chemical resistance to mineral oil	Conditional resistance	Conditional resistance	Conditional resistance	Conditional resistance	Conditional resistance
Radiological resistance to UV radiation	Resistant	Resistant	Resistant	Resistant	Resistant
Product properties, functions, components general					
Product feature					
• halogen-free	Yes	Yes	Yes	Yes	Yes
• silicon-free	Yes	Yes	Yes	Yes	Yes
Standards, specifications, approvals					
Verification of suitability					
• UL-registration	-	-	-	-	-
• RoHS conformity	Yes	Yes	Yes	Yes	Yes

Article No.	6XV1875-5DE30	6XV1875-5DH20	6XV1875-5JH10
Product-type designation	IWLAN RCoax/Antenna Connection Cable RSMA/SMA Male/ Male	IWLAN RCoax/Antenna Connection Cable RSMA/SMA Male/ Male	IWLAN Cable QMA / N-Connect Male/Female
Acceptability for application	Flexible connecting cable for connecting a cabinet bushing with SMA connection to an access point/client	Flexible connecting cable for connecting a cabinet bushing with SMA connection to an access point/client	Adapter cable for connecting an antenna with QMA connection to the flexible connecting cables
Cable length	0.3 m	2 m	1 m
Electrical data			
Number of electrical connections	2	2	2
Design of the electrical connection	RSMA/ SMA male/male	RSMA/ SMA male/male	QMA/N-Connect male/female
Transmission frequency	0 … 6 GHz	0 … 6 GHz	0 … 6 GHz
Attenuation per length			
• at 2.4 GHz typical	0.53 dB/m	0.53 dB/m	0.53 dB/m
• at 5.2 GHz typical	0.83 dB/m	0.83 dB/m	0.83 dB/m
• at 5.85 GHz typical	0.89 dB/m	0.89 dB/m	0.89 dB/m
Return loss minimum	23 dB	23 dB	23 dB
Impedance Nominal value	50 Ω	50 Ω	50 Ω
Capacity per length at 1 kHz	82 pF/m	82 pF/m	82 pF/m
Relative speed	82 %	82 %	82 %

■ **Technical specifications** (continued)

Article No.	6XV1875-5DE30	6XV1875-5DH20	6XV1875-5JH10
Product-type designation	**IWLAN RCoax/Antenna Connection Cable RSMA/SMA Male/ Male**	**IWLAN RCoax/Antenna Connection Cable RSMA/SMA Male/ Male**	**IWLAN Cable QMA / N-Connect Male/Female**
Mechanical data			
Design of shield	Braided shield made of tin-plated copper wires	Braided shield made of tin-plated copper wires	Braided shield made of tin-plated copper wires
Outer diameter			
• of the inner conductor	1.4 mm	1.4 mm	1.4 mm
• of dielectric	3.8 mm	3.8 mm	3.8 mm
• of the cable sheath	6.3 mm	6.3 mm	6.3 mm
Symmetrical tolerance of outer diameter of cable sheath	0.2 mm	0.2 mm	0.2 mm
Thickness of the cable sheath	0.76 mm	0.76 mm	0.76 mm
Material			
• of inner conductor	Cu	Cu	Cu
• of dielectric	polyethylene foam	polyethylene foam	polyethylene foam
• of the cable sheath	FRNC	FRNC	FRNC
Color of the cable sheath	Pastel turquoise	Pastel turquoise	Pastel turquoise
Bending radius			
• with single bend minimum permissible	32 mm	32 mm	32 mm
• with multiple bends minimum permissible	45 mm	45 mm	45 mm
Traction stress maximum	80 N	80 N	80 N
Weight per length	75 kg/km	75 kg/km	75 kg/km
Permitted ambient conditions			
Ambient temperature			
• during operating	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C
• during storage	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C
• during transport	-40 … +80 °C	-40 … +80 °C	-40 … +80 °C
• during installation	-25 … +80 °C	-25 … +80 °C	-25 … +80 °C
Protection class IP	IP68	IP68	IP67
Protection class IP note	when plugged in	when plugged in	when plugged in
Burning behaviour	UL 1685 (Vertical tray) and UL 1581, Sec. 1090 (H)	UL 1685 (Vertical tray) and UL 1581, Sec. 1090 (H)	UL 1685 (Vertical tray) and UL 1581, Sec. 1090 (H)
Chemical resistance to mineral oil	Conditional resistance	Conditional resistance	Conditional resistance
Radiological resistance to UV radiation	Resistant	Resistant	Resistant
Product properties, functions, components general			
Product feature			
• halogen-free	Yes	Yes	Yes
• silicon-free	Yes	Yes	Yes
Standards, specifications, approvals			
Verification of suitability			
• UL-registration	-	-	-
• RoHS conformity	Yes	Yes	Yes

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Technical specifications (continued)

Article No.	6GK5795-1TN00-1AA0	6GK5795-1TR10-0AA6	6GK5798-0AP00-4CA0	6GK5798-0SN00-0EA0
Product-type designation	**IWLAN termination impedance TI795-1N N-Connect Male**	**IWLAN termination impedance TI795-1R RSMA Male**	**IWLAN attenuator N-Connect Male/Female**	**IWLAN Power Splitter N-Connect Female**
Supply voltage, current consumption, power loss				
Type of supply voltage	-	-	-	-
Supply voltage for DC	-	-	-	-
Consumed current maximum	-	-	-	-
Active power loss maximum	-	-	-	-
Electrical data				
Number of electrical connections	1	1	2	3
Design of the electrical connection	N-Connect male	R-SMA male	N-Connect male/ N-Connect female	N-Connect female
Transmission frequency	0 … 6 GHz	0 … 6 GHz	0 … 6 GHz	2 400 … 6 GHz
Impedance	50 Ω	50 Ω	50 Ω	50 Ω
Return loss minimum	25 dB	25 dB	-	24 dB
Insertion loss maximum	-	-	10 dB	3.05 dB
Permitted ambient conditions				
Ambient temperature				
• during operating	-40 … +70 °C	-40 … +70 °C	-40 … +70 °C	-25 … +110 °C
• during storage	-40 … +70 °C	-40 … +70 °C	-40 … +70 °C	-25 … +110 °C
• during transport	-40 … +70 °C	-40 … +70 °C	-40 … +70 °C	-25 … +110 °C
Relative humidity at 25 °C without condensation during operating maximum				
Protection class IP	IP 65	IP 65	-	IP 67
Design, dimensions and weight				
Design	-	-	-	-
Width	-	-	-	71.4 mm
Height	-	-	-	-
Depth	-	-	-	34 mm
Diameter	21 mm	9 mm	21 mm	-
Length	34.5 mm	15 mm	45.7 mm	131.4 mm
Net weight	45 g	5 g	64 g	937 g
Installation	-	-	-	-
Version of the swap medium				
• C-PLUG	-	-	-	-
• KEY-PLUG	-	-	-	-

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■ Technical specifications (continued)

Article No.	6GK5798-2LP00-2AA6	6GK5798-2LP10-2AA6
Product-type designation	**Lightning Protector LP798-1N**	**Lightning Protector LP798-2N**
Electrical data		
Impedance	50 Ω	50 Ω
Mechanical data		
Design of the plug-in connection	female / female	female / female
Ambient temperature		
• during operating	-40 … +85 °C	-40 … +85 °C
• during storage	-40 … +85 °C	-40 … +85 °C
• during transport	-40 … +85 °C	-40 … +85 °C
Protection class IP	IP67	IP68
Design, dimensions and weight		
Width	54.8 mm	89.6 mm
Height	-	-
Depth	-	-
Diameter	22.8 mm	29 mm
Net weight	50 g	80 g

Article No.	6GK5798-0PT00-2AA0	6GK5798-2PP00-2AA6	6GK5798-0CP00-1AA0	6GK5798-1CS00-4AA0
Product-type designation	**IWLAN panel feedthrough N-Connect/SMA Female/ Female**	**IWLAN panel feedthrough N-Connect/N-Connect Female/Female**	**IWLAN coupler N-Connect-Male/Male**	**IWLAN angled adapter RSMA/RSMA male/female**
Electrical data				
Number of electrical connections	2	2	2	2
Design of the electrical connection	N-Connect female/ SMA female	N-Connect female/ N-Connect female	N-Connect male/ N-Connect male	R-SMA male / R-SMA female
Transmission frequency	0 … 6 GHz	0 … 11 000 MHz	0 … 6 GHz	0 … 6 GHz
Impedance	50 Ω	50 Ω	50 Ω	50 Ω
Return loss minimum	-	-	0.1 dB	-
Insertion loss maximum	-	-	-	-
Permitted ambient conditions				
Ambient temperature				
• during operating	-40 … +70 °C	-30 … +100 °C	-40 … +70 °C	-
• during storage	-40 … +70 °C	-30 … +100 °C	-40 … +70 °C	-
• during transport	-40 … +70 °C	-30 … +100 °C	-40 … +70 °C	-
Relative humidity at 25 °C without condensation during operating maximum				-
Protection class IP	-	IP 68	-	-
Design, dimensions and weight				
Design	-	-	-	-
Width	25.4 mm	-	-	17 mm
Height	25.4 mm	-	-	15 mm
Depth	-	-	-	-
Diameter	-	20.7 mm	20.8 mm	-
Length	31.3 mm	38 mm	36.4 mm	-
Net weight	35 g	55 g	60 g	-
Installation	for wall thickness max. 5.5 mm	for wall thickness max. 4.5 mm	-	-

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Industrial Wireless Communication
IWLAN – Accessories

IWLAN cabling technology

Ordering data	Article No.		Article No.
IWLAN RCoax/antenna N-Connect/R-SMA Male/male flexible connection cable Flexible connecting cable for connecting an RCoax cable or antenna to a SCALANCE W-700 access point with R-SMA connections; pre-assembled with two connections, N-Connect male and R-SMA male • 0.3 m • 1 m • 2 m • 5 m • 10 m	6XV1875-5CE30 6XV1875-5CH10 6XV1875-5CH20 6XV1875-5CH50 6XV1875-5CN10	**IWLAN RCoax/antenna RSMA male termination impedance TI795-1R** Terminating resistor for open wireless interfaces on SCALANCE W-700 devices with RSMA connections, impedance 50 ohms, RSMA male connection; IP65 (-40 to +70 °C); 3 units	6GK5795-1TR10-0AA6
IWLAN RCoax/antenna N-Connect male/male Flexible connection cable Flexible connecting cable for connecting an RCoax cable or antenna to a SCALANCE W-700 access point with N-Connect connections; pre-assembled with two N-Connect male connections • 1 m • 2 m • 5 m • 10 m	6XV1875-5AH10 6XV1875-5AH20 6XV1875-5AH50 6XV1875-5AN10	**Lightning protector LP798-1N** Lightning protector with N/N female/female connection, IP67 (-40 to +85 °C), frequency range: 0 to 6 GHz	6GK5798-2LP00-2AA6
IWLAN RCoax/antenna QMA/ N-Connect male/female Flexible connection cable Adapter cable for connecting a MIMO antenna with QMA connections to the flexible connecting cables; assembled with two connections QMA male and N-Connect female; scope of delivery: 3 units • 1 m	6XV1875-5JH10	**Lightning protector LP798-2N** Lightning protector with N/N female/female connection, IP68 (-40 to +85 °C), Quarter Wave technology, frequency range: 2 to 6 GHz	6GK5798-2LP10-2AA6
		IWLAN RCoax/antenna N-Connect female power splitter 2-way cable splitter, Y-element for splitting the RCoax cable or for using two antennas on one wireless interface	6GK5798-0SN00-0EA0
IWLAN RCoax/antenna R-SMA/SMA male/male Flexible connection cable Flexible cable for connecting an active device to components with RSMA and SMA connections, e.g. cabinet bushing; pre-assembled with two R-SMA male to SMA male connectors • 0.3 m • 2 m	6XV1875-5DE30 6XV1875-5DH20	**IWLAN RCoax/antenna N-Connect male/male coupler** HF coupling for connecting two RCoax cables; two N-Connect male connectors	6GK5798-0CP00-1AA0
		IWLAN angled adapter RSMA/ RSMA male/female HF angled adapter 90 for connecting antennas or antenna connection cables to devices with an RSMA connector	6GK5798-1CS00-4AA0
IWLAN RCoax/antenna N-Connect male termination impedance TI795-1N Terminating resistor for RCoax cable and open wireless interfaces on SCALANCE W-700 devices with N-Connect connections, impedance 50 ohms, N-male connection; IP65 (-40 to +70 °C)	6GK5795-1TN00-1AA0	**IWLAN RCoax/antenna N-Connect male/female attenuator** Attenuator with N-Connect male/ N-Connect female connectors • 10 dB	6GK5798-0AP00-4CA0
		IWLAN RCoax/antenna N-Connect/SMA female/female panel bushing Cabinet bushing with fastening flange for wall thicknesses up to 5.5 mm, SMA female and N-Connect female connections	6GK5798-0PT00-2AA0
		IWLAN RCoax/antenna N-Connect/N-Connect female/female panel bushing Cabinet bushing for wall thicknesses up to 4.5 mm, two N-Connect female connections	6GK5798-2PP00-2AA6

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More information

Selection tools:

To assist in selecting Industrial Ethernet components, the TIA Selection Tool is available at:
http://www.siemens.com/tia-selection-tool

Cabling range:

You can order components supplementary to the SIMATIC NET cabling range from your local contact. Technical advice on this subject is available from:

J. Hertlein
I IA SC CI PRM 4
Phone +49 (911) 750-4465
E-mail: juergen.hertlein@siemens.com

Industrial Wireless Communication
IWLAN – Accessories

KEY-PLUG W700

Overview

- Swap medium with which iFeatures are enabled
- If a fault occurs, it allows fast and simple device replacement of SCALANCE W components without a PG
- Can be used in all SCALANCE W700 IEEE 802.11n products with a PLUG compartment
- For the automatic backup of configuration data

Benefits

- Fast and simple replacement of SCALANCE W components without reconfiguration of the spare part.
- The device can be replaced without the need for specially trained personnel or a programming device or PC.
- The downtimes of network segments and connected Industrial Ethernet nodes can therefore be minimized if a fault occurs.

Application

The KEY-PLUG stores the configuration data of a SCALANCE W component. In addition, the iFeatures are enabled.

In addition to this, if there is a fault on a module, the module can be replaced simply and quickly without needing to reconfigure the replacement device and without specially trained personnel. If a device needs to be replaced, the KEY-PLUG is simply removed from the failed component and plugged into the replacement device. The replacement device installed in the network now starts up automatically with the same device configuration as the failed device.

Design

The KEY-PLUG has degree of protection IP20. The degree of protection of IP65 components is ensured by the design of the target device. The KEY-PLUG is inserted in the PLUG compartment of the SCALANCE W component.

Mode of operation

During startup, the device automatically backs up the configuration data on a KEY-PLUG (as-supplied from the factory) plugged into a SCALANCE W component. Changes to the configuration during operation are also saved on the KEY-PLUG without any additional operator intervention being necessary.

During startup, an unconfigured device automatically loads the configuration data from an inserted KEY-PLUG that has been written to provided the data was written by a compatible device type.

Diagnostics

Incorrect use of the KEY-PLUG, such as inserting a KEY-PLUG containing the configuration of a different device group or general malfunctions of the KEY-PLUG are indicated by diagnostics mechanisms of the host device (LEDs, SNMP, Web based Management, etc.).

Integration

Supported products

IWLAN access points
- SCALANCE W780
- SCALANCE W780 EEC
- SCALANCE W770
- SCALANCE W770 EEC

IWLAN client modules
- SCALANCE W740
- SCALANCE W730

Device type	iPCF AP mode	iPCF Client mode	iPCF-MC AP mode	iPCF-MC Client mode	iREF AP mode
SCALANCE W730		W740/W780		W740/W780	
SCALANCE W740		W740/W780		W740/W780	
SCALANCE W770	W780	W740/W780		W740/W780	W780
SCALANCE W780	W780	W740/W780	W780 [1]	W740/W780	W780

[1] only if a dual access point is used

Which KEY-PLUG do I use for which device?
- W780 = KEY-PLUG W780 iFeatures
- W740 = KEY-PLUG W740 iFeatures

Technical specifications

KEY-PLUG

Power supply	via terminal device
Power loss	0.015 mW
Installation	Can be plugged into C-PLUG slot
Constructional design • Dimensions (W x H x D) in mm • Approx. weight	24.3 x 17 x 8.1 5 g
Memory capacity	256 MB
Degree of protection	IP20

Ordering data — Article No.

KEY-PLUG W780 iFeatures — 6GK5907-8PA00

Swap medium for enabling additional iFeatures, for simple device replacement if a fault occurs, and for storing configuration data. Can be used in SCALANCE W access points with a PLUG compartment

KEY-PLUG W740 iFeatures — 6GK5907-4PA00

Swap medium for enabling additional iFeatures, for simple device replacement if a fault occurs, and for storing configuration data. Can be used in SCALANCE W client modules with a PLUG compartment

Industrial Wireless Communication
IWLAN – Accessories

Power Supply PS791-2DC and PS791-2AC

■ Overview

PS791-2DC power supply adapter

- DC/DC power supply unit for input voltages from 12 to 24 V DC and an output voltage of 18 V DC for all SCALANCE W786 devices

PS791-2AC power supply adapter

- AC/DC power supply unit for input voltages from 100 to 240 V AC and an output voltage of 18 V DC for all SCALANCE W786 devices

■ Benefits

g e t
get   Designed for Industry

- The PS791-2DC and PS791-2AC power supply adapters are designed specially for the SCALANCE W786 access points and are integrated direct into these
- Global application due to wide input voltage range
- High reliability as power supply is short-circuit proof, secure against no-load operation and is able to bridge short breaks in the mains power
- When the power supply adapter and Power-over-Ethernet (PoE) are used, redundant power supply of the access points can be achieved

■ Design

- Integral power supply adapter for SCALANCE W786
- Fan-free design
- Operating temperatures from -40 °C to +60 °C
- Resistant to condensation

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▪ Technical specifications

Article No.	6GK5791-2DC00-0AA0	6GK5791-2AC00-0AA0
Product type designation	**Power supply PS791-2DC**	**Power supply PS791-2AC**
Interfaces	• Infeed: 4-pin screw terminal for DC Power	• Infeed: 3-pin screw terminal for AC Power
	• Output voltage: 4-pin connector	• Output voltage: 4-pin connector
Input voltage	12 ... 24 V DC (min. 9 V DC, max. 32 V DC) safety extra-low voltage (SELV)	100 ... 240 V AC, 45 ... 65 Hz
Output voltage	18 V DC	18 V DC
Output power	14.4 W	14.4 W
Mains buffering	–	> 20 ms
Permissible ambient conditions		
• Operating temperature	-40 °C ... +70 °C	-40 °C ... +60 °C
Approvals	EMC: EN 61000-6-2:2005, EN 61000-6-3:2007	EMC: EN 61000-6-2:2005, EN 61000-6-3:2007
Safety regulations	EN 60950, UL 60950-1	EN 60950, UL 60950-1
Protection class	VDE 0805, VDE 0100	VDE 0805, VDE 0100
Degree of protection	IP65	IP65
Dimensions (W x H x D) in mm	133 x 45 x 30 mm	133 x 45 x 30 mm
Assembly	Installation in SCALANCE W786 and HiPath Wireless Outdoor Access Points	Installation in SCALANCE W786 and HiPath Wireless Outdoor Access Points
Weight	223 g	209 g

▪ Ordering data

	Article No.
Power supply PS791-2DC 24 V DC power supply for installation in SCALANCE W-786 products; operating instructions in German/English	**6GK5791-2DC00-0AA0**
Power supply PS791-2AC 110 V AC to 230 V AC power supply for installation in the SCALANCE W-786 products; operating instructions German/English	**6GK5791-2AC00-0AA0**

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Industrial Wireless Communication
Wireless Devices

SIMATIC Mobile Panel 277(F) IWLAN

Overview

SIMATIC Mobile Panel 277(F) IWLAN

Function

- Input/output fields
  for displaying and changing of process values.
- Function keys
  are used for directly triggering functions and actions. Up to 16 functions can be configured simultaneously on function keys. The function keys can also be used directly as PROFINET IO. The function keys can also be reconfigured as system keys. A frequently used function such as "Acknowledge alarm" can thus be assigned to a function key.
- Auxiliary operator controls
  such as handwheels, key switches and illuminated pushbuttons can be assigned with a variable or as a direct actuation via PROFINET IO (direct keys).
- Buttons
  are used for direct triggering of functions and actions. Up to 16 functions can be configured simultaneously on buttons.
- Graphics
  can be used as symbols instead of text for "labeling" function keys or buttons. They can also be used as full-screen background images.
  In the configuration software, a comprehensive library is available containing graphics and a wide variety of objects. All editors with an OLE interface can be used as graphics editors (such as PaintShop, Designer or CorelDraw).
- Vector graphics;
  simple geometric basic forms (e.g. lines, circles and rectangles) can be created directly in the configuration software.
- Text fields
  for labeling function keys, process displays, and process values in any font size.
- Trend views and bars
  are used for the graphic display of dynamic values.
- Display selection from the controller
  permits operator prompting from the controller.
- Presentation of HTML documents with MS Pocket Internet Explorer.

- Visual Basic Script, flexibility thanks to the implementation of new functions including linking to variables (comparison operations, loops, etc.).
- Language switching
  16 online languages, 32 configuration languages incl. Asiatic and Cyrillic character sets
  - Language-dependent texts and graphics
- User administration (security)
  - User-oriented access protection according to requirements of specific sectors
  - Authentication with user name and password
  - User-group-specific rights
- Signaling system
  - Discrete and analog alarms (edge alarms) as well as the ALARM_S message frame procedure for SIMATIC S7
  - Freely definable message classes (e.g. status/fault messages) for definition of acknowledgment response and display of alarm events
- Message buffer
  - Non-volatile, maintenance-free and battery-free message buffer. The messages remain stored when the mobile panel has the battery removed as well
- Recipe management
  - With additional data storage
    (on optional MultiMedia Card/SD Card)
  - Online/offline processing on the panel
  - Storage of recipe data in standard Windows format (CSV)
  - External processing using standard tools such as Excel and Access is possible
- Help texts
  for process images, messages and variables.
- Arithmetic functions
- Limit value monitoring
  for reliable process control of inputs and outputs.
- Indicator light
  for machine and plant status indication.
- Scheduler
  for cyclic function processing.
- Dynamic positioning of objects and dynamic showing/hiding of objects
- Permanent window and template concept
  - Creation of screen templates
- Simple maintenance and configuration thanks to:
  - Backup and restore of the project, operating system, recipe data records and firmware on the optional standard Multimedia Card/SD Card
  - Backup and restoration of configuration, operating system, recipe data sets and firmware on a PC using ProSave
  - Project transfer/return transfer via PROFINET/WLAN
  - Automatic transfer detection
  - Individual brightness setting
  - Project simulation directly on the configuration computer
- WinCC flexible options
  - Sm@rtService for remote operator control and monitoring of SIMATIC HMI systems based on TCP/IP networks
  - Sm@rtAccess for communication between HMI systems based on TCP/IP networks. Remote access to recipe data records, passwords and HMI system-specific information, and much more. (Mobile Panel 277F IWLAN as server: View only)
  - OPC server: Communication with applications (e.g. MES, ERP, or applications in the office sector) from various manufacturers (see HMI software/runtime software SIMATIC WinCC flexible/WinCC flexible RT options)
  - Audit

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Function (continued)

Configuration

Configuration is carried out with the SIMATIC WinCC flexible Standard or Advanced configuration software (see SIMATIC WinCC flexible HMI software/engineering software). SIMATIC WinCC flexible is the logical further development of the field-proven ProTool family. Projects generated using ProTool can be easily migrated to WinCC flexible. If WinCC flexible is started directly from SIMATIC Manager, data in STEP 7 can be accessed directly when the panel is configured. Duplicated data input and data management is, therefore, avoided.

IWLAN infrastructure

The required IWLAN infrastructure is set up using the SCALANCE W-700 IWLAN Access Points, preferably with the SCALANCE W-700 variant that has two wireless cards built into the device (Dual Access Point) and KEY-PLUG W700 iFeatures which supports the application options of the Mobile Panel 277(F) IWLAN.

The iPCF-MC functionality (rapid roaming = fast, uninterrupted switchover between multiple access points) is only available with panels in version V2 or higher.

The Access Point provides an Industrial Ethernet interface for connection to the wired network.

In addition to a reliable radio link, the SCALANCE W-700 Access Points stand out due to their optimum support of standardized IT mechanisms:

- IEEE 802.11b/ g/ a/ h for different frequency ranges
- IEEE 802.11e for multimedia, wireless multimedia (WMM) [1]
- IEEE 802.11i for security [1]
- Construction of redundant networks with the Rapid Spanning Tree Protocol (RSTP)
- Virtual networks (VLAN) to logically separate, for example, different user groups
- Sending the log entries of the SCALANCE W devices to a Syslog server

Only **the wireless** approvals printed on the **Mobile Panel are** binding. The RF approvals planned for all SIMATIC products can be viewed at http://www.siemens.com/wireless-approvals.

[1] Not supported by Mobile Panel Wireless

Integration

The SIMATIC Mobile Panel 277(F) IWLAN communicates via the WLAN Standard IEEE 802.11 a(b/g) via PROFINET. The Mobile Panel 277F IWLAN devices also support PROFIsafe communication.

There are five device variants with V2:

For mobile operation and monitoring via WLAN:
- Mobile Panel 277 IWLAN V2
- Mobile Panel 277 IWLAN V2 with handwheel, key switch and illuminated pushbuttons

As fail-safe device for safety-oriented operation as well:
- Mobile Panel 277F IWLAN V2 with acknowledgement button and emergency stop button
- Mobile Panel 277F IWLAN V2 with acknowledgement button, emergency stop button, handwheel, key switch and illuminated pushbuttons
- Mobile Panel 277F IWLAN RFID Tag (for V2 only)

For the versions Mobile Panel 277F IWLAN (PROFIsafe), the following system prerequisites apply:
- The Mobile Panel must be connected as a safe device (PROFIsafe, Distributed Safety)
- Use of a SIMATIC F-CPU

SIMATIC Mobile Panel		5 GHz frequency band (IEEE 802.11a)	SIMATIC F-CPU (Distributed Safety)
277 IWLAN	Only WLAN utilization (HMI)	●	–
	When using transponders	*!*	–
	When using Profinet IO	●	–
277F IWLAN (fail-safe)	–	–	–
		!	*!*
277F IWLAN (RFID Tag) (fail-safe)		●	*!*

● = Recommended
! = Requirement
– = Not required

The Mobile Panel 277(F) IWLAN can be connected to:
- SIMATIC S7-200/300/400 (one F-CPU required for integrating the Mobile Panel 277F IWLAN and SIMOTION (Mobile Panel 277 IWLAN V2 or higher, or Mobile Panel 277F IWLAN V2 or higher (WinCC flexible 2008 SP3 or higher))

Note:

Further information can be found under "System interfaces". The Function Manuals "Fail-Safe Operation of the Mobile Panel 277F IWLAN" are available for downloading in English, German, and Japanese.

http://support.automation.siemens.com/WW/view/en/31255853

Industrial Wireless Communication
Wireless Devices

SIMATIC Mobile Panel 277(F) IWLAN

Technical specifications

	6AV6645-0DD01-0AX1	6AV6645-0DE01-0AX1	6AV6645-0EB01-0AX1	6AV6645-0EC01-0AX1	6AV6645-0EF01-0AX1
		With handwheel key switch and two illuminated pushbutton	With integrated enabling- and emergency-stop button	With integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons	RFID with integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons
Display					
Size	7.5"	7.5"	7.5"	7.5"	7.5"
Display type	TFT, 65536 colors	TFT, 65536 colors	TFT, 65536 colors	TFT, 65536 colors	TFT, 65536 colors
Resolution (pixels) • Resolution (WxH in pixel)	640 x 480	640 x 480	640 x 480	640 x 480	640 x 480
Backlighting • MTBF backlighting (at 25 °C)	50 000 h	50 000 h	50 000 h	50 000 h	50 000 h
Control elements					
Operating options	Keys and Touch	Keys and Touch	Keys and Touch	Keys and Touch	Keys and Touch
Function keys, programmable	18 function keys, 18 with LEDs	18 function keys, 18 with LEDs	18 function keys, 18 with LEDs	18 function keys, 18 with LEDs	18 function keys, 18 with LEDs
Connection for mouse/keyboard/barcode reader	USB / USB / USB	USB / USB / USB	USB / USB / USB	USB / USB / USB	USB / USB / USB
Touch operation • Touch screen	Analog, resistive	Analog, resistive	Analog, resistive	Analog, resistive	Analog, resistive
Special operator controls • Stop button	No	No			
• Emergency stop button (forced blocking)			Yes	Yes	Yes
• Acknowledgement button	No	No	Yes	Yes	Yes
• Key-operated switch	No	Yes	No	Yes	Yes
• Illuminated pushbutton	No	Yes	No	Yes	Yes
• Handwheel	No	Yes	No	Yes	Yes
Supply voltage					
Supply voltage	DC	DC	DC	DC	DC
Via charging station	Yes	Yes	Yes	Yes	Yes
Via table power supply	Yes	Yes	Yes	Yes	Yes
Processor					
Processor	ARM, 520 MHz	ARM, 520 MHz	ARM, 520 MHz	ARM, 520 MHz	ARM, 520 MHz
Memory					
Type	Flash / RAM	Flash / RAM	Flash / RAM	Flash / RAM	Flash / RAM
Usable memory for user data	6 MB usable memory for user data	6 MB usable memory for user data	6 MB usable memory for user data	6 MB usable memory for user data	6 MB usable memory for user data
Battery Main battery • Rated voltage	7.2 V	7.2 V	7.2 V	7.2 V	7.2 V
• Capacity	5 100 mA·h	5 100 mA·h	5 100 mA·h	5 100 mA·h	5 100 mA·h
• Number of loading cycles, min	500	500	500	500	500
• Charging time, typ.	4 h	4 h	4 h	4 h	4 h
• Operating time, typ.	4 h	4 h	4 h	4 h	4 h
• Display for battery capacity	Yes	Yes	Yes	Yes	Yes
• Energy-saving mode	Yes	Yes	Yes	Yes	Yes
• Battery replacement during operation	Yes	Yes	Yes	Yes	Yes
Type of output					
Status LEDs	Yes	Yes	Yes	Yes	Yes
LED for safe			Yes	Yes	Yes
LED for communication	Yes	Yes	Yes	Yes	Yes
LED for battery	Yes	Yes	Yes	Yes	Yes
Vibrations	Yes	Yes	Yes	Yes	Yes
Time of day Clock • Type	Hardware clock, battery backup, synchronizable	Hardware clock, battery backup, synchronizable	Hardware clock, battery backup, synchronizable	Hardware clock, battery backup, synchronizable	Hardware clock, battery backup, synchronizable
• Hardware clock (real-time clock)	Yes	Yes	Yes	Yes	Yes
• Battery-backed	Yes	Yes	Yes	Yes	Yes
• Synchronizable	Yes	Yes	Yes	Yes	Yes

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■ **Technical specifications** (continued)

	6AV6645-0DD01-0AX1	6AV6645-0DE01-0AX1	6AV6645-0EB01-0AX1	6AV6645-0EC01-0AX1	6AV6645-0EF01-0AX1
		With handwheel key switch and two illuminated pushbutton	With integrated enabling- and emergency-stop button	With integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons	RFID with integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons
Interfaces					
Interfaces	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)
Number of USB interfaces	1	1	1	1	1
USB port	1 x USB	1 x USB	1 x USB	1 x USB	1 x USB
Multi Media Card slot	1 MMC/SD card slot	1 MMC/SD card slot	1 MMC/SD card slot	1 MMC/SD card slot	1 MMC/SD card slot
Industrial Ethernet • Industrial Ethernet interface	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)
WLAN • Wireless LAN • Supports rapid roaming	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
Protocols PROFINET	Yes	Yes	Yes	Yes	Yes
Supports protocol for PROFINET IO	Yes	Yes	Yes	Yes	Yes
Supports protocol for PROFIsafe	No	No	Yes	Yes	Yes
EMC Emission of radio interference acc. to EN 55 011 • Emission of radio interferences acc. to EN 55 011 (limit class A)	Yes; The product is designed for use in industrial environments. When used in residential areas, the emission of radio interference according to limit class B of EN 55011 must be ensured. For further information refer to the user documentation	Yes; The product is designed for use in industrial environments. When used in residential areas, the emission of radio interference according to limit class B of EN 55011 must be ensured. For further information refer to the user documentation	Yes; The product is designed for use in industrial environments. When used in residential areas, the emission of radio interference according to limit class B of EN 55011 must be ensured. For further information refer to the user documentation	Yes; The product is designed for use in industrial environments. When used in residential areas, the emission of radio interference according to limit class B of EN 55011 must be ensured. For further information refer to the user documentation	Yes; The product is designed for use in industrial environments. When used in residential areas, the emission of radio interference according to limit class B of EN 55011 must be ensured. For further information refer to the user documentation
Degree and class of protection IP65 enclosure	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates Certifications	CE, cULus, C-TICK	CE, cULus, C-TICK	CE, cULus, C-TICK	CE, cULus, C-TICK	CE, cULus, C-TICK
CE mark	Yes	Yes	Yes	Yes	Yes
cULus	Yes	Yes	Yes	Yes	Yes
RCM (former C-TICK)	Yes	Yes	Yes	Yes	Yes
TÜV safety certification			Yes	Yes	Yes
Highest safety class achievable in safety mode • Performance level according to EN ISO 13849-1:2008 • SIL according to IEC 61508:2010			e SIL 3	e SIL 3	e SIL 3
Ambient conditions Drop height	1.2 m	1.2 m	1.2 m	1.2 m	1.2 m
Operating temperature • Operation	0 °C to +40 °C	0 °C to +40 °C	0 °C to +40 °C	0 °C to +40 °C	0 °C to +40 °C
Storage/transport temperature • Transport, storage	-20 °C to +60 °C	-20 °C to +60 °C	-20 °C to +60 °C	-20 °C to +60 °C	-20 °C to +60 °C
Relative humidity • max. relative humidity	80 %	80 %	80 %	80 %	80 %
Operating systems Operating system	Windows CE	Windows CE	Windows CE	Windows CE	Windows CE
Languages Online languages • Number of online/runtime languages	16	16	16	16	16

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Industrial Wireless Communication
Wireless Devices

SIMATIC Mobile Panel 277(F) IWLAN

Technical specifications (continued)

	6AV6645-0DD01-0AX1	6AV6645-0DE01-0AX1	6AV6645-0EB01-0AX1	6AV6645-0EC01-0AX1	6AV6645-0EF01-0AX1
		With handwheel key switch and two illuminated pushbutton	With integrated enabling- and emergency-stop button	With integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons	RFID with integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons
Functionality under WinCC (TIA Portal)					
Libraries	Yes	Yes	Yes	Yes	Yes
Task planner	Yes	Yes	Yes	Yes	Yes
Message system					
• Number of messages	4 000	4 000	4 000	4 000	4 000
• Bit messages	Yes	Yes	Yes	Yes	Yes
• Analog messages	Yes	Yes	Yes	Yes	Yes
Recipe administration					
• Number of recipes	300	300	300	300	300
• Data records per recipe	500	500	500	500	500
• Entries per data record	1 000	1 000	1 000	1 000	1 000
• Recipe memory	64 KB integrated Flash, expandable	64 KB integrated Flash, expandable	64 KB integrated Flash, expandable	64 KB integrated Flash, expandable	64 KB integrated Flash, expandable
Variables					
• Number of variables per device	2 048	2 048	2 048	2 048	2 048
• Limit values	Yes	Yes	Yes	Yes	Yes
• Multiplexing	Yes	Yes	Yes	Yes	Yes
Images					
• Number of configurable images	500	500	500	500	500
Image objects					
• Text objects	10 000 text elements	10 000 text elements	10 000 text elements	10 000 text elements	10 000 text elements
• Graphics object	Bit maps, icons, vector graphics	Bit maps, icons, vector graphics	Bit maps, icons, vector graphics	Bit maps, icons, vector graphics	Bit maps, icons, vector graphics
Complex image objects					
• Status/control	With SIMATIC S7	With SIMATIC S7	With SIMATIC S7	With SIMATIC S7	With SIMATIC S7
• dynamic objects	Diagrams, bar graphs, sliders, analog display, invisible buttons	Diagrams, bar graphs, sliders, analog display, invisible buttons	Diagrams, bar graphs, sliders, analog display, invisible buttons	Diagrams, bar graphs, sliders, analog display, invisible buttons	Diagrams, bar graphs, sliders, analog display, invisible buttons
Lists					
• Number of text lists per project	500	500	500	500	500
• Number of graphics lists per project	400	400	400	400	400
Archiving					
• Number of archives per device	20	20	20	20	20
• Number of measuring points per project	20	20	20	20	20
• Number of entries per archive	10 000	10 000	10 000	10 000	10 000
Security					
• Number of user groups	50	50	50	50	50
• Number of user rights	32	32	32	32	32
• Password export/import	Yes	Yes	Yes	Yes	Yes
Logging through printer					
• Recording/Printing	Alarms, report (shift report), PROFINET	Alarms, report (shift report), PROFINET	Alarms, report (shift report), PROFINET	Alarms, report (shift report), PROFINET	Alarms, report (shift report), PROFINET
Transfer (upload/download)					
• Transfer of configuration	USB, Ethernet, automatic transfer recognition	USB, Ethernet, automatic transfer recognition	USB, Ethernet, automatic transfer recognition	USB, Ethernet, automatic transfer recognition	USB, Ethernet, automatic transfer recognition
• Wireless LAN	Yes	Yes	Yes	Yes	Yes

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■ **Technical specifications** (continued)

	6AV6645-0DD01-0AX1	6AV6645-0DE01-0AX1	6AV6645-0EB01-0AX1	6AV6645-0EC01-0AX1	6AV6645-0EF01-0AX1
		With handwheel key switch and two illuminated pushbutton	With integrated enabling- and emergency-stop button	With integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons	RFID with integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons
Process coupling					
• Connection to controller	S7-200, S7- 300/400 see section on "System interfaces"	S7-200, S7- 300/400 see section on "System interfaces"	S7-200, S7- 300/400 see section on "System interfaces"	S7-200, S7- 300/400 see section on "System interfaces"	S7-200, S7- 300/400 see section on "System interfaces"
• S7-1200	Yes	Yes	No	No	No
• S7-1500	Yes	Yes	No; Available soon	No; Available soon	No; Available soon
• Zones	Yes	Yes	Yes	Yes	
- Number of zones per project, max.	254	254	254	254	
- Number of transponders for zones per project, max.	255	255	255	255	
• Effective range			Yes	Yes	Yes
- Number of effective ranges per project, max.			127	127	127
- Number of transponders for effective ranges per project, max.			127	127	
• Transponder	Yes	Yes	Yes	Yes	
- Number of transponders per project, max.	256	256	256	256	
- Adjustable distance range	Yes	Yes	Yes	Yes	
- Adjustable distance, min.	2 m	2 m	2 m	2 m	
- Adjustable distance, max.	8 m	8 m	8 m	8 m	
I/O/Options					
I/O devices	Barcode reader	Barcode reader	Barcode reader	Barcode reader	Barcode reader
• Multi Media Card	Yes	Yes	Yes	Yes	Yes
Mechanics/material					
Type of housing (front)	Plastic	Plastic	Plastic	Plastic	Plastic
Dimensions					
Housing diameter/depth (mm)	Dia 290 mm / D 103 mm	Dia 290 mm / D 103 mm	Dia 290 mm / D 103 mm	Dia 290 mm / D 103 mm	Dia 290 mm / D 103 mm
Weights					
Weight (without packaging)	2.2 kg	2.2 kg	2.2 kg	2.2 kg	2.2 kg

	6AV6645-0FD01-0AX1	6AV6645-0FE01-0AX1	6AV6645-0GB01-0AX1	6AV6645-0GC01-0AX1	6AV6645-0GF01-0AX1
	USA version	USA version With handwheel key switch and two illuminated pushbutton	USA version With integrated enabling- and emergency-stop button	USA version With integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons	USA version RFID with integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons
Display					
Size	7.5"	7.5"	7.5"	7.5"	7.5"
Display type	TFT, 65536 colors	TFT, 65536 colors	TFT, 65536 colors	TFT, 65536 colors	TFT, 65536 colors
Resolution (pixels)					
• Resolution (WxH in pixel)	640 x 480	640 x 480	640 x 480	640 x 480	640 x 480
Backlighting					
• MTBF backlighting (at 25 °C)	50 000 h	50 000 h	50 000 h	50 000 h	50 000 h
Control elements					
Operating options	Keys and Touch	Keys and Touch	Keys and Touch	Keys and Touch	Keys and Touch
Function keys, programmable	18 function keys, 18 with LEDs	18 function keys, 18 with LEDs	18 function keys, 18 with LEDs	18 function keys, 18 with LEDs	18 function keys, 18 with LEDs
Connection for mouse/keyboard/barcode reader	USB / USB / USB	USB / USB / USB	USB / USB / USB	USB / USB / USB	USB / USB / USB
Touch operation					
• Touch screen	Analog, resistive	Analog, resistive	Analog, resistive	Analog, resistive	Analog, resistive

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Industrial Wireless Communication
Wireless Devices

SIMATIC Mobile Panel 277(F) IWLAN

▇ Technical specifications (continued)

	6AV6645-0FD01-0AX1	6AV6645-0FE01-0AX1	6AV6645-0GB01-0AX1	6AV6645-0GC01-0AX1	6AV6645-0GF01-0AX1
	USA version	USA version With handwheel key switch and two illuminated pushbutton	USA version With integrated enabling- and emergency-stop button	USA version With integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons	USA version RFID with integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons
Special operator controls					
• Stop button	No	No			
• Emergency stop button (forced blocking)			Yes	Yes	Yes
• Acknowledgement button	No	No	Yes	Yes	Yes
• Key-operated switch	No	Yes	No	Yes	Yes
• Illuminated pushbutton	No	Yes	No	Yes	Yes
• Handwheel	No	Yes	No	Yes	Yes
Supply voltage					
Supply voltage	DC	DC	DC	DC	DC
Via charging station	Yes	Yes	Yes	Yes	Yes
Via table power supply	Yes	Yes	Yes	Yes	Yes
Processor					
Processor	ARM, 520 MHz	ARM, 520 MHz	ARM, 520 MHz	ARM, 520 MHz	ARM, 520 MHz
Memory					
Type	Flash / RAM	Flash / RAM	Flash / RAM	Flash / RAM	Flash / RAM
Usable memory for user data	6 MB usable memory for user data	6 MB usable memory for user data	6 MB usable memory for user data	6 MB usable memory for user data	6 MB usable memory for user data
Battery Main battery					
• Rated voltage	7.2 V	7.2 V	7.2 V	7.2 V	7.2 V
• Capacity	5 100 mA·h	5 100 mA·h	5 100 mA·h	5 100 mA·h	5 100 mA·h
• Number of loading cycles, min	500	500	500	500	500
• Charging time, typ.	4 h	4 h	4 h	4 h	4 h
• Operating time, typ.	4 h	4 h	4 h	4 h	4 h
• Display for battery capacity	Yes	Yes	Yes	Yes	Yes
• Energy-saving mode	Yes	Yes	Yes	Yes	Yes
• Battery replacement during operation	Yes	Yes	Yes	Yes	Yes
Type of output					
Status LEDs	Yes	Yes	Yes	Yes	Yes
LED for safe			Yes	Yes	Yes
LED for communication	Yes	Yes	Yes	Yes	Yes
LED for battery	Yes	Yes	Yes	Yes	Yes
Vibrations	Yes	Yes	Yes	Yes	Yes
Time of day Clock					
• Type	Hardware clock, battery backup, synchronizable	Hardware clock, battery backup, synchronizable	Hardware clock, battery backup, synchronizable	Hardware clock, battery backup, synchronizable	Hardware clock, battery backup, synchronizable
• Hardware clock (real-time clock)	Yes	Yes	Yes	Yes	Yes
• Battery-backed	Yes	Yes	Yes	Yes	Yes; Via bypass battery
• Synchronizable	Yes	Yes	Yes	Yes	Yes
Interfaces					
Interfaces	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)
Number of USB interfaces	1	1	1	1	1
USB port	1 x USB	1 x USB	1 x USB	1 x USB	1 x USB
Multi Media Card slot	1 MMC/SD card slot	1 MMC/SD card slot	1 MMC/SD card slot	1 MMC/SD card slot	1 MMC/SD card slot
Industrial Ethernet					
• Industrial Ethernet interface	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)	1 x Ethernet (RJ45)
WLAN					
• Wireless LAN	Yes	Yes	Yes	Yes	Yes
• Supports rapid roaming	Yes	Yes	Yes	Yes	Yes
Protocols					
PROFINET	Yes	Yes	Yes	Yes	Yes
Supports protocol for PROFINET IO	Yes	Yes	Yes	Yes	Yes
Supports protocol for PROFIsafe	No	No	Yes	Yes	Yes

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■ Technical specifications (continued)

	6AV6645-0FD01-0AX1	6AV6645-0FE01-0AX1	6AV6645-0GB01-0AX1	6AV6645-0GC01-0AX1	6AV6645-0GF01-0AX1
	USA version	USA version With handwheel key switch and two illuminated pushbutton	USA version With integrated enabling- and emergency-stop button	USA version With integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons	USA version RFID with integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons
EMC Emission of radio interference acc. to EN 55 011					
• Emission of radio interferences acc. to EN 55 011 (limit class A)	Yes; The product is designed for use in industrial environments. When used in residential areas, the emission of radio interference according to limit class B of EN 55011 must be ensured. For further information refer to the user documentation	Yes; The product is designed for use in industrial environments. When used in residential areas, the emission of radio interference according to limit class B of EN 55011 must be ensured. For further information refer to the user documentation	Yes; The product is designed for use in industrial environments. When used in residential areas, the emission of radio interference according to limit class B of EN 55011 must be ensured. For further information refer to the user documentation	Yes; The product is designed for use in industrial environments. When used in residential areas, the emission of radio interference according to limit class B of EN 55011 must be ensured. For further information refer to the user documentation	Yes; The product is designed for use in industrial environments. When used in residential areas, the emission of radio interference according to limit class B of EN 55011 must be ensured. For further information refer to the user documentation
Degree and class of protection IP65 enclosure	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates Certifications	CE, cULus, C-TICK	CE, cULus, C-TICK	CE, cULus, C-TICK	CE, cULus, C-TICK	CE, cULus, C-TICK
CE mark	Yes	Yes	Yes	Yes	Yes
cULus	Yes	Yes	Yes	Yes	Yes
RCM (former C-TICK)	Yes	Yes	Yes	Yes	Yes
TÜV safety certification			Yes	Yes	Yes
Highest safety class achievable in safety mode					
• Performance level according to EN ISO 13849-1:2008			e	e	e
• SIL according to IEC 61508:2010			SIL 3	SIL 3	SIL 3
Ambient conditions Drop height	1.2 m	1.2 m	1.2 m	1.2 m	1.2 m
Operating temperature • Operation	0 °C to +40 °C	0 °C to +40 °C	0 °C to +40 °C	0 °C to +40 °C	0 °C to +40 °C
Storage/transport temperature • Transport, storage	-20 °C to +60 °C	-20 °C to +60 °C	-20 °C to +60 °C	-20 °C to +60 °C	-20 °C to +60 °C
Relative humidity • max. relative humidity	80 %	80 %	80 %	80 %	80 %
Operating systems Operating system	Windows CE	Windows CE	Windows CE	Windows CE	Windows CE
Languages Online languages • Number of online/runtime languages	16	16	16	16	16
Functionality under WinCC (TIA Portal) Libraries	Yes	Yes	Yes	Yes	Yes
Task planner	Yes	Yes	Yes	Yes	Yes
Message system • Number of messages • Bit messages • Analog messages	4 000 Yes Yes	4 000 Yes Yes	4 000 Yes Yes	4 000 Yes Yes	4 000 Yes Yes
Recipe administration • Number of recipes • Data records per recipe • Entries per data record • Recipe memory	300 500 1 000 64 KB integrated Flash, expandable	300 500 1 000 64 KB integrated Flash, expandable	300 500 1 000 64 KB integrated Flash, expandable	300 500 1 000 64 KB integrated Flash, expandable	300 500 1 000 64 KB integrated Flash, expandable
Variables • Number of variables per device • Limit values • Multiplexing	2 048 Yes Yes	2 048 Yes Yes	2 048 Yes Yes	2 048 Yes Yes	2 048 Yes Yes

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Industrial Wireless Communication
Wireless Devices

SIMATIC Mobile Panel 277(F) IWLAN

■ Technical specifications (continued)

	6AV6645-0FD01-0AX1	6AV6645-0FE01-0AX1	6AV6645-0GB01-0AX1	6AV6645-0GC01-0AX1	6AV6645-0GF01-0AX1
	USA version	USA version With handwheel key switch and two illuminated pushbutton	USA version With integrated enabling- and emergency-stop button	USA version With integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons	USA version RFID with integrated enabling- and emergency-stop button, handwheel, key switch and two illuminated pushbuttons
Images					
• Number of configurable images	500	500	500	500	500
Image objects					
• Text objects	10 000 text elements	10 000 text elements	10 000 text elements	10 000 text elements	10 000 text elements
• Graphics object	Bit maps, icons, vector graphics	Bit maps, icons, vector graphics	Bit maps, icons, vector graphics	Bit maps, icons, vector graphics	Bit maps, icons, vector graphics
Complex image objects					
• Status/control	With SIMATIC S7	With SIMATIC S7	With SIMATIC S7	With SIMATIC S7	With SIMATIC S7
• dynamic objects	Diagrams, bar graphs, sliders, analog display, invisible buttons	Diagrams, bar graphs, sliders, analog display, invisible buttons	Diagrams, bar graphs, sliders, analog display, invisible buttons	Diagrams, bar graphs, sliders, analog display, invisible buttons	Diagrams, bar graphs, sliders, analog display, invisible buttons
Lists					
• Number of text lists per project	500	500	500	500	500
• Number of graphics lists per project	400	400	400	400	400
Archiving					
• Number of archives per device	20	20	20	20	20
• Number of measuring points per project	20	20	20	20	20
• Number of entries per archive	10 000	10 000	10 000	10 000	10 000
Security					
• Number of user groups	50	50	50	50	50
• Number of user rights	32	32	32	32	32
• Password export/import	Yes	Yes	Yes	Yes	Yes
Logging through printer					
• Recording/Printing	Alarms, report (shift report), PROFINET	Alarms, report (shift report), PROFINET	Alarms, report (shift report), PROFINET	Alarms, report (shift report), PROFINET	Alarms, report (shift report), PROFINET
Transfer (upload/download)					
• Transfer of configuration	USB, Ethernet, automatic transfer recognition	USB, Ethernet, automatic transfer recognition	USB, Ethernet, automatic transfer recognition	USB, Ethernet, automatic transfer recognition	USB, Ethernet, automatic transfer recognition
• Wireless LAN	Yes	Yes	Yes	Yes	Yes
Process coupling					
• Connection to controller	S7-200, S7- 300/400 see section on "System interfaces"	S7-200, S7- 300/400 see section on "System interfaces"	S7-200, S7- 300/400 see section on "System interfaces"	S7-200, S7- 300/400 see section on "System interfaces"	S7-200, S7- 300/400 see section on "System interfaces"
• S7-1200	Yes	Yes	No	No	No
• S7-1500	Yes	Yes	No; Available soon	No; Available soon	No; Available soon
• Zones	Yes	Yes	Yes	Yes	
- Number of zones per project, max.	254	254	254	254	
- Number of transponders for zones per project, max.	255	255	255	255	
• Effective range			Yes	Yes	Yes
- Number of effective ranges per project, max.			127	127	127
- Number of transponders for effective ranges per project, max.			127	127	
• Transponder	Yes	Yes	Yes	Yes	
- Number of transponders per project, max.	256	256	256	256	
- Adjustable distance range	Yes	Yes	Yes	Yes	
- Adjustable distance, min.	2 m	2 m	2 m	2 m	
- Adjustable distance, max.	8 m	8 m	8 m	8 m	
I/O/Options					
I/O devices	Barcode reader	Barcode reader	Barcode reader	Barcode reader	Barcode reader
• Multi Media Card	Yes	Yes	Yes	Yes	Yes
Mechanics/material					
Type of housing (front)	Plastic	Plastic	Plastic	Plastic	Plastic
Dimensions					
Housing diameter/depth (mm)	Dia 290 mm / D 103 mm	Dia 290 mm / D 103 mm	Dia 290 mm / D 103 mm	Dia 290 mm / D 103 mm	Dia 290 mm / D 103 mm
Weights					
Weight (without packaging)	2.2 kg	2.2 kg	2.2 kg	2.2 kg	2.2 kg

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■ Ordering data

	Article No.
SIMATIC Mobile Panel 277 IWLAN V2 (RoW version [1])	
• Communication via WLAN (PROFINET)	**6AV6645-0DD01-0AX1**
• Communication via WLAN (PROFINET) with integrated handwheel, key-operated switch and two illuminated pushbuttons	**6AV6645-0DE01-0AX1**
SIMATIC Mobile Panel 277F IWLAN V2 PROFIsafe (RoW version [1])	
• Communication via WLAN (PROFINET) with acknowledgement button and emergency stop button	**6AV6645-0EB01-0AX1**
• Communication via WLAN (PROFINET) with acknowledgement button and emergency stop button with integrated handwheel, key-operated switch, and two illuminated push-buttons	**6AV6645-0EC01-0AX1**
• RFID tag version: Communication via WLAN (PROFINET) with acknowledgement button and emergency stop button with integrated handwheel, key-operated switch, and two illuminated pushbuttons	**6AV6645-0EF01-0AX1**
SIMATIC Mobile Panel 277 IWLAN V2 (USA version)	
• Communication via WLAN (PROFINET)	**6AV6645-0FD01-0AX1**
• Communication via WLAN (PROFINET) with integrated handwheel, key-operated switch and two illuminated pushbuttons	**6AV6645-0FE01-0AX1**
SIMATIC Mobile Panel 277F IWLAN V2 PROFIsafe (USA version)	
• with acknowledgement button and emergency stop button	**6AV6645-0GB01-0AX1**
• with acknowledgement button and emergency stop button with integrated handwheel, key-operated switch, and two illuminated pushbuttons	**6AV6645-0GC01-0AX1**
• with acknowledgement button and emergency stop button with integrated handwheel, key-operated switch, and two illuminated pushbuttons (tag version)	**6AV6645-0GF01-0AX1**
Starter kit SIMATIC Mobile Panel 277(F) IWLAN (RoW version[1])	
for	
• Mobile Panel 277 IWLAN V2	**6AV6651-5GA01-0AA1**
• Mobile Panel 277F IWLAN V2	**6AV6651-5HA01-0AA1**

	Article No.
Accessories	See HMI accessories
Note: Please order the table-top power supply or charging station as well. Required for charging the battery.	
Documentation (to be ordered separately)	
You can find the manuals for the Mobile Panels on the Internet at:	http://support.automation.siemens.com/WW/view/en/11599011/133300

[1] RoW version:
"Rest of World" version: Version for worldwide sales except in the U.S.

Note:

The Function Manuals "Fail-Safe Operation of the Mobile Panel 277F IWLAN V1" are available for downloading in English, German, and Japanese.

http://support.automation.siemens.com/WW/view/en/31255853

■ More information

Additional information is available in the Internet under:

http://www.siemens.com/simatic-mobile-panels

Note:

Do you need a specific modification or addition to the products described here? Then take a look under "Customer-specific products". There, you will find information on ordering additional and standard industry products as well as possibilities for customer-specific modifications and adjustments.

Industrial Wireless Communication
WirelessHART

■ Overview

HART (**H**ighway **A**ddressable **R**emote **T**ransducer) is the protocol for bus-addressed field devices. It is not a fieldbus, but a version of the digital field communication that contains many of the functionalities of fieldbuses.

WirelessHART is the wireless HART communication to field-buses in the process industry. The HART Communication Foundation (HCF) specified WirelessHART and published it as part of the HART standard V7.1. The radio transmission is based on the wireless communications standard IEEE 802.15.4. High availability is achieved by means of the meshed network architecture (each field device is simultaneously a repeater) with redundant communication paths and constantly changing frequency channels (channel hopping). 128-bit encryption in conjunction with authentication and validation of each data packet ensures secure data transfer and prevents unauthorized access to the field devices.

As a basic principle, a WirelessHART network consists of WirelessHART field devices and a WirelessHART gateway that receives the data from the field devices and forwards it to the automation system.

Wireless communication with WirelessHART

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Overview

SITRANS P280 for flexible and cost-effective applications in pressure monitoring

- Supports the WirelessHART standard (HART V 7.1)
- Very high security level for wireless data transmission
- Built-in local user interface (LUI) with 3-button operation
- Optimum display and readability using graphics display (104 x 80 pixels) with integrated background illumination
- Stand-by (deep sleep phase) can be activated and deactivated on the device with a push of a button
- Battery power supply
- Battery service live up to 5 years
- Extend battery service life with HART modem interface which can be shut off
- Optimized power consumption through new design, and increase in battery service life
- Simple configuration thanks to SIMATIC PDM
- Device meets IP65 degree of protection
- Can be used for absolute and gauge pressure measurements

Benefits

The SITRANS P280 is a pressure transmitter that features Wireless HART as the standard communication interface.

Also available is a wired interface to connect a HART modem:
- Flexible pressure measurements
- Save costs on writing for difficult installation conditions. Wireless technology offers cost advantages in cases where extensive wiring cots would normally apply.
- It enables additional hitherto unfeasible measuring points, particularly for monitoring purposes.
- Easy installation on moveable equipment parts
- Enables cost-effective temporary measurements, for example for process optimizations.
- Optimum addition to wired communication and expansion of solution options for system solutions in process automation

Application

The SITRANS P280 is a WirelessHART field device for measuring absolute and gauge pressure.

The measuring ranges for absolute and gauge pressure measurements are 0 to 1.6, 10, 50, 200 and 320 bar (0 to 23, 145, 725, 2900 and 4641 psi).

The sensor is integrated into the transmitter casing.

On the wireless communication side, the transmitter supports the WirelessHART standard. For initial commissioning in particular, a HART modem can be connected to the transmitter. You can alternatively opt for simple and easy local operation using the pushbuttons w/o any additional handset devices.

It can be used in all industries and applications in non-explosive areas.

Design

The SITRANS P280 has a robust aluminum enclosure and is suitable for outside use. It conforms with the IP65 safety class.

The operating temperature range is -40 to +80 °C (-40 to +176 °F). Power supply is provided through an integrated battery, which is available as an accessory. The device is only approved for operation with this battery.

The aerial features a rotatable joint which can be used for directional alignment. Wireless signals can thus be optimally received and transmitted.

A special highlight is the option for direct operation on the device. The operating strategy used in this case seamlessly integrates into the strategy of all new Siemens field devices.

Using the device's control buttons, it is easy to turn the HART modem interface of the device on and off. The device can be put to passive status and reactivated at any time. This helps to extend the service life of the battery.

The SITRANS P280 transmitter features a ceramic measuring cell for gauge and absolute pressure measurements.

Function

The SITRANS P280 can integrate itself into a WirelessHART network. It can be parameterized and operated through this network. Measured process values are transported via the network to the SIEMENS IE/WSN-PA link.

Field device data received by the IE/WSN-PA LINK is transmitted to the connected systems, for example the process control system SIMATIC PCS 7. For an introduction to the mode of operation of WirelessHART, please see the FI 01 catalogue, section 9 or http://www.siemens.com/wirelesshart.

Detailed information on IE/WSN-PA can be found in the FI 01 catalogue, section 8 or http://www.siemens.com/wirelesshart.

Industrial Wireless Communication
WirelessHART

SITRANS P280 for gauge and absolute pressure

◼ Integration

Connecting to SIMATIC PCS 7

The integration of field devices in SIMATIC PCS 7 and other process control systems can now be done seamlessly and cost-effectively with wireless technology, especially in situations where high wiring costs may be expected. Of particular interest are measuring points which are to be added and for which no MSR wiring is available.

Siemens WirelessHART devices are designed for optimum compatibility with products in the SCALANC W range.

Where larger distances between the IW/WSN-PA LINK and control systems need to be overcome, this connection can also be implemented on a wireless and cost-effective basis using the products of the SCALANCE W family.

◼ Configuration

Configuration of the SITRANS P280 may be carried out as follows:

• Initial start-up for the SITRANS P280 with SIMATIC PDM is generally carried out via a HART modem or the integrated local user interface, since the network ID and Join key must be set up on the device before it can be accepted and integrated into the WirelessHART network.

• Once it is integrated into the network, the device can be conveniently operated with the WirelessHART network, the onsite HART modem or via the local user interface.
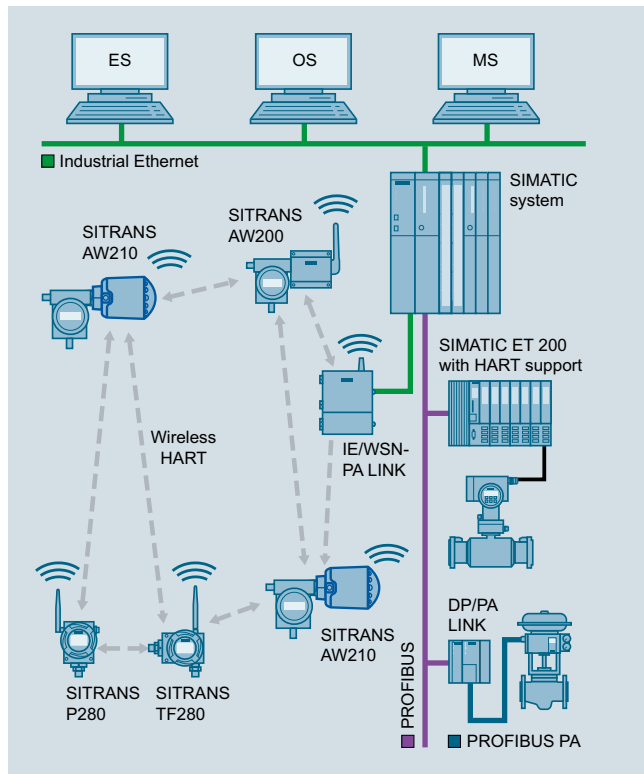
Integration of a meshed network in SIMATIC PCS7

■ Technical specifications

SITRANS P280 WirelessHART Pressure Transmitter	
Mode of operation	
Measuring principle	piezo-resistive
Measured variable	Gauge and absolute pressure
Gauge pressure input	
Measuring range	Overload limit/Burst pressure
0 ... 1.6 bar (0 ... 23 psi)	4 bar (58 psi)
0 ... 10 bar (0 ... 145 psi)	20 bar (290 psi)
0 ... 50 bar (0 ... 725 psi)	100 bar (1 450 psi)
0 ... 200 bar (0 ... 2900 psi)	400 bar (5 801 psi)
0 ... 320 bar (0 ... 4641 psi)	640 bar (9 282 psi)
Units	mbar, bar, m4H_2O, i4H_2O, atm, Torr, gcm², kgcm², Pa, kPa, MPa, psi, mmHG, mmH_2O, ftH_2O, inHG, inH_2O
Absolute pressure input	
Measuring range	Overload limit/Burst pressure
0 ... 1.6 bar a (0 ... 23 psi a)	4 bar (58 psi a)
0 ... 10 bar a (0 ... 145 psi a)	20 bar a (290 psi a)
0 ... 50 bar a (0 ... 725 psi a)	100 bar a (1450 psi a)
0 ... 200 bar a (0 ... 2900 psi a)	400 bar a (5801 psi a)
0 ... 320 bar a (0 ... 4641 psi a)	640 bar a (9282 psi a)
Units	mbar, bar, m4H_2O, i4H_2O, atm, Torr, gcm², kgcm², Pa, kPa, MPa, psi, mmHG, mmH_2O, ftH_2O, inHG, inH_2O
Output	
Output signal	2.4 GHz Wireless signal with TSMP (Time Synchronized Mesh Protocol)
Measuring accuracy	According to IEC 60770-1
Error in measurement at limit setting including hysteresis and reproducibility	typically 0.17 % of span, max. 0.25 % of sensor span
Long-term stability	max. ± 0.25 % of sensor/year span
Influence of ambient temperature	max. ± 0.2 %/10 K of sensor span
Rated conditions	
Ambient conditions	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F) (in ambient temperatures below -20 °C (-4 °F) and above +70 °C (158 °F), readability of the display is limited.)
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
• Relative humidity	< 95 %
Climatic class	4K4H in accordance with EN 60721-3-4(stationary use at locations not protected against weather)
Degree of protection	IP65/NEMA 4
Permissible medium temperature	-40 ... 85 °C (-40 ... +185 °F)

SITRANS P280 WirelessHART Pressure Transmitter	
Design	
Enclosure material	low-copper die-cast aluminum, GD-AlSi12 (Fe)
Shock resistance	in accordance with DIN EN 60068-2-29 / 03.95
Resistance to vibration	in accordance with EN 60068-2-6/ 12.07
Weight	
• without battery	1.5 kg (3.31 lb)
• With battery	1.6 kg (3.53 lb)
Dimensions (W x H x D)	See Dimensional drawing
Process connection	• G½B male thread to EN 837-1 • ½-14 NPT
Sensor break	Is recognized
Displays and controls	
Display (with illumination)	
• Size of display	104 x 80 pixels
• Number of digits	adjustable
• Number of spaces after comma	adjustable
Setting options	• on site with 3 buttons • with SIMATIC PDM or HART Communicator
Auxiliary power	
Battery	3.6 V DC
Communication	
Radio	WirelessHART V7.1 conforming
Transmission frequency band	2.4 GHz (ISM-Band)
Transmission range under reference conditions	Up to 250 m (line of sight) in outside areas
	Up to 50 m (greatly dependent on obstacles) in inside areas
Communication interfaces	• HART communication with HART modem • WirelessHART
Certificates and approvals	
Wireless communication approvals	R&TTE, FCC
General product safety	CSA$_{US/C}$, CE, UL
Classification according to pressure equipment directive (PED 97/23/EC)	Gases: Fluid group 1
	Liquids: Fluid group 1;
	meets requirements as per Section 3, Subsection 3 (good engineering practice)

6

Industrial Wireless Communication
WirelessHART

SITRANS P280 for gauge and absolute pressure

Ordering data	Article No.
Configuration	
SITRANS P280 WirelessHART pressure transmitter (Required battery not included with delivery, see accessories)	**7MP1120 -** ■ ■ ■ ■ ■ **-** ■ ■ ■ **0**
Measuring cell filling	
Dry measuring cell	**0**
Measuring span	
Gauge pressure	
• 0 ... 1.6 bar (0 ... 23 psi)	**D**
• 0 ... 10 bar (0 ... 145 psi)	**E**
• 0 ... 50 bar (0 ... 725 psi)	**F**
• 0 ... 200 bar (0 ... 2900 psi)	**G**
• 0 ... 320 bar (0 ... 4641 psi)	**H**
Absolute pressure	
• 0 ... 1.6 bar a (0 ... 3 psia)	**M**
• 0 ... 10 bar a (0 ... 145 psia)	**N**
• 0 ... 50 bar a (0 ... 725 psia)	**P**
• 0 ... 200 bar a (0 ... 2900 psia)	**Q**
• 0 ... 320 bar a (0 ... 4641 psia)	**R**
Wetted parts	
Ceramic	**K**
Display	
Display, visible	**1**
Enclosure	
Die-cast aluminum	**1**
Process connection	
G½ as per EN 837-1	**0**
½-14 NPT	**1**
Explosion protection	
Without	**A**
Antenna	
Variable, attached to device	**A**

	Article No.
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	Order code
Stainless steel tag plate	
• Measuring point description max. 16 digits entered in plain text Y15:	**Y15**
• Measuring point message max. 27 characters entered in plain text: Y16:	**Y16**
Accessories	
Lithium battery for SITRANS TF280/P280	**7MP1990-0AA00**
Mounting bracket, steel	**7MF4997-1AC**
Mounting bracket, stainless steel	**7MF4997-1AJ**
Cover, die-cast aluminum, without window	**7MF4997-1BB**
Cover, die-cast aluminum, with window	**7MF4997-1BE**
IE/WSN-PA LINK with integral, non-detachable antenna	**6GK1411-6CA40-0AA0**
IE/WSN-PA LINK	**6GK1411-6CA40-0BA0**
HART modem with USB interface	**7MF4997-1DB**
SIMATIC PDM	see Catalog FI 01, Chap. 8

6

Overview

SITRANS TF280 for flexible and cost-effective temperature measurements

- Supports the WirelessHART standard (HART V 7.1)
- Very high security level for wireless data transmission
- Built-in local user interface (LUI) with 3-button operation
- Optimum display and readability using graphics display (104 x 80 pixels) with integrated background lighting
- Stand-by (deep sleep phase) on device can be turned on and off with a push of a button
- Battery power supply
- Battery service live up to 5 years
- Extend battery service life with HART modem interface which can be shut off
- Optimized power consumption through new design, and increase in battery service life
- Simple configuration thanks to SIMATIC PDM
- Housing meets IP65 degree of protection
- Supports all Pt100 sensors as per IEC 751/DIN EN 60751

Benefits

The SITRANS TF280 is a temperature transmitter that features Wireless HART as the standard communication interface.

Also available is a wired interface to connect a HART modem:

- Flexible temperature measurement
- Save costs on writing for difficult installation conditions. Wireless technology offers cost advantages in cases where extensive wiring cots would normally apply.
- It enables additional hitherto unfeasible measuring points, particularly for monitoring purposes
- Easy installation also on moveable equipment parts
- Enables cost-effective temporary measurements, for example for process optimizations.
- Optimum addition to wired communication and expansion of solution options for system solutions in process automation

Application

The SITRANS TF280 is a WirelessHART field device for measuring temperature with a Pt100 sensor.

This sensor can be installed directly on the field device, or connected at an offset with a cable connection. On the wireless communication side, the transmitter supports the WirelessHART standard. A HART modem can be connected to the transmitter particularly for initial parameterization.

It can be used in all industries and applications in non-explosive areas.

Design

The SITRANS TF280 has a robust aluminum enclosure and is suitable for outside use. It conforms with the IP65 safety class.

The operating temperature range is -40 to +80 °C (-40 to +176 °F). Power supply is provided through an integrated battery, which is available as an accessory. The device is only approved for operation with this battery.

The aerial features a rotatable joint which can be used for directional alignment. Wireless signals can thus be optimally received and transmitted.

A special highlight is the option for direct operation on the device. The operating strategy used in this case seamlessly integrates into the strategy of all new SIEMENS field devices.

Using the device's control buttons, it is easy to turn the HART modem interface of the device on and off. The device can be put to passive status and reactivated at any time. This helps to extend the service life of the battery.

The SITRANS TF280 transmitter features a cable gland or a Pt100 sensor including protective piping.

Function

The SITRANS TF280 can integrate itself into a WirelessHART network. It can be parameterized and operated through this network. Measured process values are transported via the network to the SIEMENS IE/WSN-PA LINK.

Field device data received by the IE/WSN-PA LINK is transmitted to the connected systems, for example the process control system SIMATIC PCS 7. For an introduction to the mode of operation of WirelessHART, please see the FI 01 catalog chapter 8 or at http://www.siemens.com/wirelesshart.

Detailed information on IE/WSN-PA LINK can be found in the FI 01 catalog chapter 8 or at http://www.siemens.com/wirelesshart.

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Industrial Wireless Communication
WirelessHART

SITRANS TF280, WirelessHART

Integration

Connecting to SIMATIC PCS 7

The integration of field devices in SIMATIC PCS 7 and other process control systems can now be done seamlessly and cost-effectively with wireless technology, especially in situations where high wiring costs may be expected. Of particular interest are measuring points which are to be added and for which no MSR wiring is available.

Where larger distances between the IW/WSN-PA LINK and control systems need to be overcome, this connection can also be implemented on a wireless and cost-effective basis using the products of the SCALANCE W family.

The Siemens WirelessHART devices are designed for optimum compatibility with products of the SCALANCE W family.
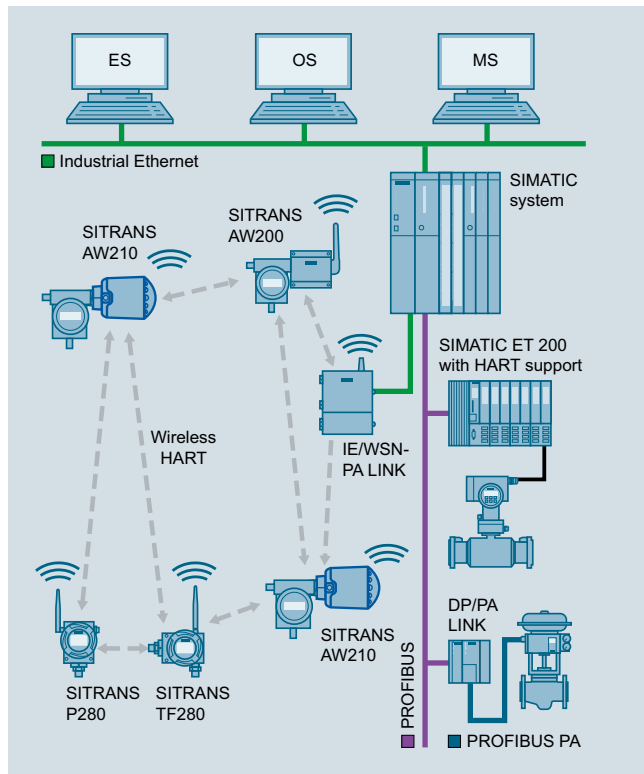
Integration of a meshed network into SIMATIC PCS 7

Configuration

Configuration of the SITRANS TF280 transmitter may be carried out as follows:

- Initial start-up for the SITRANS TF280 with SIMATIC PDM is generally carried out via a HART modem or the integrated local user interface, since the network ID and join key must be set up on the device before it can be accepted and integrated into the WirelessHART network.
- Once it is integrated into the network, the device can be conveniently operated with the WirelessHART network, the onsite HART modem or via the local user interface.

Technical specifications

The SITRANS TF280 can be mechanically installed in two ways:
- direct at the measuring point with a M20x1.5 thread Connection to other threads can be done via the adapter.
- offset from Pt100 sensor, which is connected to the transmitter via a cable

The details in the table below relate to the transmitter without taking into account a connected sensor, unless otherwise specified.

SITRANS TF280 WirelessHART temperature transmitter	
Input	
Sensor	
• Sensor type	Pt100 as per IEC 751/EN 60751[1]
• Connection	Two, three or four-wire system
• Measuring range	-200 ... +850 °C (-328 ... +1560 °F)
Cable length SITRANS TF280 and Pt100 sensor element	≤ 3 m
Measuring accuracy[2]	
Accuracy	< 0.4 % of the measured value
Long-term drift	< 0.035 % of the measuring range in first year
Temperature drift	max. ±0.01 °C/10 K
Conditions of use	
Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
Storage temperature	-40 ... +85 ° C (-40 ... +185 °F)
Relative humidity	< 95%
Climatic class	4K4H in accordance with EN 60721-3-4 (stationary use at locations not protected against weather)
Degree of protection	IP65/NEMA 4
Max. permissible temperature at transmitter for directly mounted Pt100	80 °C (176 °F)
Design	
Enclosure	Die-cast aluminum
Shock resistance	in accordance with DIN EN 60068-2-29 / 03.95
Resistance to vibration	DIN EN 60068-2-6/12.07
Weight	
• without battery	1.5 kg (3.3 lb)
• With battery	1.6 kg (3.5 lb)
Dimensions (W x H x D)	See "Catalog FI 01"
Thread for cable gland/sensor connection	M20x1.5 other threads via adapter
Cable between transmitter and sensor element	≤ 3 m for two-, three- or four-wire connections
	Cable resistance < 1 Ω (setting range in mΩ 0...9999)
Sensor break	Is recognized

▌Technical specifications (continued)

SITRANS TF280 WirelessHART temperature transmitter	
Displays and controls	
Display (with illumination)	
• Size of display	104 x 80 pixels
• Number of digits	adjustable
• Number of spaces after comma	adjustable
Setting options	• on site with 3 buttons • with SIMATIC PDM or HART Communicator
Auxiliary power	
Battery	3.6 V DC
Communication	
Wireless standard	WirelessHART V7.1 conforming
Transmission frequency band	2.4 GHz (ISM-Band)
Range under reference conditions)	Up to 250 m (line of sight) in outside areas
	Up to 50 m (greatly dependent on obstacles) in inside areas
Communication interfaces	• HART communication with HART modem • WirelessHART
Certificates and approvals	
Wireless communication approvals	R&TTE, FCC
Pressure equipment directive	This device does not fall under the pressure equipment directive.

[1] Preassembled Pt100: Class A (maximum MES: 0.15 + 0.002*|t| °C)

[2] Error calculation:
- Probable overall error = $\text{Ö}(MES^2 + AET^2 + LTD^2 + ATE^2)$
- Maximum overall error = MES + AET + LTD + ATE
- |t|: Absolute total of the measured temperature
- MES: Measuring error of the sensor
- AET: Measuring error of the transmitter (A/D conversion)
- LTD: Long-term drift
- ATE: Drift via ambient temperature

▌Ordering data

	Article No.

Configuration

SITRANS TF280 WirelessHART Temperature transmitter (Required battery not included with delivery, see accessories)	7MP1110 - 0 A ■ ■ ■ - 0 ■ ■ 0					
Connections/cable entry						
Cable gland M20x1.5 [1]			C			
Sensor pipe with Pt100, G½" male thread, pre-mounted and connected			D			
Display						
Digital display, visible				1		
Enclosure						
Die-cast aluminum					1	
Explosion protection						
Not included						A
Antenna						
Variable, attached to device						A

Further designs

	Order code
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
• Measuring point number (TAG No.) max. 16 digits entered in plain text Y15:	**Y15**
• Measuring point message max. 27 characters entered in plain text: Y16:	**Y16**

Accessories

Lithium battery for SITRANS TF280/P280	**7MP1990-0AA00**
Mounting bracket, steel	**7MF4997-1AC**
Mounting bracket, stainless steel	**7MF4997-1AJ**
Cover, die-cast aluminum, without window	**7MF4997-1BB**
Cover, die-cast aluminum, with window	**7MF4997-1BE**
Thread adapter M20x1.5 (male thread) on ½-14 NP (female thread)	**7MP1990-0BA00**
Thread adapter M20x1.5 (male thread) on G½B (female thread)	**7MP1990-0BB00**
IE/WSN-PA LINK with integral, non-detachable antenna	**6GK1411-6CA40-0AA0**
IE/WSN-PA LINK N connector for connection of external antennas	**6GK1411-6CA40-0BA0**
HART modem with USB interface	**7MF4997-1DB**

[1] Please order sensor separately.

6

Industrial Wireless Communication
WirelessHART

SITRANS AW200 WirelessHART adapter

■ Overview

SITRANS AW200 WirelessHART Adapter

The SITRANS AW200 WirelessHART adapter is a battery-powered communication component, which integrates HART and 4 ... 20 mA field devices into a WirelessHART network. On the wireless communication side, the adapter supports the WirelessHART standard. HART and 4 ... 20 mA field devices are connected on the field device side.

The SITRANS AW200 WirelessHART adapter

- support the WirelessHART standard (HART V 7.1)
- features a very high degree of security for wireless data transmission
- integrates one 4 ... 20 mA field device or up to four HART field devices (in multidrop mode) into a WirelessHART network
- features intelligent energy management for the power supply of connected field devices
- can be easily parameterized using SIMATIC PDM

■ Benefits

- High quality and service life
- Save on wiring costs in difficult installation conditions (e.g. for moveable components) and for temporary installations.
- Subsequent integration of an installed field device with a HART interface into maintenance and diagnostic systems if the control system does not feature the required communication mechanisms. See page 9/3.
- Proven HART devices can continue to be used for wireless communication without any limitations.
- Field devices with a 4 ... 20 mA interface (without HART) can also be connected.
- Intelligent energy management to achieve the best possible service life for the installed battery unit
- Optimum addition to wired communication and expansion of solution options for system solutions in process automation
- Burst mode and event notification configuration for the adapter and connected field devices.

■ Application

The WirelessHART adapter can be used in a number of different applications:

- Access to installed basis
  Diagnostic information is obtained from existing wired HART devices thanks to the permanent electrical connection of a WirelessHART adapter, and is sent to system-based asset management software such as SITRANS MDS.
- Status monitoring of system
  Wireless devices are mounted at critical points in the system, which are not usually connected to the control room due to difficult accessibility or extensive costs for wiring. Better data flow and diagnostics increase plant reliability, transparency and safety.
- Process optimization
  Temporary installation of a 4 ... 20mA or standard HART device together with a SITRANS AW200 WirelessHART adapter allows easier, flexible monitoring and plant optimization at lower costs.
- Process monitoring
  Measured values, for example from tanks or silos, are transmitted to a higher-level system at regular intervals, together with the device and battery status.

Design

SITRANS AW200 WirelessHART Adapter consists of

- An enclosure with a fitted aerial
- Electronics
- A high-performance lithium battery unit

1	LED
2	Push button
3	Plug to connect battery
4	Battery compartment
5	Terminals 1 to 6
6	Terminal tag for HART modem
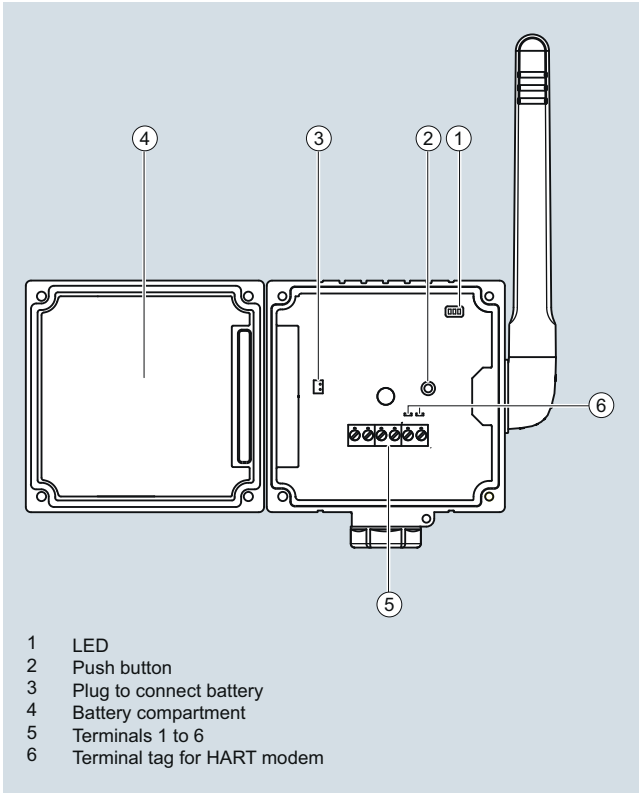
SITRANS AW200 Wireless-HART Adapter, assembly

The enclosure can be opened by loosening 4 screws. This enables you to access the electronics and battery unit. The battery unit is removed without the use of tools, since it is connected to the housing with clips.

On the back of the enclosure is the connector with a fixing nut onto which various different replaceable connecting pieces can be screwed to mount the adapter straight onto a field device.

On the base of the enclosure is an optional cable inlet which can be used for a cable gland. Up to 2 cables can be inserted for offset adapter installation.

Function
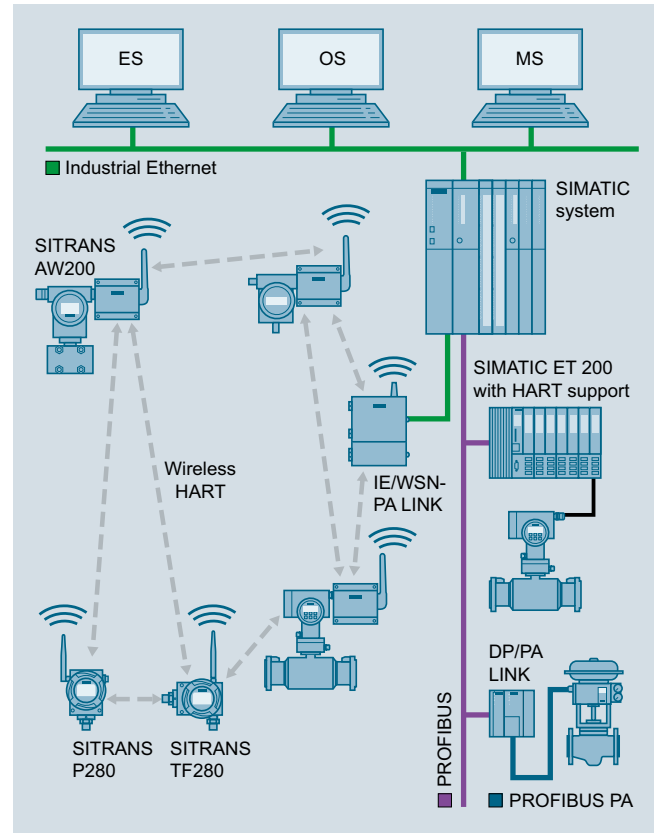
SITRANS AW200 WirelessHART Adapter. functional diagram

Measured values and diagnostic information of connected field devices with HART communication are transmitted via a wired connection to the WirelessHART adapter. The adapter transmits this information in the form of wireless signals to the IE/WSN-PA link, the Siemens WirelessHART gateway. From here, the information is available to the network of the system.

If a field device with a 4 ... 20 mA output signal is connected to the adapter, only the measured value will be transmitted.

Following configuration and integration into a WirelessHART network, each WirelessHART adapter is able to recognize its neighbors. It notes the strength of the wireless signal, synchronizes itself, receives network information and then establishes connections to its neighbors in the wireless network. A WirelessHART network organizes itself. Manual settings for organization are not required.

Two and four-wire field devices can be connected to a WirelessHART adapter. In the case of a connected two-wire field device, voltage can be supplied by the adapter. Where multiple two-wire field devices are connected (multi drop operation), the adapter must be connected to an external power supply.

The WirelessHART adapter may also be connected in parallel to an already existing installation which consists of a power supply and a HART field device.

Industrial Wireless Communication
WirelessHART

SITRANS AW200 WirelessHART adapter

◼ Function (continued)

Interface	Connection	Function
1		Power supply for the field device
2		HART/4 ... 20 mA
3		External supply/Dimensions
4		High-resistance HART connection
5, 7		High-resistance HART connection
6, 8		Mass, high-resistance connection

Terminal block with 6 screw connection clamps

Parameterization

SITRANS AW200 configured via HART. Configuration can be carried out using a handheld communicator or, more conveniently, with a HART modem and the SIMATIC PDM configuration software.

Initial startup of the adapter is usually carried out via SIMATIC PDM and a HART modem or a handheld communicator. During initial startup, the network ID and join key are set in the adapter. These parameters are used to integrate the adapter into an existing WirelessHART network.

Following integration into the network, the adapter and HART devices connected can be conveniently operated via the WirelessHART network or with the local HART modem.

Siemens HART field devices for the adapter

HART and 4…20mA field devices can be connected to the SITRANS AW200 WirelessHART adapter. Depending on the electrical data of the field devices, they can receive their power supply from the WirelessHART adapter or will require an external power supply.
See http://www.siemens.com/automation/service&support for FAQ with the latest information on connectivity for Siemens field devices.

Note:

Siemens has only approved the Siemens HART field devices listed there for the adapter, and will only provide technical support for these devices.

Based on HART specifications, it is generally possible to connect devices that are not listed, however with the following limitations:

• All warranties and liability will be excluded
• No technical support

◼ Technical specifications

Input	
Input	Point-to-Point connection to a HART field device or
	Point-to-Point connection to a 4 ... 20 mA field device or
	up to four HART field devices with external power supply which are integrated using the multidrop method
Communication	HART communication using multidrop method, 4 ... 20 mA power signal with Point-to-Point connection
Protocol	HART V7 (compatible with previous HART versions)
Transfer rate	1200 bits/s using HART multidrop method
Output	
Communication	WirelessHART V7
Transfer rate	Nominal 250 kBits/s
Transmission frequency band	2.4 GHZ (ISM band)
Range (under reference conditions)	Outside areas up to 250 m, within buildings up to 50 m
RF signal strength	Can be configured: 0 dBm and 10 dBm
Output signals	
• WirelessHART Adapter	Measured voltage and up to three other variables may be selected from the following: adapter temperature, battery voltage, energy consumed, expected battery service life
• 4 ... 20 mA field device	Scaled or linearized process values
• HART field device	up to four process variables, can be configured via PDM or gateway
Measuring accuracy (as per reference conditions IEC 61298-2)	
Max. measuring error (4 ... 20 mA circuit)	0.125 % re: measuring range
Effect of ambient temperature (4 ... 20 mA circuit)	5 µA/0°K
Rated conditions	
Location	Outside/Inside
Ambient conditions	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
	The capacity of the battery decreases rapidly if ambient temperature falls flow -30 °C.
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F) without batteries
	< 21 °C with batteries
• Relative humidity	Max 90 % at 25 °C (non-condensating)
• Resistance to vibration	$20 \leq f \leq 2000$ Hz: 0.01 g²/Hz as per IEC 68-2-64
• Shock resistance	15 g, 11 ms as per IEC 68-2-27
Electromagnetic compatibility	As per EN 61326, EN 301 489-1/17 and NAMUR NE 21

■ Technical specifications (continued)

Design	
Weight	0.5 kg without battery, 0.75 kg with battery
Enclosure	
• Material	Polyester (PBT FR)
• Cable entry	2x M20x1.5
Degree of protection	IP65, IP66; NEMA 4
Aerial	Omnidirectional dipolar aerial, vertical rotation
Mounting adapter	M20x1.5 on M20x1.5, M20x1.5 on G½, M20x1.5 on ½ - 14 NPT, M20x1.5 on ¾ - 14 NPT

Auxiliary power	
Battery	Lithium thionylchlorid high-performance battery unit
Power supply	5 V DC ... 7.2 V DC
Capacity	19 AH at 20 °C
Service life	5 ... 7 years, depending on update rate, connected field device and ambient conditions
Field device voltage supply (not in multidrop mode)	
• No-load voltage	8 ... 23 V DC
• Current	4 … 20mA (in accordance with NAMUR Recommendation NE 43)
• Fault current (not with multidrop)	I ≤ 3.6 mA or I ≥ 21 mA
• Protection	Short-circuit proof, activated at voltages > 25 mA
Voltage supply for one or more field devices (in multidrop mode)	
• Power	< 30 V direct current
• Current	< 25 mA

Certificates and approvals	
Wireless communication approvals	ETSI (R&TTE)
	FCC Part 15.247 for wireless applications in the 2.4 GHz transmission frequency band
	EN 300 328

■ Ordering data   Article No.

Configuration

SITRANS AW200 adapter for Wireless HART Communication	**7MP3112 -** ■ ■ ■ ■ **0 - 0 A A 0**		
WirelessHART adapter AW200 with 4 ... 20 mA- or HART interface			
Without battery	**1**		
Power supply			
Battery powered	**A**		
Certificates and approvals[1]			
Without	**A**		
Enclosure			
Polyester	**0**		

Accessories

Lithium battery for SITRANS AW200	**7MP3990-0AA00**
Thread adapter for direct mounting of the adapter to a field device	
• M20 thread adapter	**7MP3990-0BA00**
• Thread adapter G½	**7MP3990-0BB00**
• Thread adapter ½" - 14 NPT	**7MP3990-0BC00**
• Thread adapter ¾" - 14 NPT	**7MP3990-0BD00**
Mounting bracket for attaching to wall/pipe, material: stainless steel SS304, including cable gland	**7MP3990-0CA00**

[1] Additional approvals in process

Note:

Circuit diagrams and dimensional drawings can be found in Catalog FI 01.

6

Industrial Wireless Communication
WirelessHART

SITRANS AW210 WirelessHART adapter

Overview

SITRANS AW210 WirelessHART adapter

The WirelessHART adapter SITRANS AW210 is a communication component which can integrate a wide range of field devices into a WirelessHART network. On the wireless communication side, the adapter supports the WirelessHART standard. HART and 4 to 20 mA field devices are connected on the field device side.

The WirelessHART adapter SITRANS AW210

- Supports the WirelessHART standard (HART V 7.1)
- Features an extremely high degree of security for wireless data transmission.
- Integrates a 4 to 20 mA field device into a WirelessHART network
- Integrates up to eight HART field devices (in multidrop mode) into a WirelessHART network
- Can be powered with the 4 to 20 mA loop or an external power supply
- Power management can be activated to minimize energy consumption
- Easy to configure with SIMATIC PDM, AMS, Handheld 475.

Benefits

- "Intrinsically safe" or "Explosion proof"
- High quality and service life
- Extremely rugged enclosure
- No additional cabling required with loop power supply
- Subsequent integration of an installed field device with HART interface into maintenance and diagnostic systems if the control system does not feature the required communication mechanisms
- Proven HART devices can continue to be used for wireless communication without any limitations
- Field devices with a 4 to 20 mA interface (without HART) can also be connected
- Ideal addition to wired communication and to the range of system solutions in process automation
- Burst mode and event notification configuration for the adapter and connected field devices

Application

The WirelessHART adapter can be used in a number of different applications:

- Access to installed basis
  Diagnostic information is obtained from existing wired HART devices thanks to the permanent electrical connection of a WirelessHART adapter and power from the 4 to 20 mA loop. This information is sent to central system-based asset management software such as SITRANS MDS.
- Status monitoring of the plant
  Wireless devices are mounted at critical points in the plant which are not usually connected to the control room due to difficult access or high wiring costs. Better data flow and diagnostics increase plant reliability, transparency and safety.
- Process optimization
  Temporary installation of a 4 to 20mA or standard HART device together with a SITRANS AW210 WirelessHART adapter allows easier, flexible monitoring and plant optimization at lower costs. SITRANS AW210 can also be usefully used where there is already an external power supply, or one is needed anyway.
- Process monitoring
  Measured values, for example from tanks or silos, are transmitted to a higher-level system at regular intervals together with the device status. SITRANS AW210 is particularly easy to use with 4-wire devices, as they have an external power supply.

Design

SITRANS AW210 WirelessHART Adapter consists of:
- An enclosure with a fitted aerial
- Electronics

① Ground connection
② Enclosure with potted aerial
③ ½" NPT screw connection
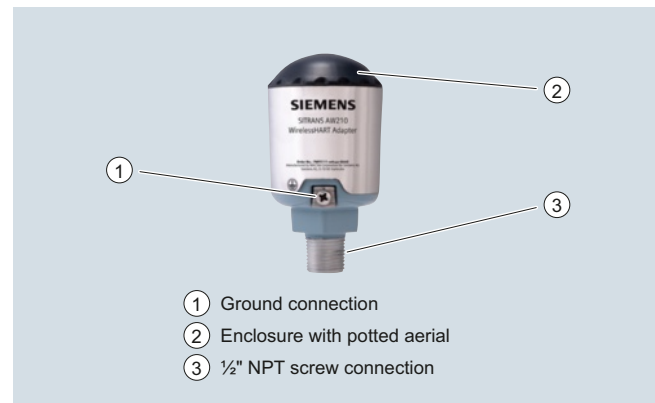
SITRANS AW210 Wireless-HART Adapter, assembly

The enclosure contains the potted electronics and the wireless module. The aerial is fitted at the top in the enclosure.

On the base of the enclosure is the connector with a ½" NPT female thread. Six cables run from this connector to connect the adapter.

6

■ **Function**

SITRANS AW210 WirelessHART Adapter, functional diagram

The measured values and diagnostic information from the connected field devices with HART communication are transmitted to the WirelessHART adapter over wired connections. The adapter transmits this information as wireless signals to the IE/WSN-PA link, the Siemens WirelessHART gateway. The measured values, all parameters and diagnostic information about the plant network can be accessed from this gateway.

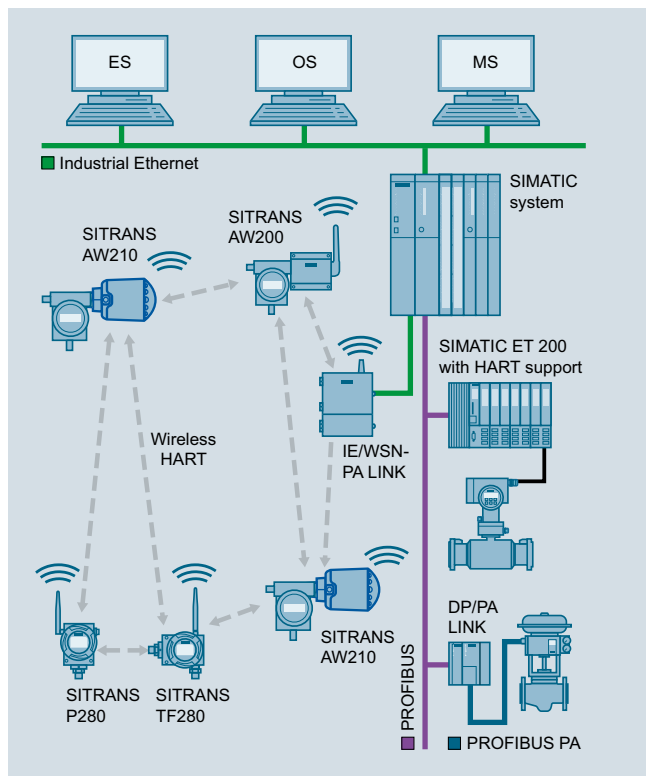If a field device with a 4 to 20 mA output signal is connected to the adapter, the current will be converted to a digital measured value and transmitted on the basis of a measuring range specified in SITRANS AW210.

Following configuration and integration into a WirelessHART network, each WirelessHART adapter is able to recognize its neighbors. It notes the strength of the wireless signal, synchronizes itself, receives network information and then establishes connections to its neighbors in the wireless network.
A WirelessHART network organizes itself. Manual settings for organization are not required.

Two-wire and four-wire field devices can be connected to a WirelessHART adapter. Either up to 2 or up to 8 HART field devices can be connected to the adapter, depending on the selected product version. The adapter either has an external voltage supply or is loop-powered. The WirelessHART adapter can therefore also be connected in parallel to an existing installation consisting of a voltage supply and a HART field device.

Parameter assignment

SITRANS AW210 is configured via HART. Configuration can be carried out using handheld communicator 475 or, more conveniently, with a HART modem and the SIMATIC PDM configuration software.

Initial startup of the adapter is usually carried out via SIMATIC PDM and a HART modem or a handheld communicator. During initial startup, the network ID and join key are set in the adapter. These parameters are used to integrate the adapter into an existing WirelessHART network.

Following integration into the network, the adapter and HART devices connected can be conveniently operated via the WirelessHART network or locally, as detailed above.

Siemens HART field devices for the adapter

In principle, all HART devices certified by the HART Communication Foundation (HCF) can be operated with the SITRANS AW210 WirelessHART adapter.
See http://www.siemens.com/automation/service&support for FAQ with the latest information on connectivity for Siemens field devices.

Note:

Siemens has only approved the Siemens HART field devices listed there for the adapter, and will only provide technical support for these devices.

Based on HART specifications, it is generally possible to connect devices that are not listed, however with the following restrictions:

• All warranties and liability will be excluded
• No technical support

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Industrial Wireless Communication
WirelessHART

SITRANS AW210 WirelessHART adapter

Technical specifications

Input	
	Point-to-point connection to a HART field device or Point-to-point connection to a 4 ... 20 mA field device or Up to eight HART field devices with an external voltage supply integrated using multidrop

Communication	• HART communication with multi-drop, as primary or secondary HART master (can be specified)
	• 4 ... 20 mA current signal with a point-to-point connection scaling in user-defined measuring range in SITRANS AW210
	  - Linear
	  - User-defined scaling with up to 32 points

Protocol	HART V7 (compatible with previous HART versions)

Output	
Communication	WirelessHART V7
Transmission frequency band	2.4 ... 2.4835 GHz (ISM band), 16-channel frequency hopping spread spectrum
Range (under reference conditions)	Outside up to 235 m (771.00 ft)
RF signal strength	10 dBm
Output signals	
• WirelessHART adapter	• HART Cmd 3 Measured current and up to 4 other dynamic variables (measured values, derived values) or device variables • HART Cmd 9 Up to 8 dynamic variables with status • HART Cmd 48 Additional status information
• 4 ... 20 mA field device	Scaled or linearized process values
• HART field device	• HART Cmd 3 Measured current and up to 4 other dynamic variables (measured values, derived values) or device variables • HART Cmd 9 Up to 8 dynamic variables with status • HART Cmd 48 Additional status information

Update time for output signals	
	You can set the update times separately for the adapter and the connected devices. The possible settings are: • 1, 2, 4, 8, 16, 32 s • 1, 2, 5, 10, 30, 60 min (times also depend on the gateway)

Measuring accuracy	
Max. measuring error (4 ... 20 mA circuit)	1 % of measuring range, 40 ... 85 °C (104 ... 185 °F)

Rated conditions	
Location	Outside/inside
Ambient conditions • Ambient temperature	-40 ... +85 °C (-40 ... +185 °F) In hazardous areas up to 75 °C (167 °F)
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
Electromagnetic compatibility	To EN 301 489-17 and EN 300 328-1

Design	
Weight	0.46 kg (1.01 lb)
Enclosure • Material	Enclosure: Aluminum alloy, RoHS-compliant polyurethane corrosion-resistant coating Cap: Resin
• Cable entry	½" NPT female thread
Degree of protection	IP68
Aerial	Potted in enclosure

Auxiliary power	
Power supply	Loop power 1 ... DC 2.5 V, can be set by user in 0.5 V DC increments
Loop-powered, operating current	DC 3.2 ... 25 mA operating current; overvoltage, surge and reverse polarity protection

Certificates and approvals	
Wireless communication approvals	• CE (R&TTE, EMC) • FCC Part 15.247 for wireless applications in the 2.4 GHz transmission frequency band • IC

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Technical specifications (continued)

Explosion protection	
Intrinsic safe "i" gases and vapors	II 1G Ex ia IIC T*; IP68 T* = T5 for Ta = -40 ... +85 °C T* = T6 for Ta = -40 ... +75 °C
Intrinsic safe dust	II 1 D Ex iaD 20 IP68 T95C; Ta = -40 ... +85 °C
Non-sparking (zone 2)	II 3 G Ex nA nC IIC T* Gc; IP68 T* = T5 for Ta = -40 ... +85 °C T* = T6 for Ta = -40 ... +75 °C
Explosion protection to FM for US Intrinsic safe, Non-sparking	IS/I,II,III/1/ABCDEFG/ T5 Ta = -40 ... +85 °C, T6 Ta = -40 ... +75 °C NI/I/2/ABCD/ T5 Ta = -40 ... +85 °C, T6 Ta = -40 ... +75 °C S/II,III/2/EFG/ T5 Ta = -40 ... +85 °C, T6 Ta = -40 ... +75 °C I/0/AEx ia/IIC/ T5 Ta = -40 ... +85 °C T6 Ta = -40 ... +75 °C; 20/AEx iaD/T95°C; Ta = -40 ... 85°C I/2/AEx nA nC/IIC/ T5 Ta = -40 ... +85 °C, T6 Ta = -40 ... +75 °C; IP68
Explosion protection to FM for CA Intrinsic safe, Non-sparking	IS/I,II,III/1/ABCDEFG/ T5 Ta = -40 ... +85 °C T6 Ta = -40 ... +75 °C; NI/I/2/ABCD/ T5 Ta = -40 ... +85 °C T6 Ta = -40 ... +75 °C; S/II,III/2/EFG/ T5 Ta = -40 ... +85 °C T6 Ta = -40 ... +75 °C; I/0/Ex ia/IIC/ T5 Ta = -40 ... +85 °C T6 Ta = -40 ... +75 °C; I/2/Ex nA nC/IIC/ T5 Ta = -40 ... +85 °C T6 Ta = -40 ... +75 °C II/1/EFG Ta = -40 ... +85°C; IP68
Flameproof gases and vapors	II 2 G Ex d IIC T* Gb; IP68 T* = T5 for Ta = -40 ... +85 °C T* = T6 for Ta = -40 ... +75 °C
Protection by enclosure dust	II 2 D Ex tb IIIC T95°C Ta = -40 ... +85°C; IP68
Explosion protection to FM for US Explosionproof, flameproof, gas, dust	XP/I/1/ABCD I/1 AEx d IIC T5, T6 Gb DIP/II,III/1/EFG 21/AEx tb IIIC T95°C T5 Ta = -40 ... +85°C, T6 Ta = -40 ... +75°C Type 6P, IP68
Explosion protection to FM for CA Explosionproof, flameproof, gas, dust	XP/I/1/ABCD I/1 Ex d IIC T5, T6 Gb DIP/II,III/1/EFG T5 Ta = -40 ... +85°C, T6 Ta = -40 ... +75°C

Ordering data

	Article No.
Configuration	
SITRANS AW210 **Adapter for WirelessHART** **Communication**	**7MP3111 -** ■ ■ ■ ■ **0 - 0 A A 0**
WirelessHART-Adapter AW210 **with 4 ... 20 mA-** **or HART-interface**	
• 2 devices	1
• 8 devices	2
Auxiliary power	
Loop powered or 24 VDC (external)	A
Certificates and approvals	
Intrinsically safe gas, vapors and dust (ATEX), Intrinsic Safe (FM)	B
Explosionproof gas, vapour and dust (ATEX), Explosionproof (FM)	C
Enclosure	
Aluminum	0

Note:

Circuit diagrams and dimensional drawings can be found in Catalog FI 01.

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Industrial Wireless Communication
WirelessHART

IE/WSN-PA LINK

■ Overview

- The IE/WSN-PA LINK is a network transition for the connection of WirelessHART field devices (HART V7.1) to Industrial Ethernet, as an alternative or supplement to the wired connection.
- Connection of up to 100 WirelessHART devices
- Approved for operation in hazardous areas in Zone 2
- Open TCP/IP communication and Modbus TCP via the Ethernet interface
- Can be used with HART-OPC servers of the HART Communication Foundation

Note:

A general introduction to WirelessHART and information on the WirelessHART adapter and the WirelessHART field devices can be found in Catalog FI 01 or on the Internet at http://www.siemens.com/wirelesshart

■ Benefits

get Designed for Industry

- Extended possible solutions for connecting process industry field devices by means of alternative or supplementary WirelessHART communication
- Reliable data transmission using intermeshed network technology; the self-organizing network with alternative paths enables radio obstacles to be bypassed
- Reduction of cabling costs under difficult installation conditions, e.g. if the field devices are located on inaccessible plant components or are only required temporarily
- To improve process monitoring and for maintenance tasks, sensors can be retrofitted
- Existing transmitters can be integrated wirelessly into maintenance and diagnostics systems by means of WirelessHART adapters
- Without additional software, restricted monitoring is possible via web services and the integrated web server of the IE/WSN-PA LINK.

■ Application

The IE/WSN-PA LINK connects wireless HART field devices by radio to the Ethernet. On the radio side, the IE/WSN-PA LINK supports the WirelessHART standard and on the Ethernet side the TCP/IP and Modbus TCP communication.

The IE/WSN-PA LINK thus enables wireless diagnostics, maintenance and process monitoring.

Monitoring

WirelessHART is particularly suitable for use in plant sections that are to be included in monitoring, but which do not have any existing MSR cabling, e.g. external tank stores or other installations where high cabling costs are anticipated. Data for the visualization can be retrieved from the IE/WSN-PA link via Industrial Ethernet or Modbus TCP.
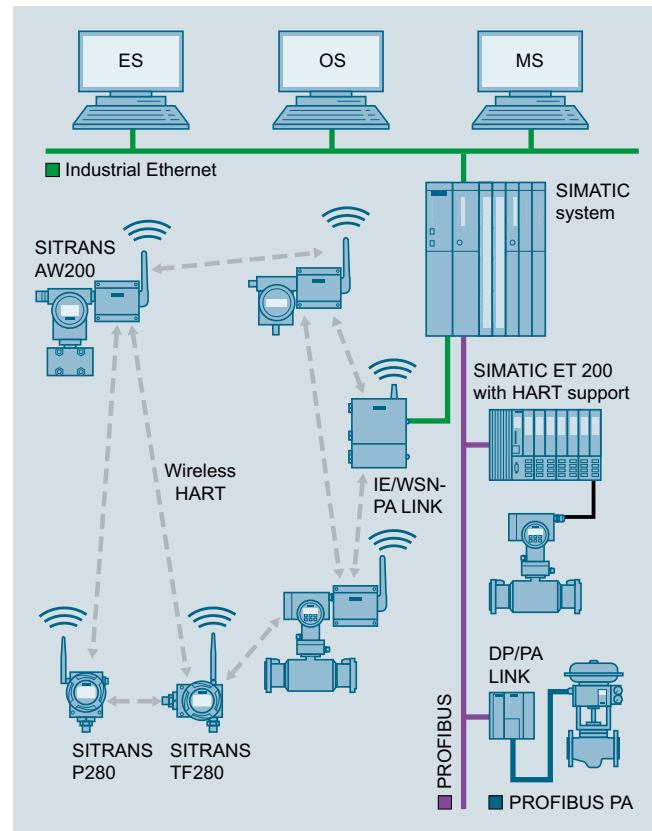
Monitoring of process states via WirelessHART

Application (continued)

Retrofitting for diagnostics and maintenance

For this application, wireless adapters are looped into the 4-20 mA interface or screwed directly onto the HART device. The acyclic HART message frames are transmitted by radio between IE/WSN-PA LINK and a wireless adapter. Without affecting the operation of the plant, the wireless adapter modulates the acyclic HART message frames to the 4-20 mA interface or extracts them from the 4-20 mA interface.

The IE/WSN-PA LINK collects the data of all wireless adapters and transfers it via Industrial Ethernet to the diagnostics and maintenance station.

If greater distances between the IE/WSN-PA LINK and the monitoring station are to be spanned without cabling, this can be implemented by means of Industrial Wireless LAN with the access points and client modules of the SCALANCE W family.
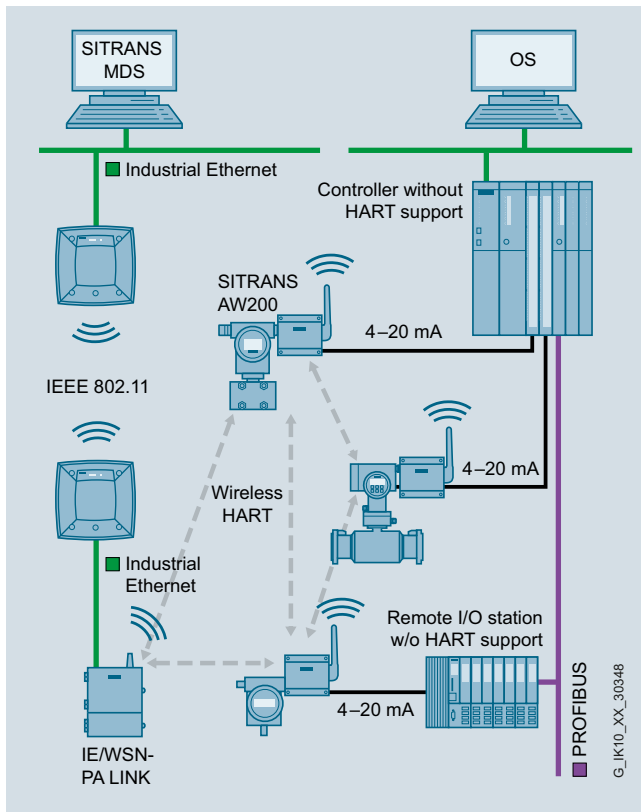
Retrofitting of plants for diagnostics and maintenance

Design

- 2 x 10/100/1 000 Mbit/s RJ45 ports, electrical (no integral switch; interfaces can be used, for example, for continuous connection to the plant network as well as the temporary connection of a PC)
- 1 x screw terminal for connection to Modbus RTU via RS485
- 1 x screw terminal for the 24 V DC connection
- Rugged metal enclosure with IP65 protection for use outdoors, also in hazardous zone 2
- Mounting: wall or mast mounting (vertical); U-bolts for mast mounting are included in the scope of delivery.

Product versions

- With integral, non-detachable antenna
- Redundancy function and with N connector for connection of an external antenna

Function

WirelessHART

The IE/WSN-PA LINK establishes on the radio side an inter-meshed wireless sensor network for communication with wireless field devices (e.g. transmitters). The data from the wireless field devices is received by the IE/WSN-PA LINK and transmitted via Industrial Ethernet to the connected systems. The supported wireless network is an open wireless network specified by the HART Communication Foundation (HCF) in accordance with the WirelessHART (HART V7.1) standard.

On the field device side, the IE/WSN-PA LINK requires field devices that support WirelessHART (HART). Existing field devices can be integrated by means of wireless adapters into the WirelessHART communication. To this end, the adapters are looped into the 4-20 mA interface. In addition, as many as four standard HART field devices with external power supply can be connected to the adapter in multidrop mode. Individually connected devices can be operated with the battery of the adapter.

The adapter wirelessly transmits all data and process values of the connected devices. The advantage of this solution is that tried and tested devices can continue to be used.

Industrial Ethernet

Via the Ethernet interface the IE/WSN-PA LINK supports the use of the HART OPC server and the Modbus TCP protocol.

Configuration

The configuration is web-based, without additional software, and performed from the PC. By means of the web user interface it is also possible to display the device states and measured values of the WirelessHART devices.

Industrial Wireless Communication
WirelessHART

■ Function (continued)

Increased availability of WirelessHART application due to redundancy mode

For increased availability requirements, the link can be used redundantly. The redundancy function is only available for the device variant with a connection for an external antenna.

Two links are connected to the same Ethernet subnet via a switch to provide the redundancy. The two links are connected to each other via an Ethernet cable (management coupling). One of the two links is configured as the active device. It carries out the communication between the control center and the WirelessHART wireless network under normal conditions. The second link is configured identically. It is used as a standby device. In a redundancy scenario, the standby device becomes the active device.
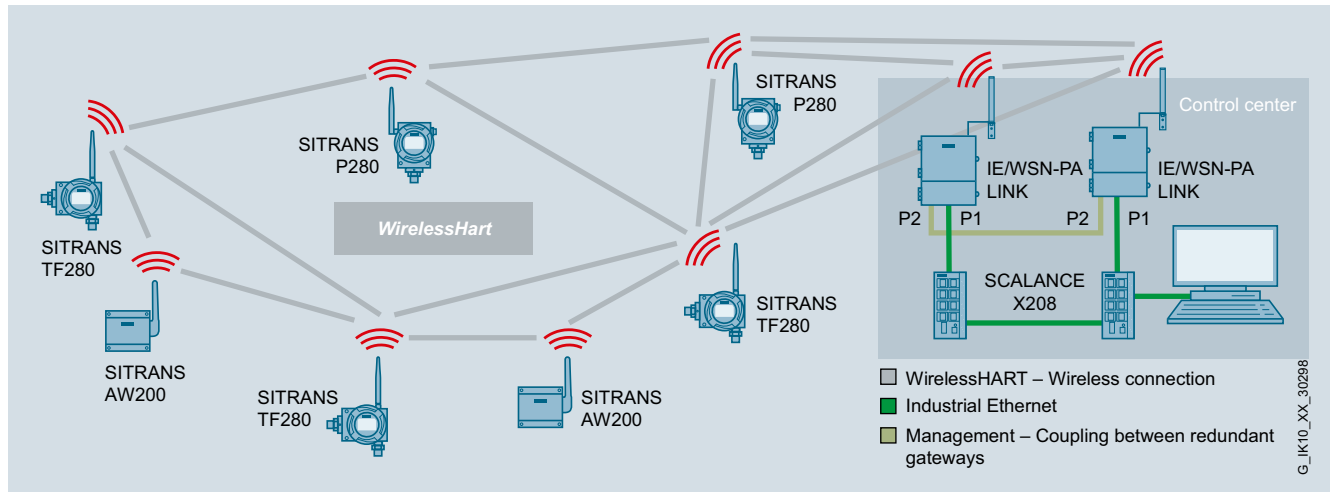
WirelessHART network operated with a redundant gateway

■ Integration

Integration into automation systems

The IE/WSN-PA LINK can be integrated into automation systems via Ethernet or Modbus TCP. Communication modules (CP 343-1 or CP 443-1) are required to connect the IE/WSN-PA LINK to SIMATIC S7-300/400. Function blocks and technical support can be found at:

www.siemens.com/simatic-net/ik-info

Integration in PCS 7

For integration of the IE/WSN-PA LINK into PCS 7 you can obtain function blocks and technical support at:

www.siemens.com/simatic-net/ik-info

■ **Technical specifications**

Article No.	6GK1411-6CA40-0AA0	6GK1411-6CA40-0BA0
Product-type designation	IE/WSN-PA LINK	IE/WSN-PA LINK
Transfer rate		
• at the interface 1	10 … 100 Mbit/s	10 … 100 Mbit/s
• at the interface 2	10 … 100 Mbit/s	10 … 100 Mbit/s
• at interface 3	9.6 … 57.6 kbit/s	9.6 … 57.6 kbit/s
Interfaces		
Number of electrical connections		
• at interface 1 in accordance with Industrial Ethernet	1	1
• at interface 2 in accordance with Industrial Ethernet	1	1
• at interface 3 in accordance with RS 485	1	1
• for power supply	1	1
Design of electrical connection		
• at interface 1 in accordance with Industrial Ethernet	RJ 45 port	RJ 45 port
• at interface 2 in accordance with Industrial Ethernet	RJ 45 port	RJ 45 port
• at interface 3 in accordance with RS 485	2-pole terminal strip	2-pole terminal strip
• for power supply	3-pole terminal strip	3-pole terminal strip
Interfaces wireless		
Number of radio cards permanently installed	1	1
Number of internal antennas	1	0
Number of electrical connections for external antenna(s)	0	1
Design of the electrical connection for external antenna(s)	-	N-Connector
Supply voltage, current consumption, power loss		
Type of voltage supply	DC	DC
Supply voltage external	24 V	24 V
• minimum	20 V	20 V
• maximum	28 V	28 V
Consumed current from external supply voltage at 24 V with DC maximum	0.5 A	0.5 A
Active power loss maximum	12 W	12 W
Permitted ambient conditions		
Ambient temperature		
• during operating	-40 … +70 °C	-40 … +70 °C
• during storage	-40 … +85 °C	-40 … +85 °C
• during transport	-40 … +85 °C	-40 … +85 °C
Relative humidity at 25 °C without condensation during operating maximum	90 %	90 %
Protection class IP	IP 65	IP 65
Design, dimensions and weight		
Width of the housing	229 mm	229 mm
Height of the enclosure		
• without antenna	306 mm	306 mm
• with antenna	354 mm	354 mm
Depth of the housing	89 mm	89 mm
Net weight	4.54 kg	4.54 kg
Mounting type		
• wall mounting	Yes	Yes
• mast mounting	Yes	Yes
Mounting type	Material for mast mounting included in scope of delivery	Material for mast mounting included in scope of delivery

Industrial Wireless Communication
WirelessHART

IE/WSN-PA LINK

Technical specifications (continued)

Article No.	6GK1411-6CA40-0AA0	6GK1411-6CA40-0BA0
Product-type designation	IE/WSN-PA LINK	IE/WSN-PA LINK
Wireless frequencies		
Radio frequency for WirelessHART in 2.4 GHz frequency band		
• initial value	2.4 GHz	2.4 GHz
• end value	2.5 GHz	2.5 GHz
Performance data WirelessHART		
Number of WirelessHART devices can be operated	100	100
Network latency		
• for 100 field devicesfor WirelessHART network maximum	10 s	10 s
• for 50 field devices for WirelessHART network maximum	5 s	5 s
Transmission link between two devices for WirelessHART network		
• maximum	100 m	100 m
• note	Values may vary in the case of radio obstacles	Values may vary in the case of radio obstacles
Protocol is supported HARD	Yes	Yes
Product properties, functions, components general		
Protocol is supported		
• Address Resolution Protocol (ARP)	Yes	Yes
• HTTP	Yes	Yes
• HTTPS	Yes	Yes
• Modbus TCP	Yes	Yes
• Modbus TCP secure	Yes	Yes
• Modbus RTU	Yes	Yes
Product functions management, configuration		
Product function		
• web-based management	Yes	Yes
• DHCP client	Yes	Yes
Product functions Diagnosis		
Product function		
• Web-based diagnostics	Yes	Yes
• WirelessHART diagnostics via Modbus	Yes	Yes
Product functions Redundancy		
Product function device redundancy	No	Yes
Product functions Security		
Product function		
• Password protection - multi-level	Yes	Yes
• WirelessHART Join Key	Yes	Yes
• ACL - MAC-based	Yes	Yes
• WirelessHART Network ID	Yes	Yes
Protocol is supported SSL	Yes	Yes
Principle of encryption	AES 128 bit	AES 128 bit
Product functions Time		
Protocol is supported NTP	Yes	Yes

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▉ Technical specifications (continued)

Article No.	6GK1411-6CA40-0AA0	6GK1411-6CA40-0BA0
Product-type designation	IE/WSN-PA LINK	IE/WSN-PA LINK
Standards, specifications, approvals		
Standard for WirelessHART	HART V 7.1	HART V 7.1
Standard for wireless communication IEEE 802.15.4	Yes	Yes
Verification of suitability		
• CE mark	Yes	Yes
• concerning CSA	CSA Division 2 & Dust Ignition-proof for Class I, Division 2, Groups A, B, C, and D. Dust Ignition-proof for Class II, Groups E, F, and G / Suitable for Class III Hazardous Locations. / Install per Siemens drawing A5E02467236A. Temperature Code: T4 (-40°C < Ta < 60°C) CSA Enclosure Type 4X	CSA Division 2 & Dust Ignition-proof for Class I, Division 2, Groups A, B, C, and D. Dust Ignition-proof for Class II, Groups E, F, and G / Suitable for Class III Hazardous Locations. / Install per Siemens drawing A5E02467236A. Temperature Code: T4 (-40°C < Ta < 60°C) CSA Enclosure Type 4X
• concerning FM	FM Division 2, Non-Incendive for Class I, Division 2, Groups A, B, C, and D. Dust Ignition-proof for Class II, III, Division 1, Groups E, F, and G / Indoor and outdoor locations / NEMA Type 4X Temperature Code: T4 (-40°C < Ta < 60°C)	FM Division 2, Non-Incendive for Class I, Division 2, Groups A, B, C, and D. Dust Ignition-proof for Class II, III, Division 1, Groups E, F, and G / Indoor and outdoor locations / NEMA Type 4X Temperature Code: T4 (-40°C < Ta < 60°C)
• concerning ATEX	ATEX type n, see note: certificate number: Baseefa10ATEX0044X, ATEX marking: Ex II 3 G, Ex nA nL IIC T4 (-40°C <= Ta <= 60°C), rated voltage: 28 V, ATEX dust ignition-proof: certificate number: Baseefa10ATEX0045X, ATEX marking: II 3D, Ex tD A22 IP66 T135 (-40°C <= Ta <= 60°C), rated voltage: 28 V. Note on type n: conditions for safe handling during installation. The device does not pass the 500 V insulation test in accordance with paragraph 6.8.1 of EN 60079-15:2005. This must be taken into account when the device is mounted	ATEX type n, see note: certificate number: Baseefa10ATEX0044X, ATEX marking: Ex II 3 G, Ex nA nL IIC T4 (-40°C <= Ta <= 60°C), rated voltage: 28 V, ATEX dust ignition-proof: certificate number: Baseefa10ATEX0045X, ATEX marking: II 3D, Ex tD A22 IP66 T135 (-40°C <= Ta <= 60°C), rated voltage: 28 V. Note on type n: conditions for safe handling during installation. The device does not pass the 500 V insulation test in accordance with paragraph 6.8.1 of EN 60079-15:2005. This must be taken into account when the device is mounted.
• regarding IECEx	IECEx type n, see note: certificate number: IECEx BAS 10.0014X, Ex nA nL IIC T4 (-40°C <= Ta <= 60°C), rated voltage: 28 V, IECEx dust ignition-proof, see note: certificate number: IECEx BAS 10.0015X, Ex tD A22 IP66 T135 (-40°C <= Ta <= 60°C), rated voltage: 28 V. Note on type n: conditions for safe handling during installation. The device does not pass the 500 V insulation test in accordance with paragraph 6.8.1 of EN 60079-15:2005. This must be taken into account when the device is mounted.	IECEx type n, see note: certificate number: IECEx BAS 10.0014X, Ex nA nL IIC T4 (-40°C <= Ta <= 60°C), rated voltage: 28 V, IECEx dust ignition-proof, see note: certificate number: IECEx BAS 10.0015X, Ex tD A22 IP66 T135 (-40°C <= Ta <= 60°C), rated voltage: 28 V. Note on type n: conditions for safe handling during installation. The device does not pass the 500 V insulation test in accordance with paragraph 6.8.1 of EN 60079-15:2005. This must be taken into account when the device is mounted.
• regarding NEMA	-	-
Wireless approval	FCC and IC approval	IC approval

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Industrial Wireless Communication
WirelessHART

IE/WSN-PA LINK

◾ Ordering data

	Article No.		Article No.
IE/WSN-PA LINK		*Accessories*	
Gateway between WirelessHART and Industrial Ethernet; transmission frequency: 2.4 GHz		**IE FC M12 Plug PRO**	
• With integral, non-detachable antenna	**6GK1411-6CA40-0AA0**	M12 plug-in connector suitable for on-site assembly (D-coded, IP65/IP67), metal housing, FastConnect connection system, for connecting HARTING adapter cables to the Industrial Ethernet	
• N connector for connection of external antennas	**6GK1411-6CA40-0BA0**	• 1 unit	**6GK1901-0DB20-6AA0**
Antennas		**IE FC TP Standard Cable GP 2 x 2 (Type A)**	**6XV1840-2AH10**
Antennas with omni-directional characteristics; country permits, compact instructions (hard copy), German/English		4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1 000 m, minimum order quantity 20 m	
Wall or mast-mounting			
• **Antenna ANT792-6MN** Antenna gain including N-Connect connector 6 dBi, 2.4 GHz	6GK5792-6MN00-0AA6		
Roof mounting		**IE FC Stripping Tool**	**6GK1901-1GA00**
• **ANT795-6MN antenna** Antenna gain incl. N-Connect connector 6/8 dBi, 2.4/5 GHz	6GK5795-6MN00-0AA6	Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
• **Antenna mounting tool (ANT795-6MN)** Mounting tool for installation of ANT795-6MN under a roof	6GK5795-6MN01-0AA6	**Network components for IWLAN**	see "Industrial Wireless Communication"
LP798-1N Lightning Protector	**6GK5798-2LP00-2AA6**	**HARTING adapter cable** [1] M12 female NPT 1/2 thread to RJ45 11cm, (minimum order quantity: 10); The adapter is provided for easy connection of the link to the Industrial Ethernet;	**21036836420** Not included in the scope of delivery of the IE/WSN-PA link; You can find ordering information on the Internet at: http://www.harting.com/en/contact/
Lightning protector with N/N female/female connector, IP65 (-40 to +100 °C)			
Antenna cables		**SITOP compact 24 V/ 0.6 A**	**6EP1331-5BA00**
IWLAN N-Connect male/male flexible connection cable		1-phase power supply with wide-range input 85 – 264 V AC/110 – 300 V DC, stabilized output voltage 24 V, rated output current value 0.6 A, slim design	
Flexible connecting cable for connecting an external antenna; assembled with two N-Connect male connectors			
• 1 m	**6XV1875-5AH10**		
• 2 m	**6XV1875-5AH20**		
• 5 m	**6XV1875-5AH50**		
• 10 m	**6XV1875-5AN10**		
HF coupling	**6GK5798-0CP00-1AA0**		
N-Connect male/male connector for connecting the LP798-1N lightning protector			

[1] When using the Harting adapter cable for the Ethernet connection, the requirements for intrinsic safety approval are not applicable. When used in an application relevant to intrinsic safety guidelines, it requires acceptance by the appropriate approval agency.

◾ More information

Current approvals can be found on the Internet at:
http://support.automation.siemens.com/WW/view/en/46374734