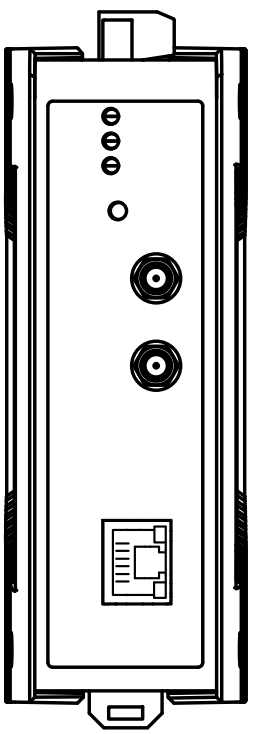
HIRSCHMANN
A BELDEN BRAND

User Manual

Installation
Industrial Access-Point / Client / Access-Bridge
BAT867-R



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Safety instructions

WARNING

UNCONTROLLED MACHINE ACTIONS

To avoid uncontrolled machine actions caused by data loss, configure all the data transmission devices individually.
Before you start any machine which is controlled via data transmission, be sure to complete the configuration of all data transmission devices.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

General safety instructions

You operate this device with electricity. Improper usage of the device entails the risk of physical injury or significant property damage. The proper and safe operation of this device depends on proper handling during transportation, proper storage and installation, and careful operation and maintenance procedures.

- ☐ Before connecting any cable, read this document, and the safety instructions and warnings.
- ☐ Operate the device with undamaged components exclusively.
- ☐ The device is free of any service components. In case of a damaged or malfunctioning device, turn off the supply voltage and return the device to Hirschmann for inspection.

Certified usage

- ☐ Use the product only for the application cases described in the Hirschmann product information, including this manual.
- ☐ Operate the product only according to the technical specifications. See “Technical data” on page 35.
- ☐ Connect to the product only components suitable for the requirements of the specific application case.

Installation site requirements

Restricted access location:

- ▶ The location is outside the operator access area.
- ▶ The location is accessible to the service personnel even when the device is switched on.

Indoor operator access area:

- The location is accessible without tools.
- The person responsible for the area has provided access for the operator intentionally.
- The operator knows of the access possibilities, regardless of whether they need a tool.

☐ Relevant for Europe:

- Supply only 24 V DC to the device and use a fuse.
  Regarding the properties of this fuse: See “General technical data” on page 35.

☐ For use in UL 60950-1 conditions:
Install the device in a fire enclosure.

Device casing

Only technicians authorized by the manufacturer are permitted to open the casing.

☐ Never insert pointed objects (narrow screwdrivers, wires, etc.) into the device or into the connection terminals for electric conductors. Do not touch the connection terminals.

☐ Keep the ventilation slits free to ensure good air circulation.
See “General technical data” on page 35.

☐ Mount the device in the vertical position.

Qualification requirements for personnel

☐ Only allow qualified personnel to work on the device.

Qualified personnel have the following characteristics:

- Qualified personnel are properly trained. Training as well as practical knowledge and experience make up their qualifications. This is the prerequisite for grounding and labeling circuits, devices, and systems in accordance with current standards in safety technology.
- Qualified personnel are aware of the dangers that exist in their work.
- Qualified personnel are familiar with appropriate measures against these hazards in order to reduce the risk for themselves and others.
- Qualified personnel receive training on a regular basis.

National and international safety regulations

☐ Verify that the electrical installation meets local or nationally applicable safety regulations.

☐ When installing antennas, observe the regulations of the country in which you are operating the WLAN device with regard to the general operating permission and the maximum emission levels.

☐ Install and operate this equipment with a minimum distance of 19.7 inches (50 cm) between the antenna and your body.

Grounding the device

For the functional earth (FE), there is a separate functional earth screw on top of the device. The functional earth is electrically connected to the circuit ground and the metal housing of the device.

Shielding ground

The overall shield of a connected shielded twisted pair cable is connected to the grounding connector on the front panel as a conductor.

☐ Beware of possible short circuits when connecting a cable section with conductive shielding braiding.

Requirements for connecting electrical wires

Before connecting the electrical wires, **always** verify that the requirements listed are complied with.

The following requirements apply without restrictions:
▶ The electrical wires are voltage-free.
▶ The cables used are permitted for the temperature range of the application case.
▶ The voltage connected complies with the requirements for a safety extra-low voltage (SELV) as per IEC/EN 60950-1.
▶ Relevant for North America: Exclusively use 60/75 °C (140/167 °F) or 75 °C (167 °F) copper (Cu) wire.

Table 1: Requirements for connecting electrical wires

Requirements for connecting the supply voltage

The following requirements apply without restrictions:	
All of the following requirements are complied with: ▶ The supply voltage corresponds to the voltage specified on the type plate of the device. ▶ The power supply conforms to overvoltage category I or II. ▶ The power supply has an easily accessible disconnecting device (for example a switch or a plug). This disconnecting device is clearly identified. So in the case of an emergency, it is clear which disconnecting device belongs to which power supply cable. ▶ The power supply cable is suitable for the voltage, the current and the physical load. Hirschmann recommends a wire diameter of 0.5 mm² to 0.75 mm² (AWG20 up to AWG18). ▶ The cross-section of the ground conductor is the same size as or bigger than the cross-section of the power supply cables.	
The following requirements apply alternatively:	
Alternative 1	The power supply complies with the requirements for a limited power source (LPS) as per EN 60950-1.
Alternative 2	Relevant for North America: The power supply complies with the requirements according to NEC Class 2.
Alternative 3	**All** of the following requirements are complied with: ▶ The power supply complies with the requirements for a safety extra-low voltage (SELV) as per IEC/EN 60950-1. ▶ A fuse suitable for DC voltage is located in the plus conductor of the power supply. The minus conductor is on ground potential. Otherwise, a fuse is also located in the minus conductor. Regarding the properties of this fuse: See “Technical data” on page 35.

Table 2: Requirements for connecting the supply voltage

The supply voltage is connected to the device casing through protective elements exclusively.

Lightning protection

▶ The installation of the device occurs in accordance with valid standards (such as VDE 0185 and IEC 62305), and in accordance with the lightning protection procedures recognized and proven for the application and the environment.

☐ Refer to the information in the “WLAN Outdoor Guide” on “Lightning and overvoltage protection”.
You can download the manual from the Internet on the Hirschmann product pages (www.hirschmann.com).

☐ Protect antennas installed outside with lightning protection devices (for example lightning conductors).

☐ Take lightning protection measures which mitigate the effects of lightning strikes.

CE marking

The labeled devices comply with the regulations contained in the following European directive(s):

2011/65/EU (RoHS)
Directive of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

2014/53/EU (RED)
Directive of the European Parliament and of the council on the harmonization of the laws of the Member States relating to the making available on the market of radio equipment.

CE This product may be operated in all EU (European Union) countries under the condition that it has been configured correctly.

In accordance with the above-named EU directive(s), the EU conformity declaration will be available to the relevant authorities at the following address:

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Germany

The product can be used in living areas (living area, place of business, small business) and in industrial areas.

- Interference immunity: EN 61000-6-1
- Emitted interference: EN 55032
- Reliability: EN 60950-1

You find more information on technical standards here:
“Underlying technical standards” on page 46

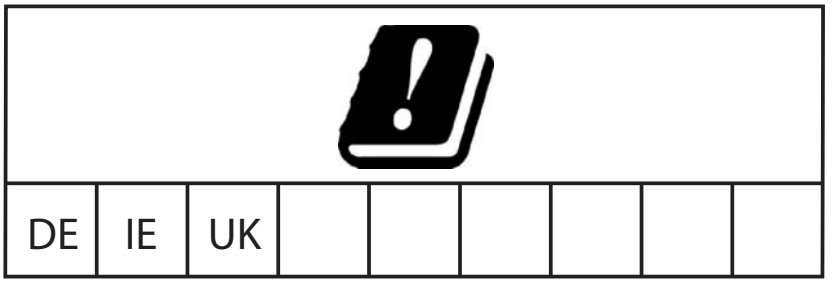
Note: The assembly guidelines provided in these instructions must be strictly adhered to in order to observe the EMC threshold values.

Notes for countries with the following country codes:

AT	BE	BG	CH	CY	CZ	DE	DK	EE
EL	ES	FI	FR	HR	HU	IE	IT	LI
LT	LU	LV	MT	NL	NO	PL	PT	RO
RS	SE	SI	SK	TR	UK			

- The RED compliance requires compliant operation of the device in the 5 GHz band channels. Compliant operation of the device is achieved by an unchangeable determination of the country setting. To obtain RED compliance, perform the work steps described in chapter “Obtain compliance for operation in the European Union” on page 28.

Notes for Germany (DE), Ireland (IE), and the United Kingdom (UK):



Operation in the 5.8 GHz band at a radiated power (EIRP) >25 mW is subject to meeting the following conditions:

- Germany (DE)
  Frequency range: 5725 MHz to 5875 MHz
  Condition: The usage of this band is restricted to commercial public telecommunication services. Registration at the Federal Network Agency is required.
  Name and website of the competent authority:
  Bundesnetzagentur
  www.bundesnetzagentur.de

- Ireland (IE)
  Frequency range: 5725 MHz to 5875 MHz
  Condition: Registration of operational base stations
  Name and website of the competent authority:
  Commission for Communications Regulation
  www.comreg.ie

- United Kingdom (UK):
  Frequency range: 5725 MHz to 5850 MHz
  Condition: Light-licensing regime
  Name and website of the competent authority:
  Ofcom
  www.ofcom.org.uk

FCC note:

This device complies with part 15 of the FCC rules.
Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

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

- ☐ Reposition the receiver antenna or change the angle of the receiver antenna.
- ☐ Increase the separation between the device and the receiver.
- ☐ Connect the device to a different power supply from that to which the receiver is connected.
- ☐ Consult a specialist retailer or an electronic systems engineer for help.

Changes or modifications not expressly approved by the holder of the certificate could void the user's authority to operate this equipment.

Note for the use in the USA and in Canada

The following section applies to BAT867-R variants with the characteristic value US (USA/Canada) for country approvals which are labeled as follows:

Contains Transmitter Module
FCC ID: TK4WLE600VX
IC: 7849A-WLE600VX

This equipment complies with FCC and IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. Install and operate this equipment with a minimum distance of 19.7 in (50 cm) (related to a 9 dBi antenna) between the radiation source and your body.

The antenna used for this transmitter must not be co-located with any other transmitters within a host device, except in accordance with FCC multi-transmitter product procedures.

This transmitter is restricted to indoor use only within the 5.15 to 5.25 GHz band to reduce potential for harmful interference to co-channel mobile satellite systems.

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

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

Antennas operating with this device model:	Permitted band of operation				
	2.4 GHz band	5 GHz band			
		5180 ... 5240 MHz	5260 ... 5320 MHz	5500 ... 5720 MHz	5745 ... 5825 MHz
BAT-ANT-RSMA-2AGN-R[a]	Yes	Yes	Yes	Yes	Yes
BAT-ANT-N-MiMoDB-5N-IP65	Yes	Yes	Yes	Yes	Yes

a. Note: When using 2 antennas type BAT-ANT-RSMA-2AGN-R, you must align each antenna in another spatial direction (x-y) so that both antennas are arranged at right angles to each other.

The FCC approval is valid only in conjunction with the listed antennas. If other antennas are used, the approval expires. The responsibility lies with the operator of the system. The required antenna impedance is 50 Ω.

Recycling note

After usage, this device must be disposed of properly as electronic waste, in accordance with the current disposal regulations of your county, state, and country.

About this manual

The “Installation” user manual contains a device description, safety instructions, a description of the display, and the other information that you need to install the device.

Key

The symbols used in this manual have the following meanings:

▶	Listing
☐	Work step
■	Subheading

1 Description

1.1 General description

The devices allow you to set up WLANs (Wireless Local Area Networks) in a local network. In contrast to a conventional network connection through copper cables and fiber optic cables, some of the communication is performed by means of a radio link.

The devices allow you to install a new LAN or expand an existing LAN. Thanks to their high level of flexibility, the BAT867-R device is suitable for a wide range of applications. Anywhere that high bandwidths, stable operation and network security is required, WLAN with these devices provides the ideal solution.

The devices are dual-band industrial high-performance wireless LAN access points or clients complying with IEEE 802.11a/b/g/n/ac. They provide a high radio output with a bandwidth of up to 867 Mbit/s. The devices support MIMO (Multiple Input Multiple Output) and Multipath. The bandwidth is increased by using the multipath transmission by means of reflections. 2 antennas for sending and receiving help ensure stable network coverage with few shadow areas.

The BAT867-R devices are designed for the special requirements of industrial automation. They meet the relevant industry standards, provide very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.
The devices work without a fan.

The following installation options are available:

- Mounting on the DIN rail

There are convenient options for managing the device. Manage your devices via:

- Web browser
- SSH
- Telnet
- HiDiscovery (software for putting the device into operation)
- Management software (for example Industrial HiVision, LANconfig/ LANmonitor)

The devices provide you with a large range of functions, which the manuals for the operating software inform you about. You can download these manuals as PDF files from the Internet on the Hirschmann product pages (www.hirschmann.com).
The Hirschmann network components help you ensure continuous communication across all levels of the company.

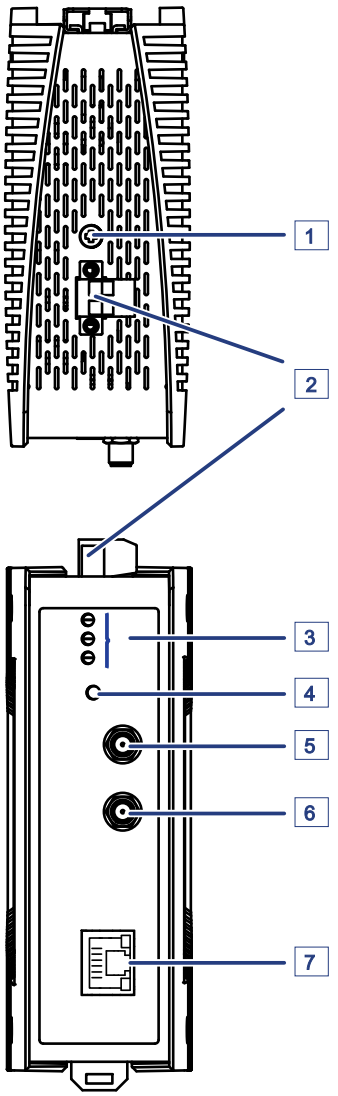
1.2 Device name and product code

The device name corresponds to the product code. The product code is made up of characteristics with defined positions. The characteristic values stand for specific product properties.

Item	Characteristic	Characteristic value	Description
1 ... 8	Product	BAT867-R	IP40 housing
9 ... 10	Country approvals	XX	You can determine the current country approvals using the configurator (www.e-catalog.beldensolutions.com).
	Example: Singapore	Example: SG	
11	Slot 1	W	WLAN module
12	Slot 2	9	Not assembled
13	Slot 3	9	Not assembled
14	Access point or client	A	Access Point
		C	Client
15	Supply voltage 1	U	Rated voltage 24 V DC
16	Supply voltage 2	9	Not assembled
17	Approvals 1	9	No additional approvals
18	Approvals 2	9	No additional approvals
19	Mounting	A	Standard
20 ... 21	Ethernet port 1	T1	RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections
22 ... 23	Optional: Ethernet port 2 or interface	99	Not assembled
24	Temperature range	L	+14 °F ... +140 °F (−10 °C ... +60 °C)
25	Software option 1	9	Not present
26	Software option 2	9	Not present
27	Software option 3	9	Not present
28	Configuration	Z	Accessory package
		9	Not present
29	Device model	H	Hirschmann standard

Table 3: Device name and product code

1.3 Device view



1	Functional earth screw
2	2-pin terminal block for the supply voltage
3	LED display elements
4	Reset button
5	Antenna connection 1
6	Antenna connection 2
7	RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections

1.4 Power supply

A 2-pin terminal block is available to supply the device with power.
Further information:
See “Connecting the terminal blocks” on page 24.

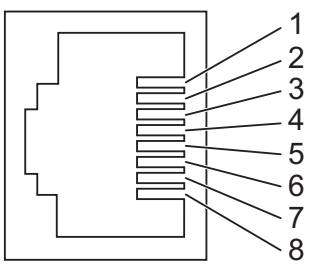
1.5 10/100/1000 Mbit/s twisted pair port

This port is an RJ45 socket.
The 10/100/1000 Mbit/s twisted pair port allows you to connect network components according to the IEEE 802.3 10BASE-T/100BASE-TX/ 1000BASE-T standard.
This port supports:

- Autonegotiation
- Autopolarity
- Autocrossing (if autonegotiation is activated)
- 1000 Mbit/s full duplex
- 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
- 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode

Delivery state: Autonegotiation activated
The port casing is electrically connected to the front panel.
The pin assignment corresponds to MDI-X.

1.5.1 Pin assignments

RJ45	Pin	10/100 Mbit/s	1000 Mbit/s
	**MDI mode**		
	1	TX+	BI_DA+
	2	TX−	BI_DA−
	3	RX+	BI_DB+
	4	—	BI_DC+
	5	—	BI_DC−
	6	RX−	BI_DB−
	7	—	BI_DD+
	8	—	BI_DD−
	MDI-X mode		
	1	RX+	BI_DB+
	2	RX−	BI_DB−
	3	TX+	BI_DA+
	4	—	BI_DD+
	5	—	BI_DD−
	6	TX−	BI_DA−
	7	—	BI_DC+
	8	—	BI_DC−

1.6 Connections for antennas

You require antennas for operating the devices.
The devices have 2 Reverse SMA connectors for connecting external antennas.
The "Antenna Guide" document provides an overview of the antennas that can be used as well as the suitable antenna accessories.
This document is available for download as a PDF file on the Hirschmann product pages (www.hirschmann.com).

1.7 Display elements

After the supply voltage is set up, the software starts and initializes itself. Afterwards, the device performs a self-test. During this process, various LEDs light up.

1.7.1 Device state

These LEDs provide information about conditions which affect the operation of the whole device.

P Color	Activity	Meaning
green	lights up	LED lights up after the configuration
red	flashing	Device has detected at least one hardware error.
green/red	Short flashing	No password or the default password is set

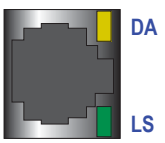
LS/DA Color	Activity	Meaning
—	off	No network device connected
green	lights up	Ethernet connection active
yellow	flashing	Data traffic

WLAN Color	Activity	Meaning
—	off	▶ No WLAN network specified ▶ WLAN module deactivated ▶ WLAN module does not send any beacons
green	lights up	▶ At least one WLAN network defined ▶ WLAN module activated

WLAN Color	Activity	Meaning
green	inverse flashing	Number of flashes corresponds to number of connected WLAN stations and P2P radio lines.
green	flashing	▶ DFS scanning or another scan procedure ▶ Display of signal strength in client or P2P
red	flashing	Device has detected at least one hardware error.

1.7.2 Port status

These LEDs provide port-related information.



LS/DA Color	Activity	Meaning
—	off	No network device connected
green	lights up	Ethernet connection active
yellow	flashing	Data traffic

1.8 Reset button

The device has a reset button.
You will find more information in the “User Manual Configuration Guide”, in the chapter “Using the Boot Configurations”.

2 Installation

The devices have been developed for practical application in a harsh industrial environment.
On delivery, the device is ready for operation.

Perform the following steps to install and configure the device:
- Checking the package contents
- Installing and grounding the device
- Installing the antennas
- Connecting the terminal blocks
- Operating the device
- Connecting data cables
- Making basic settings
- Configuring the transmit power

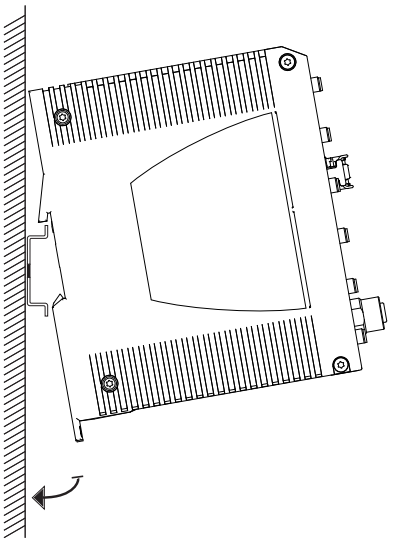
2.1 Checking the package contents

☐ Check whether the package includes all items named in the section “Scope of delivery” on page 44.
☐ Check the individual parts for transport damage.

2.2 Installing and grounding the device

2.2.1 Installing the device onto the DIN rail

Verify that the device maintains the minimum clearing in order to meet the climatic conditions:
- Top and bottom sides of device: 1.97 in (5 cm)
- Left and right device side: 0.79 in (2 cm)



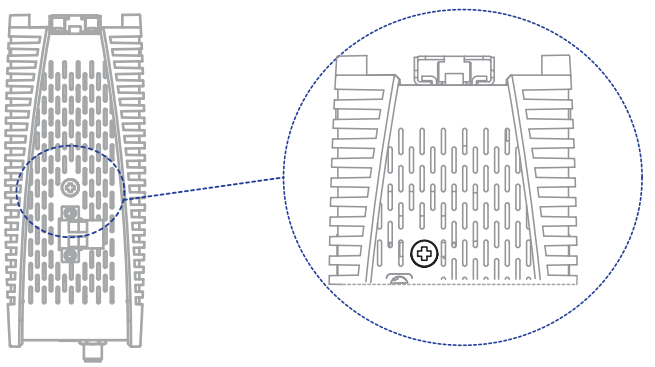
To mount the device onto a horizontally mounted 35 mm DIN rail according to DIN EN 60715, proceed as follows:

☐ Slide the upper snap-in guide of the device into the DIN rail.
☐ Pull the rail lock slide down using a screwdriver, and press the lower part of the device against the DIN rail.
☐ Snap in the device by releasing the rail lock slide.

2.2.2 Grounding the device

Prerequisite:

▶ Use a wire diameter for the functional earth conductor that is no smaller than the diameter of the supply voltage connection, however of at least 0.5 mm² (AWG20).



Proceed as follows:

☐ Ground the device via the functional earth screw.
The functional earth screw is located on the topside as shown in the illustration.

2.3 Installing the antennas

The devices have 2 Reverse SMA connectors for connecting external antennas.

Note: When using 2 antennas type BAT-ANT-RSMA-2AGN-R, you must align each antenna in another spatial direction (x-y) so that both antennas are arranged at right angles to each other.

When mounting only 1 antenna, insert a terminating resistor into the unused socket. You can obtain terminating resistors as accessory.
See “Accessories” on page 44.

Note: Device variants with the configuration characteristic value Z contain a pre-mounted terminating resistor SMA to ANT2 for RSMA ANT connectors.

You will find information on setting the transmit power in chapter “Configuring the transmit power” on page 31.

2.4 Connecting the terminal blocks

⚠ WARNING

ELECTRIC SHOCK

Before connecting the electrical wires, **always** verify that the requirements listed are complied with.
See “Requirements for connecting electrical wires” on page 7.
See “Requirements for connecting the supply voltage” on page 8.

Never insert sharp objects (small screwdrivers, wires, etc.) into the connection terminals for electric conductors, and do not touch the terminals.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Note: The supply voltage is connected to the device casing through protective elements exclusively.

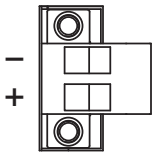


Figure 1: Supply voltage with characteristic value U: 2-pin terminal block with screw lock

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment on the device	
DC voltage	Rated voltage range 24 V DC Voltage range incl. maximum tolerances 18 V DC ... 32 V DC	−	Minus terminal of the supply voltage
		+	Plus terminal of the supply voltage

Table 4: Supply voltage with characteristic value U: type and specification of the supply voltage, pin assignment on the device

Proceed as follows:

☐ Verify the required conditions for connecting the voltage supply.
See “Requirements for connecting electrical wires” on page 7.
See “Requirements for connecting the supply voltage” on page 8.

☐ Remove the terminal connector from the device.

☐ Connect the protective conductor with the clamp.

☐ Connect the wires according to the pin assignment on the device with the clamps.

2.5 Operating the device

⚠ WARNING

ELECTRIC SHOCK

Before connecting the electrical wires, **always** verify that the requirements listed are complied with.
See “Requirements for connecting electrical wires” on page 7.
See “Requirements for connecting the supply voltage” on page 8.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

By connecting the supply voltage via the terminal block, you start the operation of the device.

2.5.1 Connecting the power supply through a terminal block

Relevant for North America:
The torque for tightening the supply voltage terminal block on the device is 4.5 lb-in (0.51 Nm).

☐ Mount the terminal block on the device using screws.
☐ Enable the supply voltage.

2.6 Connecting data cables

2.6.1 10/100/1000 Mbit/s twisted pair port

Further information:
See “10/100/1000 Mbit/s twisted pair port” on page 19.
☐ Connect the data cables according to your requirements.

3 Making basic settings

The IP parameters must be entered when the device is installed for the first time. The device provides the following options for configuring IP addresses:

- Entry via the HiDiscovery protocol in the applications HiDiscovery or Industrial HiVision
- Configuration via BOOTP

You will find more information in the “User Manual Configuration Guide”. This document is available for download as a PDF file on the Hirschmann product pages (www.hirschmann.com).

4 Obtain compliance for operation in the European Union

For operation in the European Union, the device must comply with the Radio Equipment Directive (RED) 2014/53/EU. The RED compliance requires compliant operation of the device in the 5 GHz band channels. Compliant operation of the device is achieved by an unchangeable determination of the country setting.

Make the country setting unchangeable using the Command Line Interface (CLI), the graphical user interface or the LANconfig software. You can download the LANconfig software as an ISO image from the Hirschmann product pages (www.hirschmann.com).

Perform the following work steps:

Command Line Interface (CLI)

☐ To access the possible country settings, execute the following command:

```
set Setup/WLAN/Country ?
```

Note: The country setting “Europe” is valid for all European countries. Specific country settings such as “France” or “Germany” include additional country specific channels in comparison to the “Europe” country setting.
The device ignores specific country settings and uses the country setting “Europe” until the RED compliance has been obtained.

☐ Select the desired country setting with the following command:

```
set Setup/WLAN/Country [Country]
```

```
Example:
set Setup/WLAN/Country France
```

☐ Execute the following command:

```
> REDcompliance
```

Note: To check the country setting and correct it, type `no`. Then check the country setting with the following command: `ls Setup/WLAN/Country`.

☐ To obtain RED compliance, type `yes`. This makes the country setting unchangeable. Subsequently, the device restarts.

Graphical user interface

☐ Open the **Configuration > Wireless LAN > General** dialog and select the desired country setting.

Note: The country setting “Europe” is valid for all European countries. Specific country settings such as “France” or “Germany” include additional country specific channels in comparison to the “Europe” country setting.
The device ignores specific country settings and uses the country setting “Europe” until the RED compliance has been obtained.

☐ To confirm your choice, click the “Send” button.

☐ Open the **Extras > RED compliance** dialog.

Note: To check the country setting and correct it, open the **Configuration > Wireless LAN > General** dialog.

☐ To obtain RED compliance, click the “Confirm RED compliance” button. This makes the country setting unchangeable. Subsequently, the device restarts.

LANconfig

☐ In the LANconfig device overview, highlight the row containing the desired device.

☐ In the menu bar, select **Device > Configure**.

☐ Open the **Configuration > Wireless LAN > General** dialog and select the desired country setting.

Note: The country setting “Europe” is valid for all European countries. Specific country settings such as “France” or “Germany” include additional country specific channels in comparison to the “Europe” country setting.
The device ignores specific country settings and uses the country setting “Europe” until the RED compliance has been obtained.

☐ To confirm your choice, click the “OK” button.

☐ In the LANconfig device overview, highlight the row containing the desired device.

☐ In the menu bar, select **Device > RED compliance**.

Note: To check the country setting and correct it, click the “No” button. Then open the **Configuration > Wireless LAN > General** dialog.

☐ To obtain RED compliance, click the “Yes” button. This makes the country setting unchangeable. Subsequently, the device restarts.

5 Configuring the transmit power

Note: The operator of a WLAN radio installation must adhere to the applicable transmission threshold values.

Use the graphical user interface or the LANconfig software. You can download the LANconfig software as an ISO image from the Hirschmann product pages (www.hirschmann.com).

In the graphical user interface, proceed as follows:

☐ In the menu tree, open the **Configuration > Wireless LAN > General** dialog.

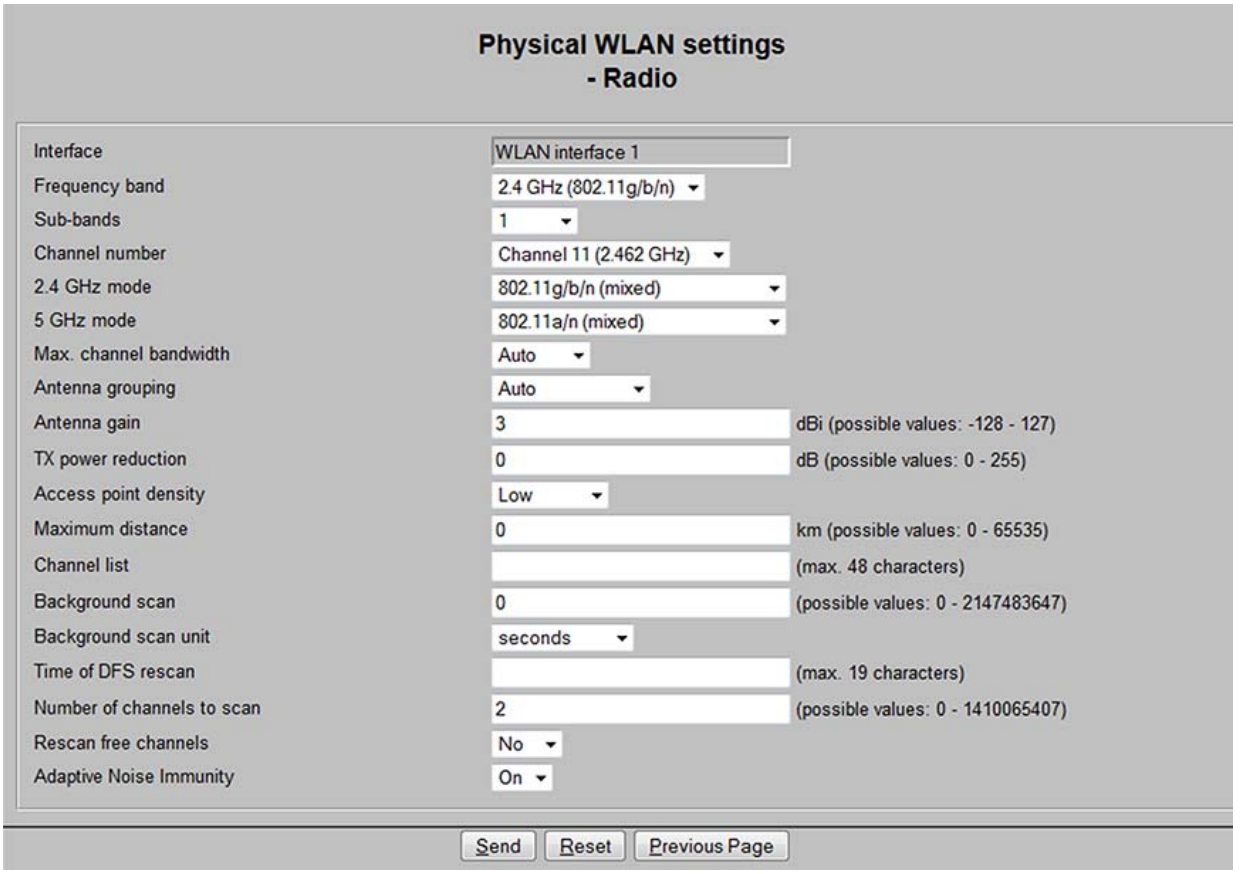
☐ In the “General” tab, specify in the “General” frame the country in which you install the device, and click the “Send” button.

Note: For devices that are operated in the European Union perform thework steps described in chapter “Obtain compliance for operation in the European Union” on page 28.

☐ In the menu tree, open the **Configuration > Wireless LAN > General > Physical WLAN settings - Radio** dialog.

☐ In the “General” tab, click in the “Interface” column the physical WLAN interface to which you connect the antenna.

☐ Subtract the cable and installed overvoltage protector attenuation from the antenna gain. Enter the calculated value in the “Antenna gain” field.



☐ To save the value, click the “Send” button.

6 Maintenance and service

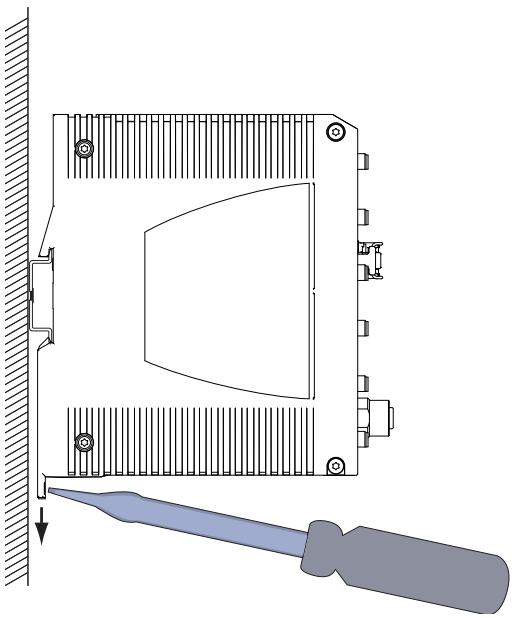
- When designing this device, Hirschmann largely avoided using high-wear parts. The parts subject to wear and tear are dimensioned to last longer than the lifetime of the product when it is operated normally. Operate this device according to the specifications.
- Hirschmann is continually working on improving and developing their software. Check regularly whether there is an updated version of the software that provides you with additional benefits. You find information and software downloads on the Hirschmann product pages on the Internet (http://www.hirschmann.com).
- Depending on the degree of pollution in the operating environment, check at regular intervals that the ventilation slots in the device are not obstructed.

Note: You find information on settling complaints on the Internet at http://www.beldensolutions.com/en/Service/Repairs/index.phtml.

7 Disassembly

7.1 Removing the device

☐ Disconnect the data cables.
☐ Disable the supply voltage.
☐ Remove the terminal connector from the device.
☐ Remove the antennas.
☐ Disconnect the grounding.
☐ Insert a screwdriver horizontally below the housing into the locking gate.
☐ Pull the locking gate down without tilting the screwdriver.
☐ Lift the bottom of the device away from the DIN rail.



8 Technical data

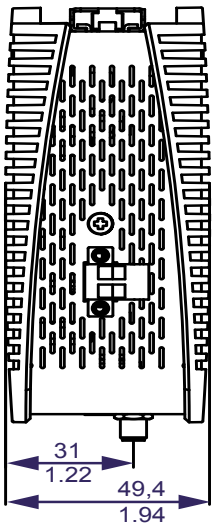
8.1 General technical data

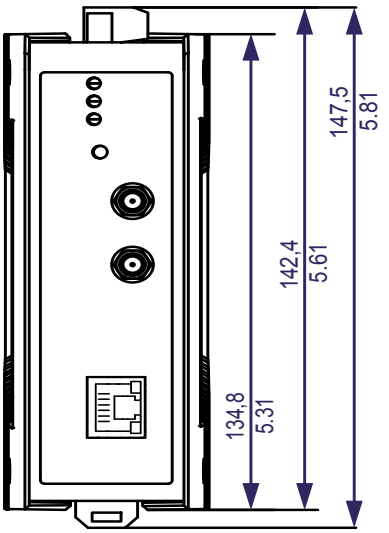
Dimensions W × H × D	BAT867-R	See “Dimension drawings” on page 36.
Weight		0.92 oz (520 g)
Supply voltage	Rated voltage	24 V DC
	Voltage range incl. maximum tolerances	18 V DC ... 32 V DC
	Connection type	2-pin terminal block
	Power loss buffer	10 ms at 24 V DC
	Overload current protection at input	Non-replaceable fuse
	Back-up fuse	Nominal rating: 3.5 A
		Characteristic: slow blow
	Peak inrush current (slow voltage increase)	850 mA
	Current integral I^2t	0.373 A^2s
Climatic conditions during operation	Minimum clearance around the device	Top and bottom sides of device: 1.97 in (5 cm) Left and right device side: 0.79 in (2 cm)
	Ambient air temperature[a]	+14 °F ... +140 °F (−10 °C ... +60 °C)
	Maximum inner temperature of device (guideline)	194 °F (90 °C)
	Humidity	10 % ... 95 % (non-condensing)
	Air pressure	min. 700 hPa (+9842 ft; +3000 m) max. 1060 hPa (−1312 ft; −400 m)
Climatic conditions during storage	Ambient air temperature[a]	−40 °F ... +158 °F (−40 °C ... +70 °C)
	Humidity	10 % ... 95 % (non-condensing)
	Air pressure	min. 700 hPa (+9842 ft; +3000 m) max. 1060 hPa (−1312 ft; −400 m)
Pollution degree		2
Protection classes	Degree of protection	IP40[b]

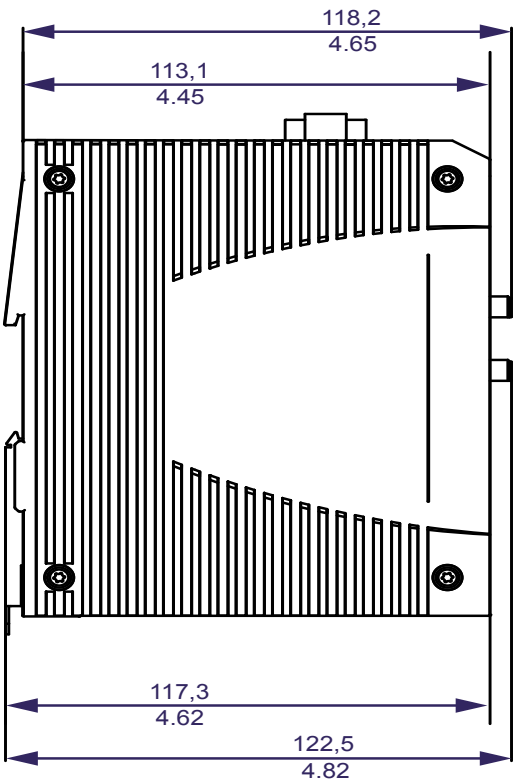
a. Temperature of the ambient air at a distance of 2 in (5 cm) from the device
b. for DIN rail mounting

8.2 Dimension drawings

mm
inch







8.3 Radio technology

Antenna connection	2 × Reverse SMA connector
Range	Depending on the antenna used, frequency range and data rate
Encryption	▶ IEEE 802.11i/WPA2 with passphrase or IEEE 802.1x and hardware-accelerated AES ▶ Closed Network ▶ WEP 64 ▶ WEP 128 ▶ WEP 152 ▶ User authentication ▶ 802.1x/EAP ▶ LEPS ▶ WPA1/TKIP ▶ For more information, see the HiLCOS data sheet.
Frequency range	▶ Support of 2.4 GHz and 5 GHz: 2412 MHz to 2472 MHz and 5180 MHz to 5825 MHz
Modulation technology	▶ OFDM: BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM ▶ DSSS/CCK
Radio topology	WLAN Access-Point, Bridge-, Router-, Point-to-Point-, Client-, Client-Bridge-Mode

8.4 Roaming

- ▶ IEEE 802.11F (Inter-Access Point Protocol)
- ▶ IEEE 802.11r (Fast Roaming)
- ▶ PMK caching
- ▶ Pre authentification
- ▶ OKC (Opportunistic key caching)

8.5 Receiving sensitivity, transmit power and data rate

The values of the WLAN module shown in the following tables are subject to a tolerance of ±2 dB. If you use only 1 antenna, the transmit power is reduced by 3 dB. The values are in no case to be perceived as a guaranteed property of the overall product. For some country profiles, the module reduces data rate and transmit power automatically. The reason for this are national standards.

8.5.1 IEEE 802.11b

IEEE 802.11b Frequency range 2.412 GHz to 2.472 GHz Bandwidth 20 MHz		
Data rate	**Transmit power**	**Receiving sensitivity**
1 Mbit/s	23 dBm	−95 dBm
2 Mbit/s	23 dBm	−94 dBm
5.5 Mbit/s	23 dBm	−92 dBm
11 Mbit/s	23 dBm	−90 dBm

Table 5: IEEE 802.11b, frequency range 2.412 GHz to 2.472 GHz, bandwidth 20 MHz

8.5.2 IEEE 802.11g

IEEE 802.11g Frequency range 2.412 GHz to 2.472 GHz Bandwidth 20 MHz		
Data rate	**Transmit power**	**Receiving sensitivity**
6 Mbit/s	24 dBm	−94 dBm
9 Mbit/s	24 dBm	−93 dBm
12 Mbit/s	24 dBm	−92 dBm
18 Mbit/s	24 dBm	−90 dBm
24 Mbit/s	24 dBm	−88 dBm
36 Mbit/s	23 dBm	−85 dBm
48 Mbit/s	22 dBm	−81 dBm
54 Mbit/s	21 dBm	−80 dBm

Table 6: IEEE 802.11g, frequency range 2.412 GHz to 2.472 GHz, bandwidth 20 MHz

8.5.3 IEEE 802.11a

IEEE 802.11a Frequency range 5.180 GHz to 5.825 GHz Bandwidth 20 MHz		
Data rate	**Transmit power**	**Receiving sensitivity**
6 Mbit/s	23 dBm	−94 dBm
9 Mbit/s	23 dBm	−94 dBm
12 Mbit/s	23 dBm	−92 dBm
18 Mbit/s	23 dBm	−90 dBm
24 Mbit/s	23 dBm	−86 dBm
36 Mbit/s	21 dBm	−84 dBm
48 Mbit/s	19 dBm	−81 dBm
54 Mbit/s	18 dBm	−80 dBm

Table 7: IEEE 802.11a, frequency range 5.180 GHz to 5.825 GHz, bandwidth 20 MHz

8.5.4 IEEE 802.11n

IEEE 802.11n Frequency range 2.412 GHz to 2.472 GHz Bandwidth 20 MHz		
Coding	**Transmit power**	**Receiving sensitivity**
MCS 0 / 8	24 dBm	−93 dBm
MCS 1 / 9	24 dBm	−91 dBm
MCS 2 / 10	24 dBm	−89 dBm
MCS 3 / 11	23 dBm	−84 dBm
MCS 4 / 12	23 dBm	−83 dBm
MCS 5 / 13	23 dBm	−78 dBm
MCS 6 / 14	21 dBm	−78 dBm
MCS 7 / 15	19 dBm	−76 dBm

Table 8: IEEE 802.11n, frequency range 2.412 GHz to 2.472 GHz, bandwidth 20 MHz

IEEE 802.11n Frequency range 2.412 GHz to 2.472 GHz Bandwidth 40 MHz		
Coding	**Transmit power**	**Receiving sensitivity**
MCS 0 / 8	23 dBm	−92 dBm
MCS 1 / 9	23 dBm	−88 dBm

Table 9: IEEE 802.11n, frequency range 2.412 GHz to 2.472 GHz, bandwidth 40 MHz

IEEE 802.11n Frequency range 2.412 GHz to 2.472 GHz Bandwidth 40 MHz		
Coding	**Transmit power**	**Receiving sensitivity**
MCS 2 / 10	23 dBm	−85 dBm
MCS 3 / 11	22 dBm	−82 dBm
MCS 4 / 12	22 dBm	−79 dBm
MCS 5 / 13	22 dBm	−75 dBm
MCS 6 / 14	21 dBm	−75 dBm
MCS 7 / 15	19 dBm	−73 dBm

Table 9: IEEE 802.11n, frequency range 2.412 GHz to 2.472 GHz, bandwidth 40 MHz

IEEE 802.11n Frequency range 5.180 GHz to 5.825 GHz Bandwidth 20 MHz		
Coding	**Transmit power**	**Receiving sensitivity**
MCS 0 / 8	22 dBm	−93 dBm
MCS 1 / 9	22 dBm	−90 dBm
MCS 2 / 10	22 dBm	−87 dBm
MCS 3 / 11	21 dBm	−83 dBm
MCS 4 / 12	21 dBm	−80 dBm
MCS 5 / 13	20 dBm	−77 dBm
MCS 6 / 14	19 dBm	−74 dBm
MCS 7 / 15	17 dBm	−73 dBm

Table 10: IEEE 802.11n, frequency range 5.180 GHz to 5.825 GHz, bandwidth 20 MHz

IEEE 802.11n Frequency range 5.180 GHz to 5.825 GHz Bandwidth 40 MHz		
Coding	**Transmit power**	**Receiving sensitivity**
MCS 0 / 8	21 dBm	−90 dBm
MCS 1 / 9	21 dBm	−88 dBm
MCS 2 / 10	21 dBm	−85 dBm
MCS 3 / 11	20 dBm	−82 dBm
MCS 4 / 12	20 dBm	−79 dBm

Table 11: IEEE 802.11n, frequency range 5.180 GHz to 5.825 GHz, bandwidth 40 MHz

IEEE 802.11n Frequency range 5.180 GHz to 5.825 GHz Bandwidth 40 MHz		
Coding	**Transmit power**	**Receiving sensitivity**
MCS 5 / 13	19 dBm	−75 dBm
MCS 6 / 14	18 dBm	−73 dBm
MCS 7 / 15	17 dBm	−73 dBm

Table 11: IEEE 802.11n, frequency range 5.180 GHz to 5.825 GHz, bandwidth 40 MHz

8.5.5 IEEE 802.11ac

IEEE 802.11ac Frequency range 5.180 GHz to 5.825 GHz Bandwidth 20 MHz		
Coding	**Transmit power**	**Receiving sensitivity**
MCS 0	22 dBm	−93 dBm
MCS 1	22 dBm	−90 dBm
MCS 2	22 dBm	−87 dBm
MCS 3	21 dBm	−83 dBm
MCS 4	21 dBm	−80 dBm
MCS 5	20 dBm	−77 dBm
MCS 6	19 dBm	−74 dBm
MCS 7	17 dBm	−73 dBm
MCS 8	16 dBm	−71 dBm

Table 12: IEEE 802.11ac, frequency range 5.180 GHz to 5.825 GHz, bandwidth 20 MHz

IEEE 802.11ac Frequency range 5.180 GHz to 5.825 GHz Bandwidth 40 MHz		
Coding	**Transmit power**	**Receiving sensitivity**
MCS 0	21 dBm	−90 dBm
MCS 1	21 dBm	−88 dBm
MCS 2	21 dBm	−85 dBm
MCS 3	20 dBm	−82 dBm
MCS 4	20 dBm	−79 dBm

Table 13: IEEE 802.11ac, frequency range 5.180 GHz to 5.825 GHz, bandwidth 40 MHz

IEEE 802.11ac Frequency range 5.180 GHz to 5.825 GHz Bandwidth 40 MHz		
Coding	**Transmit power**	**Receiving sensitivity**
MCS 5	19 dBm	−75 dBm
MCS 6	18 dBm	−73 dBm
MCS 7	17 dBm	−73 dBm
MCS 8	16 dBm	−69 dBm
MCS 9	16 dBm	−66 dBm

Table 13: IEEE 802.11ac, frequency range 5.180 GHz to 5.825 GHz, bandwidth 40 MHz

IEEE 802.11ac Frequency range 5.180 GHz to 5.825 GHz Bandwidth 80 MHz		
Coding	**Transmit power**	**Receiving sensitivity**
MCS 0	21 dBm	−88 dBm
MCS 1	21 dBm	−86 dBm
MCS 2	21 dBm	−84 dBm
MCS 3	20 dBm	−81 dBm
MCS 4	20 dBm	−77 dBm
MCS 5	19 dBm	−74 dBm
MCS 6	18 dBm	−73 dBm
MCS 7	17 dBm	−70 dBm
MCS 8	16 dBm	−67 dBm
MCS 9	16 dBm	−65 dBm

Table 14: IEEE 802.11ac, frequency range 5.180 GHz to 5.825 GHz, bandwidth 80 MHz

8.6 EMC and immunity

EMC interference immunity		
EN 61000-4-2	Electrostatic discharge	
	Contact discharge	±4 kV
	Air discharge	±8 kV

EMC interference immunity		
EN 61000-4-3	Electromagnetic field	
	80 MHz ... 1000 MHz	10 V/m
	1400 MHz ... 2700 MHz	10 V/m
EN 61000-4-4	Fast transients (burst)	
	DC power line	±2 kV
	Data line	±4 kV
EN 61000-4-5	Voltage surges	
	DC power line	±1 kV line/ground; ±0.5 kV line/line
	Data line, shielded	±1 kV line/ground
	Data line, unshielded	±1 kV
EN 61000-4-6	Conducted disturbances	
	150 kHz ... 80 MHz	10 V

EMC interference emission	
EN 55032	Class B

Stability		
IEC 60068-2-6, test Fc	Vibration	5 Hz ... 8.4 Hz with 0.14 in. (3.5 mm) amplitude
		8.4 Hz ... 150 Hz with 1 g
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms

8.7 Network range

10/100/1000 Mbit/s twisted pair port	
Length of a twisted pair segment	max. 328 ft (100 m) (for Cat5e cable)

Table 15: Network range: 10/100/1000 Mbit/s twisted pair port

8.8 Power consumption/power output

Power consumption	Power output
9 W	31.0 Btu (IT)/h

Table 16: Power consumption/power output

9 Scope of delivery, order numbers and accessories

Scope of delivery

Number	Article
1 ×	Device
1 ×	General safety instructions
1 ×	EU Declaration of Conformity
1 × 1 × premounted	2-pin terminal block for the supply voltage

Figure 2: Scope of delivery for device variants featuring Configuration with the characteristic value 9

Number	Article
1 ×	Device
1 ×	General safety instructions
1 ×	EU Declaration of Conformity
1 × premounted	2-pin terminal block for the supply voltage
1 × premounted	Terminating resistor SMA to ANT2 for RSMA ANT connectors
2 × included	Antenna type BAT-ANT-RSMA-2AGN-R for RSMA ANT connectors

Figure 3: Scope of delivery for device variants featuring Configuration with the characteristic value Z

Accessories

Note that products recommended as accessories may have different characteristics to those of the device, which may limit the application range of the overall system. For example, if you add an accessory with IP20 to a device with IP65, the degree of protection of the overall system is reduced to IP20.

For reliable receive power and transmission power, you require antennas that pertain to your application case.
The "Antenna Guide" document provides an overview of the antennas that can be used as well as the suitable antenna accessories.
This document is available for download as a PDF file on the Hirschmann product pages (www.hirschmann.com).

Other accessories	Order number
2-pin terminal block (50 pieces) for supply voltage	943 845-009
BAT-ANT-RSMA-2AGN-R (10 pieces)	942 046-001

Other accessories	Order number
50 Ω terminating resistors for sealing unused antenna connections, N (10 pieces)	942 117-001

10 Underlying technical standards

Name	
EN 50121-4	Railway applications – EMC – Emission and immunity of the signaling and telecommunications apparatus (Rail Trackside)
EN 55032	Electromagnetic compatibility of multimedia equipment – Emission Requirements
EN 60529	Degrees of protection provided by housing – IP-Code
EN 60950-1	Information technology equipment – Safety – Part 1: General requirements
EN 61000-6-1	Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity for residential, commercial and light-industrial environments
EN 61131-2	Programmable controllers – Part 2: Equipment requirements and tests
EN 300 328	Electromagnetic compatibility and radio spectrum matters (ERM) - bandwidth transfer systems - data transmission equipment operating in 2.4 GHz ISM band and using spread spectrum modulation technology
EN 301 893	Broadband radio access networks (BRAN) – 5 GHz high performance Remote Local Area Network (RLAN)
EN 301 489-1	Electromagnetic compatibility for radio equipment and services
EN 301 489-17	Electromagnetic compatibility (EMC) for radio equipment and services - specific conditions for 2.4 GHz broadband transmission systems and 5 GHz high-performance RLAN equipment
EN 302 502	Broadband radio access networks (BRAN) – permanently installed broadband data transmission systems with 5.8 GHz band
FCC 47 CFR Part 15	Code of Federal Regulations
IEEE 802.1D	MAC Bridges (switching function)
IEEE 802.1Q	Virtual LANs (VLANs, MRP, Spanning Tree)
IEEE 802.11a/b/g/n/ac	WLAN
IEEE 802.3	Ethernet
UL 60950-1	Information technology equipment – Safety – Part 1: General requirements

The device has an approval based on a specific standard only if the approval indicator appears on the device casing.
The device generally fulfills the technical standards named in their current versions.

A Further support

Technical questions

For technical questions, please contact any Hirschmann dealer in your area or Hirschmann directly.

You find the addresses of our partners on the Internet at http://www.hirschmann.com.

A list of local telephone numbers and email addresses for technical support directly from Hirschmann is available at https://hirschmann-support.belden.com.

This site also includes a free of charge knowledge base and a software download section.

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