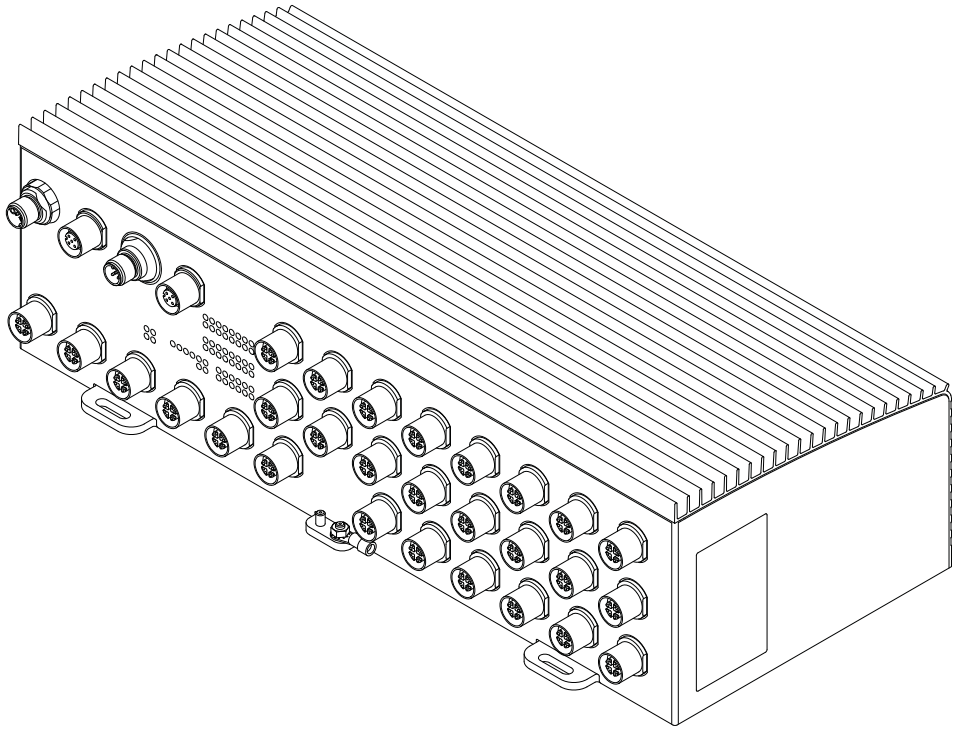
HIRSCHMANN
A BELDEN BRAND

User Manual

Installation
Industrial Ethernet Bobcat Xtreme Performance
BXP Front/Rear Mount Family



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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.

Documentation mentioned in the “Installation” user manual that is not supplied with your device as a printout can be found as PDF files for downloading on the Internet at: *https://www.doc.hirschmann.com*

Important information

Read these instructions carefully, and familiarize yourself with the device before trying to install, operate, or maintain it. The following notes may appear throughout this documentation or on the device. These notes warn of potential hazards or call attention to information that clarifies or simplifies a procedure.

Warning symbols

This is a general warning symbol. This symbol alerts you to potential personal injury hazards. Observe all safety notes that follow this symbol to avoid possible injury or death.

If this symbol is displayed in addition to a safety instruction of the type “Danger” or “Warning”, it means that there is a danger of electric shock and failure to observe the instructions will inevitably result in injury.

This symbol indicates the danger of hot surfaces on the device. In connection with safety instructions, non-observance of the instructions will inevitably result in injuries.

⚠ DANGER	
	**DANGER draws attention to an immediately dangerous situation, which will inevitably result in a serious or fatal accident if not observed.**

⚠ WARNING	
	**WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

⚠ CAUTION	
	**CAUTION indicates a possible danger which, if not avoided, may result in minor injuries.**

NOTICE

NOTICE provides information about procedures that do not involve the risk of injury.

Contents

1. Safety instructions

⚠ WARNING	
	**UNCONTROLLED MACHINE ACTIONS** **Failure to follow these instructions can result in death, serious injury, or equipment damage.** 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.

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.

- Verify that the electrical installation meets local or nationally applicable safety regulations.
- 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.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

1.1. 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.

1.2. Intended use

- Use the product only for the application cases described in the Hirschmann Automation and Control GmbH product information, including this manual.
- Operate the product only according to the technical specifications.

  See *General data* on page 63
- Connect to the product only components suitable for the requirements of the specific application case.

1.3. Installation site requirements

- Exclusively install this device in a restricted access location, to which maintenance staff have exclusive access. Install the device in such a way that it is protected against mechanical forces in the area of the power supply.
- Exclusively install the device indoors.
- Exclusively mount the device on a suitable flat metal surface made from solid metal without any holes to ensure adequate cooling of the device.

  The maximum temperature measured at the reference point on the metal plate in a distance of 5 cm (2 in) from the device) is not allowed to exceed +70 °C (+158 °F).
- See chapter *Mounting the device* on page 47 for detailed information.

1.4. Device casing

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

- Keep the cooling fins free to ensure good air circulation.
- The surfaces of the device casing may become hot. Avoid touching the device while it is operating.
- For operation according to EN 45545-2 HL3: Seal all unused connections and ports exclusively with metal protection screws and metal screw caps. The use of plastic protection screws is prohibited. Protection screws and screw caps made of metal are available as *Accessories* on page 73.

1.5. Strain relief

Note: If the strain relief is insufficient, there is a potential risk of torsion, contact problems and creeping interruptions.

- Relieve the connection points of cables and lines from mechanical stress.
- Design strain reliefs in such a way that they help prevent any mechanical damage to cables, wires or conductors caused by external influences or their own weight.
- To help prevent damage to device connections, connectors and cables, follow the instructions for proper installation in accordance with DIN VDE 0100-520:2013-06, sections 522.6, 522.7 and 522.13.

1.6. Electrical connections

1.6.1. Grounding the device

Grounding the device is by means of a separate ground connection on the device.

You find more information in chapter *Grounding the device* on page 52.

- Ground the device before connecting any other cables.
- Disconnect the grounding only after disconnecting all other cables.

1.6.2. Shielding ground

The shield of a connectable power supply cable with a protective conductor is conductively connected to the ground connection at the casing of the device.

1.6.3. General requirements for connecting electrical wires

Before connecting the electrical wires, **always** verify that the requirements listed are complied with. The following requirements apply without restriction:

- The electrical wires are voltage-free.
- The device is grounded via the designated ground connection(s).
- The cross-section of the ground conductor is 8 mm² or larger.
- The connected voltage source is limited by a current limitation device or a fuse.
- The device is only switched on after installation.
- The ground connection is disconnected only after all other cables have been disconnected.
- The cables used are permitted for the temperature range of the application case.

   Relevant for North America: Exclusively use +60/75 °C (+140/167 °F or +75 °C (+167 °F) copper wire (Cu wire).
- A UL certified cable with a suitable evaluation is used to connect devices (CYJV or PVVA).
- The external circuits intended to be connected to this device are separated from the mains supply or hazardous live voltage by reinforced or double insulation.

1.6.4. General requirements for connecting the supply voltage

Before connecting the supply voltage, **always** verify that the requirements listed are complied with. The following requirements apply without restrictions:

- The supply voltage corresponds to the voltage specified on the type plate of the device.
- The power supply cable is suitable for the required voltage, current, and physical load.
- The cross-section of the ground conductor is at least 8 mm² (8 AWG) or larger.
- The power supply conforms to overvoltage category I or II.
- Exclusively applies to non-PoE devices:

  The power supply conforms to NEC Class 2.
- The power supply has an easily accessible disconnecting device (for example a swich or a plug). This disconnecting device is clearly labelled and identifyable, so that in case of an emergency it is clear which power supply the disconnecting device belongs to.
- Verify that the power supply feeding the device has double or reinforced insulation.
- Applies to device variants with supply voltage characteristic value MB (110 V DC): The conductor cross-section of the power supply cable is at least 1 mm² (18 AWG) on the supply voltage input of the device.
- Applies to device variants with supply voltage characteristic value H9, HB (24/36/48 V DC, PoE): The conductor cross-section of the power supply cable is at least 1.5 mm² (16 AWG) at the supply voltage input of the device.

1.6.5. Requirements for connecting the signal contact

Before connecting the signal contact, **always** verify that the requirements listed are complied with. The following requirements apply without restriction:

- The connected voltage source is limited by a current limitation device or a fuse.
- The electrical threshold values for the signal contact are observed.

Signal contact (via Digital IN) on page 66

1.7. Recycling note

The symbol of a crossed-out wheeled bin shown on the device indicates that the device **MUST NOT** be disposed of with household waste at the end of its service life.

After its service life, the used device must be disposed of properly as electronic waste in accordance with the locally applicable disposal regulations.

End users are responsible for deleting personal data from the used device prior to disposal.

End users are obliged to separate used batteries and accumulators that are not enclosed by the used device from the used device in a non-destructive manner before disposing of the used device. The used batteries and accumulators must be handed in for separate collection. This does not apply if the used device is handed in for reuse.

2. Approvals

2.1. CE marking

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

- **2011/65/EU and 2015/863/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.
- **2014/30/EU (EMC)**
  Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

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

You can download the PDF file of the EU conformity declaration at: *https://www.doc.hirschmann.com/certificates.html*

The device can be used in industrial environments

- Interference immunity: EN 61000-6-2
- Emitted interference: EN 55032
- Safety: IEC/EN 62368-1

For more information on technical data, see *General data* on page 63

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

Warning! This is a Class A device. This device can cause interference in living areas, and in this case the operator may be required to take appropriate measures.

2.2. FCC note

Supplier's Declaration of Conformity

47 CFR § 2.1077 Compliance Information

Bobcat Xtreme Performance

BXP Front/Rear Mount Family

U.S. Contact Information

Belden Inc. – St. Louis
1 N Brentwood Blvd. 15th Floor
St. Louis, Missouri 63105,
United States
Phone: 314.854.8000

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

3. Description

The next-generation Industrial Ethernet Switch Bobcat Xtreme Performance (BXP Front/Rear Mount) with up to 28 ports (6 × 10 Gbit/s and 22 × 1 Gbit/s) and various configurations is characterized by a robust metal casing with M12 connectors. Designed for industrial environments and transportation market conditions, BXP Front/Rear Mount devices support the following key features:

- Wide temperature range: -40 °C ... +70 °C (-40 °F ... +158 °F)
- PoE(+/++)
- Fast Ethernet and Gigabit Ethernet: 100 Mbit/s, 1 Gbit/s, 2.5 Gbit/s, and 10 Gbit/s
- Optional bypass functionality up to 4 ports
- HiOS Software
- IP degree of protection IP40 or IP41, depending on device variant and mounting orientation
- Different supply voltage options, depending on device variant:

  24/36/48 V DC or 110 V DC

The device allows you to set up switched Industrial Ethernet networks according to the standard IEEE 802.3.

You can choose from a wide range of variants based on your individual requirements:

- Number of ports
- Transmission speed
- Temperature range
- Supply voltage range
- Certifications
- Software level

Type of the device mounting:

- Mounting on a flat surface

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

- Web browser
- SSH
- Telnet
- Network management software (for example Industrial HiVision)

  The Network Management Software Industrial HiVision provides you with options for smooth configuration and monitoring. You find further information on the Internet at the Hirschmann product pages: *https://www.hirschmann.com/en/QR/INET-Industrial-HiVision*

- USB M12 interface (locally on the device)
- V.24 interface (locally on the device)

The device provides 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 at: *https://www.doc.hirschmann.com*

3.1. 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.

You find a list of available device variants in chapter *Order numbers* on page 73.

Table 1. Device name and product code

Item	Characteristic	Characteristic value	Description	
1 ... 3	Product	BXP	Bobcat Xtreme Performance	
4	Data rate	6	1 Gbit/s, 2.5 Gbit/s, 10 Gbit/s	
5	Hardware type	0	Standard	
		2	Standard plus PoE+/++	
6	(hyphen)	–		
7 ... 8	Number: (10)/100/1000 Mbit/s ports	14	14 ×	(10)/100/1000 Mbit/s ports
		22	22 ×	(10)/100/1000 Mbit/s ports
9 ... 10	Number: 100/1000/2500 Mbit/s ports	00	0 ×	100/1000/2500 Mbit/s ports
11 ... 12	Number: 1 Gbit/s, 2.5 Gbit/s, 10 Gbit/s	06	6 ×	1/2.5/10 Gbit/s ports
13	Configuration of the **first uplink port group**	A	2 ×	10 Gbit/s F/O, QODC
		I	2 ×	1/2.5/10 Gbit/s twisted pair, M12 “X”-coded
		K	2 ×	1/2.5/10 Gbit/s twisted pair, M12 “X”-coded, with Bypass relay
14	Configuration of the **second uplink port group**	A	2 ×	10 Gbit/s F/O, QODC
		I	2 ×	1/2.5/10 Gbit/s twisted pair, M12 “X”-coded
		K	2 ×	1/2.5/10 Gbit/s twisted pair, M12 “X”-coded, with Bypass relay
15	Configuration of the **third uplink port group**	I	2 ×	1/2.5/10 Gbit/s twisted pair, M12 “X”-coded
		S	2 ×	1/2.5/10 Gbit/s twisted pair, M12 “X”-coded, with PoE +/++

Table 1. Device name and product code (continued)

Item	Characteristic	Characteristic value	Description	
16	Configuration of the **first standard port pair**	G	6 ×	10/100/1000 Mbit/s twisted pair, M12 “X”-coded
		H	6 ×	10/100/1000 Mbit/s twisted pair, M12 “X”-coded, with PoE+/++
17	Configuration of the **second standard port pair**	E	8 ×	10/100/1000 Mbit/s twisted pair, M12 “X”-coded
		F	8 ×	10/100/1000 Mbit/s twisted pair, M12 “X”-coded, with PoE+
18	Configuration of the **third standard port pair**	9	0 ×	not configurable
		E	8 ×	10/100/1000 Mbit/s twisted pair, M12 “X”-coded
		F	8 ×	10/100/1000 Mbit/s twisted pair, M12 “X”-coded, with PoE+
19	(hyphen)	–		
20	Temperature range	V	Standard with Conformal Coating	-40 °C ... +60 °C (-40 °F ... +140 °F)
		E	Extended with Conformal Coating	-40 °C ... +70 °C (-40 °F ... +158 °F)
21 ... 22	Supply voltage	MB	Rated	110 V DC
			Rated voltage range	77 V DC / 138 V DC
			Connection type	5-pin, “K”-coded M12 connector
21 ... 22	Supply voltage	HB	Rated	24/36/48 V DC
			Rated voltage range	16.8 V DC … 60 V DC
			Connection type	5-pin, “L”-coded M12 connector
23	Casing	F	IP40 Metal (side mount)	
		R	IP41 Metal (front/rear mount)	
24	Certificates and declarations	Z	CE, FCC, EN 61131, EN 62368-1	
		T	Z + EN 50121-4	
		S	Z + EN 50121-4, EN 50155	
		R	Z + E1	

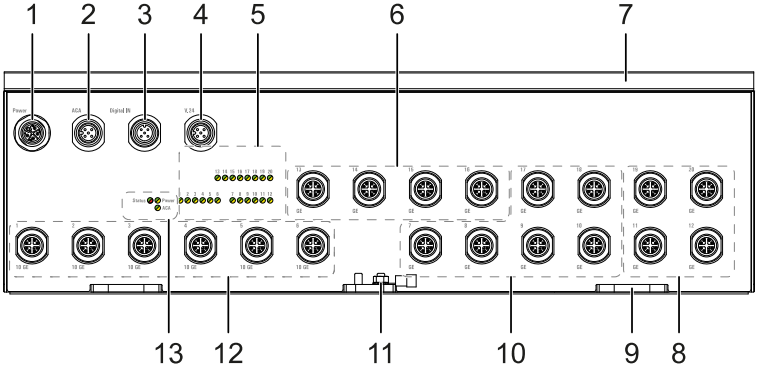
Table 1. Device name and product code (continued)

Item	Characteristic	Characteristic value	Description
25	Certificates and declarations	9	No additional approvals
		T	EN 50121-4
		S	EN 50121-4, EN 50155
		R	E1
21 ... 27	Customer-specific version	HH	Hirschmann Standard Unicast
		HM	Hirschmann Standard Multicast
		HR	Hirschmann Multicast USB-M12
28	Technology	S	Hirschmann Standard Unicast
		N	Hirschmann Standard Multicast
		R	Redundancy (HSR/PRP)
		E	Edge Computing
		T	Prepared for train backbone
		M	MRP
29	Software configuration	E	Empty
30 ... 31	Software level	2S	HiOS Layer 2 Advanced Standard
		2A	HiOS Layer 2 Advanced
		3A	HiOS Layer 3 Advanced
32 ... 36	Software version	10.0.	Software Version 10.0.
		XX.X	Current software version
37 ... 38	Maintenance	00	Maintenance version 00
		XX	Current maintenance version

3.2. Device views

3.2.1. Front view

Figure 1. Front view of a non-PoE device variant (BXP60) with 20 ports and 24/36/48 V DC supply voltage (characteristic value HB)

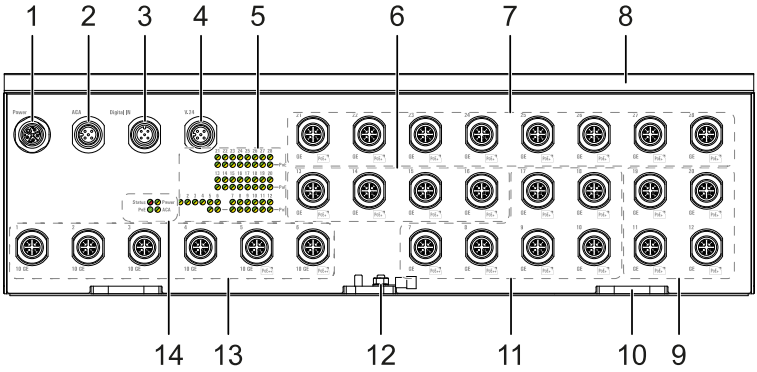


The device elements are described in the following table:

Table 2. Description of device elements: Front view of a non-PoE device variant (BXP60) with 20 ports and 24/36/48 V DC supply voltage (characteristic value HB)

1	Supply voltage connection 5-pin, “L”-coded M12 socket
2	Interface for AutoConfiguration Adapter ACA22-M12-USB (EEC) 5-pin, “A”-coded M12 socket (female)
3	Digital input / Signal contact 5-pin, “A”-coded M12 socket (male)
4	V.24 interface 5-pin, “A”-coded M12 socket (female)
5	LED display elements for port status
6	4 × 10/100/1000 Mbit/s twisted pair port 8-pin, “X”-coded M12 socket
7	Cooling fins
8	4 × 10/100/1000 Mbit/s twisted pair port 8-pin, “X”-coded M12 socket
9	Mounting panel with slot hole for flat surface mounting
10	6 × 10/100/1000 Mbit/s twisted pair port 8-pin, “X”-coded M12 socket These ports exclusively support full-duplex.
11	Connection for protective ground
12	6 × 100/1000/2500/10000 Mbit/s twisted pair port 8-pin, “X”-coded M12 socket These ports exclusively support full-duplex.
13	LED display elements for device status

Figure 2. Front view of a PoE device variant (BXP62) with 28 ports and 24/36/48 V DC supply voltage (characteristic value HB)



The device elements are described in the following table:

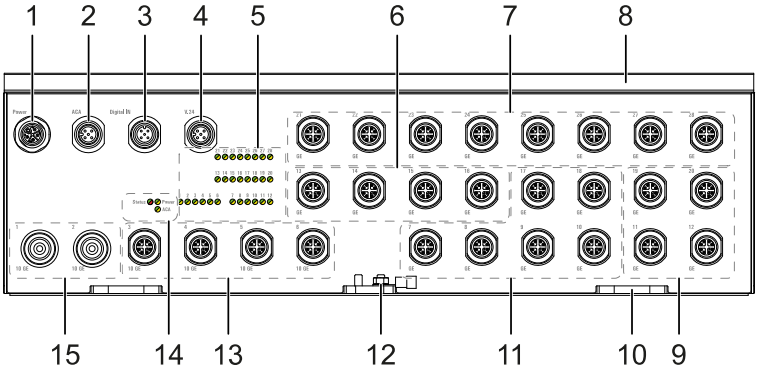
Table 3. Description of device elements: Front view of a PoE device variant (BXP62) with 28 ports and 24/36/48 V DC supply voltage (characteristic value HB)

1	Supply voltage connection 5-pin, “L”-coded M12 socket
2	Interface for AutoConfiguration Adapter ACA22-M12-USB (EEC) 5-pin, “A”-coded M12 socket (female)
3	Digital input / Signal contact 5-pin, “A”-coded M12 socket (male)
4	V.24 interface 5-pin, “A”-coded M12 socket (female)
5	LED display elements for port status
6	4 × 10/100/1000 Mbit/s twisted pair port with PoE+ 8-pin, “X”-coded M12 socket
7	8 × 10/100/1000 Mbit/s twisted pair port with PoE+ 8-pin, “X”-coded M12 socket
8	Cooling fins
9	4 × 10/100/1000 Mbit/s twisted pair port with PoE+ 8-pin, “X”-coded M12 socket
10	Mounting panel with slot hole for flat surface mounting
11	4 × 10/100/1000 Mbit/s twisted pair port with PoE+ (Ports: 9, 10, 17, 18) 2 × 10/100/1000 Mbit/s twisted pair port with PoE++ (Ports: 7, 8) 8-pin, “X”-coded M12 socket

Table 3. Description of device elements: Front view of a PoE device variant (BXP62) with 28 ports and 24/36/48 V DC supply voltage (characteristic value HB) (continued)

	These ports exclusively support full-duplex.
12	Connection for protective ground
13	4 × 100/1000/2500/10000 Mbit/s twisted pair port 2 × 100/1000/2500/10000 Mbit/s twisted pair port with PoE++ (Ports: 5, 6) 8-pin, “X”-coded M12 socket These ports exclusively support full-duplex.
14	LED display elements for device status

Figure 3. Front view of a non-PoE device variant (BXP60) with 26 twisted pair ports, 2 F/O ports and 24/36/48 V DC supply voltage (characteristic value HB)



The device elements are described in the following table:

Table 4. Description of device elements: Front view of a non-PoE device variant (BXP60) with 26 twisted pair ports, 2 F/O ports and 24/36/48 V DC supply voltage (characteristic value HB)

1	Supply voltage connection 5-pin, “L”-coded M12 socket
2	Interface for AutoConfiguration Adapter ACA22-M12-USB (EEC) 5-pin, “A”-coded M12 socket (female)
3	Digital input / Signal contact 5-pin, “A”-coded M12 socket (male)
4	V.24 interface 5-pin, “A”-coded M12 socket (female)

Table 4. Description of device elements: Front view of a non-PoE device variant (BXP60) with 26 twisted pair ports, 2 F/O ports and 24/36/48 V DC supply voltage (characteristic value HB) (continued)

5	LED display elements for port status
6	4 × 10/100/1000 Mbit/s twisted pair port 8-pin, “X”-coded M12 socket
7	8 × 10/100/1000 Mbit/s twisted pair port 8-pin, “X”-coded M12 socket
8	Cooling fins
9	4 × 10/100/1000 Mbit/s twisted pair port 8-pin, “X”-coded M12 socket
10	Mounting panel with slot hole for flat surface mounting
11	6 × 10/100/1000 Mbit/s twisted pair port 8-pin, “X”-coded M12 socket These ports exclusively support full-duplex.
12	Connection for protective ground
13	4 × 100/1000/2500/10000 Mbit/s twisted pair port 8-pin, “X”-coded M12 socket These ports exclusively support full-duplex.
14	LED display elements for device status
15	2 × 1000/2500/10000 Mbit/s F/O port QODC connector These ports exclusively support full-duplex. These ports serve as uplink ports in case of power failure.

3.2.1.1. Port assignment

Figure 4. Port assignment: Port assignment Bobcat Xtreme Performance

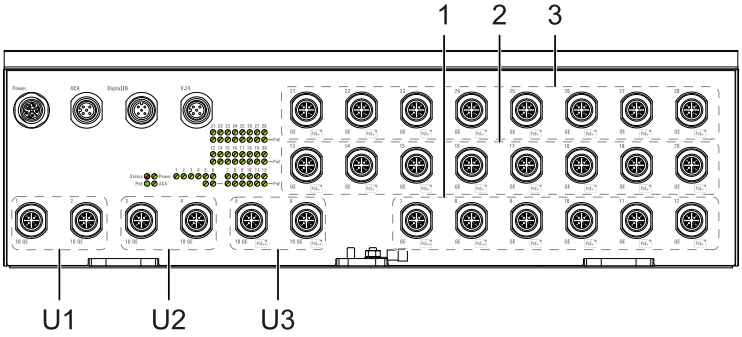


Table 5. Port assignment: Exemplary port assignment of a PoE device variant with 28 ports and casing characteristic value R (front view)

Group	Description
U1	Uplink group 1 (product code item 13)
U2	Uplink group 2 (product code item 14)
U3	Uplink group 3 (product code item 15)
1	Port group 1 (product code item 16)
2	Port group 2 (product code item 17)
3	Port group 3 (product code item 18)[1]

Note:

- The numerical sequence of the port assignment is identical for every device variant.
- For devices with PoE/PoE+/PoE++ ports: The exact position and type of the PoE/PoE+/PoE++ ports on the device are printed on the device. Ports with PoE/Poe+/PoE++ are marked with the PoE/PoE+/PoE++ logo on the bottom right side of the port.

1. Exclusively applicable for 28 port device variants.

3.3. Power supply

The following options for power supply are available:

3.3.1. Supply voltage 24/36/48 V DC

Corresponds to supply voltage characteristic value HB in the product code.

24/36/48 V DC with 5-pin “L”-coded M12 plug.

For information about the position on the device see chapter *Device views* on page 24.

You will find information on connecting the supply voltage here:

Connecting the supply voltage on page 53

3.3.2. Supply voltage 110 V DC

Corresponds to supply voltage characteristic value MB in the product code.

The power is supplied via a 5-pin, “K”-coded M12 plug.

For information about the position on the device see chapter *Device views* on page 24.

You will find information on connecting the supply voltage here:

Connecting the supply voltage on page 53

3.4. Management Interfaces

3.4.1. USB interface

This interface is a 5-pin, “A”-coded M12 socket (female) with shielding.

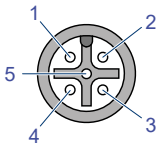
For information about the position on the device see chapter *Device views* on page 24.

The USB interface allows you to connect the ACA22-M12-USB (EEC) storage medium. This is used for saving/loading the configuration data and diagnostic information, and for loading the software.

The USB interface has the following properties:

- Supplies current of max. 500 mA
- Supports the USB master mode
- Supports USB 2.0
- M12 "A"-coded connector
- Voltage not electrically isolated
- Supported file system: FAT32

Table 6. Pin assignment: USB interface

5-pin M12 socket, “A”-coded	Pin	Function
	1	U
	2	-
	3	D-
	4	GND
	5	D+

Note: The USB interface can be disabled via the configuration. You find detailed information on the configuration via the digital input in the software user documentation. You find the software user documentation as PDF files on the Internet at: *https://www.doc.hirschmann.com*

3.4.2. V.24 interface (external management)

This interface is a 5-pin, “A”-coded M12 socket (female).

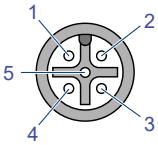
For information about the position on the device see chapter *Device views* on page 24.

The V.24 interface is a serial interface for the local connection of an external management station (VT100 terminal or PC with corresponding terminal emulation). This allows you to set up a connection to the Command Line Interface (CLI) and to the system monitor.

VT100 terminal settings	
Speed	9600 Baud
Data	8 bit
Stopbit	1 bit
Handshake	off
Parity	none

The V.24 interface is electrically insulated from the supply voltage.

Table 7. Pin assignment: V.24 interface

5-pin, “A”-coded M12 socket (female)	Pin	Function
	1	TX
	2	RX
	3	-
	4	GND
	5	-

Note: The V.24 interface can be disabled via the configuration. You find detailed information on the configuration via the digital input in the software user documentation. You find the software user documentation as PDF files on the Internet at: *https://www.doc.hirschmann.com*

3.5. Ethernet ports

You have the option to connect end devices or other segments to the device ports via twisted pair cables.

Exclusively for device variants with QODC connectors:

You have the option to connect end devices or other segments to the device ports using twisted pair cables or optical fibers (F/O).

3.5.1. Twisted pair port 10/100/1000 Mbit/s

This port is an 8-pin, “X”-coded M12 socket (female).

For information about the position on the device see chapter *Device views* on page 24.

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:

- 10 Mbit/s half duplex mode, 10 Mbit/s full duplex mode

  Note: Some ports support full duplex mode only: See *Front view* on page 24.

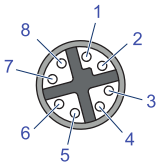
- 100 Mbit/s half duplex mode, 100 Mbit/s full duplex mode

  Note: Some ports support full duplex mode only: See *Front view* on page 24.

- 1000 Mbit/s full duplex mode
- Autonegotiation (Delivery state: activated)
- Autopolarity
- The pin assignment corresponds to MDI-X.

The port casing is electrically connected to the front panel.

Table 8. Pin assignment

8-pin M12 socket, “X”-coded	Pin	10/100 Mbit/s	1000 Mbit/s
	1	RX+	BI_DB+
	2	RX-	BI_DB-
	3	TX+	BI_DA+
	4	TX-	BI_DA-
	5	–	BI_DC+
	6	–	BI_DC-
	7	–	BI_DD-
	8	–	BI_DD+

3.5.2. Twisted pair port 100/1000/2500/ 10000 Mbit/s

This port is an 8-pin, “X”-coded M12 socket (female).

For information about the position on the device see chapter *Device views* on page 24.

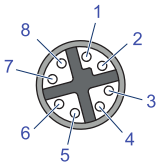
The 100/1000/2500/10000 Mbit/s twisted pair port allows you to connect network components according to the IEEE 802.3 100BASE-TX, IEEE 802.3 1000BASE-T, IEEE 802.3bz 2.5GBASE-T and IEEE 802.3 and 10GBASE-T standards.

This port supports:

- Autonegotiation (Delivery state: activated)
- Autopolarity
- Autocrossing
- 100/1000/2500/10000 Mbit/s full duplex mode
- The pin assignment corresponds to MDI-X.

The port casing is electrically connected to the front panel.

Table 9. Pin assignment

8-pin M12 socket, “X”-coded	Pin	100 Mbit/s	1000/2500/10000 Mbit/s
	1	RX+	BI_DB+
	2	RX-	BI_DB-
	3	TX+	BI_DA+
	4	TX-	BI_DA-
	5	–	BI_DC+
	6	–	BI_DC-
	7	–	BI_DD-
	8	–	BI_DD+

3.5.3. Support of PoE+/++

The device variants featuring hardware type characteristic value 2 support Power over Ethernet (PoE+/++). With the presence of the PoE power supply, a separate power supply for the connected device is unnecessary.

You can identify PoE+/++ ports by the following symbols.

Maximum power available to PoE end devices in total: 120 W, divided between the ports:

Port 1 ... 4: 0 W

Port 5 ... 6: 90 W

Port 7 ... 8: 60 W

Port 9 ... 20/28: 30 W

Connect only PoE-powered devices whose data connections are located in the interior of the building and are specified as SELV circuits according to IEC 60950-1 or ES1 circuits according to IEC/EN 62368-1.

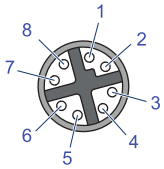
The PoE support complies with the following technical standards:

Technical standard	Description
IEEE 802.3at	PoE+ max. Powered Device (PD) Class 4 (30 W)
IEEE 802.3bt	PoE++ max. Powered Device (PD) Class 5, 6, 7, 8 (40 W, 51 W, 62 W, 71 W)

3.5.3.1. 10/100/1000 Mbit/s PoE+/++ port

The 10/100/1000 Mbit/s PoE port allows you to connect network components as a powered device (PD) according to standards IEEE 802.3 10BASE-T/100BASE-TX/1000BASE-T, IEEE 802.3af/at and IEEE 802.3bt.

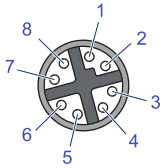
Table 10. Pin assignment: GE port

8-pin M12 socket, “X”-coded	Pin	10/100 Mbit/s	1000 Mbit/s	PoE+	PoE++
	1	RX+	BI_DB+	Negative V^{PSE}	Negative V^{PSE}
	2	RX-	BI_DB-	Negative V^{PSE}	Negative V^{PSE}
	3	TX+	BI_DA+	Positive V^{PSE}	Positive V^{PSE}
	4	TX-	BI_DA-	Positive V^{PSE}	Positive V^{PSE}
	5	–	BI_DC+	–	Negative V^{PSE}
	6	–	BI_DC-	–	Negative V^{PSE}
	7	–	BI_DD-	–	Positive V^{PSE}
	8	–	BI_DD+	–	Positive V^{PSE}

3.5.3.2. 1/2.5/10 Gbit/s PoE+/++ port

The 1/2.5/10 Gbit/s PoE port allows you to connect network components as a powered device (PD) according to the IEEE 802.3 1000BASE-T, IEEE 802.3bz 2.5GBASE-T and IEEE 802.3, 10GBASE-T, IEEE 802.3at and IEEE 802.3bt standards.

Table 11. Pin assignment: GE port

8-pin M12 socket, “X”-coded	Pin	Function	PoE+	PoE++
	1	BI_DB+	Negative V^{PSE}	Negative V^{PSE}
	2	BI_DB-	Negative V^{PSE}	Negative V^{PSE}
	3	BI_DA+	Positive V^{PSE}	Positive V^{PSE}
	4	BI_DA-	Positive V^{PSE}	Positive V^{PSE}
	5	BI_DC+	–	Negative V^{PSE}
	6	BI_DC-	–	Negative V^{PSE}
	7	BI_DD-	–	Positive V^{PSE}
	8	BI_DD+	–	Positive V^{PSE}

3.5.4. F/O port 1/2.5/10 Gbit/s

This port is a QODC connector.

The port allows you to connect network components according to the standards IEEE 802.3 1000BASE-SX/1000BASE-LX or IEEE 802.3 (Clause 49) 10GBASE-R.

This port supports:
Full duplex mode

Delivery state:
Full duplex mode

Note: The F/O ports of the current device versions are not capable of Fast Ethernet.

3.6. Display elements

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

3.6.1. Device status

Device status display elements provide information on the operational status of the device.

Figure 5. Device status: Location of the device status display elements on the device (device variants with 18 twisted pair ports and 2 F/O ports)

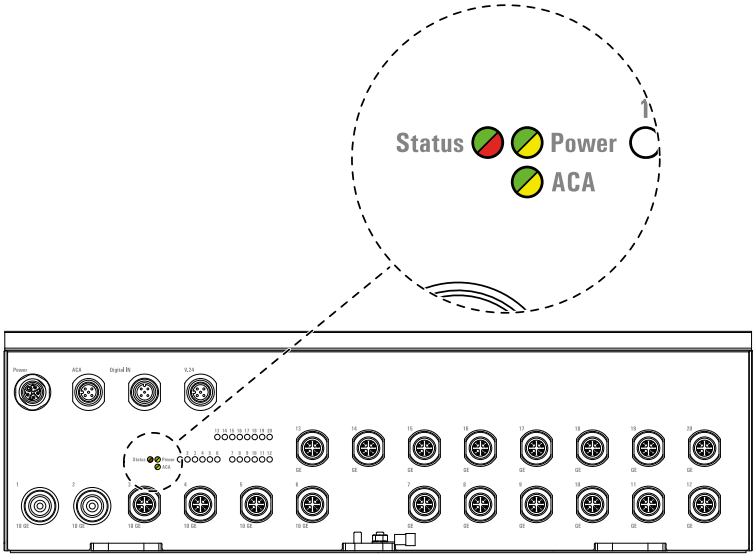


Figure 6. Device status: Location of the device status display elements on the device (device variants with 28 ports and PoE)

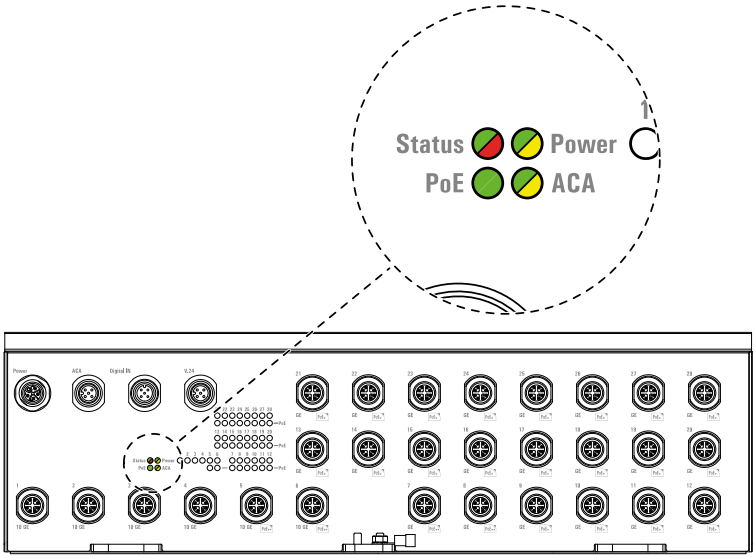


Table 12. Power LED: Color, activity and meaning

Color	Activity	Meaning
none	none	Supply voltage is too low or not available
yellow	flashes 4 × a period	Software update is running. Maintain the power supply
green	lights up	Supply voltage is on

Table 13. Status LED: Color, activity and meaning

Color	Activity	Meaning
none	none	Device is starting and/or is not ready for operation
red	lights up	Device is ready for operation Device has detected at least one error in the monitoring results
red	flashes 1 × a period	The boot parameters used when the device has been started differ from the boot parameters saved. Start the device again.
red	flashes 4 × a period	Device has detected a multiple IP address
red/ green	flashes alternately	Device is in recovery mode
green	lights up	Device is ready for operation

Table 13. Status LED: Color, activity and meaning (continued)

Color	Activity	Meaning
		Characteristics can be configured

Table 14. ACA LED: Color, activity and meaning

Color	Activity	Meaning
none	none	ACA storage medium not connected
none	none	Device is starting and/or is not ready for operation
yellow	lights up	ACA is not ready for operation
green	lights up	ACA storage medium connected
green	flashes 3 × a period	Device writes to/reads from the storage medium

Table 15. PoE (power) LED: Color, activity and meaning

Color	Activity	Meaning
green	lights up	PoE voltage is on

Note: Only PoE device variants have PoE display elements.

3.6.2. Port status

Port status display elements provide port-related information.

Figure 7. Port status: Location of the port status display elements on the device (device variants with 18 twisted pair ports and 2 F/O ports)

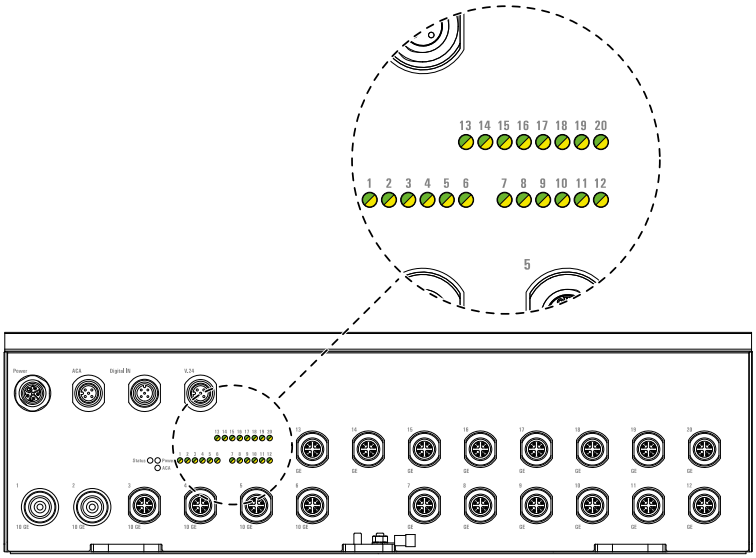


Figure 8. Port status: Location of the port status display elements on the device (device variants with 28 ports and PoE)

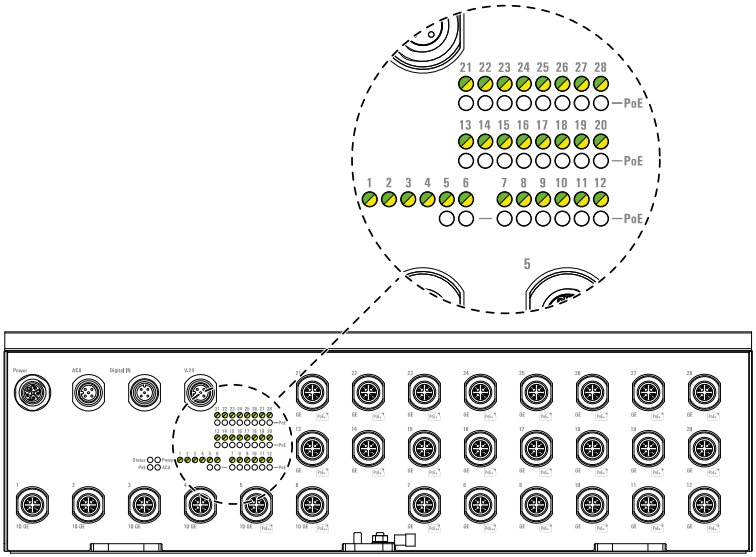


Table 16. Port status LED: Color, activity and meaning

Color	Activity	Meaning
none	none	Device detects an invalid or missing link
yellow	flashing	Device is transmitting and/or receiving data
yellow	flashes 1 × a period	Device detects at least one unauthorized MAC address (Port Security Violation)
yellow	flashes 3 × a period	The port is switched to Standby mode or switched off by the device (auto switch off)
yellow	lights up	Device detects a data rate that is not supported
green	lights up	Device detects a valid link
green	flashes 1 × a period	Port is switched to stand-by
green	flashes 3 × a period	Port is switched off

3.6.3. PoE status

PoE status display elements provide PoE-related information.

Note: Only PoE device variants have PoE display elements.

Figure 9. PoE status: Location of the PoE status display elements on the device (device variants with 28 ports and PoE)

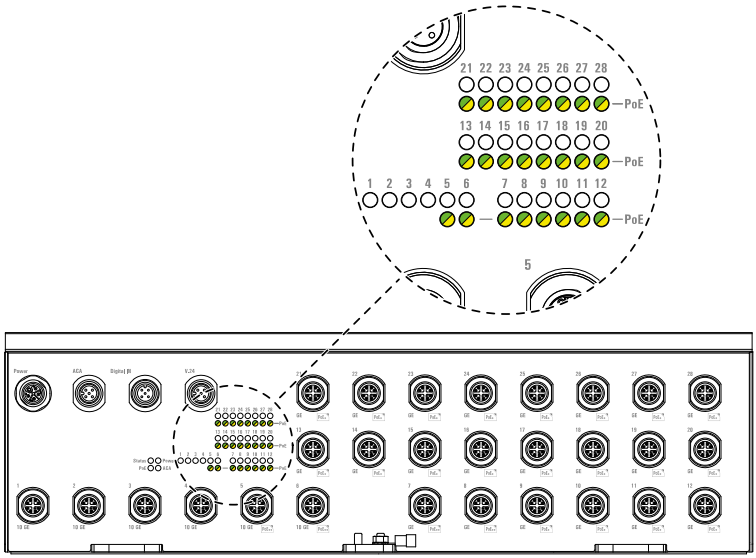


Table 17. PoE status LED: Color, activity and meaning

Color	Activity	Meaning
none	none	No powered device connected
yellow	flashes 1 × a period	Output budget has been exceeded Device has detected a connected powered device
yellow	flashes 3 × a period	PoE administrator status deactivated
green	lights up	Powered device is supplied with PoE voltage.

3.7. Input/output interfaces

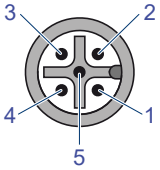
The following input/output interface is available:

Digital IN interface. The digital input and the signal contact are both using the Digital IN interface.

3.7.1. Digital input (via Digital IN)

For information about the position on the device see chapter *Device views* on page 24.

Table 18. Pin assignment

Digital input 5-pin, “A”-coded M12 socket (male socket)	Pin	Function
	**1**	**Input +**
	2	NO (Normally open contact)
	3	NC (Normally closed contact)
	4	**Input -**
	5	CO (Changeover contact)

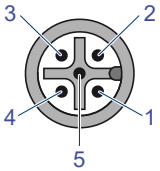
The Digital IN port is a configurable port. It can be used to capture and forward signals or reset the device to Factory parameters.

You find detailed information on possible applications and the configuration of the digital input in the software user documentation. You find the software user documentation as PDF files on the Internet at: *https://www.doc.hirschmann.com*

3.7.2. Signal contact (via Digital IN)

For information about the position on the device see chapter *Device views* on page 24.

Table 19. Pin assignment

Signal contact 5-pin, “A”-coded M12 socket (male socket)	Pin	Function
	1	Input +
	2	**NO (Normally open contact)**
	3	**NC (Normally closed contact)**
	4	Input -
	5	**CO (Changeover contact)**

The signal contact is a potential-free changeover contact. If the device is not connected to a power supply, the changeover contact (5) is connected to the normally closed contact (3).

The signal contact allows you to control external devices or monitor device functions.

In the configuration, you specify how the device uses the signal contact.

You find detailed information on possible applications and the configuration of the signal contact in the software user documentation. You find the software user documentation available as download on the Internet at:

https://www.doc.hirschmann.com

4. 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:

4.1. Checking the package contents

- Check whether the package includes all items named in the section *Scope of delivery* on page 73.
- Check the individual parts for transport damage.

4.2. Mounting the device

⚠ CAUTION

BURN HAZARD
Failure to follow these instructions can result in injury or equipment damage.

The surfaces of the device casing may become hot. Avoid touching the device while it is operating.

If ambient temperatures are ≥45 °C (≥113 °F), exclusively install the device in “restricted access locations” according to EN 62368-1.

⚠ CAUTION

OVERHEATING OF THE DEVICE
Failure to follow these instructions can result in minor injury or equipment damage.

Verify that all ventilation fins are clear when installing the device. Avoid touching the device while it is operating.

NOTICE

RISK OF POLLUTION AND REDUCED HEAT CONDUCTION
Failure to follow these instructions can result in equipment damage.

Pollution of the thermal pads on the back of the device may cause reduced thermal conductivity, thus limiting the performance of the device.

To avoid pollution of the thermal pads, mount the device in a clean, dust-free environment. Exclusively remove the protective film of the thermal pads once you have verified that your workplace and the flat metal surface are clean.

- When selecting the installation location, verify that you observe the climatic threshold values of the device specified in the technical data. Take measures to prevent ambient conditions such as heat from affecting the device.
- Remove the provided transport protection caps and the transport protection screws from the device.
- Exclusively mount the device on a suitable flat metal surface (not included) made of solid metal without holes. For the dimensions of this flat metal surface, see *Figure 2* on page 67.

You have the following option(s) for mounting your device:

- *Mounting on a flat surface* on page 48

4.2.1. Mounting on a flat surface

Prerequisites:

- Prepare the holes in the flat surface for mounting the device. You find dimensions for drilling and mounting the device in chapter

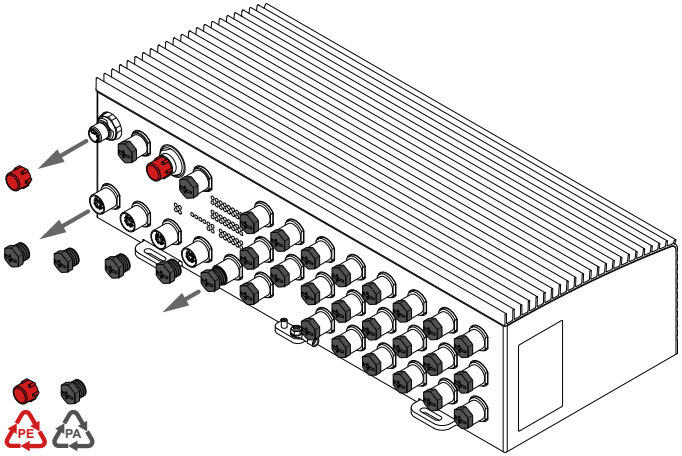
  Dimension drawings on page 66.

- Exclusively use screws, clamps, or other appropriate means suitable for the installation, environment, and use case to ensure flawless operation of the device. Hirschmann recommends using 4 metal screws (M5).
- Exclusively mount the device on a flat metal surface with the following specifications:
  - The flat metal surface must be clean, plane, solid, and without any burrs or holes other than holes used for mounting.
  - The flat metal surface consists of a material with high thermal conductivity.
  - The flat metal surface is **NOT** connected to any other heat source.
  - The plane below surface has the capability to sink heat in a way that the maximum temperature measured at the reference point on the metal plate in a distance of 5 cm (2 in) from the device) is not allowed to exceed +70 °C (+158 °F).
  - The flat metal surface has the following dimensions: See *Table 22: General data* on page 63.
- Verify with the end user that the load-bearing capacity of the mounting points is in accordance with the weight, environment, and use case of the device.

Perform the following work steps:

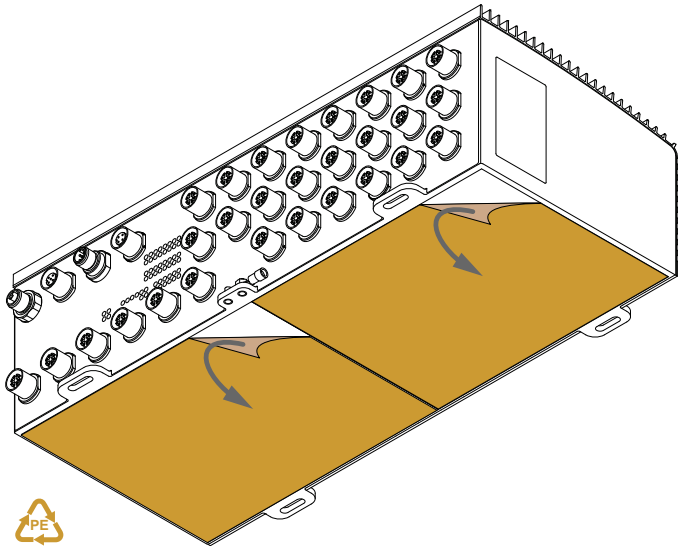
- Prepare the flat metal surface as outlined in *Prerequisites* on page 48.
- Remove the transport protection screws and port caps from the device (*Figure 10: Mounting on a flat surface: Removing the transport protection screws and port caps* on page 50).

Figure 10. Mounting on a flat surface: Removing the transport protection screws and port caps



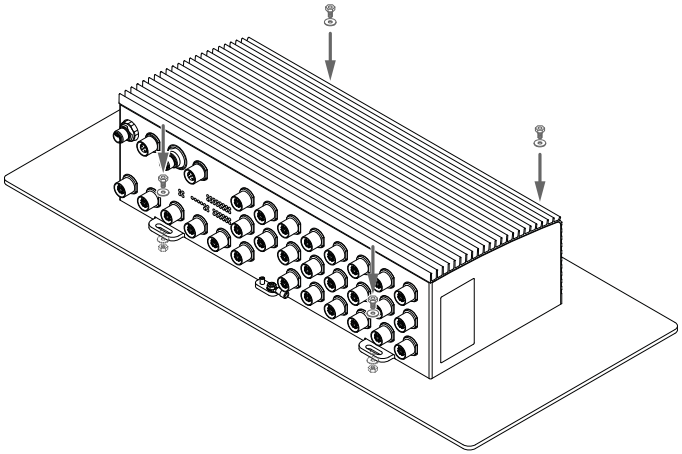
- Remove the protective film from the thermal pads on the bottom side of the device (*Figure 11: Mounting on a flat surface: Removing the protective plastic film from the thermal pads on the bottom side of the device* on page 51).

Figure 11. Mounting on a flat surface: Removing the protective plastic film from the thermal pads on the bottom side of the device



- Mount the device on the flat metal surface with 4 metal screws (M5) or other appropriate means (*Figure 12: Mounting on a flat surface: Mounting the device on a flat metal surface* on page 51).

Figure 12. Mounting on a flat surface: Mounting the device on a flat metal surface



- Verifiy that the device is firmly mounted on the flat metal surface.
- If the flat metal surface is not the final installation location:
  - Install the device via the attached flat metal surface in a suitable installation location.
  - Verify that the device is firmly mounted in the installation location.

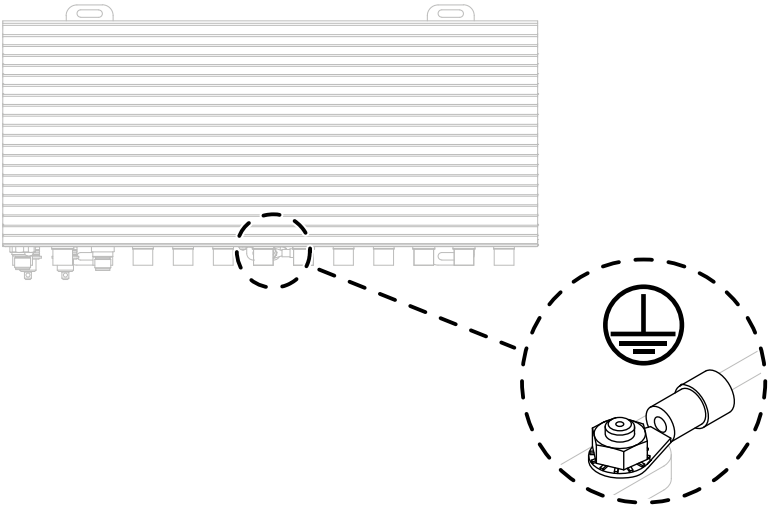
Note: To keep the IP41 classification of the device, exclusively install the device with the cooling fins on top, with the device label facing sideways. Seal all unused ports and connections with metal protection screws and metal screw caps. The IP41 classification of the device is only valid when installed horizontally. If there is any deviation, only an IP40 classification applies.

Note: For operation according to EN 45545-2 HL3: Seal all unused connections and ports exclusively with metal protection screws and metal screw caps. The use of plastic protection screws is prohibited. Protection screws and screw caps made of metal are available as *Accessories* on page 73.

4.3. Grounding the device

⚠ CAUTION	
	**ELECTRIC SHOCK** **Failure to follow these instructions can result in minor injury, or equipment damage.** Ground the device before connecting any other cables.

Figure 13. Location of the ground connection on the device (front side of the device)



Perform the following work steps:

- Ground the device via the ground screw (*Figure 13: Location of the ground connection on the device (front side of the device)* on page 53) with a tightening torque of 0.5 Nm ... 1.0 Nm (4.4 lb-in ... 8.8 lb-in).

The cross-section of the ground conductor is 8 mm² (8 AWG) or larger.

4.4. Connecting the supply voltage

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

⚠ WARNING

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

Make sure that the power supply feeding the device has double or reinforced insulation.

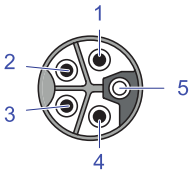
Exclusively connect a supply voltage that corresponds to the type plate of your device.

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

4.4.1. Supply voltage 24/36/48 V DC

Corresponds to supply voltage characteristic value HB in the product code.

Table 20. Supply voltage 24/36/48 V DC

5-pin M12 connector, “L”-coded	Pin	Function
	1	P+ Positive terminal of the supply voltage
	2	Do not use
	3	P- Negative terminal of the supply voltage
	4	Do not use
	5	FE Functional earth connection

For the supply voltage to be connected, perform the following work steps:

- Mount the power supply cable to the power supply connector of the device.

  You find the prescribed tightening torque in chapter:

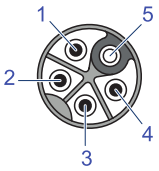
  Supply voltage 24/36/48 V DC on page 63

- Enable the supply voltage.

4.4.2. Supply voltage 110 V DC

Corresponds to supply voltage characteristic value MB in the product code.

Table 21. Supply voltage 110 V DC

5-pin M12 connector, “K”-coded	Pin	Function	
	1	+	Positive terminal of supply voltage
	2		Do not use
	3	-	Negative terminal of supply voltage
	4		Do not use
	5	PE	Protective earth connection

For the supply voltage to be connected, perform the following work steps:

- Mount the power supply cable to the power supply connector of the device.

  You find the prescribed tightening torque in chapter:

  Supply voltage 110 V DC on page 64

- Enable the supply voltage.

4.5. Operating the device

When you connect the supply voltage, you start up the device.

You find detailed information on the operation of the device in the software user documentation. You find the software user documentation as PDF files on the Internet at: *https://www.doc.hirschmann.com*

4.6. Connecting data cables

Note the following general recommendations for data cable connections in environments with high electrical interference levels:

- Keep the length of the data cables as short as possible.
- When using copper cables, provide a sufficient separation between the power supply cables and the data cables. Ideally, install the cables in separate cable ducts.
- Verify that power supply cables and data cables do not run parallel over longer distances. If reducing the inductive coupling is necessary, verify that the power supply cables and data cables cross at a 90° angle.
- Use shielded data cables for gigabit transmission via copper cables. Only use shielded data cables to meet EMC requirements according to EN 50121-4 and marine applications.
  Electromagnetic compatibility (EMC) on page 69
- It is strongly recommended to use cable connectors with full thread and not partial thread to guarantee the electrical connection between the M12 cable and socket.
- BXP devices feature push-pull according to IEC 61076-2-010. Data cables can be connected via push-pull or screw thread, depending on the M12 connector on the cable.
- Connect the data cables according to your requirements.
  See *Ethernet ports* on page 32

Perform the following work steps:

- Connect the data cables.

Note: For operation according to EN 45545-2 HL3: Seal all unused connections and ports exclusively with metal protection screws and metal screw caps. The use of plastic protection screws is prohibited. Protection screws and screw caps made of metal are available as *Accessories* on page 73.

5. Basic settings

5.1. Default settings

- Ethernet ports: link status is not evaluated (signal contact)
- IP address: The device looks for its IP address parameters using DHCP
- Management password:
  Login: user, password: public (read only)
  Login admin, password: private (read/write)
- Twisted pair ports: Autonegotiation
- Rapid Spanning Tree Protocol (RSTP): enabled
- V.24 data rate: 9600 Baud

5.2. First login (Password change)

To help prevent undesired access to the device, it is imperative that you change the default password during initial setup.

Perform the following work steps:

- Open the Graphical User Interface, the Command Line Interface, HiView, or Provize Explorer the first time you log on to the device.
- Log on to the device with the default password "private". On successful login, the device prompts you to type in a new password.
- Type in your new password.

  To help increase security, choose a password that contains at least 8 characters which includes upper-case characters, lower-case characters, numerical digits, and special characters.
- When you log on to the device with the Command Line Interface, the device prompts you to confirm your new password.

  The device displays an error when the new password entered and the password confirmed do not match.
- Log on to the device again with your new password.

Note: If you lost your password, use the System Monitor to reset the password.

For further information, see *https://hirschmann-support.belden.com/en/kb/required-password-change-new-procedure-for-first-time-login*

6. Monitoring the temperature of the metal plate

Operate the device below the specified maximum temperature of the metal plate exclusively.

Climatic conditions during operation on page 67

The temperature displayed in the CLI (Command Line Interface) and the GUI (Graphical User Interface) is the internal temperature of the device. It is higher than the temperature of the mounting plate. The maximum internal temperature of the device named in the technical data is a guideline that indicates to you that the maximum temperature of the mounting plate has possibly been exceeded.

7. 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 (*https://www.belden.com*).
- Internal fuses are triggered only in the case of a detected error in the device. In case of damage or malfunction of the device, turn off the supply voltage and return the device to the plant for inspection.

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

8. Disassembly

8.1. Removing the device

⚠ WARNING	
	**ELECTRIC SHOCK** **Failure to follow these instructions can result in death, serious injury, or equipment damage.** Disconnect the grounding only after disconnecting all other cables.

Perform the following work steps:

- Disable the supply voltage.
- Disconnect the data cables.
- Disconnect the power supply cable.
- Disconnect the grounding.
- Remove the screws.
- Remove the device from the flat metal surface.

Note: The thermal pad on the bottom side of the device is susceptible to pollution. After removing the device from the flat metal surface, cover the thermal pad with plastic foil to prevent it from picking up dirt and debris.

9. Technical data

9.1. General data

Table 22. General data

BXP Front/Rear Mount	
Dimensions device W × H × D	See *Dimension drawings* on page 66 The dimensions apply to all BXP device variants.
Dimensions flat metal surface W × H × D (item not included)	530 mm × 270 mm × 3 mm (20.9 in × 10.63 in × 0.12 in) See also: *Dimension drawings* on page 66
Weight	**BXP62 (6 × 10 Gbit/s, 22 × 1 Gbit/s)** 6500 g (14.33 lb)
Mounting	*Mounting on a flat surface* on page 48
Pollution degree	2
Degree of protection	IP40 or IP41 (depending on the device variant and mounting)

9.2. Supply voltage

9.2.1. Supply voltage 24/36/48 V DC

Table 23. Supply voltage with characteristic value HB

Rated voltage	24/36/48 V DC	
Voltage range including maximum tolerances	16.8 V DC ... 60 V DC (defined at socket of device)	
Connection type	5-pin, “L”-coded M12 plug	
	Tightening torque	0.6 Nm (5.3 lb-in)
	Wire cross-section	1.5 mm² (16 AWG)[2]
Power loss buffer	>10 ms at 24 V >16 ms at 48 V	
Overload current protection on the device	Non-replaceable fuse	
Back-up fuse for each voltage input	Nominal rating:	max. 20 A
	Characteristic:	slow blow
Peak inrush current	8 A	

2. Undervoltage on the device affects the function of the display elements. Therefore, select the power supply voltage and cable specifications (length and conductor cross-section) in a way that the voltage on the device does not fall below the specified minimum.

Table 23. Supply voltage with characteristic value HB (continued)

Connection for functional ground	*Grounding the device* on page 52	
Current integral I^2t	<1.5 A^2s	
Max. PoE power	Nominally	60 W

Table 24. Ground connection

Ground connection		
Ground connection	*Grounding the device* on page 52	
Connection type	M4 screw	
	Tightening torque	min. 0.5 Nm max. 1.0 Nm
	min. conductor cross-section	The cross-section of the ground conductor is 8 mm² (8 AWG) or larger.

9.2.2. Supply voltage 110 V DC

Table 25. Supply voltage with characteristic value MB

Rated voltage	110 V DC	
Voltage range including maximum tolerances	77 V DC ... 138 V DC (defined at socket of device)	
Connection type	5-pin, “K”-coded M12 plug	
	Tightening torque	0.6 Nm (5.31 lb-in)
	Wire cross-section	1 mm² (18 AWG)[3]
Overload current protection on the device	Non-replaceable fuse	
Power loss buffer	10 ms	
Back-up fuse for the voltage input	Nominal rating:	max. 10 A
	Characteristic:	Circuit breaker type B
Peak inrush current	3.3 A	
Connection for protective ground	*Grounding the device* on page 52	
Current integral I^2t	< 1 A^2s	

3. Undervoltage on the device affects the function of the display elements. Therefore, select the power supply voltage and cable specifications (length and conductor cross-section) in a way that the voltage on the device does not fall below the specified minimum.

Table 26. Ground connection

Ground connection		
Ground connection	*Grounding the device* on page 52	
Connection type	M4 screw	
	Tightening torque	min. 0.5 Nm max. 1.0 Nm
	min. conductor cross-section	The cross-section of the ground conductor is 8 mm² (8 AWG) or larger.

9.3. Power consumption/power output

Table 27. Power consumption/power output

Device name	Max. power consumption	Power output
BXP62-14... (14 × 1 Gbit/s)	57 W	195 Btu (IT)/h
BXP62-22... (22 × 1 Gbit/s)	60 W	205 Btu (IT)/h

9.4. Digital input (via Digital IN)

Digital IN interface, pins 1 and 4.

Table 28. Digital input

Digital input	
Connection type	5-pin, “A”-coded M12 socket (male)
	Tightening torque: 0.8 Nm (7.1 lb-in)
Maximum permitted input voltage range	between -32 V DC and +32 V DC
Nominal input voltage	+24 V DC
Input voltage, low level, status “0”	-0.3 V DC … +5 V DC
Input voltage, high level, status “1”	+11 V DC … +30 V DC
Maximum input current at nominal input voltage	15 mA
Permitted closed-circuit current for 2-wire sensors	1.5 mA
Input characteristic according to IEC 61131-2 (current-consuming)	Typ 3

For more information on the digital input interface, see *Digital input (via Digital IN)* on page 44.

9.5. Signal contact (via Digital IN)

Digital IN interface, pins 2, 3, and 5.

Table 29. Signal contact

Signal contact		
Connection type	5-pin, “A”-coded M12 socket (male)	
	Tightening torque	0.8 Nm (7.1 lb-in)
	Wire cross-section	1.5 mm² (16 AWG)
Nominal value	I^{max} = 2 A at U^{max} = 30 V DC	

For more information on the signal contact, see *Signal contact (via Digital IN)* on page 44.

9.6. Dimension drawings

9.6.1. Dimension drawings

Figure 14. Dimension drawings: Example of a PoE device variant with 28 ports

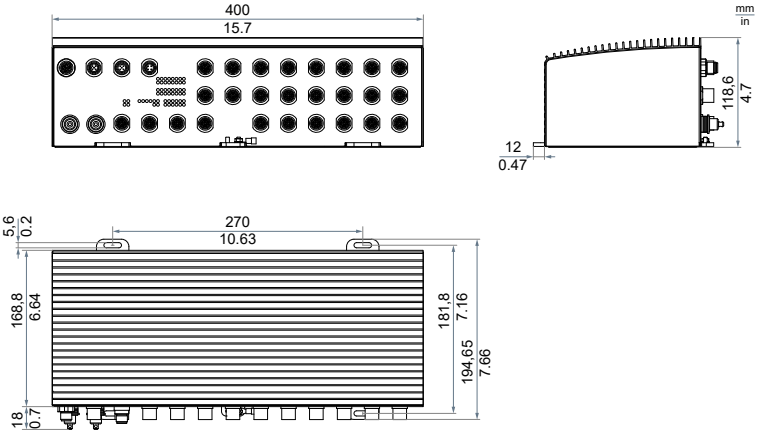
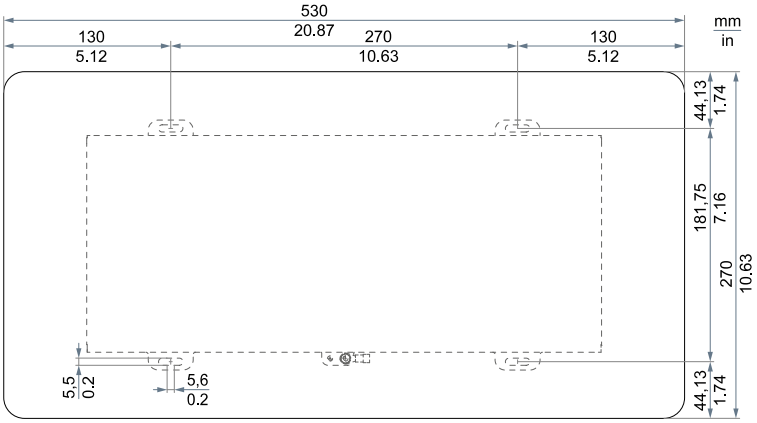


Figure 15. Dimension drawings: Drill hole locations and measurements for flat metal surface



9.7. Climatic conditions during operation

Table 30. Climatic conditions during operation

Climatic conditions during operation	
Temperature of the metal plate (measured at the reference point on the metal plate in a distance of 5 cm (2 in) from the device)	**Standard with conformal coating (Temperature range characteristic value V)** -40 °C ... +60 °C (-40 °F ... +140 °F) **Extended with conformal coating (Temperature range characteristic value E)** -40 °C ... +70 °C (-40 °F ... +158 °F)
Humidity	1 % ... 95 % (non-condensing)
Air pressure	min. 700 hPa (+3000 m ASL; +9842 ft ASL) max. 1060 hPa (-400 m ASL; -1312 ft ASL)

9.8. Climatic conditions during storage

Table 31. Climatic conditions during storage

Climatic conditions during storage		
Ambient temperature	-40 °C ... +85 °C (-40 °F ... +185 °F)	up to 3 months
	-40 °C ... +50 °C (-40 °F ... +122 °F)	up to 2 years

Table 31. Climatic conditions during storage (continued)

Climatic conditions during storage		
	0 °C ... +30 °C (+32 °F ... +86 °F)	up to 10 years
Humidity	1 % ... 95 % (non-condensing)	
Air pressure	min. 700 hPa (+3000 m ASL; +9842 ft ASL) max. 1060 hPa (-400 m ASL; -1312 ft ASL)	

9.9. Immunity

Table 32. Immunity: Standard applications

EN 61131-2, CE, FCC – applies to all devices

Applicable standard		
IEC 60068-2-6, test Fc	Vibration	5 Hz ... 8.4 Hz with 3.5 mm (0.14 in) amplitude
IEC 60068-2-6, test Fc	Vibration	8.4 Hz ... 200 Hz with 1 g
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms

Table 33. Immunity: Railway applications (on vehicles)

According to EN 50121-4

Applicable standard		
IEC 60068-2-6, test Fc	Vibration	Operating 5 Hz ... 150 Hz, Broadband noise vertical: 1.0 m/s² (rms) horizontal: 0.7 m/s² (rms)
IEC 60068-2-6, test Fc	Vibration	disabled: 5 Hz ... 150 Hz, Broadband noise vertically: 5.72 m/s² (rms) horizontally: 3.96 m/s² (rms)
IEC 60068-2-27, test Ea	Shock	vertical: 30 m/s², 30 ms horizontal: 50 m/s², 30 ms

9.10. Electromagnetic compatibility (EMC)

9.10.1. EMC interference emission

Table 34. EMC interference emission: Standard applications

EN 61131-2, CE, FCC – applies to all devices

Applicable standard		
Radiated emission		
FCC 47 CFR Part 15		Class A
EN 55032		Class A
EN 61000-6-4		Fulfilled
Conducted emission		
FCC 47 CFR Part 15		Class A
EN 55032		Class A
EN 61000-6-4		Fulfilled

Table 35. EMC interference emission: Railway applications (trackside)

According to EN 50121-4

Applicable standard		
Radiated emission		
FCC 47 CFR Part 15		Class A
EN 55032		Class A
EN 61000-6-4		Fulfilled
Conducted emission		
FCC 47 CFR Part 15		Class A
EN 55032	Supply connection	Class A
EN 55032	Telecommunication connections	Class A
EN 61000-6-4	Supply connection	Fulfilled
EN 61000-6-4	Telecommunication connections	Fulfilled

Table 36. EMC interference emission: Railway applications (on vehicles)

According to EN 50155

Applicable standard		
Radiated emission		
FCC 47 CFR Part 15		Class A
EN 55032		Class A
EN 61000-6-4		Fulfilled
EMV 06 Rev. 2.0		Class S1
Conducted emission		
FCC 47 CFR Part 15		Class A
EN 55032	Supply connection	Class A
EN 55032	Telecommunication connections	Class A
EN 61000-6-4	Supply connection	Fulfilled
EN 61000-6-4	Telecommunication connections	Fulfilled

9.10.2. EMC interference immunity

Table 37. EMC interference immunity: Standard applications

EN 61131-2, CE, FCC – applies to all devices

Applicable standard		
Electrostatic discharge		
EN 61000-4-2	Contact discharge	±4 kV
EN 61000-4-2	Air discharge	±8 kV
Electromagnetic field		
EN 61000-4-3	80 MHz ... 800 MHz	10 V/m
EN 61000-4-3	80 MHz ... 1000 MHz	10 V/m
EN 61000-4-3	1.4 GHz ... 2.0 GHz	3 V/m
EN 61000-4-3	2.0 GHz ... 2.7 GHz	1 V/m
EN 61000-4-3	2.7 GHz ... 5.1 GHz	3 V/m
EN 61000-4-3	5.1 GHz ... 6.0 GHz	3 V/m
Fast transients (burst)		
EN 61000-4-4	Power supply connection	±2 kV

Table 37. EMC interference immunity: Standard applications

EN 61131-2, CE, FCC – applies to all devices

(continued)

Applicable standard		
EN 61000-4-4	Data line	±1 kV
Voltage surges - power supply connection		
EN 61000-4-5	line/ground	±2 kV
EN 61000-4-5	line/line	±1 kV
Voltage surges - data line		
EN 61000-4-5	line/ground	±1 kV
Conducted disturbances		
EN 61000-4-6	150 kHz ... 80 MHz	10 V

Table 38. EMC interference immunity: Railway applications (trackside)

According to EN 50121-4

Applicable standard		
Electrostatic discharge		
EN 61000-4-2	Contact discharge	±6 kV
EN 61000-4-2	Air discharge	±8 kV
Electromagnetic field		
EN 61000-4-3	80 MHz ... 800 MHz	10 V/m
EN 61000-4-3	80 MHz ... 1000 MHz	20 V/m
EN 61000-4-3	1.4 GHz ... 2.0 GHz	10 V/m
EN 61000-4-3	2.0 GHz ... 2.7 GHz	5 V/m
EN 61000-4-3	5.1 GHz ... 6.0 GHz	3 V/m
Fast transients (burst)		
EN 61000-4-4	Power supply connection	±2 kV
EN 61000-4-4	Data line	±2 kV
Voltage surges - power supply connection		
EN 61000-4-5	line/ground	±2 kV
EN 61000-4-5	line/line	±1 kV
Voltage surges - data line		
EN 61000-4-5	line/ground	±2 kV

Table 38. EMC interference immunity: Railway applications (trackside)

According to EN 50121-4

(continued)

Applicable standard		
Conducted disturbances		
EN 61000-4-6	150 kHz ... 80 MHz	10 V

Table 39. EMC interference immunity: Railway applications (on vehicles)

According to EN 50155

Applicable standard		
Electrostatic discharge		
EN 61000-4-2	Contact discharge	±6 kV
EN 61000-4-2	Air discharge	±8 kV
Electromagnetic field		
EN 61000-4-3	80 MHz ... 800 MHz	20 V/m
EN 61000-4-3	80 MHz ... 1000 MHz	20 V/m
EN 61000-4-3	1.4 GHz ... 2.0 GHz	10 V/m
EN 61000-4-3	2.0 GHz ... 2.7 GHz	5 V/m
EN 61000-4-3	5.1 GHz ... 6.0 GHz	3 V/m
Fast transients (burst)		
EN 61000-4-4	Power supply connection	±2 kV
EN 61000-4-4	Data line	±2 kV
Voltage surges - power supply connection		
EN 61000-4-5	line/ground	±2 kV
EN 61000-4-5	line/line	±1 kV
Voltage surges - data line		
EN 61000-4-5	line/ground	±2 kV
Conducted disturbances		
EN 61000-4-6	150 kHz ... 80 MHz	10 V

9.11. Accessories

Table 40. General accessories

Article	Order number
AutoConfiguration Adapter ACA22-M12-USB (EEC)	942125001
Field attachable connector for the power supply, M12, “K”-coded, for crimp connections with wire cross-section 1.5 mm² (16 AWG)	934935002
Field attachable connector for the power supply, M12, “L”-coded, for crimp connections with wire cross-section 1.5 mm² (16 AWG)	934935006
Network management software Industrial HiVision	943156xxx
Protection screw for M12 socket, metal, IP65/67/69K (25 pieces)	942057001
Protection screw for M12 socket, plastic, IP65/67 (25 pieces)	942057002
Terminal cable	943902001
AutoConfiguration Adapter ACA22-M12-USB (EEC), cordless	942306001

9.12. Scope of delivery

Table 41. Scope of delivery

Amount	Article
1 ×	Device
1 ×	Safety and general information sheet
1 ×	Exclusively for device variants featuring supply voltage with characteristic value MB: Connector for the power supply, M12, “K”-coded
1 ×	Exclusively for device variants featuring supply voltage with characteristic value HB: Connector for the power supply, M12, “L”-coded

9.13. Order numbers

Table 42. Order numbers for standard variants

Device	Product code	Order number
BXP62 20TX-EECC-HV-2A	BXP62-140006IISHF9-EMBFS9HHSE2AXX.X.XX	942334001
BXP62 20TX-EECC-HV-3A	BXP62-140006IISHF9-EMBFS9HHSE3AXX.X.XX	942334002
BXP62 28TX-EECC-HV-2A	BXP62-220006IISHFF-EMBFS9HHSE2AXX.X.XX	942334003

Table 42. Order numbers for standard variants (continued)

Device	Product code	Order number
BXP62 28TX-EECC-HV-3A	BXP62-220006IISHFF-EMBFS9HHSE3AXX.X.XX	942334004
BXP60 20TX-EECC-HV-2A	BXP62-140006KKSHF9-EMBFS9HHSE2AXX.X.XX	942334005
BXP60 20TX-EECC-HV-3A	BXP62-140006KKSHF9-EMBFS9HHSE3AXX.X.XX	942334006
BXP60 28TX-EECC-HV-2A	BXP62-220006KKSHFF-EMBFS9HHSE2AXX.X.XX	942334007
BXP60 28TX-EECC-HV-3A	BXP62-220006KKSHFF-EMBFS9HHSE3AXX.X.XX	942334008
BXP60-20TX-EECC-HV-2A	BXP60-140006IIIGE9-ENBFS9HHSE2AXX.X.XX	942334009
BXP62-DR 28TX-EECC-LV-3A-BP	BXP62-220006KISHFF-EHBRS9DRSE3AXX.X.XX	942334019
BXP62-DR 28TX-EECC-HV-3A-BP	BXP62-220006KISHFF-EMBRS9DRSE3AXX.X.XX	942334020
BXP62-DR 28TX-EECC-LV-3A-2BP	BXP62-220006KKSHFF-EHBRS9DRSE3AXX.X.XX	942334021
BXP62-DR 28TX-EECC-HV-3A-2BP	BXP62-220006KKSHFF-EMBRS9DRSE3AXX.X.XX	942334022

9.14. Underlying technical standards

The device has an approval based on a specific standard exclusively if the approval indicator appears on the device casing.

The device generally fulfills the technical standards named in their current versions.

Table 43. List of the technical standards

EMV 06	Regulation No. EMV 06: Technical rules for electromagnetic compatibility – Proof of radio compatibility of rail vehicles with railway radio services
EN 50121-4	Railway applications – EMC – Emission and immunity of the signaling and telecommunications apparatus (Rail Trackside)
EN 50155	Railway applications – Electronic equipment on rail vehicles
EN 61131-2	Programmable controllers – Part 2: Equipment requirements and tests
IEC/EN 62368-1	Equipment for audio/video, information and communication technology - Part 1: Safety requirements
FCC 47 CFR Part 15	Code of Federal Regulations
IEEE 802.3	Ethernet
UL 61010-1/-2-201	Safety for Industrial Control Equipment
UN/ECE No. 10	E type approval for use in vehicles.
UN/ECE No. 118	Burning behaviour of materials used in motor vehicles.

Table 43. List of the technical standards (continued)

IEC 62443-4-2	Security for industrial automation and control systems.

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:
https://www.belden.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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