

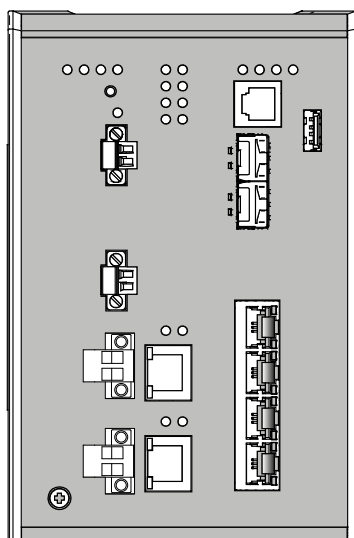
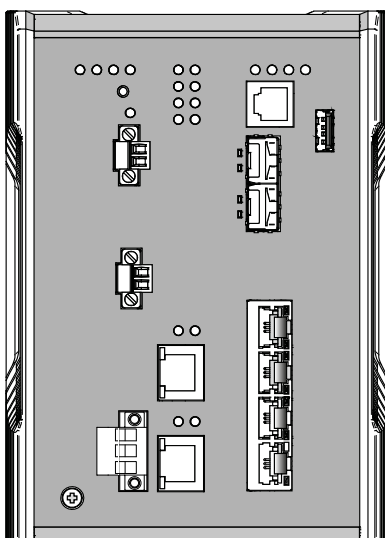
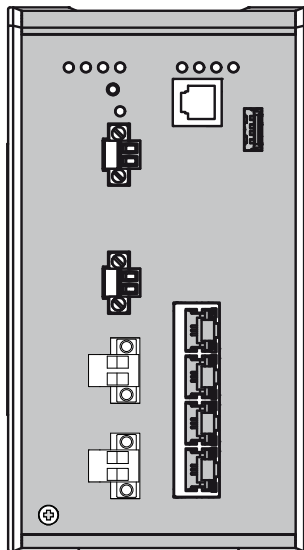
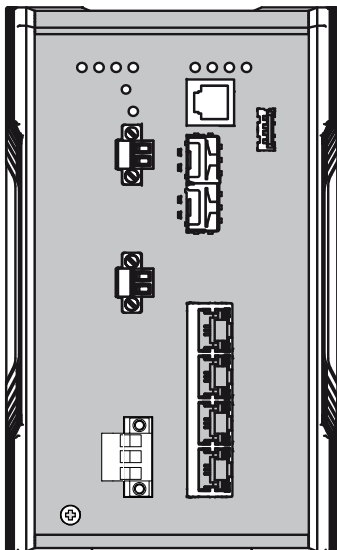


HIRSCHMANN

A **BELDEN** BRAND

User Manual

Installation Industrial Security Router EAGLE20/30



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You can get the latest version of this manual on the Internet at the Hirschmann product site (www.hirschmann.com).

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Important information

Note: 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.

■ Symbol explanation



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

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

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 these instructions 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 47.](#)
- Connect to the product only components suitable for the requirements of the specific application case.

■ Installation site requirements

- If you connect the device to a power supply that does **NOT** meet the requirements for Limited Power Source, NEC Class 2 or PS2 according to IEC/EN 62368-1 and is **NOT** limited to 100 W output power, the device must be installed in either a switch cabinet or other fire enclosure.

The fire enclosure can be made of metal or plastic with fire-protection properties of at least V-1 according to IEC 60695-11-10. Bottom openings of the fire enclosure must **NOT** exceed 2 mm in diameter.

- Only for device variants featuring supply voltage with characteristic value K9 or KK:
Install this device only in a switch cabinet or in an operating site with restricted access, to which maintenance staff have exclusive access.

■ Strain relief

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

- Relieve the connection points of cables and lines from mechanical stress.
- Design strain relieves in such a way that they prevent any mechanical damage to cables, wires or conductors caused by external influences or their own weight.
- To 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.

■ 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 “Installing the device onto the DIN rail” on page 33.](#)
- Mount the device in the vertical position.
- At ambient air temperatures > +140 °F (+60 °C):
The surfaces of the device housing may become hot. Avoid touching the device while it is operating.

■ 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.

■ **Grounding the device**

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

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

■ **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.

All of the following requirements are complied with:

- ▶ The electrical wires are voltage-free.
 - ▶ The cables used are permitted for the temperature range of the application case.
 - ▶ Only for device variants featuring supply voltage with the characteristic value CC:
The voltage connected complies with the requirements for a safety extra-low voltage (SELV) as per IEC 60950-1 or ES1 as per IEC/EN 62368-1.
-

Table 1: General requirements for connecting electrical wires

■ Requirements for connecting the signal contact

All of the following requirements are complied with:

- ▶ The voltage connected complies with the requirements for a safety extra-low voltage (SELV) as per IEC 60950-1 or ES1 as per IEC/EN 62368-1.
- ▶ The connected voltage is limited by a current limitation device or a fuse.
Observe the electrical threshold values for the signal contact.
[See “General technical data” on page 47.](#)

Table 2: *Requirements for connecting the signal contact*

■ Requirements for connecting the supply voltage

Device variant	Requirements
All variants	<p>All of the following requirements are complied with:</p> <ul style="list-style-type: none">▶ 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 cross-section of the ground conductor is the same size as or bigger than the cross-section of the power supply cables.▶ Relevant for North America: The power supply cables are suitable for ambient air temperatures of at least +167 °F (+75 °C). The wires of the power supply cables are made of copper.

Table 3: *Requirements for connecting the supply voltage*

Device variant	Requirements
Only for device variants featuring supply voltage with the characteristic value CC:	<p>If you connect 2 independent power sources, verify that the minus terminal is grounded. Failure to follow this instruction can result in equipment damage.</p> <p>The wire diameter of the supply voltage at the input is at least 1 mm² (North America AWG16).</p>
The following requirements are alternatively complied with:	
Alternative 1	<p>Relevant for North America: The power supply complies with the requirements according to NEC Class 2.</p>
Alternative 2	<p>All of the following requirements are complied with:</p> <ul style="list-style-type: none"> ▶ The power supply complies with the requirements for a safety extra-low voltage (SELV) according to IEC 60950-1 or ES1 according to IEC/EN 62368-1. ▶ A back-up fuse suitable for DC voltage is located in the plus conductor of the power supply. The minus conductor is on ground potential. Otherwise, a back-up fuse is also located in the minus conductor. Regarding the properties of this back-up fuse: See “General technical data” on page 47.
Only for device variants featuring supply voltage with characteristic value K9 or KK:	<p>All of the following requirements are complied with:</p> <ul style="list-style-type: none"> ▶ Disconnect device for equipment supplied from IT supply system, shall disconnect both poles of mains supply.^a ▶ Supply with DC voltage: A back-up fuse suitable for DC voltage is located in the plus conductor of the power supply. The minus conductor is on ground potential. Otherwise, a back-up fuse is also located in the minus conductor. Regarding the properties of this back-up fuse: See “General technical data” on page 47. ▶ Supply with AC voltage: A back-up fuse is located in the outer conductor of the power supply. The neutral conductor is on ground potential at both voltage inputs. Otherwise, a back-up fuse is also located in the neutral conductor. Regarding the properties of this back-up fuse: See “General technical data” on page 47. ▶ The wire diameter of the power supply cable is at least 0.75 mm² (North America: AWG18) on the supply voltage input.

Table 3: Requirements for connecting the supply voltage

a. IT supply system according to the technical standard UL 60950-1

■ Supply voltage

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

■ Instructions for Use in Hazardous Locations

Note: The following information applies only to models without WAN ports.

See [“Device name and product code”](#) on page 20.

SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D HAZARDOUS LOCATIONS, OR NONHAZARDOUS LOCATIONS ONLY.

WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF ANY COMPONENT MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

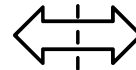
For USB and Relay: Install per Control Drawing 000172287DNR.

Avertissement - Risque d'explosion - Ne pas débrancher tant que le circuit est sous tension à moins que l'emplacement soit connu pour ne contenir aucune concentration de gaz inflammable.

Avertissement - Risque d'explosion - La substitution de tout composant peut rendre ce matériel incompatible pour une utilisation en classe I, division 2.



Ordinary Location, Non-Hazardous Area,
non-explosive atmosphere



Explosive Atmosphere

Class I, Division 2
Groups A, B, C, D
Hazardous Location

USB connection:
Equipment with non-incendive field wiring parameters.
USB entity parameters:

$V_{oc} = 5.5 \text{ V}$ $I_{sc} = 1.25 \text{ A}$
 $C_a = 10 \mu\text{F}$ $L_a = 10 \mu\text{H}$

For usage with Hirschmann USB devices certified and labelled according Class I Div 2 hazardous location requirements such as ACA21-USB EEC, or succeeding types.

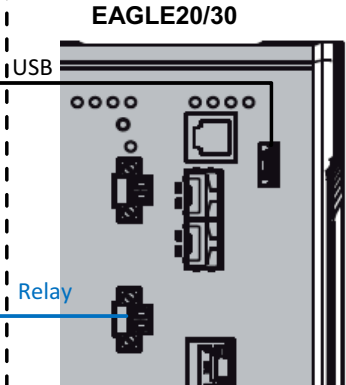
Relay contacts:
Equipment with non-incendive field wiring parameters.
Polarity is not relevant.
The relay terminals are dependent upon the following entity parameters:

$V_i = 30 \text{ V}$ $I_i = 90 \text{ mA}$
 $C_i = 2 \text{ nF}$ $L_i = 1 \mu\text{H}$

Power Supply unit type C: 24 V DC – 48 V DC
Power Supply unit type K: 110 V AC – 230 V AC or
60 V DC – 250 V DC

(Refer to the power supply code of the type designation on the device)

Temperature Code: T4
Ambient Temperature rating:
Ta : 0° C to +60° C for “S” temperature types
Ta: -40° C to +70° C for “T” or “E” temperature types
(Refer to the temperature code of the type designation on the device)



Control Drawing for EAGLE20/30 devices according to Class I Division 2 Hazardous Locations

Rev.: 2

Doc. No.: 000172287DNR

Page 1 of 2

For Use in Hazardous Locations Class I Division 2 Groups A, B, C, D:
Only allowed for EAGLE20/30 model No's. which are individually labelled
"FOR USE IN HAZARDOUS LOCATIONS"

Non-incendive field wiring circuits must be wired in accordance with
the National Electrical Code (NEC), NFPA 70 , article 501.

The earth conductor must be at least the same wire size (mm² or AWG) as the supply
conductors.

**WARNING – EXPLOSION HAZARD – SUBSTITUTION OF ANY COMPONENTS MAY
IMPAIR SUITABILITY FOR HAZARDOUS LOCATIONS OR EXPLOSIVE
ATMOSPHERES.**

**WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS
POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-
HAZARDOUS.**

Control Drawing for EAGLE20/30 devices according to Class 1 Division 2 Hazardous Locations

Rev.: 2

Doc. No.: 000172287DNR

Page 2 of 2

■ CE marking

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

Device variant	Directive
All variants	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.
All variants	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.
Only for device variants featuring supply voltage with characteristic value K9 or KK:	2014/35/EU Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.

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

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

You find the EU conformity declaration as PDF file for downloading on the Internet at: <https://www.doc.hirschmann.com/certificates.html>

The product can be used in the industrial sector.

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

You find more information on technical standards here:

[“Technical data” on page 47](#)

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

Connecting the SHDSL ports DSL1 and DSL2 to the public telecommunications system is illegal. The SHDSL port is used exclusively for direct data connections between SHDSL-enabled devices.

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.

■ **LED or laser components**

LED or LASER components according to IEC 60825-1 (2014):
CLASS 1 LASER PRODUCT
CLASS 1 LED PRODUCT

■ **FCC note**

Supplier's Declaration of Conformity 47 CFR § 2.1077 Compliance Information

EAGLE20/30

U.S. Contact Information

Belden – 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.

■ **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 device description

You can choose from a wide range of variants. You have the option to set up your device individually based on different criteria:

- ▶ Number of ports
- ▶ Transmission speed
- ▶ Types of connectors
- ▶ Temperature range
- ▶ Supply voltage range
- ▶ Certifications

The device is designed for the special requirements of industrial automation. The device meets the relevant industry standards, provides very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.

The devices allow you to set up switched and routed industrial Ethernet networks that conform to the IEEE 802.3 standard. The device works without a fan.

The device is mounted by latching in place on a DIN rail.

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

- ▶ Web browser
- ▶ SSH
- ▶ HiView (software for putting the device into operation)
- ▶ 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:
<http://www.hirschmann.com/en/QR/INET-Industrial-HiVision>
- ▶ 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 find these manuals as PDF files on the Internet at <http://www.doc.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.

You have numerous options of combining the device characteristics. You can determine the possible combinations using the configurator which is available in the Belden Online Catalog <https://catalog.belden.com> on the web page of the device.

Item	Product characteristic	Character istic value	Description
1 ... 7	Device	EAGLE20	Router without gigabit ports
		EAGLE30	Router with gigabit ports
8	(hyphen)	–	
9 ... 10	Number: Fast Ethernet ports	04	4 ×
11 ... 12	Number: Gigabit Ethernet ports	00	0 ×
		02	2 ×
13 ... 15	Configuration of the uplink ports	206	2 × SFP slot
		999	Not present
16 ... 17	Configuration of the other ports	TT	All the other ports are RJ45 sockets for twisted pairs
18	Cellular phone interface	9	Not present
19 ... 20	WAN port	99	Not present
		H2	2 × SHDSL port
21	Temperature range	S	Standard +32 °F ... +140 °F (0 °C ... +60 °C)
		T	Extended -40 °F ... +158 °F (-40 °C ... +70 °C)
		E	Extended with Conformal Coating -40 °F ... +158 °F (-40 °C ... +70 °C)

Table 4: Device name and product code

Item	Product characteristic	Characteristic value	Description
22 ... 23	Supply voltage	CC	2 × Voltage input Rated voltage range DC 24 V DC ... 48 V DC
		K9	1 × Voltage input Rated voltage range AC 110 V AC ... 230 V AC, 50 Hz ... 60 Hz Rated voltage range DC 60 V DC ... 250 V DC
		KK	2 × Voltage input Rated voltage range AC 110 V AC ... 230 V AC, 50 Hz ... 60 Hz Rated voltage range DC 60 V DC ... 250 V DC
24 ... 25	Certifications	Note: You will find detailed information on the certificates and declarations applying to your device in a separate overview. See table 5 on page 22.	

Table 4: Device name and product code

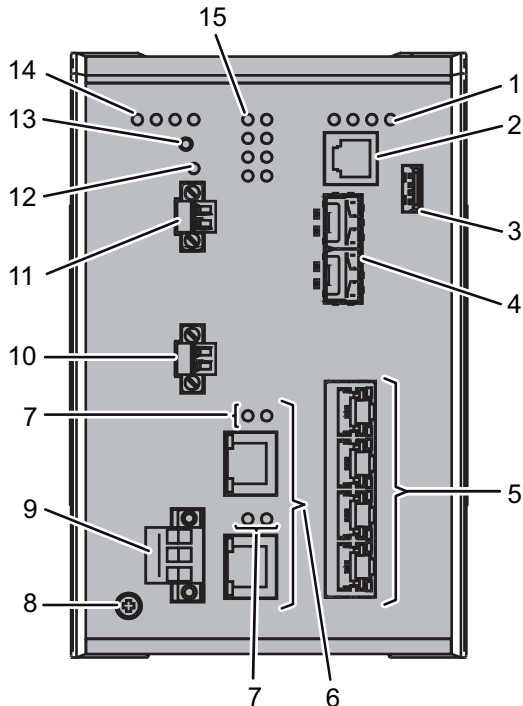
Application case	Certificates and declarations	Characteristic value ^a														
		P9	T9	TY	U9	UT	UY	UX	V9	VP	VT	VU	VY	X9	Y9	Z9
Standard applications	CE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	UL 508	X		X		X	X	X		X	X	X	X	X	X	
	IEC/EN 62368-1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	EN 61131-2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	FCC	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Oil and gas applications	ANSI/UL 121201 – Class I, Div. 2								X						X	
Substation applications	IEC 61850-3									X	X	X	X	X		
	IEEE 1613									X	X	X	X	X		
Navy applications	DNV GL				X	X	X	X					X			
Railway applications	EN 50121-4		X	X		X						X				

Table 5: Assignment: application cases, certificates and declarations, characteristic values

- a. X = Certificate or declaration present
 (X) = Certificate or declaration in preparation
 (x) = Certificate or declaration available upon request

1.3 Device views

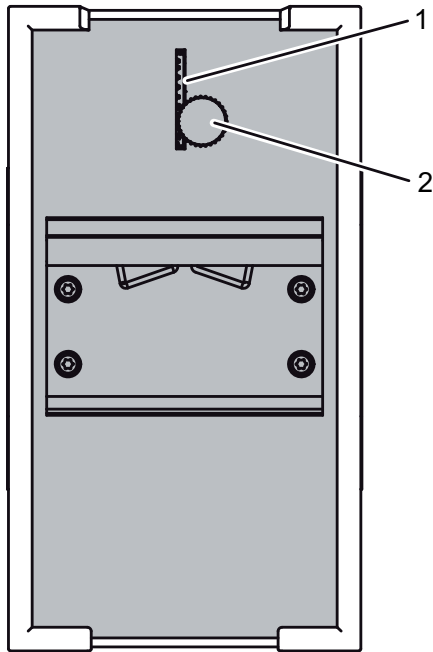
1.3.1 Front view



EAGLE30-0402206TT9H2SCC...

1	LED display elements for device status
2	V.24 interface
3	USB interface
4	2 × SFP slot (optional)
5	4 × Fast Ethernet ports
6	2 × SHDSL port (optional)
7	LED display elements for the status of the SHDSL ports
8	Grounding screw
9	Supply voltage connection
	alternatively, depending on device variant
	Supply voltage with the characteristic value CC: ▶ 2 voltage inputs for redundant power supply ▶ 2-pin terminal block
	Supply voltage with the characteristic value K9: ▶ 1 voltage input ▶ 3-pin terminal block
	Supply voltage with the characteristic value KK: ▶ 2 voltage inputs for redundant power supply ▶ 3-pin terminal block
10	Connection for the signal contact
11	Connection for digital input
12	LED display element for digital input
13	Save/Load/Reset button
	The support of the function is dependent on the software release. Software support for the function is unimplemented at the time of publishing this manual.
14	LED display elements for additional status information
15	LED display elements
	The support of the function is dependent on the software release. Software support for the function is unimplemented at the time of publishing this manual.

1.3.2 Rear view



1 Slot for the SD card

2 Thumb screw

1.4 Power supply

1.4.1 Supply voltage with the characteristic value K9

For the power supply of the device, a 3-pin terminal block is available.

For further information see [“Supply voltage with the characteristic value K9” on page 36.](#)

1.4.2 Supply voltage with the characteristic value KK

For the redundant power supply of the device, two 3-pin terminal blocks are available.

For further information see [“Supply voltage with the characteristic value KK” on page 24.](#)

1.4.3 Supply voltage with the characteristic value CC

For the redundant power supply of the device, two 2-pin terminal blocks are available.

For further information see [“Supply voltage with the characteristic value CC” on page 24.](#)

1.5 Ethernet ports

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

You find information on pin assignments for making patch cables here:

See “10/100 Mbit/s twisted pair port” on page 25.

1.5.1 10/100 Mbit/s twisted pair port

This port is an RJ45 socket.

The 10/100 Mbit/s twisted pair port allows you to connect network components according to the IEEE 802.3 10BASE-T/100BASE-TX standard.

This port supports:

- ▶ Autonegotiation
- ▶ Autopolarity
- ▶ Autocrossing (if autonegotiation is activated)
- ▶ 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.

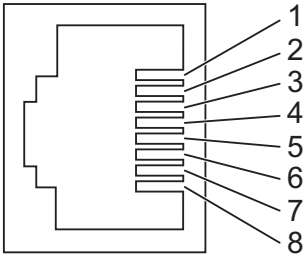
	Pin	Function
	1	RD+ Receive path
	2	RD- Receive path
	3	TD+ Transmission path
	4	
	5	
	6	TD- Transmission path
	4,5,7,8	—

Table 6: Pin assignment of the 10/100/1000 Mbit/s twisted pair port, RJ45 socket, 10/100 Mbit/s mode

1.5.2 100/1000 Mbit/s F/O port (optional)

This port is an SFP slot.

The 100/1000 Mbit/s F/O port allows you to connect network components according to the IEEE 802.3 100BASE-FX/1000BASE-SX/1000BASE-LX standard.

This port supports:

- ▶ Full duplex mode

1.5.3 100/1000 Mbit/s twisted pair port (optional)

Note: The following information applies only to device variants with HiSecOS, software versions 01.2.00 and higher.

This port is an SFP slot.

The 100/1000-Mbit/s twisted pair port offers you the possibility to connect network components according to the IEEE 802.3 100BASE-FX/1000BASE-SX/1000BASE-LX standard.

This port supports:

- ▶ 1000 Mbit/s full duplex
- ▶ 100 Mbit/s, full duplex
- ▶ Autonegotiation when using a Gigabit Ethernet SFP transceiver

Delivery state:

- ▶ 1000 Mbit/s full duplex when using a Gigabit Ethernet SFP transceiver
- ▶ Autonegotiation activated when using a Gigabit Ethernet SFP transceiver
- ▶ 100 Mbit/s full duplex when using a Fast Ethernet SFP transceiver

1.6 WAN port (optional)

Note: The following information applies only to models with WAN ports. See [“Device name and product code” on page 20](#).

■ SHDSL port

This port is an RJ45 socket.

The WAN port offers you the ability to connect network components according to the IEEE 802.3ah standard.

This port supports:

- ▶ Aggregation of 2 links within the same port
- ▶ SHDSL (Single Pair High Bit Rate Digital Subscriber Line)

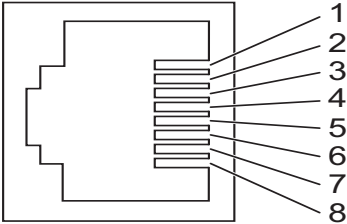
	Pin	Function
	1	Tip Pair 1
	2	Ring
	3	
	4	Tip Pair 0
	5	Ring
	6	
	7	
	8	

Table 7: Pin assignment of SHDSL port, RJ-45 socket

1.7 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.

1.7.1 Device state

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



LED	Display	Color	Activity	Meaning
Power	Supply voltage	—	none	Supply voltage is too low
		yellow	lights up	Device variants with redundant power supply: Supply voltage 1 or 2 is on
			flashes 4 times a period	Software update is running. Maintain the power supply.
		green	lights up	Device variants with redundant power supply: Supply voltage 1 and 2 is on Device variants with single power supply: Supply voltage is on
Status	Device Status	—	none	Device starts Device is not ready for operation
		green	lights up	Device is ready for operation. Characteristics can be configured
		red	lights up	The device reports a detected error. See “Reference Manual GUI Graphical User Interface”, Chapter “Device Status”.
			flashes 1 time a period	The boot parameters used when the device has been started differ from the boot parameters saved. Start the device again.
RM	Ring Manager	—	none	The support of the function is dependent on the software release. Software support for the function is unimplemented at the time of publishing this manual.
ACA	Storage medium ACA31 ACA22	—	none	No ACA connected
		green	lights up	ACA storage medium connected
			flashes 3 times a period	Device writes to/reads from the storage medium
	yellow	lights up	ACA storage medium inoperative Check the file system format See “SD card interface” on page 30. Deactivate the write protection on the ACA31 by pushing the lock towards the contacts.	

1.7.2 Digital input (optional)

Note: Only for supply voltage with the following characteristic values:

- ▶ CC
- ▶ K9

LED	Display	Color	Activity	Meaning
IN	The support of the function is dependent on the software release. Software support for the function is unimplemented at the time of publishing this manual.			

1.7.3 Port status

■ Ethernet ports

These LEDs display port-related information. During the boot phase, they indicate the status of the boot process.

The LEDs are directly located on the ports.

Display	Color	Activity	Meaning
Link status	—	none	Device detects an invalid or missing link
	green	lights up	Device detects a valid link
		flashes 1 time a period	Port is switched to stand-by
		flashes 3 times a period	Port is switched off
yellow	flashing	Device is transmitting and/or receiving data	

■ WAN port (optional)

The LEDs are directly located on the ports.

LED	Display	Color	Activity	Meaning
LS	Link status	—	none	Device detects an invalid or missing link
		green	lights up	Device detects a valid link
			lights up 2 times a period	The device is establishing a link
DA	data	yellow	flashing	Device is transmitting and/or receiving data

1.7.4 Additional status information (optional)

Note: Only for supply voltage with the following characteristic values:

- ▶ CC
- ▶ K9



LED	Display	Color	Activity	Meaning
VPN	VPN connections	green	lights up	The LED lights up green when one or more VPN connections are active and are in the <code>up</code> state.
RD	VRRP instances	—	none	No VRRP instances are active. Possible reasons: 1) VRRP is globally disabled. 2) The configured VRRP instances have not met the preconditions for operation.
		green	lights up	At least 1 VRRP instance is in Master mode.
		yellow	lights up	No VRRP instances are in Master mode, but at least one VRRP instance is in Backup mode.
S1 S2	The support of the function is dependent on the software release. Software support for the function is unimplemented at the time of publishing this manual.			

Note: The following information applies only to device variants with SHDSL ports.

See [“Device name and product code” on page 20](#).

CO AL

LED	Display	Color	Activity	Meaning
CO	Operational Mode	green	lights up	The port is in the Central Office mode.
		—	none	The port is in Remote Office mode.
AL	The support of the function is dependent on the software release. Software support for the function is unimplemented at the time of publishing this manual.			

1.8 Management interfaces

1.8.1 V.24 interface (external management)

Note: For information about the position on the device see [“Front view” on page 23](#).

A serial interface is provided on the RJ11 socket (V.24 interface) for the local connection of an external management station (VT100 terminal or PC with corresponding terminal emulation). This enables 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 socket housing is electrically connected to the front panel of the device. The V.24 interface is electrically insulated from the supply voltage.

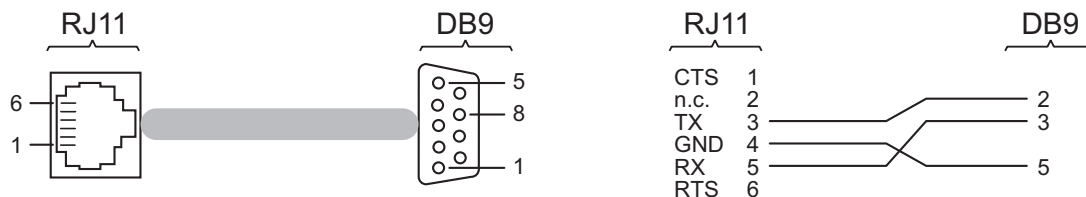


Figure 1: Pin assignment of the V.24 interface and the DB9 plug

The Terminal cable is available as an accessory. See [“Accessories” on page 60.](#)

1.8.2 SD card interface

Note: For information about the position on the device see [“Rear view” on page 24.](#)

The SD card interface allows you to connect the AutoConfiguration Adapter ACA31 storage medium. This is used for saving/loading the configuration data and diagnostic information, and for loading the software. The ACA31 supports the FAT16 file system format exclusively.

1.8.3 USB interface

Note: For information about the position on the device see [“Front view” on page 23.](#)

The USB socket has an interface for the local connection of an AutoConfiguration Adapter ACA22. It is used for saving/loading the configuration data and diagnostic information, and for loading the software.

The USB interface has the following properties:

- ▶ Supports the USB master mode
- ▶ Supports USB 2.0 (data rate max. 480 MBit/s)
- ▶ Connector type A
- ▶ Supplies current of max. 500 mA

- ▶ Voltage not potential-separated
- ▶ Supported file system: FAT32

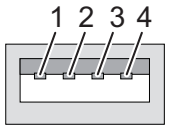
Figure	Pin	Function
	1	VCC (VBus)
	2	- Data
	3	+ Data
	4	Ground (GND)

Table 8: Pin assignment of the USB interface

1.9 Input/output interfaces

1.9.1 Signal contact

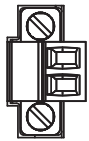


Figure 2: Signal contact: 2-pin terminal block with screw locking

In the state on delivery, the signal contact indicates the device status. It is configurable using the device management.

1.9.2 Digital input (optional)

Note: Only for supply voltage with the following characteristic values:

- ▶ CC
- ▶ K9

The support of the function is dependent on the software release. Software support for the function is unimplemented at the time of publishing this manual.

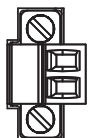


Figure 3: Input: 2-pin terminal block with screw locking

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 the SD card \(optional\)](#)
- ▶ [Installing and grounding the device](#)
- ▶ [Installing an SFP transceiver \(optional\)](#)
- ▶ [Connecting the terminal blocks](#)
- ▶ [Operating the device](#)
- ▶ [Connecting data cables](#)
- ▶ [Filling out the inscription label](#)

2.1 Checking the package contents

- Check whether the package includes all items named in the section [“Scope of delivery” on page 59](#).
- Check the individual parts for transport damage.

2.2 Installing the SD card (optional)

Note: For information about the position on the device see [“Rear view” on page 24](#).

- Push the SD card into the slot with the beveled corner facing upwards.
- Tighten the thumb screw hand-tight to fix the SD card.

2.3 Installing and grounding the device

WARNING

FIRE HAZARD

If you connect the device to a power supply that does **NOT** meet the requirements for Limited Power Source, NEC Class 2 or PS2 according to IEC/EN 62368-1 and is **NOT** limited to 100 W output power, the device must be installed in either a switch cabinet or other fire enclosure. The fire enclosure can be made of metal or plastic with fire-protection properties of at least V-1 according to IEC 60695-11-10. Bottom openings of the fire enclosure must **NOT** exceed 2 mm in diameter.

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

WARNING

Only for device variants featuring supply voltage with characteristic value K9 or KK:

ELECTRIC SHOCK

Install this device only in a switch cabinet or in an operating site with restricted access, to which maintenance staff have exclusive access.

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

2.3.1 Installing the device onto the DIN rail

Note: Verify that there is at least 4 in (10 cm) of space above and below the device.

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

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.
- Press the media module downwards onto the clip-in bar.
- Snap in the device.

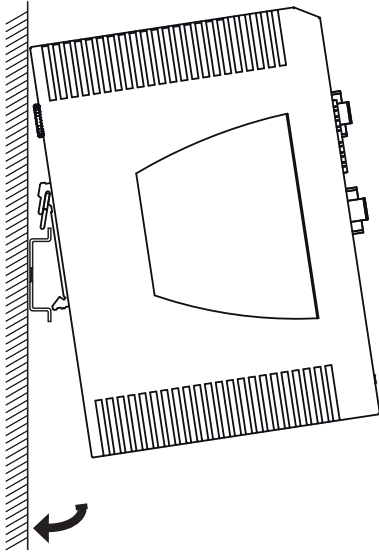


Figure 4: Mounting on the DIN rail

2.3.2 Grounding the device


WARNING


ELECTRIC SHOCK

Ground the device before connecting any other cables.

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

The device is grounded via the separate ground screw on the bottom left of the front side of the device.

The device variants **with** SHDSL ports and the device variants featuring supply voltage with the characteristic value K9 or KK have a connection for protective grounding .

The device variants featuring supply voltage with the characteristic value CC and not featuring SHDSL ports have a connection for functional grounding .

Ground the device via the ground screw.

2.4 Installing an SFP transceiver (optional)

Prerequisites:

Exclusively use Hirschmann SFP transceivers.

See “Accessories” on page 60.

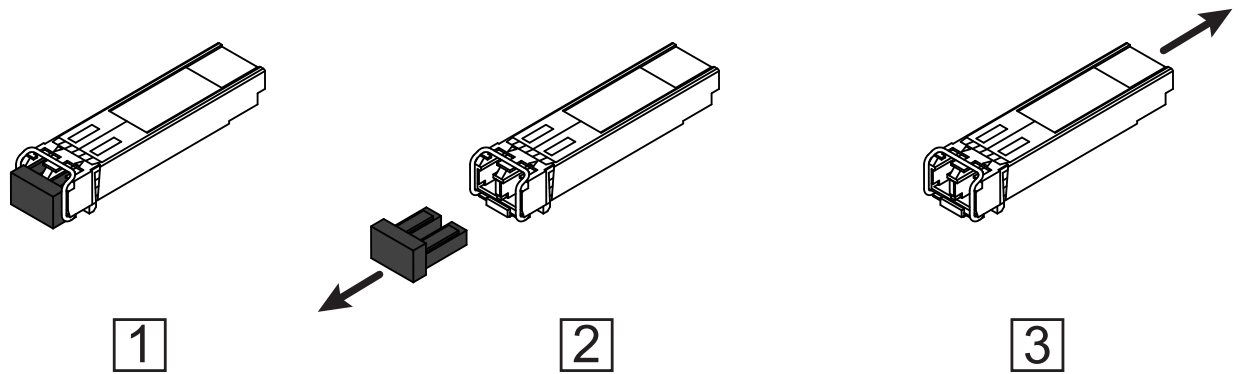


Figure 5: Installing SFP transceivers: Installation sequence

Proceed as follows:

- Take the SFP transceiver out of the transport packaging (1).
- Remove the protection cap from the SFP transceiver (2).
- Push the SFP transceiver with the lock closed into the slot until it latches in (3).

2.5 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 9.

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.

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.

2.5.1 Supply voltage with the characteristic value K9

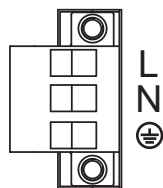




Figure 6: Supply voltage with the characteristic value K9: 3-pin terminal block with screw locking

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment
DC voltage	Rated voltage range DC 60 V DC ... 250 V DC Voltage range DC incl. maximum tolerances 48 V DC ... 320 V DC	+/L Plus terminal of the supply voltage
		-/N Minus terminal of the supply voltage
		 Protective conductor
AC voltage	Rated voltage range AC 110 V AC ... 230 V AC, 50 Hz ... 60 Hz Voltage range AC incl. maximum tolerances 88 V AC ... 265 V AC, 47 Hz ... 63 Hz	+/L Outer conductor
		-/N Neutral conductor
		 Protective conductor

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

- Remove the terminal connector from the device.
- Connect the wires according to the pin assignment on the device with the clamps.
- Fasten the wires in the terminal block by tightening the terminal screws.

2.5.2 Supply voltage with the characteristic value KK

You have the option of supplying the supply voltage redundantly, without load distribution.

Both supply voltage inputs are uncoupled.

With a redundant supply, the supply voltage 1 (upper voltage input on the device) has priority.

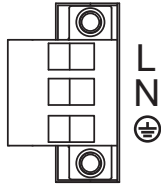




Figure 7: Supply voltage with the characteristic value KK: 3-pin terminal block with screw locking

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment
DC voltage	Rated voltage range DC 60 V DC ... 250 V DC Voltage range DC incl. maximum tolerances 48 V DC ... 320 V DC	+/L Plus terminal of the supply voltage
		-/N Minus terminal of the supply voltage
		 Protective conductor
AC voltage	Rated voltage range AC 110 V AC ... 230 V AC, 50 Hz ... 60 Hz Voltage range AC incl. maximum tolerances 88 V AC ... 265 V AC, 47 Hz ... 63 Hz	+/L Outer conductor
		-/N Neutral conductor
		 Protective conductor

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

- Remove the terminal connector from the device.
- Connect the wires according to the pin assignment on the device with the clamps.
- Fasten the wires in the terminal block by tightening the terminal screws.

With a non-redundant supply of the supply voltage, the device reports the loss of a supply voltage. You can prevent this message by applying the supply voltage via both inputs, or by changing the configuration in the Management.

2.5.3 Supply voltage with the characteristic value CC

You have the option of supplying the supply voltage redundantly, without load distribution.

Both supply voltage inputs are uncoupled.

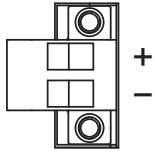


Figure 8: Supply voltage with the characteristic value CC: 2-pin terminal block with screw locking

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment
DC voltage	Rated voltage range DC 24 V DC ... 48 V DC Voltage range DC incl. maximum tolerances 18 V DC ... 60 V DC	+ Plus terminal of the supply voltage - Minus terminal of the supply voltage

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

- Remove the terminal connector from the device.
 - Connect the wires according to the pin assignment on the device with the clamps.
 - Fasten the wires in the terminal block by tightening the terminal screws.
- With non-redundant supply of the mains voltage, the device reports a power failure. You can avoid this message by changing the configuration in the management, or, with power supply units of the same type, by feeding the supply voltage in through both inputs.

2.5.4 Signal contact

Every time you connect the electrical conductors, make sure that the following requirements are met:

- ▶ The electrical wires are voltage-free.
- ▶ The connected voltage is limited by a current limitation device or a fuse. Observe the electrical threshold values for the signal contact.
[See “General technical data” on page 47.](#)
- Connect the signal contact lines with the terminal block connections.

2.6 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 9.

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

Note: Relevant for North America:

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

The torque for tightening the signal contact and input terminal block on the device is 3 lb-in (0.34 Nm).

- Use screws to secure the connectors to the device.
- Enable the supply voltage.

2.7 Connecting data cables

2.7.1 Twisted Pair ports

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.
- Use optical data cables for the data transmission between the buildings.
- When using copper cables, provide a sufficient separation between the power supply cables and the data cables. Ideally, install the cables in separate cable channels.
- Verify that power supply cables and data cables do not run parallel over longer distances. To reduce inductive coupling, verify that the power supply cables and data cables cross at a 90° angle.
- Use shielded data cables for gigabit transmission via copper cables, for example SF/UTP cables according to ISO/IEC 11801. Exclusively use shielded data cables to meet EMC requirements according to EN 50121-4 and marine applications.
- Connect the data cables according to your requirements.

See [“Ethernet ports”](#) on page 25.

2.7.2 100/1000 Mbit/s F/O port (optional)

Verify that you connect LH ports only with LH ports, SX ports only with SX ports, and LX ports only with LX ports.

- Connect the data cables according to your requirements.

[See “Ethernet ports” on page 25.](#)

2.7.3 WAN port (optional)

Note: In general, you should adhere to the following recommendations for data cable connections in environments with high electrical interference levels:

- Provide copper cabling to ensure sufficient distance between the power supply cables and data cables. Ideally, install the cables in separate cable channels.
- Use shielded cables.

2.8 Filling out the inscription label

The information field for the IP address helps you identify your device.

3 Making basic settings

Note: 2 or more devices configured with the same IP address can cause unpredictable operation of your network.

Install and maintain a process that assigns a unique IP address to every device in the network.

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:

- ▶ Input via the V.24 interface
- ▶ Input via the HiView or Industrial HiVision application. You find further information about the applications HiView or Industrial HiVision on the Internet at the Hirschmann product pages:

HiView

<http://www.hirschmann.com/en/QR/INET-HiView>

Industrial HiVision

<http://www.hirschmann.com/en/QR/INET-Industrial-HiVision>

- ▶ AutoConfiguration Adapter

■ **Default settings**

- ▶ V.24 data rate: 9600 Baud
- ▶ Ethernet ports: link status is not evaluated (signal contact)
- ▶ Optical ports: Full duplex
- ▶ TP ports: Autonegotiation

3.1 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 steps:

- Open the Graphical User Interface, the Command Line Interface, or HiView the first time you log on to the device.
- Log on to the device with the default password “”. 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, then the device prompts you to confirm your new password.
- Log on to the device again with your new password.

Note: If you lost your password, then 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>

4 Monitoring the ambient air temperature

Operate the device below the specified maximum ambient air temperature exclusively.

See [“General technical data” on page 47](#).

The ambient air temperature is the temperature of the air at a distance of 2 in (5 cm) from the device. It depends on the installation conditions of the device, for example the distance from other devices or other objects, and the output of neighboring devices.

The temperature displayed in the CLI and the GUI is the internal temperature of the device. It is up to 68 °F (20 °C) higher than the ambient temperature. This depends on the configuration of your device.

5 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.
- Relays are subject to natural wear. This wear depends on the frequency of the switching operations. Check the resistance of the closed relay contacts and the switching function depending on the frequency of the switching operations.
- Depending on the degree of pollution in the operating environment, check at regular intervals that the ventilation slots in the device are not obstructed.

6 Disassembly

6.1 Removing the device



WARNING

ELECTRIC SHOCK

Disconnect the grounding only after disconnecting all other cables.

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

- Disconnect the data cables.
- Disable the supply voltage.
- Disconnect the terminal blocks.
- Disconnect the grounding.
- To remove the device from the DIN rail, press the device downwards and pull it out from under the DIN rail.

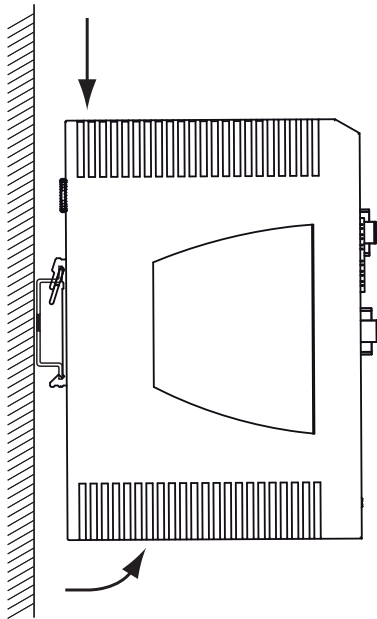


Figure 9: Removal from the DIN rail

6.2 Removing an SFP transceiver (optional)

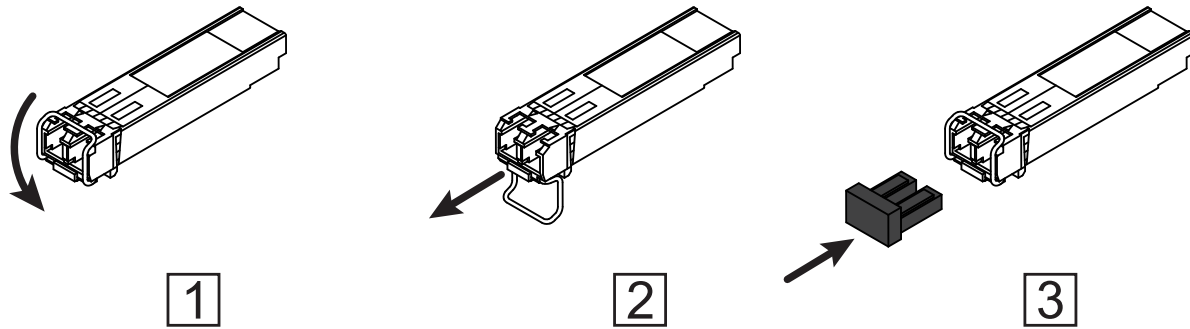


Figure 10: De-installing SFP transceivers: De-installation sequence

Proceed as follows:

- Open the locking mechanism of the SFP transceiver (1).
- Pull the SFP transceiver out of the slot via the open locking mechanism (2).
- Close the SFP transceiver with the protection cap (3).

7 Technical data

■ General technical data

Weight	EAGLE..-.....999S..	approx. 2.65 lb (1.2 kg)		
	EAGLE..-.....999T..	approx. 3.31 lb (1.5 kg)		
	EAGLE..-.....999E..			
	EAGLE..-.....9H2S..			
	EAGLE..-.....9H2E..	approx. 4.19 lb (1.9 kg)		
EAGLE..-.....9H2T..				
Power supply	See “Requirements for connecting electrical wires” on page 9.			
Supply voltage with the characteristic value CC	Nominal voltage DC	24 V DC ... 48 V DC		
	Voltage range DC incl. maximum tolerances	18 V DC ... 60 V DC		
	Voltage range DC in Hazardous Locations (Class I, Division 2) incl. maximum tolerances	22 V DC ... 52 V DC		
	Connection type	2-pin terminal block		
	Power loss buffer	>10 ms at 20.4 V DC		
	Overload current protection on the device	Non-replaceable fuse		
	Back-up fuse	Nominal rating:	6.3 A	
		Characteristic:	slow blow	
	Peak inrush current	<4 A		
Power supply	See “Requirements for connecting electrical wires” on page 9.			
Supply voltage with the characteristic value K9 and KK	Nominal voltage AC	110 V AC ... 230 V AC, 50 Hz ... 60 Hz		
	Voltage range AC incl. maximum tolerances	88 V AC ... 265 V AC, 47 Hz ... 63 Hz		
	Voltage range AC in Hazardous Locations (Class I, Division 2) incl. maximum tolerances	99 V AC ... 253 V AC		
	Nominal voltage DC	60 V DC ... 250 V DC		
	Voltage range DC incl. maximum tolerances	48 V DC ... 320 V DC		
	Voltage range DC in Hazardous Locations (Class I, Division 2) incl. maximum tolerances	54 V DC ... 275 V DC		
	Connection type	3-pin terminal block		
	Power loss buffer	>10 ms at 98 V AC		
	Overload current protection on the device	Non-replaceable fuse		
	Back-up fuse	Nominal rating:	min. 2.5 A	
		Characteristic:	max. 20 A	
		slow blow		
Peak inrush current	<3.5 A			

Climatic conditions during operation	Ambient air temperature ^a	Devices with operating temperature characteristic value S (Standard): +32 °F ... +140 °F (0 °C ... +60 °C)
		Devices with operating temperature characteristic value E and T (extended): -40 °F ... +158 °F (-40 °C ... +70 °C) ^{b,c}
	Humidity	5 % ... 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 ^d	-40 °F ... +185 °F (-40 °C ... +85 °C)
	Humidity	10 % ... 95 % (non-condensing)
	Air pressure	min. 700 hPa (+9842 ft; +3000 m) max. 1060 hPa (-1312 ft; -400 m)
Signal contact "FAULT"	Switching current	max. 1 A SELV according to IEC 60950-1 or ES1 according to IEC/EN 62368-1
	Switching voltage	max. 60 V DC or max. 30 V AC SELV according to IEC 60950-1 or ES1 according to IEC/EN 62368-1
Pollution degree		2
Protection classes	Laser protection	Class 1 in compliance with IEC 60825-1
	Degree of protection	IP20

- a. Temperature of the ambient air at a distance of 2 in (5 cm) from the device
- b. Only use SFP transceivers with the "EEC" extension.
- c. +185 °F (+85 °C) for 16 hours (tested according to IEC 60068-2-2)
- d. Temperature of the ambient air at a distance of 2 in (5 cm) from the device

■ Digital input (optional)

Note: Only for supply voltage with the following characteristic values:

- ▶ CC
- ▶ K9

The support of the function depends on the software release. Software support for the function is unimplemented at the time of printing this manual.

Maximum permitted input voltage range	-32 V DC ... +32 V DC
Input voltage, low level, status "0"	-0.3 V DC ... +5.0 V DC
Input voltage, high level, status "1"	+11 V DC ... +30 V DC
Maximum input current at 24 V input voltage	15 mA
Input characteristic according to IEC 61131-2 (current-consuming)	Type 3

■ SHDSL range

Profile	Data rate per link (kbit/s)	Data rate per port (with activated link aggregation) (kbit/s)	Power (dBm)	Region	Configuration	Range ^a (m (ft))
1	5696	11392	13.5	North America (Annex A)	32-TCPAM	2000 (6562)
2	3072	6144	13.5	North America (Annex A)	32-TCPAM	2800 (9186)
3	2048	4096	13.5	North America (Annex A)	16-TCPAM	3300 (10827)
4	1024	2048	13.5	North America (Annex A)	16-TCPAM	4500 (14764)
5	704	1408	13.5	North America (Annex A)	16-TCPAM	5100 (16732)
6	512	1024	13.5	North America (Annex A)	16-TCPAM	5700 (18701)
7	5696	11392	14.5	Europe (Annex B)	32-TCPAM	2000 (6562)
8	3072	6144	14.5	Europe (Annex B)	32-TCPAM	2900 (9514)
9	2048	4096	14.5	Europe (Annex B)	16-TCPAM	3300 (10827)
10	1024	2048	13.5	Europe (Annex B)	16-TCPAM	4500 (14764)

Table 9: Profiles with settings

Profile	Data rate per link (kbit/s)	Data rate per port (with activated link aggregation) (kbit/s)	Power (dBm)	Region	Configuration	Range ^a (m (ft))
11	704	1408	13.5	Europe (Annex B)	16-TCPAM	5100 (16732)
12	512	1024	13.5	Europe (Annex B)	16-TCPAM	5700 (18701)

Table 9: Profiles with settings

a. The range depends on the installed cable quality and electromagnetic interference. There may be deviations depending on environmental conditions.

Dimension drawings

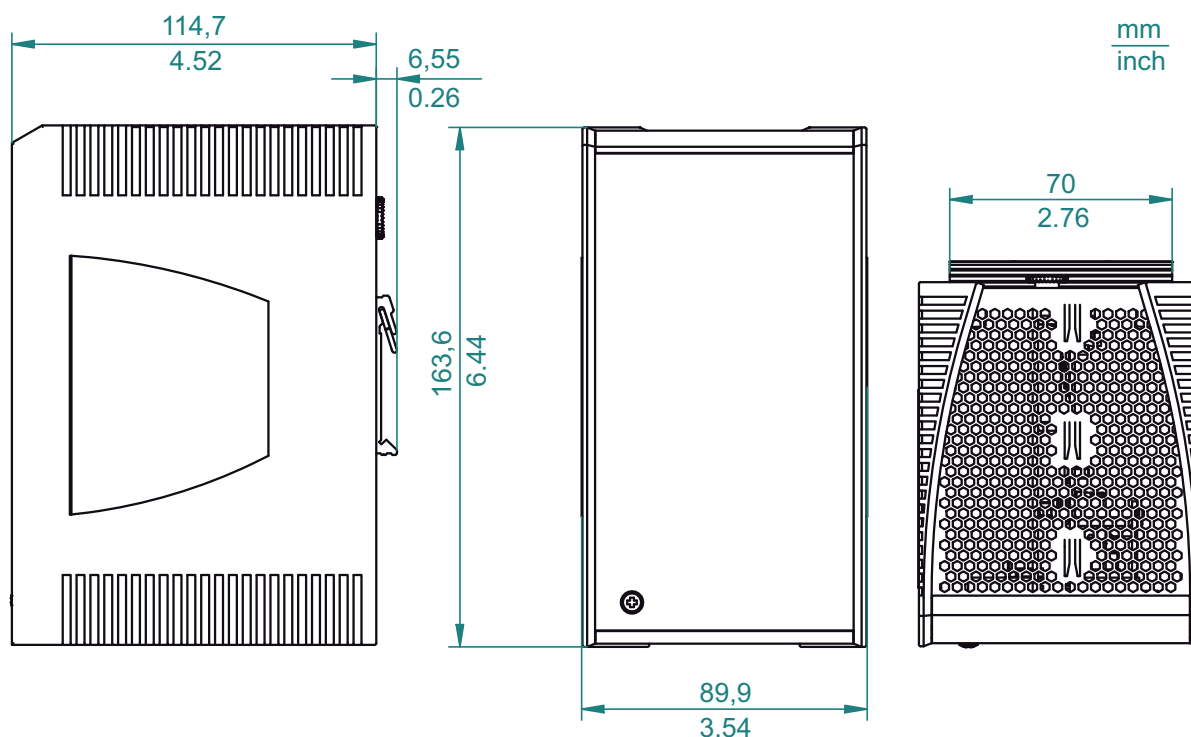


Figure 11: Dimensions of the device variants without WAN ports with operating characteristic value S. For the characteristic value, see “Device name and product code” on page 20.

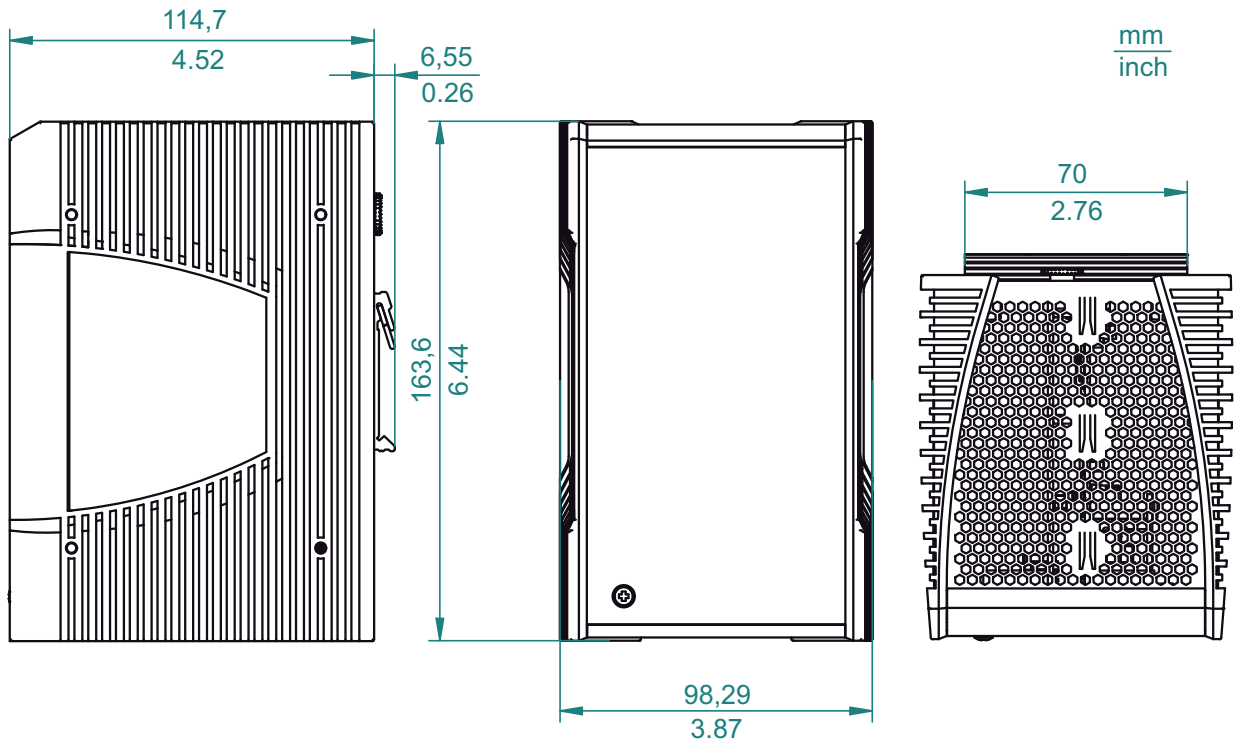


Figure 12: Dimensions of the device variants without WAN ports with operating characteristic value E and T. For the characteristic value, see “Device name and product code” on page 20.

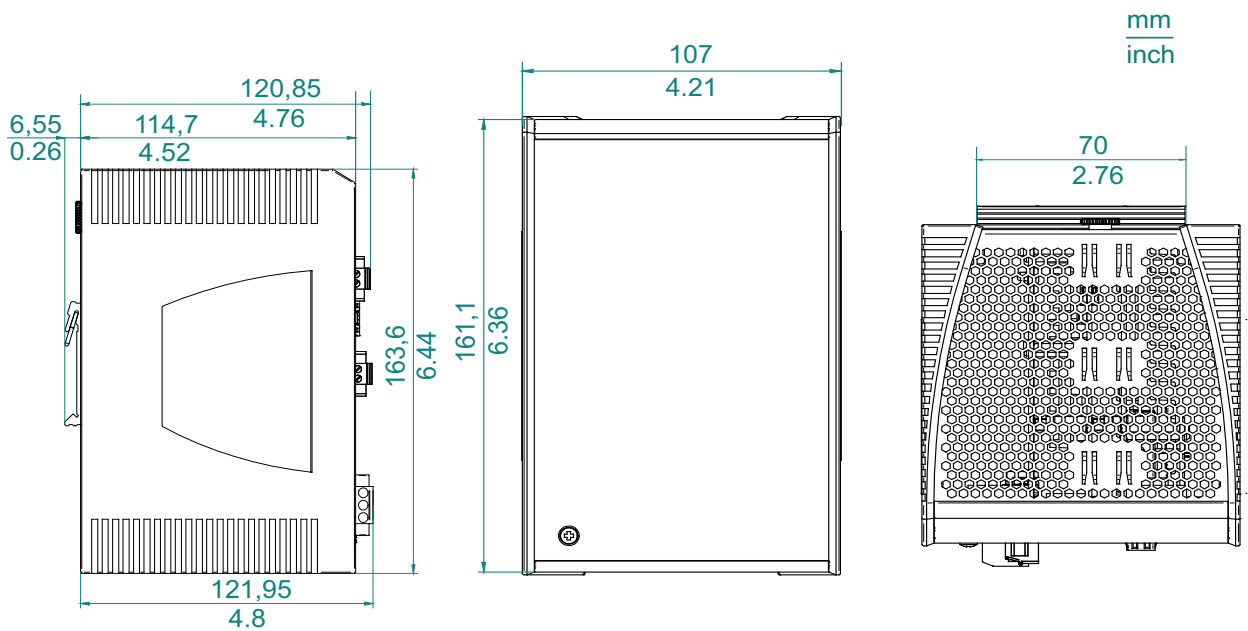


Figure 13: Dimensions of the device variants with WAN ports with operating characteristic value S. For the characteristic value, see “Device name and product code” on page 20.

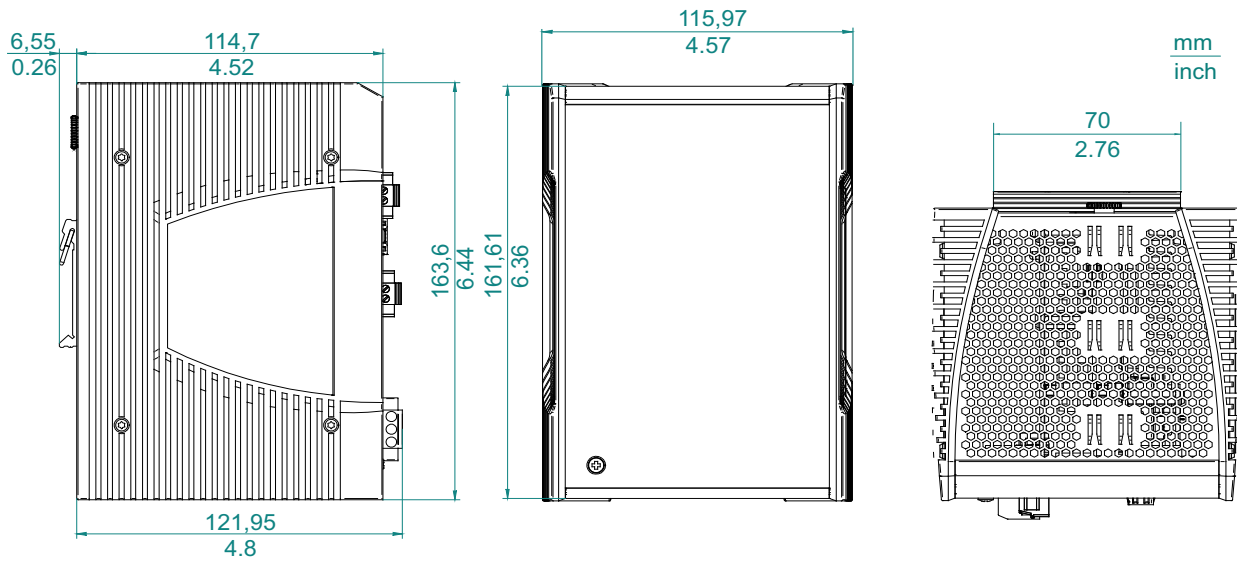


Figure 14: Dimensions of the device variants with WAN ports with operating characteristic value E and T. For the characteristic value, see “[Device name and product code](#)” on page 20.

■ EMC and immunity

Note: You will find detailed information on the certificates and declarations applying to your device in a separate overview.

[See table 5 on page 22.](#)

EMC interference emission		Standard applications	Navy applications	Railway applications	Substation applications
Radiated emission					
EN 55032		Class A	—	—	Class A
DNV GL Guidelines		—	EMC B	—	—
FCC 47 CFR Part 15		Class A	—	—	Class A
EN 61000-6-4		Fulfilled	—	Fulfilled	—
Conducted emission					
EN 55032	AC and DC supply connections	Class A	—	—	Class A
DNV GL Guidelines	AC and DC supply connections	—	EMC B	—	—
FCC 47 CFR Part 15	AC and DC supply connections	Class A	—	—	Class A
EN 61000-6-4	AC and DC supply connections	Fulfilled	—	Fulfilled	—
EN 55032	Telecommunication connections	Class A	—	—	Class A
EN 61000-6-4	Telecommunication connections	Fulfilled	—	Fulfilled	—

EMC interference immunity		Standard applications	Navy applications	Railway applications	Substation applications
Electrostatic discharge					
EN 61000-4-2	Contact discharge	±4 kV	±6 kV	±6 kV	±8 kV
IEEE C37.90.3					
EN 61000-4-2	Air discharge	±8 kV	±8 kV	±8 kV	±15 kV
IEEE C37.90.3					
Electromagnetic field					
EN 61000-4-3	80 MHz ... 6000 MHz	—	10 V/m	—	—

EMC interference immunity		Standard applications	Navy applications	Railway applications	Substation applications
EN 61000-4-3	80 MHz ... 800 MHz	10 V/m	—	10 V/m	10 V/m
EN 61000-4-3	800 MHz ... 1000 MHz	10 V/m	—	20 V/m	10 V/m
EN 61000-4-3	1400 MHz ... 6000 MHz	3 V/m	—	—	—
EN 61000-4-3	1400 MHz ... 3000 MHz	—	—	—	10 V/m
EN 61000-4-3	1400 MHz ... 2000 MHz	—	—	10 V/m	—
EN 61000-4-3	2000 MHz ... 2700 MHz	—	—	5 V/m	—
EN 61000-4-3	5100 MHz ... 6000 MHz	—	—	3 V/m	—
IEEE 1613	80 MHz ... 1000 MHz	—	—	—	35 V/m
Fast transients (burst)					
EN 61000-4-4 IEEE C37.90.1	AC/DC supply connection	±1 kV	±1 kV	±2 kV	±4 kV
EN 61000-4-4 IEEE C37.90.1	Data line	±4 kV	±1 kV	±2 kV	±4 kV
Voltage surges - DC supply connection					
EN 61000-4-5 IEEE 1613	line/ground	±2 kV	±1 kV	±2 kV	±5 kV
EN 61000-4-5	line/line	±1 kV	±0.5 kV	±1 kV	±1 kV
Voltage surges - AC supply connection					
EN 61000-4-5 IEEE 1613	line/ground	±2 kV	±1 kV	±2 kV	±5 kV
EN 61000-4-5	line/line	±1 kV	±0.5 kV	±1 kV	±2 kV
Voltage surges - data line					
EN 61000-4-5	line/ground	±1 kV	—	±2 kV	±4 kV
Conducted disturbances					
EN 61000-4-6	150 kHz ... 80 MHz	10 V	10 V	10 V	10 V

EMC interference immunity		Standard applications	Navy applications	Railway applications	Substation applications
Damped oscillation - AC/DC supply connection					
EN 61000-4-18 IEEE C37.90.1	line/ground	—	—	—	2.5 kV
EN 61000-4-12 IEEE C37.90.1	line/line	—	—	—	1 kV
Damped oscillation – data line					
EN 61000-4-18 IEEE C37.90.1	line/ground	—	—	—	2.5 kV
EN 61000-4-12	line/line	—	—	—	±1 kV

Immunity		Standard applications	Navy applications	Railway applications	Substation applications
IEC 60068-2-6, test Fc	Vibration	5 Hz ... 8.4 Hz with 0.14 in (3.5 mm) amplitude	2 Hz ... 13.2 Hz with 0.04 in (1 mm) amplitude	—	1 Hz ... 8.2 Hz with 3.5 mm amplitude
		8.4 Hz ... 150 Hz with 1 g	13.2 Hz ... 100 Hz with 0.7 g	—	8.2 Hz ... 150 Hz with 1 g
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms	—	—	15 g at 11 ms

■ Network range

Note: The line lengths specified for the transceivers apply for the respective fiber data (fiber attenuation and Bandwidth Length Product (BLP)/ Dispersion).

Product code M-SFP-...	Wave length	Fiber	System attenuation	Example for F/O cable length ^a	Fiber attenuation	BLP ^b / Dispersion
-SX/LC...	MM 850 nm	50/125 μm	0 dB ... 7.5 dB	0 mi ... 0.34 mi (0 km ... 0.55 km)	3.0 dB/km	400 MHz×km
-SX/LC...	MM 850 nm	62.5/125 μm	0 dB ... 7.5 dB	0 mi ... 0.17 mi (0 km ... 0.275 km)	3.2 dB/km	200 MHz×km
-MX/LC EEC	MM 1310 nm	50/125 μm	0 dB ... 12 dB	0 mi ... 0.93 mi (0 km ... 1.5 km)	1.0 dB/km	800 MHz×km
-MX/LC EEC	MM 1310 nm	62.5/125 μm	0 dB ... 12 dB	0 mi ... 0.31 mi (0 km ... 0.5 km)	1.0 dB/km	500 MHz×km
-LX/LC...	MM 1310 nm ^c	50/125 μm	0 dB ... 10.5 dB	0 mi ... 0.34 mi (0 km ... 0.55 km)	1.0 dB/km	800 MHz×km
-LX/LC...	MM 1310 nm ^d	62.5/125 μm	0 dB ... 10.5 dB	0 mi ... 0.34 mi (0 km ... 0.55 km)	1.0 dB/km	500 MHz×km
-LX/LC...	SM 1310 nm	9/125 μm	0 dB ... 10.5 dB	0 mi ... 12.43 mi (0 km ... 20 km) ^e	0.4 dB/km	3.5 ps/ (nm×km)
-LX+/LC...	SM 1310 nm	9/125 μm	5 dB ... 20 dB	8.70 mi ... 26.10 mi (14 km ... 42 km)	0.4 dB/km	3.5 ps/ (nm×km)
-LH/LC...	LH 1550 nm	9/125 μm	5 dB ... 22 dB	14.29 mi . ..49.71 mi (23 km ... 80 km)	0.25 dB/km	19 ps/(nm×km)

Table 10: F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

Product code M-SFP-...	Wave length	Fiber	System attenuation	Example for F/O cable length ^a	Fiber attenuation	BLP ^b / Dispersion
-LH+/LC	LH 1550 nm	9/125 μm	15 dB ... 30 dB	44.12 mi .. 67.11 mi (71 km ... 108 km)	0.25 dB/km	19 ps/(nm×km)
-LH+/LC	LH 1550 nm	9/125 μm	15 dB ... 30 dB	44.12 mi .. 79.54 mi (typically) (71 km ... 128 km)	0.21 dB/km	19 ps/(nm×km)

Table 10: F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

- a. Including 3 dB system reserve when compliance with the fiber data is observed.
- b. Using the bandwidth-length product is inappropriate for expansion calculations.
- c. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
- d. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
- e. Including 2.5 dB system reserve when compliance with the fiber data is observed.

MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul

Product code M-SFP- BIDI...	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O cable length ^a	Fiber attenuation	Dispersion
Type A LX/LC EEC	SM 1310 nm	1550 nm	9/125 μm	0 dB ... 11 dB	0 km ... 12.43 mi (0 km ... 20 km)	0.4 dB/km	3.5 ps/ (nm×km)
Type B LX/LC EEC	SM 1550 nm	1310 nm	9/125 μm	0 dB ... 11 dB	0 mi ... 12.43 mi (0 km ... 20 km)	0.25 dB/km	19 ps/(nm×km)
Type A LH/LC EEC	LH 1490 nm	1590 nm	9/125 μm	5 dB ... 24 dB	14.29 mi ... 49.71 mi (23 km .. . 80 km)	0.25 dB/km	19 ps/(nm×km)
Type B LH/LC EEC	LH 1590 nm	1490 nm	9/125 μm	5 dB ... 24 dB	14.29 mi ... 49.71 mi (23 km .. . 80 km)	0.25 dB/km	19 ps/(nm×km)

Table 11: F/O port (bidirectional Gigabit Ethernet SFP transceiver)

- a. Including 3 dB system reserve when compliance with the fiber data is observed.

MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul

Product code M-FAST-SFP-...	Wave length	Fiber	System attenuation	Example for F/O cable length ^a	Fiber attenuation	BLP/Dispersion
-MM/LC...	MM 1310 nm	50/125 μm	0 dB ... 8 dB	0 mi ... 3.11 mi (0 km ... 5 km)	1.0 dB/km	800 MHz×km
-MM/LC...	MM 1310 nm	62.5/125 μm	0 dB ... 11 dB	0 mi ... 2.49 mi (0 km ... 4 km)	1.0 dB/km	500 MHz×km
-SM/LC...	SM 1310 nm	9/125 μm	0 dB ... 13 dB	0 mi ... 15.53 mi (0 km ... 25 km)	0.4 dB/km	3.5 ps/(nm×km)
-SM+/LC...	SM 1310 nm	9/125 μm	10 dB ... 29 dB	15.53 mi . . 40.39 mi (25 km ... 65 km)	0.4 dB/km	3.5 ps/(nm×km)
-LH/LC...	SM 1550 nm	9/125 μm	10 dB ... 29 dB	29.20 mi . . 64.62 mi (47 km ... 104 km)	0.25 dB/km	19 ps/(nm×km)
-LH/LC...	SM 1550 nm	9/125 μm	10 dB ... 29 dB	14.29 mi . . 86.99 mi (55 km ... 140 km)	0.18 dB/km ^b	18 ps/(nm×km)

Table 12: Fiber port 100BASE-FX (SFP fiber optic Fast Ethernet Transceiver)

- a. Including 3 dB system reserve when compliance with the fiber data is observed.
- b. With ultra-low-loss optical fiber.

MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul

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

Table 13: Network range: 10/100/1000 Mbit/s twisted pair port

■ Power consumption/power output, order numbers

The order numbers correspond to the product codes of the devices.
See [“Device name and product code”](#) on page 20.

Device name	Maximum power consumption	Power output
EAGLE20-0400999TT999...	12 W	41 Btu (IT)/h
EAGLE30-04022O6TT999...	14 W	48 Btu (IT)/h
EAGLE30-04022O6TT9H2...	19 W	65 Btu (IT)/h

■ Scope of delivery

Amount	Article
1 ×	Device
2 ×	2-pin terminal block for signal contact and input (only for device variants featuring supply voltage with characteristic value K9 and CC)
1 ×	2-pin terminal block for signal contact (exclusively for device variants featuring supply voltage with characteristic value KK)
1 ×	3-pin terminal block for the supply voltage (only for device variants featuring supply voltage with characteristic value K9)
2 ×	3-pin terminal block for the supply voltage (exclusively for device variants featuring supply voltage with characteristic value KK)
2 ×	2-pin terminal block for the supply voltage (only for device variants featuring supply voltage with characteristic value CC)
1 ×	Safety and general information sheet

■ 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.

Name	Order number
Terminal cable	943 301-001
AutoConfiguration Adapter ACA22-USB (EEC)	942 124-001
AutoConfiguration Adapter ACA31	942 074-001
For device variants featuring supply voltage with characteristic value K9 or KK: 3-pin terminal block for supply voltage (50 pieces)	943 845-008
For device variants featuring supply voltage with characteristic value CC: 2-pin terminal block (50 pieces) for supply voltage	943 845-009
2-pin terminal block (50 pcs.) for signal contact and input	943 845-010
Rail Power Supply RPS 30	943 662-003
Rail Power Supply RPS 80 EEC	943 662-080
Rail Power Supply RPS 120 EEC (CC)	943 662-121
Industrial HiVision Network Management Software	943 156-xxx

Gigabit Ethernet SFP transceiver	Order number
M-SFP-TX/RJ45	943 977-001
M-SFP-TX/RJ45 EEC	942 161-001

The following operating conditions apply to twisted pair transceivers:

- ▶ Usable with:
 - HiOS as of software version 03.0.00
 - Classic Switch software, as of software version 04.1.00.
 - HiSecOS as of software version 01.2.00
- Do not use with the following devices:
 - SPIDER II
 - MSP/MSM
 - EES
- ▶ Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly.
- ▶ Not applicable for combo and Fast Ethernet ports.
- ▶ Exclusively supports the autonegotiation mode including autocrossing.

M-SFP-SX/LC	943 014-001
M-SFP-SX/LC EEC	943 896-001
M-SFP-MX/LC EEC	942 108-001
M-SFP-LX/LC	943 015-001
M-SFP-LX/LC EEC	943 897-001
M-SFP-LX+/LC	942 023-001
M-SFP-LX+/ LC EEC	942 024-001
M-SFP-LH/LC	943 042-001
M-SFP-LH/LC EEC	943 898-001
M-SFP-LH+/LC	943 049-001
M-SFP-LH+/LC EEC	942 119-001

Table 14: Accessory: Gigabit Ethernet SFP transceiver

Gigabit Ethernet SFP transceiver	Order number
SFP-GIG-LX/LC ^a	942 196-001
SFP-GIG-LX/LC EEC ^a	942 196-002

Table 14: Accessory: Gigabit Ethernet SFP transceiver

- a. You will find further information on certifications on the Internet on the Hirschmann product pages (www.hirschmann.com).

Bidirectional Gigabit Ethernet SFP transceiver	Order number
M-SFP-BIDI Type A LX/LC EEC	943 974-001
M-SFP-BIDI Type B LX/LC EEC	943 974-002
M-SFP-BIDI Type A LH/LC EEC	943 975-001
M-SFP-BIDI Type B LH/LC EEC	943 975-002
M-SFP-BIDI Bundle LX/LC EEC (Type A + B)	943 974-101
M-SFP-BIDI Bundle LH/LC EEC (Type A + B)	943 975-101

Table 15: Accessory: Bidirectional Gigabit Ethernet SFP transceiver

Fast Ethernet SFP transceiver	Order number
M-FAST SFP-TX/RJ45	942 098-001
M-FAST SFP-TX/RJ45 EEC	942 098-002

The following operating conditions apply to twisted pair transceivers:

- ▶ Usable with:
 - HiOS as of software version 03.0.00
 - for PRP ports on RSP devices, as of software version 02.0.01
 - for PRP ports on EES devices, as of software version 02.0.02
 - Classic switch software as of software version 08.0.00
 - HiSecOS as of software version 01.2.00
- ▶ Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly.
- ▶ Not applicable for combo ports.
- ▶ Not applicable for ports which support only Gigabit Ethernet.
- ▶ It is currently not possible to set autocrossing manually.

M-FAST SFP-MM/LC	943 865-001
M-FAST SFP-MM/LC EEC	943 945-001
M-FAST SFP-SM/LC	943 866-001
M-FAST SFP-SM/LC EEC	943 946-001
M-FAST SFP-SM+/LC	943 867-001
M-FAST SFP-SM+/LC EEC	943 947-001
M-FAST SFP-LH/LC	943 868-001
M-FAST SFP-LH/LC EEC	943 948-001
SFP-FAST-MM/LC ^a	942 194-001
SFP-FAST-MM/LC EEC ^a	942 194-002
SFP-FAST-SM/LC ^a	942 195-001
SFP-FAST-SM/LC EEC ^a	942 195-002

Table 16: Accessory: Fast Ethernet SFP transceiver

- a. You will find further information on certifications on the Internet on the Hirschmann product pages (www.hirschmann.com).

■ Underlying technical standards

Designation	
CSA C22.2 No. 142	Canadian National Standard(s) – Process Control Equipment – Industrial Products
ANSI/UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
CAN/CSA C22.2 No. 213	Non-incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations.
EN 50121-4	Railway applications - EMC - emitted interference and interference immunity for signal and telecommunication systems
EN 55032	Electromagnetic compatibility of multimedia equipment – Emission Requirements
IEC/EN 62368-1	Equipment for audio/video, information and communication technology - Part 1: safety requirements
EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61000-6-4	Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emitted interference in industrial environments
EN 61131-2	Programmable controllers – Part 2: Equipment requirements and tests
FCC 47 CFR Part 15	Code of Federal Regulations
DNVGL-CG-0339	Environmental test specification for electrical, electronic and programmable equipment and systems.
IEC/EN 61850-3	Communication networks and systems for power utility automation - Part 3: General requirements.
IEEE 1613	Standard Environment and Testing Requirements for Communication Networking Devices in Electric Power Substations
IEEE 802.1AB	Station and Media Access Control Connectivity Discovery
IEEE 802.1D	MAC Bridges (switching function)
IEEE 802.1Q	Virtual LANs (VLANs, MRP, Spanning Tree)
IEEE 802.3	Ethernet
NEMA TS 2	Traffic Controller Assemblies with NTCIP Requirements (environmental requirements)
UL 508	Safety for Industrial Control Equipment

Table 17: List of the technical standards

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

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

If your device has a shipping approval according to DNV GL, you find the approval mark printed on the device label. You will find out whether your device has other shipping approvals on the Hirschmann website at www.hirschmann.com in the product information.

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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