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A **BELDEN** BRAND

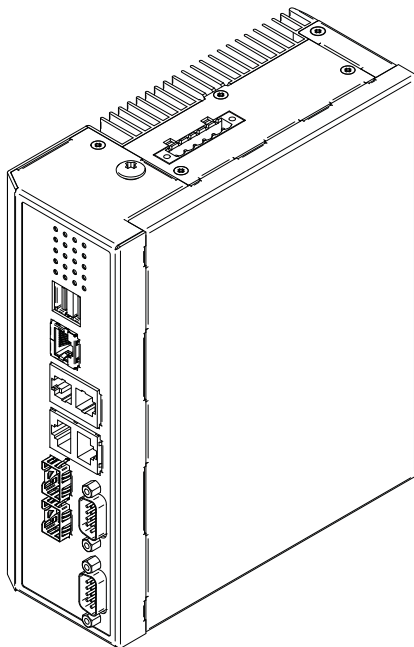
User Manual

Installation

Industrial Security Router

EAGLE40-03

EAGLE40-07



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You can get the latest version of this manual on the Internet at:
<https://www.doc.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

NOTICE 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 the 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 49.](#)
- ☐ Connect to the product only components suitable for the requirements of the specific application case.
- ☐ This equipment is not suitable for use in locations where children are likely to be present.

■ Installation site requirements

- ☐ Install the device in a fire enclosure according to IEC/EN 62368-1.
- ☐ 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 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.

■ **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.
- ☐ Install the device in the vertical position.
- ☐ At ambient temperatures $> +60\text{ °C}$ ($+140\text{ °F}$):
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 ground 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 the 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.
▶ The voltage connected complies with the requirements for a safety extra-low voltage (SELV) according to IEC 60950-1 or ES1 according to IEC/EN 62368-1.

Table 1: General requirements for connecting the electrical wires

■ **Requirements for connecting the signal contact**

- ☐ Before connecting the signal contact, **always** verify that the requirements listed are complied with.

All of the following requirements are complied with:
▶ The voltage connected complies with the requirements for a safety extra-low voltage (SELV) according to IEC 60950-1 or ES1 according to 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 “Technical data” on page 49.
▶ The cross-section of the ground conductor is the same size as or bigger than the cross-section of the power supply cables.

Table 2: Requirements for connecting the signal contact

■ **Requirements for connecting the supply voltage**

- ☐ Before connecting the supply voltage, **always** verify that the requirements listed are complied with.

Device variant	Requirements
All variants	All of the following requirements are complied with: ▶ The supply voltage corresponds to the voltage specified on the type plate of the device. ▶ The power supply complies with the requirements as per NEC Class 2. ▶ 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 cords are suitable for ambient air temperatures of at least +75 °C (+167 °F). The power cord wires are made of copper.

Table 3: Requirements for connecting the supply voltage

■ **Supply voltage**

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

■ **Relevant for use in explosion hazard areas (Hazardous Locations, Class I, Division 2)**

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D – OR non-hazardous locations, if labeled “FOR USE IN HAZARDOUS LOCATIONS”.

This device is an open-type device that is to be installed in an enclosure suitable for the environment such that the device is only accessible with the use of a tool.

Cet équipement est un dispositif de type ouvert qui doit être installé dans une enveloppe adaptée à l’environnement afin que le dispositif soit accessible uniquement avec l’utilisation d’un outil.

Ta: -40 °F ... +158 °F (-40 °C ... +70 °C), temperature code: T4

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

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

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.

■ **ATEX directive 2014/34/EU – specific regulations for safe operation for EAGLE40-03 devices**

In Ex zone 2, only EAGLE40-03 devices with a corresponding label may be operated. When operating the EAGLE40-03 devices and modules in Ex zone 2, the following applies:



II 3 G

Ex ec nC IIC T4 Gc

Ta: -40 °F ... +158 °F (-40 °C ... +70 °C)

DEMKO 20 ATEX 2374X

Temperature code: T4

DO NOT OPEN THE DEVICE WHEN IT IS ELECTRICALLY CHARGED.

THE USB CONNECTOR MUST NOT BE USED WHEN THE DEVICE IS OPERATED IN EXPLOSIVE HAZARDOUS LOCATIONS.

 Special conditions for safe use

- ☐ Install the device according to EN 60664-1 in an environment not exceeding degree of pollution 2.
- ☐ Install the basic devices and media modules in a suitable enclosure providing a degree of protection of at least IP54 according to EN 60079-0, taking into account the ambient conditions under which the equipment will be used.
- ☐ When end users provide optical SFP transceivers, these must be limited to Laser Class I.

■ **ATEX directive 2014/34/EU – specific regulations for safe operation for EAGLE40-07 devices**

In Ex zone 2, only EAGLE40-07 devices with a corresponding label may be operated. When operating the EAGLE40-07 devices and modules in Ex zone 2, the following applies:



II 3 G

Ex ec nC IIC T4 Gc

Ta: -40 °F ... +158 °F (-40 °C ... +70 °C)

UL 24 ATEX 3192X

Temperature code: T4

DO NOT OPEN THE DEVICE WHEN IT IS ELECTRICALLY CHARGED.

THE USB CONNECTOR MUST NOT BE USED WHEN THE DEVICE IS OPERATED IN EXPLOSIVE HAZARDOUS LOCATIONS.



Special conditions for safe use

- ☐ Install the device according to EN 60664-1 in an environment not exceeding degree of pollution 2.
- ☐ Install the basic devices and media modules in a suitable enclosure providing a degree of protection of at least IP54 according to EN 60079-0, taking into account the ambient conditions under which the equipment will be used.
- ☐ When end users provide optical SFP transceivers, these must be limited to Laser Class I.

■ IECEx – Certification Scheme for Explosive Atmospheres for EAGLE40-03 devices



The following applies to EAGLE40-03 devices and modules for use in hazardous locations:

- ☐ List of standards:
 - IEC 60079-0:2017
 - IEC 60079-7:2017
 - IEC 60079-15:2017
- ☐ Make sure that the device has the following label:
Ex ec nC IIC T4 Gc IECEx ULD 23.0007 X

T4: $-40\text{ °C} \leq T_a \leq +70\text{ °C}$ ($-40\text{ °F} \leq T_a \leq +158\text{ °F}$)

- ☐ The equipment is suitable for use in an area with maximum pollution degree 2, as defined in IEC 60664-1.
- ☐ Install the modules in a suitable enclosure according to IEC 60079-0 providing a degree of protection of at least IP54 according to IEC 60529, taking into account the environmental conditions under which the equipment will be used.
- ☐ Make provisions to prevent transient disturbances from exceeding 119 V at the voltage inputs.
- ☐ When end users provide optical SFP transceivers, these must be limited to Laser Class I.
- ☐ Connectors shall be connected or disconnected exclusively in dead-voltage state.



WARNING! The USB connection is for temporary connection only during maintenance. Do NOT use, connect or disconnect unless the area is known to be non-hazardous. Connection or disconnection in an explosive atmosphere could result in an explosion.

■ IECEx – Certification Scheme for Explosive Atmospheres for EAGLE40-07 devices



The following applies to EAGLE40-07 devices and modules for use in hazardous locations:

- ☐ List of standards:
 - IEC 60079-0:2017
 - IEC 60079-7:2017
 - IEC 60079-15:2017
- ☐ Make sure that the device has the following label:
Ex ec nC IIC T4 Gc IECEx ULD 26.0015X

T4: $-40\text{ °C} \leq T_a \leq +70\text{ °C}$ ($-40\text{ °F} \leq T_a \leq +158\text{ °F}$)

- ☐ The equipment is suitable for use in an area with maximum pollution degree 2, as defined in IEC 60664-1.
- ☐ Install the modules in a suitable enclosure according to IEC 60079-0 providing a degree of protection of at least IP54 according to IEC 60529, taking into account the environmental conditions under which the equipment will be used.
- ☐ Make provisions to prevent transient disturbances from exceeding 119 V at the voltage inputs.
- ☐ When end users provide optical SFP transceivers, these must be limited to Laser Class I.
- ☐ Connectors shall be connected or disconnected exclusively in dead-voltage state.



WARNING! The USB connection is for temporary connection only during maintenance. Do NOT use, connect or disconnect unless the area is known to be non-hazardous. Connection or disconnection in an explosive atmosphere could result in an explosion.

■ **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.

► **2014/34/EU (ATEX)**

Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres.

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

► Reliability: IEC/EN 62368-1

You find more information on technical standards here:

[See "Technical data" on page 49.](#)

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.

■ **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

EAGLE40

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



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.

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.

The manual is available for download on the Internet: [https://
www.doc.hirschmann.com](https://www.doc.hirschmann.com)

Key

The symbols used in this manual have the following meanings:

▶	Listing
□	Work step
■	Subheading

1 Description

1.1 General device description

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

Key Features of EAGLE40-03:

- ▶ A fanless industrial grade security appliance
- ▶ Flexible LAN: 2 × GE with 1 pair bypass Gen 3 and 1 × GE or 1 × SFP
- ▶ Supports wall mount kit and DIN rail kit

Key Features of EAGLE40-07:

- ▶ A fanless industrial grade security appliance
- ▶ Flexible LAN: 5 × GE with 1 pair bypass Gen 3 and 2 × SFP
- ▶ Supports wall mount kit and DIN rail kit

The device allows you to set up switched and routed industrial Ethernet networks according to IEEE 802.3.

The device provides you with a large range of functions, which the manuals for the operating software inform you about. You will find these manuals in the form of PDF files for downloading on the Internet on the Hirschmann product pages (<https://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	Characteristic value	Description
1 ... 7	Device	EAGLE40	Security Router and Firewall
8	(hyphen)	—	
9 ... 10	Number: Gigabit Ethernet ports	03	3 × 1000 Mbit/s
		07	7 × 1000 Mbit/s
11 ... 13	Configuration of the uplink ports	3T1	3 × Twisted pair RJ45
		1O6	1 × SFP, 2 × Twisted pair RJ45
		2O6	2 × SFP, 5 × Twisted pair RJ45
14	Temperature range	S	Standard 0 °C ... +60 °C (+32 °F ... +140 °F)
		T	Extended -40 °C ... +70 °C (-40 °F ... +158 °F)
		E	Extended with conformal coating -40 °C ... +70 °C (-40 °F ... +158 °F)
15 ... 16	Supply voltage	CC	2 × Voltage input
			Rated voltage range 24 V DC ... 48 V DC
17	Approval Part 1	Note: You will find detailed information on the certificates and declarations applying to your device in a separate overview. See "Assignment: application cases, certificates and declarations, characteristic values" on page 24.	
	Applies to EAGLE40-03 device variants	Z	CE, FCC, EN 61131, (IEC/EN 62368-1)
		Y	Z + UL 62368-1
		X	Z + UL 62368-1 + ANSI/UL 121201 + ATEX + IECEx
		T	Z + EN 50121-4
	Applies to EAGLE40-07 device variants	A	CE, FCC, (IEC/EN 62368-1)
		B	A + UL 62368-1
		C	A + IEC 61850-3, IEEE 1613
		D	B + DNV

Table 4: Device name and product code

Item	Product characteristic	Characteristic value	Description
18	Approval Part 2	Note: You will find detailed information on the certificates and declarations applying to your device in a separate overview. See “Assignment: application cases, certificates and declarations, characteristic values” on page 24.	
		Applies to EAGLE40-03 and EAGLE40-07 device variants	9 No additional Approval
		Applies to EAGLE40-07 device variants	F DNV
			G ATEX + IECEx
			Y UL 62368-1
19... 20	Type	HS	Hirschmann Standard
21	Software Configuration	R	Router Mode
22	Intrusion Detection System (IDS)	A	Not applicable
23... 24	Security Modules	NF	No additional modules, firewall only
		IN	Industrial Automation Protection Suite (Modbus + OPC Enforcer)
		SU	Substation Protection Suite (DNP3 + Modbus Enforcer)
		UN	Unified Protection Suite (All Enforcers)
25... 29	Software Version	XX.X.	Latest Software Version

Table 4: Device name and product code

1.3 Assignment: application cases, certificates and declarations, characteristic values

Application case	Certificates and declarations	Characteristic value ^a			
		T9	X9	Y9	Z9
Standard applications	ATEX		X		
	CE	X	X	X	X
	EN 50121-4	X			
	EN 61131-2	X	X	X	X
	IEC/EN 62368-1	X	X	X	X
	FCC	X	X	X	X
	IEC 61850-3				
	IEEE 1613				
	ANSI/UL 121201		X		
	UL 62368-1		X	X	
	IECEX		X		
	DNV				

Table 5: EAGLE40-03 device variants

a. X = Certificate or declaration present

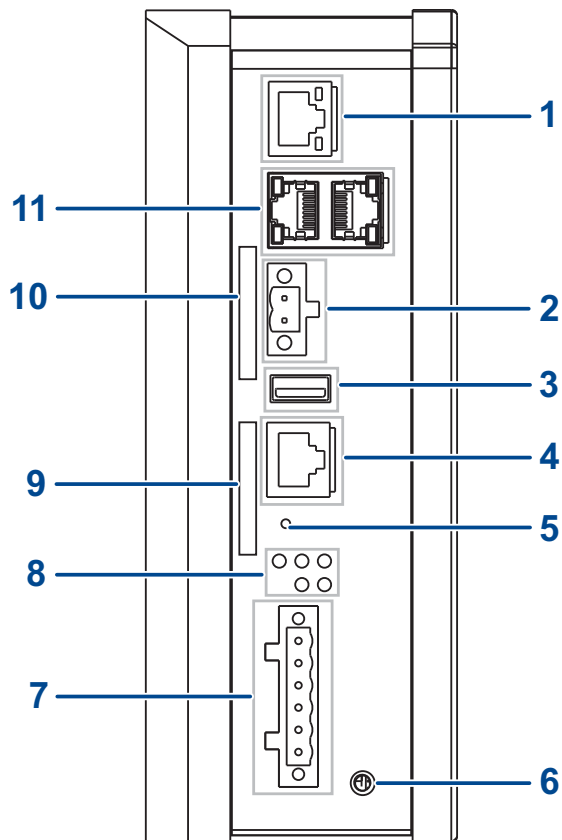
Application case	Certificates and declarations	Characteristic value ^a										
		A9	AF	AG	B9	BG	C9	CF	CG	CY	D9	DG
Standard applications	ATEX			X		X			X			X
	CE	X	X	X	X	X	X	X	X	X	X	X
	EN 50121-4											
	EN 61131-2											
	IEC/EN 62368-1	X	X	X	X	X	X	X	X	X	X	X
	FCC	X	X	X	X	X	X	X	X	X	X	X
	IEC 61850-3						X	X	X	X		
	IEEE 1613						X	X	X	X		
	ANSI/UL 121201											
	UL 62368-1				X	X				X	X	X
	IECEX			X		X			X			X
	DNV		X					X			X	X

Table 6: EAGLE40-07 device variants

a. X = Certificate or declaration present

1.4 Device views EAGLE40-03

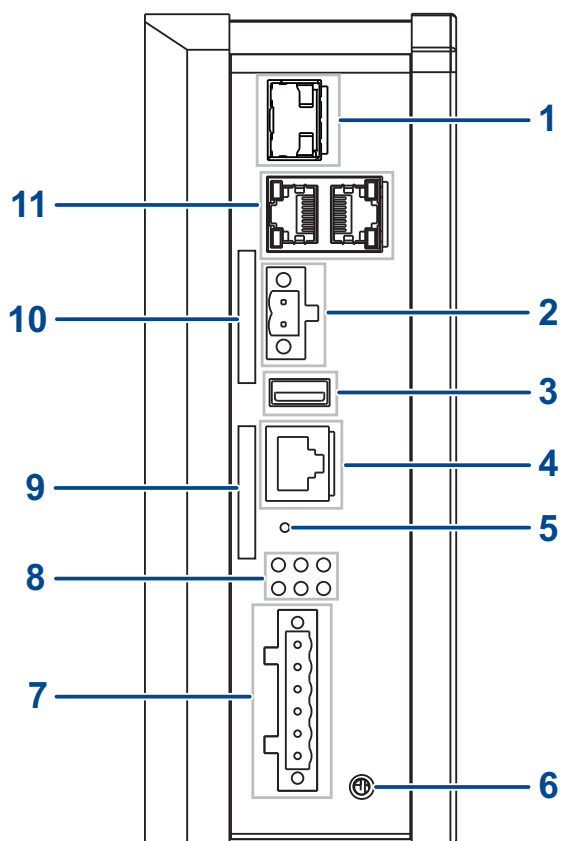
1.4.1 Front view EAGLE40-03-3T1...



1	Ethernet port (RJ45) for 10/100/1000 Mbit/s Twisted pair connections
2	Connection for digital input
3	USB interface
4	V.24 interface
5	Save/Load/Reset button ^a
6	Grounding screw
7	6-pin terminal block connection
8	LED display element
9	Label area for MAC address
10	Label area for IP address
11	2 × Gigabit Ethernet ports (RJ45) for 10/100/1000 Mbit/s Twisted pair connections

a. The save/load/reset button has no functionality in the current release.

1.4.2 Front view EAGLE40-03-106...

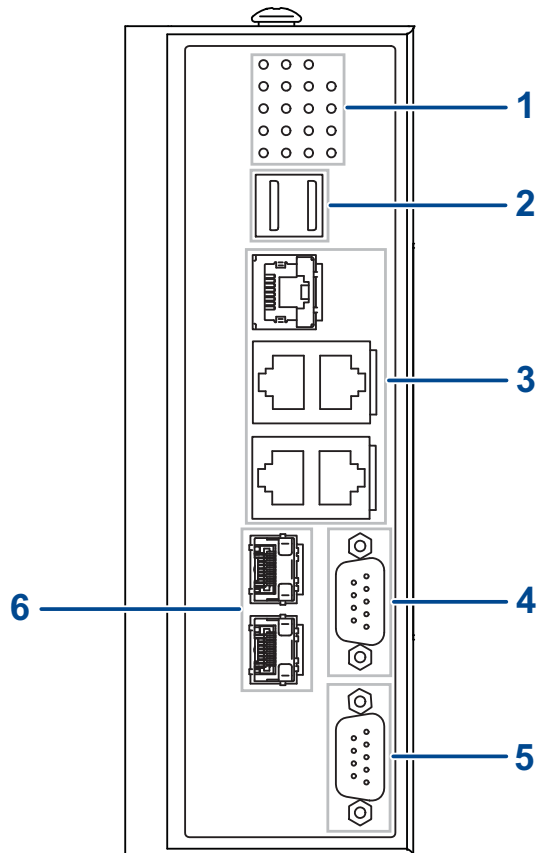


1	1 × SFP slot for 1000 Mbit/s fiber optic connections
2	Connection for digital input
3	USB interface
4	V.24 interface
5	Save/Load/Reset button ^a
6	Grounding screw
7	6-pin terminal block connection
8	LED display element
9	Label area for MAC address
10	Label area for IP address
11	2 × Gigabit Ethernet ports (RJ45) for 10/100/1000 Mbit/s Twisted pair connections

a. The save/load/reset button has no functionality in the current release.

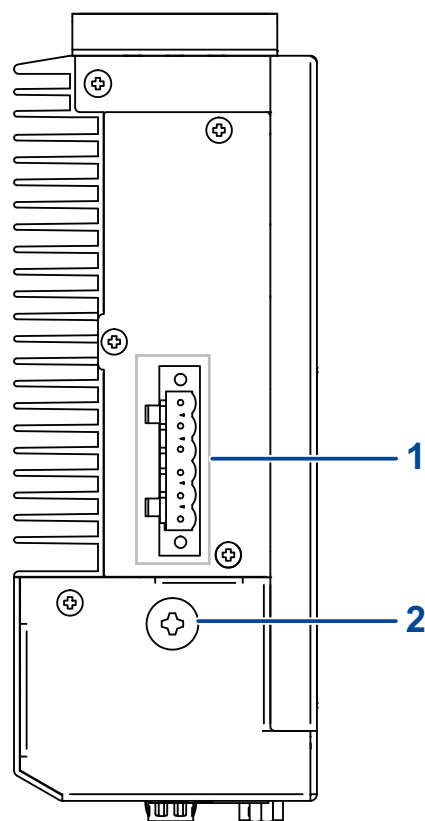
1.5 Device views EAGLE40-07

1.5.1 Front view



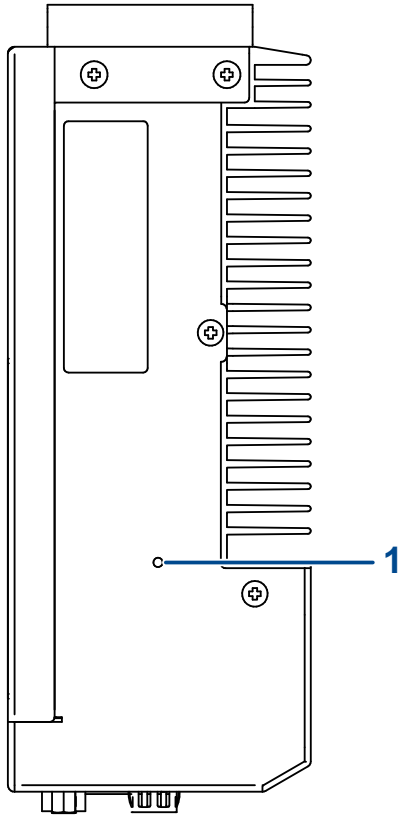
1	LED display element
2	2 × USB interface
3	5 × Gigabit Ethernet ports (RJ45) for 10/100/1000 Mbit/s Twisted pair connections
4	COM port (DB9 port)
5	CONSOLE port (DB9 port)
6	2 × SFP ports for 1000 Mbit/s fiber optic connections

1.5.2 Top view



1	6-pin terminal block connection
2	Grounding screw

1.5.3 Bottom view



1 Reset button^a

a. The reset button has no functionality in the current software release.

1.6 Power supply

A 6-pin, screwable terminal block is available for the redundant supply to the device.

For further information: [See “Connecting the power supply and signal lines” on page 40.](#)

1.7 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 “Pin assignments” on page 30.](#)

1.7.1 10/100/1000 Mbit/s twisted pair port

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

This port supports:

- ▶ Autonegotiation
- ▶ Autopolarity
- ▶ Autocrossing (if autonegotiation is activated)
- ▶ 1000 Mbit/s half-duplex mode, 1000 Mbit/s full duplex mode
- ▶ 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 socket housing is electrically connected with the front panel.

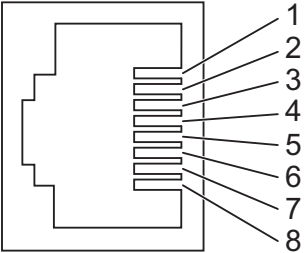
1.7.2 1000 Mbit/s F/O port

This port is an SFP slot.
The 1000 Mbit/s F/O port offers you the ability to connect network components according to the IEEE 802.3 1000BASE-SX/1000BASE-LX standard.

This port supports:

- ▶ Full duplex mode

1.7.3 Pin assignments

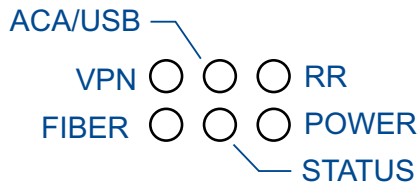
RJ45	Pin	10/100 Mbit/s	1000 Mbit/s
	MDI mode		
	1	TX+	BI_DA+
	2	TX-	BI_DA-
	3	RX+	BI_DB+
	4	—	BI_DC+
	5	—	BI_DC-
	6	RX-	BI_DB-
	7	—	BI_DD+
	8	—	BI_DD-
	MDI-X mode		
	1	RX+	BI_DB+
	2	RX-	BI_DB-
	3	TX+	BI_DA+
	4	—	BI_DD+
	5	—	BI_DD-
	6	TX-	BI_DA-
	7	—	BI_DC+
	8	—	BI_DC-

1.8 Display elements EAGLE40-03

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

1.8.1 Device status

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	The supply voltage is less than 44 V DC.
		Green	Lights up	The supply voltage is greater than 44 V DC.
STATUS	Device status	—	None	The signal contact is closed. It is not reporting any detected errors. Device is ready for operation.
		Red	Lights up	The signal contact is open. It is reporting a detected error. Device is not ready for operation.
			Flashing	The boot parameters used when the device has been started differ from the boot parameters saved. Start the device again.
FIBER	Fiber connection	—	None	No SFP connection
		Yellow	Lights up	The fiber link has been established.
			Flashing	The connection is active.
VPN	Virtual Private Network	—	None	At least one of the following cases applies: ▶ The VPN status display is switched off. ▶ No VPN connection is active. ▶ No active VPN connection is in the "up" status.
		Yellow	Lights up	The VPN status display is switched on, and at least 1 VPN connection is active and in the "up" status.
			Flashing	Device writes to/reads from the storage medium.
ACA/USB	Storage medium ACA21/22-USB (EEC)	—	None	No storage medium connected
		Green	Lights up	Storage medium is plugged.
			Flashing	Device writes to/reads from the storage medium.
		Yellow	Lights up	Storage medium is not ready for operation.

LED	Display	Color	Activity	Meaning
RR	Router redundancy	—	None	No router redundancy configured
		Green	Lights up	The device is in the Router Redundancy Master mode.
			Flashing	The device is in the Router Redundancy Backup mode.

1.8.2 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

1.9 Display elements EAGLE40-07

1.9.1 Device status

HDD ○ STA ○ POWER

LED	Display	Color	Activity	Meaning
POWER	Supply voltage	—	None	Supply voltage is too low.
		Green	Lights up	Supply voltage is on.
STA	Device status	—	None	Device is powered off.
		Green	Lights up	Device is not reporting any device status alarms.
		Red	Lights up	Device is reporting a device status alarm.
HDD	Hard disk activity	—	None	No data access activity
		Yellow	Flashing	Data access activity

1.9.2 Port status

1 ○ 2 ○
3 ○ 4 ○
6 ○ 7 ○ 5 ○
○ ○
CONSOLE COM

LED	Display	Color	Activity	Meaning
1 ... 5	Link status (LED on the left)	—	None	No link is established.
		Yellow	Lights up	Link has been established.
			Flashing	The connection is active.
	Speed (LED on the right)	—	None	Operating as a 10-Mbit/s connection
		Green	Lights up	Operating as a Gigabit connection
		Yellow	Lights up	Operating as a 100-Mbit/s connection (1000 Mbit/s)
6 ... 7	Link status	—	None	No link is established.
		Yellow	Lights up	Link has been established.
			Flashing	The connection is active.
CONSOLE	TX activity (LED on the left)	—	None	No data activity
		Yellow	Lights up	Device is transmitting data
	RX activity (LED on the right)	—	None	No data activity
		Yellow	Lights up	Device is receiving data
COM	TX activity (LED on the left)	—	None	No data activity
		Yellow	Lights up	Device is transmitting data
	RX activity (LED on the right)	—	None	No data activity
		Yellow	Lights up	Device is receiving data

1.10 Management interfaces

1.10.1 V.24 interface (external management)

Note: EAGLE40-03 devices have a V.24 interface for console access. For information about the position on the device: [See “Front view EAGLE40-03-106...” on page 26.](#)

A serial interface is provided on the RJ45 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.

VT 100 terminal settings	
Speed	115200 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.

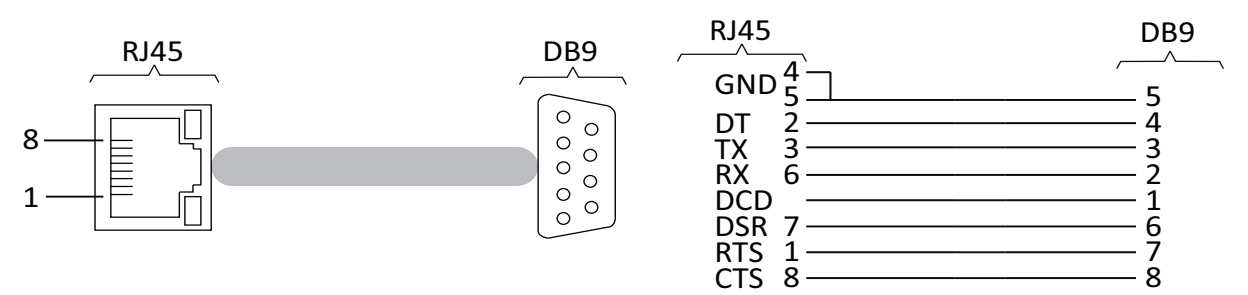


Figure 1: Pin assignment of the V.24 interface and the DB9 connector

1.10.2 DB9 port

Note: EAGLE40-07 devices have a DB9 port for console access. The port is labeled "CONSOLE". The "COM" port has no functionality in the current release. For information about the position on the device: [See “Front view” on page 27.](#)

A serial interface is provided on the DB9 port 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.

VT 100 terminal settings	
Speed	115200 Baud
Data	8 bit
Stop bit	1 bit
Flow control	none
Parity	none

The socket housing is electrically connected to the front panel of the device. The DB9 port is electrically insulated from the supply voltage.

1.10.3 USB interface

Note: For information about the position on the device, see [“Device views EAGLE40-03” on page 25](#) or [“Device views EAGLE40-07” on page 27](#).

The USB socket has an interface for the local connection of an AutoConfiguration Adapter ACA21. 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 3.0 (data rate max. 480 MBit/s)
- ▶ Connector type A
- ▶ Supplies current of max. 500 mA
- ▶ Voltage not potential-separated
- ▶ Supported file system: FAT32

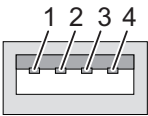
Figure	Pin	Operation
	1	VCC (VBus)
	2	– Data
	3	+ Data
	4	Ground (GND)

Table 7: Pin assignment of the USB interface

Note: Please note that in EAGLE40-07 devices, you can currently only use 1 of the 2 USB interfaces. Which one of the USB interfaces you decide to use does not make a difference.

1.11 Input/output interfaces

1.11.1 Signal contact

The signal contact is a potential-free relay contact. The device allows you to perform remote diagnosis via the signal contact. In the process, the device signals events such as a line interruption. When an event occurs, the device opens the relay contact and interrupts the closed circuit. The management setting specifies which events switch a contact. You can also use the management to switch the signal contact manually and thus control external devices.

Note: Only EAGLE40-03 devices allow you to control the signal contact from software.

1.11.2 Digital input

Only EAGLE40-03 devices have a digital input. The support of the function is dependent on the software release. Software support for the function is unimplemented at the time of printing this manual.

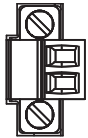


Figure 2: Input: 2-pin terminal block with screw locking

The digital input allows you to capture and forward signals from digital sensors. In the configuration, you specify how the device uses the digital input.

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

2 Installation

The device has been developed for practical application in a harsh industrial environment.

On delivery, the device is ready for operation.

Perform the following work steps to install and configure the device:

- ▶ [Checking the package contents](#)
- ▶ [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 57](#).
- ☐ Check the individual parts for transport damage.

2.2 Installing and grounding the device

 WARNING
FIRE HAZARD Install the device in a fire enclosure according to IEC/EN 62368-1 or IEC 60950-1 if you are connecting it to a power supply >100 W (PS3) or >NEC Class 2. Failure to follow these instructions can result in death, serious injury, or equipment damage.

2.2.1 Installing the device onto the DIN rail

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

Note: The overall shield of a connected shielded twisted pair cable is connected to the ground 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.

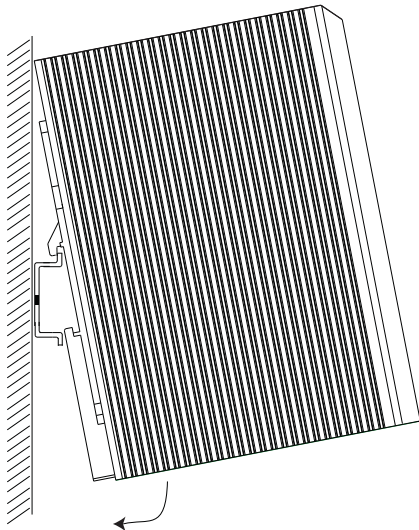


Figure 3: Mounting on the DIN rail

2.2.2 Grounding the device



WARNING

ELECTRIC SHOCK

Ground the device before connecting any other cables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The device has a functional ground connection.

The casing is grounded via the separate ground screw on the bottom right of the front panel.

- ☐ Ground the device via the ground screw.

2.3 Installing an SFP transceiver (optional)

Prerequisites:

Exclusively use Hirschmann SFP transceivers.

See [“Accessories” on page 58](#).

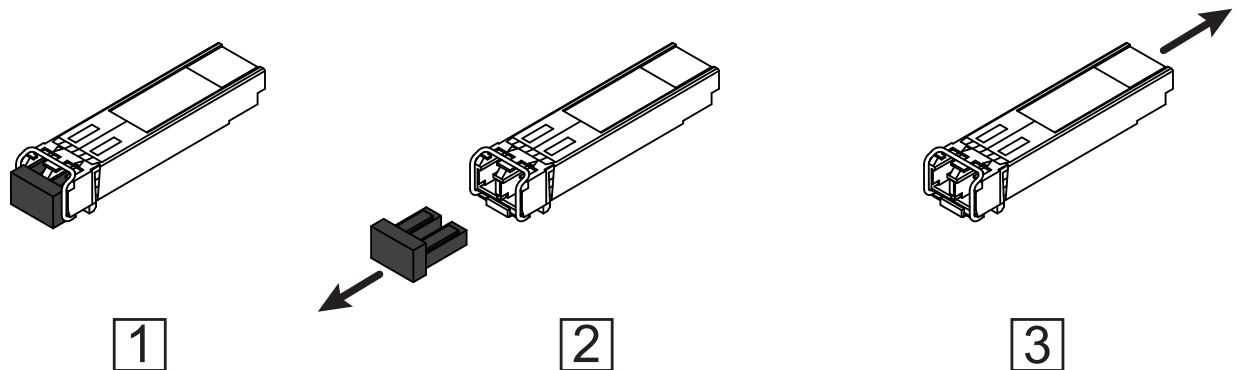


Figure 4: Installing SFP transceivers: Installation sequence

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).

2.4 Connecting the terminal blocks



WARNING

ELECTRIC SHOCK

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.

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

See [“Requirements for connecting the electrical wires” on page 10](#).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

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

2.4.1 Connecting the power supply and signal lines

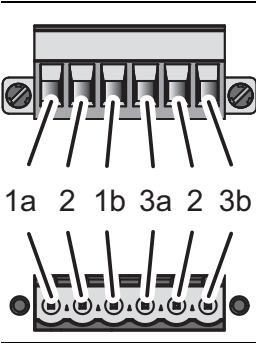
	1	Power supply connection 1
	1a	24 V DC
	1b	0 V DC
	2	Connection for the signal contact
	3	Power supply connection 2
	3a	0 V DC
	3b	24 V DC

Table 8: EAGLE40-03 pin assignment: 6 pin, screwable terminal block (on the top), connection to the device (at the bottom)

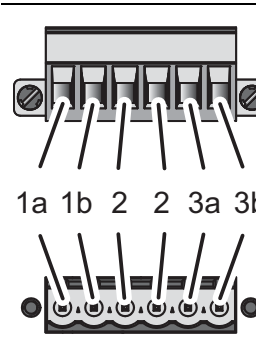
	1	Power supply connection 1
	1a	0 V DC
	1b	24 V DC
	2	Connection for the signal contact
	3	Power supply connection 2
	3a	0 V DC
	3b	24 V DC

Table 9: EAGLE40-07 pin assignment: 6 pin, screwable terminal block (on the top), connection to the device (at the bottom)

Supply voltage

The supply voltage can be connected redundantly. Both inputs are uncoupled. There is no distributed load. With redundant supply, the power supply unit with the higher output voltage supplies the device on its own. The supply voltage is electrically isolated from the housing. 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.

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment on the device
DC voltage	Rated voltage range 24 V DC ... 48 V DC	24 V DC Plus terminal of the supply voltage
		0 V DC Minus terminal of the supply voltage

Table 10: Type and specification of the supply voltage, pin assignment on the device

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

■ **Signal contact (optional)**

- ☐ Connect the wires according to the pin assignment on the device with the clamps.
- ☐ Fasten the wires connected by tightening the terminal screws.

2.4.2 Wiring the digital input (optional)

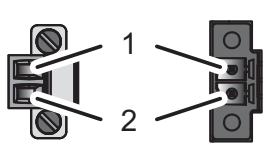
	Pin	Signal, terminal	Function
	1	DI (+)	Signal input
	2	DI (-)	Reference potential

Table 11: Pin assignment: 2 pin, screwable terminal block (on the left), connection to the device (to the right)

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

2.5 Operating the device

 <b style="font-size: 1.5em; margin-left: 10px;">WARNING
ELECTRIC SHOCK Before connecting the electrical wires, always verify that the requirements listed are complied with. See “Requirements for connecting the electrical wires” on page 10. Failure to follow these instructions 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 EAGLE40 devices is 0.79 Nm (7 lb-in).

The torque for tightening the signal contact and input terminal block on the EAGLE40-03 devices is 0.79 Nm (7 lb-in).

The tightening torque for the COM port and the CONSOLE port on the EAGLE40-07 devices is 0.79 Nm (7 lb-in).

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

2.6 Connecting data cables

2.6.1 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. To meet EN 50121-4 and marine application requirements, use shielded data cables at all transmission rates.
- ☐ Connect the data cables according to your requirements.
[See “10/100/1000 Mbit/s twisted pair port” on page 30.](#)

2.6.2 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 29.](#)

2.7 Filling out the inscription label

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

2.8 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:

- ▶ Entry via V.24 connection
- ▶ Entry via the HiDiscovery protocol in the applications HiDiscovery or Industrial HiVision
- ▶ AutoConfiguration Adapter

Further information on the basic settings of the device can be found in the user manual.

■ Default settings for EAGLE40-03

- ▶ V.24 data rate: 115200 Baud
- ▶ Ethernet ports: link status is not evaluated (signal contact)
- ▶ Optical ports: Full duplex
- ▶ TP ports: Autonegotiation

■ Default settings for EAGLE40-07

- ▶ DB9 port data rate: 115200 Baud
- ▶ Ethernet ports: link status is not evaluated (signal contact)
- ▶ Optical ports: Full duplex
- ▶ TP ports: Autonegotiation

2.8.1 First Login (Password)

Applies from software version HiSecOS 3.4:

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, or HiView the first time you log on to the device.
- ☐ Log on to the device with the default password “private”. 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>

3 Monitoring the ambient air temperature

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

[See “Technical data” on page 49.](#)

The ambient air temperature is the temperature of the air at a distance of 5 cm (2 in) 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 +20 °C (+68 °F) higher than the ambient temperature. This depends on the configuration of your device.

4 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.

5 Disassembly

5.1 Removing the device



WARNING

ELECTRIC SHOCK

Disconnect the grounding only after disconnecting all other cables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

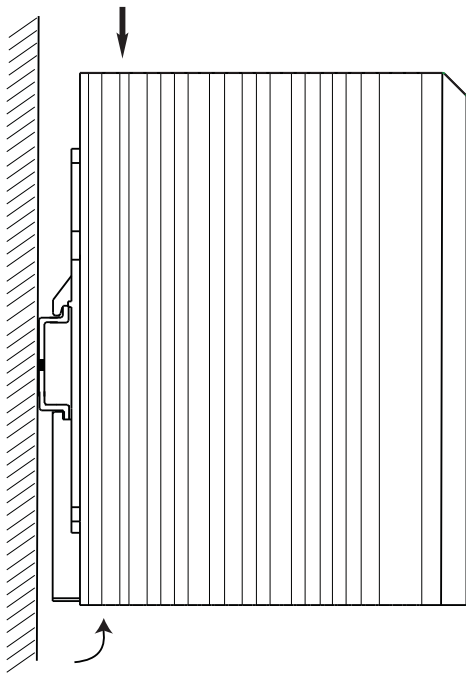


Figure 5: Removal from the DIN rail

- ☐ 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.

5.2 Removing an SFP transceiver (optional)

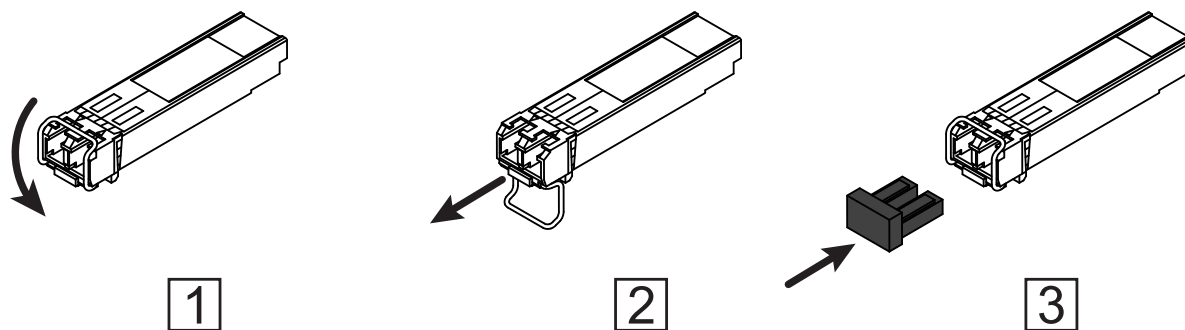


Figure 6: De-installing SFP transceivers: De-installation sequence

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).

6 Technical data

6.1 General technical data

General technical data	
Dimensions W × H × D	See "Dimension drawings" on page 51.
Weight	EAGLE40-03 1960 g (69.13 oz)
	EAGLE40-07 1560 g (55.03 oz)
Power supply	▶ 2 voltage inputs for redundant power supply ▶ Safety extra-low voltage (SELV), redundant inputs disconnected
	Nominal voltage range 24 V DC ... 48 V DC
	Voltage range including maximum tolerances
	EAGLE40-03 20 V DC ... 58 V DC
	EAGLE40-07 20 V DC ... 54 V DC
	Connection type 6-pin terminal block
	Input terminal block 18 AWG ... 24 AWG (0.75 mm ² ... 0.2 mm ²) One individual conductor in a clamping point.
	Grounding conductor at least 18 AWG (0.75 mm ²)
	Peak inrush current 4.4 A
Climatic conditions during operation	Ambient air temperature -40 °C ... +70 °C (-40 °F ... +158 °F)
	Relative humidity (non-condensing) 5 % ... 95 %
Climatic conditions during storage	Ambient air temperature -40 °C ... +85 °C (-40 °F ... +185 °F)
	Relative humidity (non-condensing) 5 % ... 95 %
Pollution degree	2
Degree of protection	IP40

6.2 Signal contact

Signal contact	
Connection type	6-pin terminal block
	Tightening torque 0.79 Nm (7 lb-in)
Nominal value	I _{max} = 0.5 A at U _{max} = 24 V AC
	I _{max} = 0.5 A at U _{max} = 48 V DC

6.3 Digital input

Digital input EAGLE40-03		
Connection type	2-pin terminal block	
	Tightening torque	0.79 Nm (7 lb-in)
	min. conductor cross-section	0.2 mm ² (24 AWG)
	max. conductor cross-section	0.75 mm ² (18 AWG)
Maximum permitted input voltage range	-32 V DC ... +32 V DC	
Nominal input voltage	24 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 acc. to IEC 61131-2 (current-consuming)	Type 3	

6.4 Power consumption/power output

Device name	Maximum power consumption	Power output
EAGLE40-033T1...	15 W	51 Btu (IT)/h
EAGLE40-03106...	15 W	51 Btu (IT)/h
EAGLE40-07...	25 W	85 Btu (IT)/h

6.5 Dimension drawings

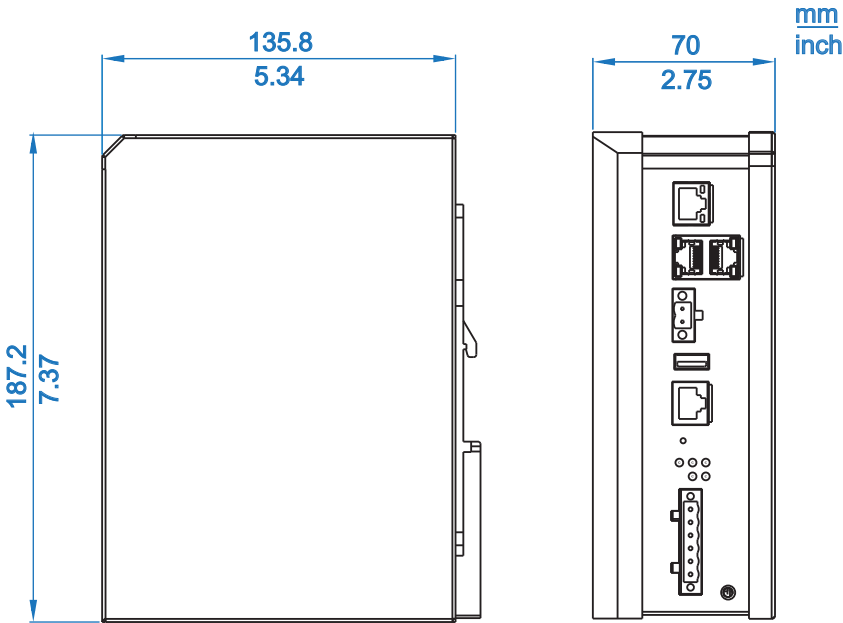


Figure 7: Dimensions of the EAGLE40-03-3T1... device variants.

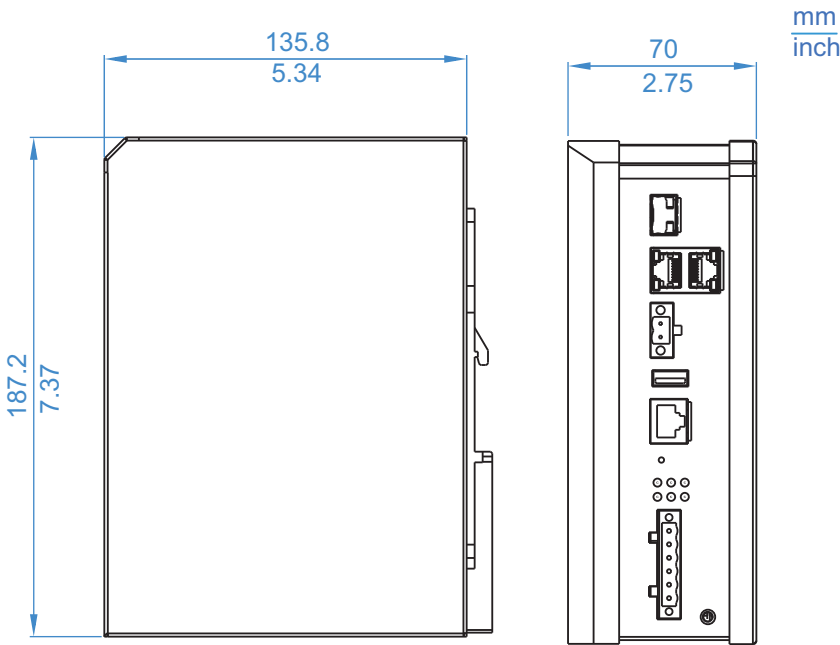


Figure 8: Dimensions of the EAGLE40-03-106... device variants.

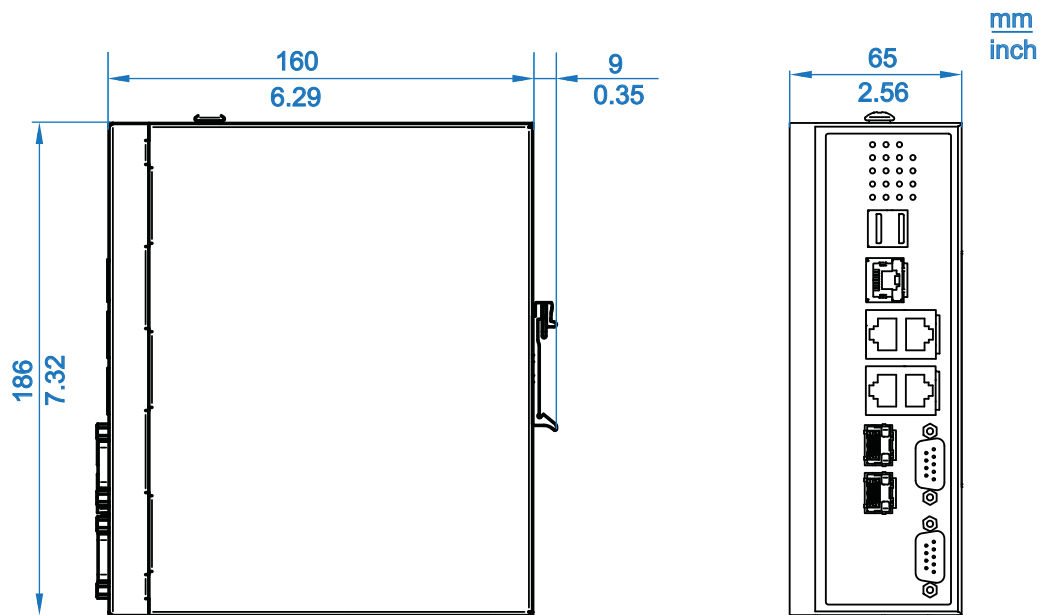


Figure 9: Dimensions of the EAGLE40-07 device variants.

6.6 EMC and immunity

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

See [“Assignment: application cases, certificates and declarations, characteristic values”](#) on page 24.

EMC interference emission		Standard applications
Radiated emission		
EN 55032		Class A
FCC 47 CFR Part 15		Class A
EN 61000-6-4		Fulfilled

EMC interference immunity		Standard applications
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 ... 1000 MHz	10 V/m
	1.4 GHz ... 6.0 GHz	3 V/m
Fast transients (burst) - power supply connection		
EN 61000-4-4		±2 kV
Fast transients (burst) - data line		
EN 61000-4-4		± 1 kV
Voltage surges - power supply connection		
EN 61000-4-5	line/ground	± 1 kV
EN 61000-4-5	line/line	± 0.5 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

6.7 Network range

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

Product code M-SFP-...	Mode ^a	Wave length	Fiber	System attenuation	Example for F/O line length ^b	Fiber attenuation	BLP ^c / 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...	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...	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 ^d	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 ^e	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 ... 12.42 mi (0 km ... 20 km ^f)	0.4 dB/km	3.5 ps/(nm×km)
-LX+/LC...	SM	1310 nm	9/125 µm	5 dB ... 20 dB	8.7 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)
-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 (71 km ... 128 km)	0.21 dB/km (typically)	19 ps/(nm×km)

Table 12: Fiber port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

Product code M-SFP-...	Mode ^a	Wave length	Fiber	System attenuation	Example for F/O line length ^b	Fiber attenuation	BLP ^c / dispersion
-LH+/LC..	LH	1550 nm	9/125 µm	13 dB ... 32 dB	38.52 mi ... 72.07 mi (62 km ... 116 km)	0.25 dB/km (typically)	19 ps/(nm×km)
-LH+/LC..	LH	1550 nm	9/125 µm	13 dB ... 32 dB	38.52 mi ... 85.75 mi (62 km ... 138 km)	0.21 dB/km (typically)	19 ps/(nm×km)

Table 12: Fiber port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

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

Product code SFP-GIG-B-...	Mode ^a Mode	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O line length ^b	Fiber attenuation	Dispersion
SFP-GIG-BA LX/ LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 15 dB	0 mi ... 12.42 mi (0 km ... 20 km)	0.4 dB/km	3.5 ps/(nm×km)
SFP-GIG-BB LX/ LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 15 dB	0 mi ... 12.43 mi (0 km ... 20 km)	0.25 dB/km	19 ps/(nm×km)
SFP-GIG-BA LX+/LC EEC	SM	1310 nm	1550 nm	9/125 µm	3 dB ... 20 dB	7.45 mi ... 24.86 mi (12 km ... 40 km)	0.4 dB/km	3.5 ps/(nm×km)
SFP-GIG-BB LX+/LC EEC	SM	1550 nm	1310 nm	9/125 µm	3 dB ... 20 dB	7.45 mi ... 24.86 mi (12 km ... 40 km)	0.25 dB/km	19 ps/(nm×km)
SFP-GIG-BA LH/ LC EEC	SM	1490 nm	1550 nm	9/125 µm	4 dB ... 24 dB	11.80 mi ... 49.71 mi (19 km ... 80 km)	0.25 dB/km	19 ps/(nm×km)
SFP-GIG-BB LH/ LC EEC	SM	1550 nm	1490 nm	9/125 µm	4 dB ... 24 dB	11.80 mi ... 49.71 mi (19 km ... 80 km)	0.25 dB/km	19 ps/(nm×km)

Table 13: F/O port (bidirectional Gigabit Ethernet SFP Transceiver)

- a. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul
- b. including 3 dB system reserve when compliance with the fiber data is observed

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

Table 14: Network range: 10/100/1000 Mbit/s twisted pair port

7 Scope of delivery

Number	Article
1 ×	Device
1 ×	Safety and general information sheet
1 ×	Applies to device variants featuring Approval Part 1 with characteristic value X: EAGLE40-03 Information sheet for use in explosive atmospheres
1 ×	Applies to device variants featuring Approval Part 2 with characteristic value G: EAGLE40-07 Information sheet for use in explosive atmospheres
1 ×	Open source information sheet
1 ×	6-pin terminal block for power supply
1 ×	2-pin terminal block for the signal contact and the digital input

8 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 IP of the overall system is reduced to IP20.

Name	Order number
Terminal cable	942 097-001
AutoConfiguration Adapter ACA22-USB (EEC)	942 124-001
AutoConfiguration Adapter ACA21-USB (EEC)	943 271-003
6-pin terminal block (50 pieces) for supply voltage	943 845-013
2-pin terminal block (50 pcs.) for signal contact and input	943 845-010
Industrial HiVision Network Management Software	943 156-xxx

Gigabit Ethernet SFP transceiver	Order number
M-SFP-TX/RJ45 ^a	943 977-001
M-SFP-TX/RJ45 EEC ^a	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.
- ▶ Only support of 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
SFP-GIG-LX/LC ^b	942 196-001
SFP-GIG-LX/LC EEC ^b	942 196-002

a. Only suitable for EAGLE40-03 devices.

b. Further information on certifications can be found on the Internet at the Belden product pages (<https://www.belden.com>).

Note: Operate EAGLE40-07 devices with fiber optic SFP transceivers only. Copper SFP transceivers are inadmissible.

Bidirectional Gigabit Ethernet SFP transceiver	Order number
SFP-GIG BA LX/LC EEC ^a	942 207-001
SFP-GIG BB LX/LC EEC ^a	942 207-002
SFP-GIG BA LX+/LC EEC ^a	942 208-001
SFP-GIG BB LX+/LC EEC ^a	942 208-002
SFP-GIG BA LH/LC EEC ^a	942 209-001
SFP-GIG BB LH/LC EEC ^a	942 209-002

- a. Further information on certifications can be found on the Internet at the Belden product pages (<https://www.belden.com>).

9 Underlying technical standards

Designation	
EN 50121-4	Railway applications – EMC – Emission and immunity of the signaling and telecommunications apparatus (Rail Trackside)
EN 55032	Electromagnetic compatibility of multimedia equipment - Emission requirement
EN 60079-0	Explosive atmospheres – Part 0: Equipment – General requirements
EN 60079-7	Explosive atmospheres – Part 7: Equipment protection by increased safety
EN 60079-15	Explosive atmospheres – Part 15: Equipment protection by type of protection
IEC/EN 62368-1	Equipment of audio/video, information and communication technology - Part 1: safety requirement
EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61131-2	Programmable controllers – Part 2: Equipment requirements and tests
FCC 47 CFR Part 15	Code of Federal Regulations
DNV-CG-0339	Environmental test specification for electrical, electronic and programmable equipment and systems.
IEC 61850-3	Communication networks and systems for power utility automation. Part 3: General requirements
IEEE 1613	Environmental and testing requirements for communications networking devices installed in electric power substations
IEEE 802.3	Ethernet
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
UL 62368-1	Audio/video, information and communication technology equipment – Part 1: Safety requirements

Table 15: List of the 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.

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 my.belden.com.

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

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- ▶ Support ranges from the first installation through the standby service to maintenance concepts.

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