



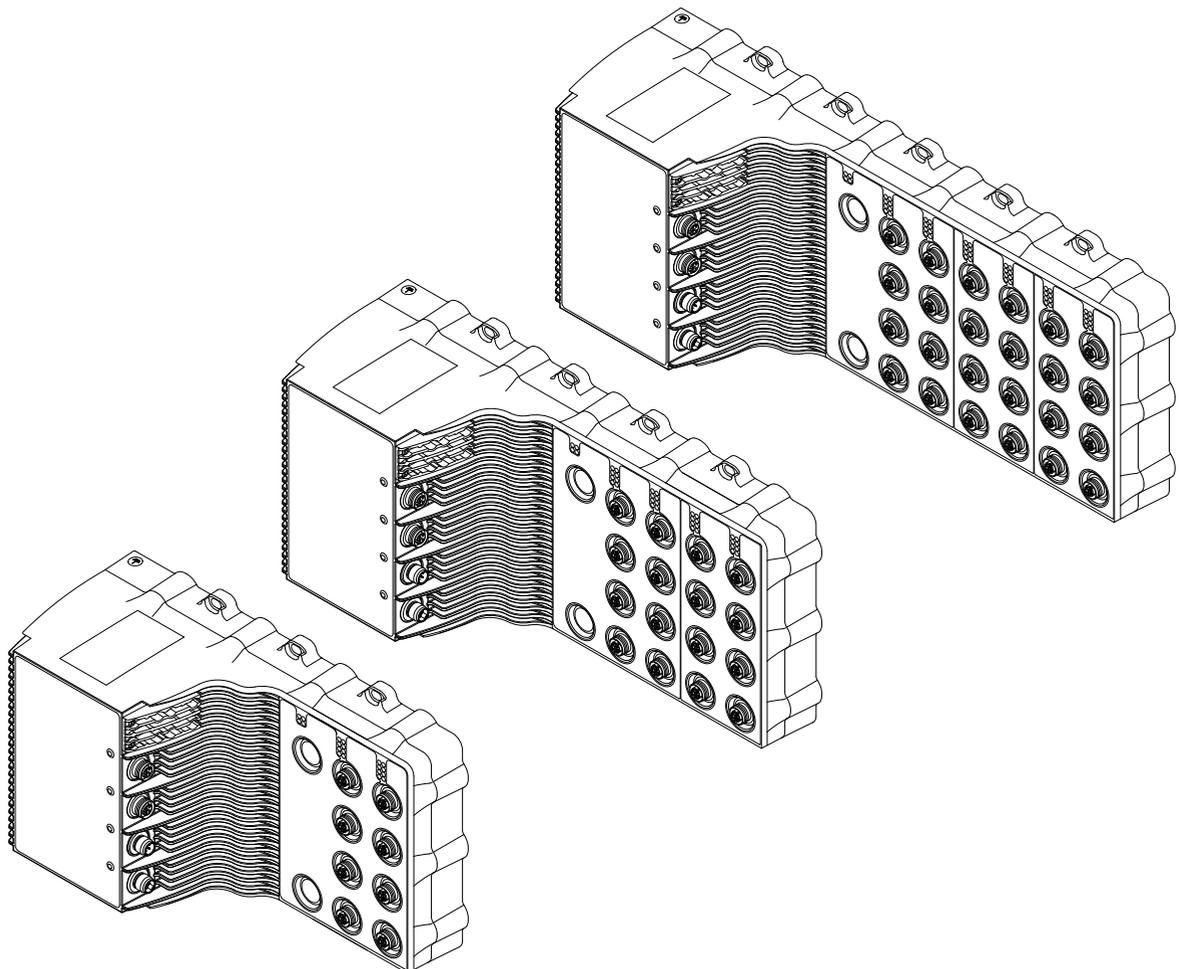
HIRSCHMANN

A **BELDEN** BRAND

User Manual

Installation

Managed Ethernet Switch OCTOPUS OS3



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Safety instructions



WARNING

UNCONTROLLED MACHINE ACTIONS

To avoid uncontrolled machine actions caused by data loss, configure all the data transmission devices individually.

Before you start any machine which is controlled via data transmission, be sure to complete the configuration of all data transmission devices.

Failure to follow 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.

■ National and international safety regulations

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

■ 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 39.](#)
- Connect to the product only components suitable for the requirements of the specific application case.

■ 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.

■ **Installation site requirements**

- Verify that there is at least 4 in (10 cm) of space above and below the device.
- Install this device solely in an operating site with restricted access, to which maintenance staff have exclusive access. Install the device in such a way that it is protected against mechanical forces in the area of the power supply.
- Exclusively mount the device on a suitable flat metal surface to ensure adequate cooling of the device.

■ **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 cooling fins free to ensure good air circulation.
- The surfaces of the device housing may become hot. Avoid touching the device while it is operating.
- Devices starting with serial number 942258...0003..... are suitable for degree of protection IP65/67.

You find the serial number of your device on the device label on top of the device.

- To sustain the IP65/67 suitability for your device, seal all unused connections and ports with the provided plastic protection screws. See [“Scope of delivery” on page 51](#). See [“Accessories” on page 51](#) in case of an additional demand.

To sustain the IP65/67 suitability for your device, exclusively connect components with degree of protection IP65/67.

The torque for tightening the protection screws on the device is 5.3 lb-in (0.6 Nm).

- For operation according to EN 45545: Seal all unused connections and ports exclusively with metal protection screws and metal screw caps. The use of plastic protection screws is prohibited. Protection screws and screw caps made of metal are available as an accessory.

[See “Accessories” on page 51.](#)

■ 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.

The overall shield of a connected power supply cable is connected to the ground connection on the metal casing as a conductor.

■ Requirements for connecting electrical wires

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

General requirements for connecting electrical wires

The following requirements apply without restrictions:

- ▶ The electrical wires are voltage-free.
- ▶ The cables used are permitted for the temperature range of the application case.
- ▶ Relevant for North America:
Exclusively use 60/75 °C (140/167 °F) or 75 °C (167 °F) copper (Cu) wire.

Requirements for connecting the signal contact

The following requirements apply without restrictions:

- ▶ The connected voltage complies with the requirements for a safety extra-low voltage (SELV) 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 data" on page 39.](#)

Requirements for connecting the supply voltage

The following requirements apply without restrictions:

All of the following requirements are complied with:

- ▶ The supply voltage corresponds to the voltage specified on the type plate of the device.
- ▶ The power supply conforms to overvoltage category I or II.
- ▶ The power supply has an easily accessible disconnecting device (for example a switch or a plug). This disconnecting device is clearly identified. So in the case of an emergency, it is clear which disconnecting device belongs to which power supply cable.
- ▶ The wire diameter of the power supply cable is at least 1 mm² (North America: AWG16) on the supply voltage input.

The following requirements apply alternatively:

Relevant when the device is supplied via 1 voltage input:

Relevant for North America:

The power supply complies with the requirements according to NEC Class 2.

Relevant when the device is supplied via 2 voltage inputs:

Relevant for North America:

The **total** voltage supply complies with the requirements as per NEC Class 2.

■ **CE marking**

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

2011/65/EU and 2015/863/EU (RoHS)

Directive of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

2014/30/EU (EMC)

Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

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

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
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Germany
www.hirschmann.com

The device 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:

[See "Technical data" on page 39.](#)

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.

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

■ **FCC note**

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; (2) this device must accept any interference received, including interference that may cause undesired operation.

Appropriate testing has established that this device fulfills the requirements of a class A digital device in line with part 15 of the FCC regulations.

These requirements are designed to provide sufficient protection against interference when the device is being used in a business environment.

The device creates and uses high frequencies and can also radiate these frequencies. If it is not installed and used in accordance with this operating manual, it can cause radio transmission interference. The use of this device in a residential area can also cause interference, and in this case the user is obliged to cover the costs of removing the interference.

■ **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.

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

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. The device meets the relevant industry standards, provides very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.

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

The device works without a fan.

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.

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>

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

- ▶ Network management software (for example Industrial HiVision)
- ▶ Web browser
- ▶ V.24 interface (locally on the device)
- ▶ SSH
- ▶ Telnet

1.2 Device name and product code

The product code is made up of characteristics with defined positions. The characteristic values stand for specific product properties.

Item	Characteristic	Characteristic value	Description
1 ... 3	Product	OS3	OCTOPUS OS3
4	(hyphen)	-	
5	Data rate	3	10/100 Mbit/s ports 10/100/1000 Mbit/s ports
		4	10/100/1000 Mbit/s ports
6	Hardware type	0	Standard
		4	Suitable for PoE or PoE+
7	(hyphen)	-	
8 ... 9	Total number: PoE/PoE+ ports	00	0 × PoE/PoE+ ports
		08	8 ×
		16	16 ×
		24	24 ×
10 ... 11	Number: 10 ^a /100 Mbit/s PoE/ PoE+ ports	00	0 × 10/100 Mbit/s PoE/PoE+ ports
		08	8 × 10/100 Mbit/s PoE/PoE+ ports
		16	16 × 10/100 Mbit/s PoE/PoE+ ports
12 ... 13	Number: 10 ^a /100/1000 Mbit/s PoE/PoE+ ports	00	0 × 10/100/1000 Mbit/s PoE/PoE+ ports
		08	8 × 10/100/1000 Mbit/s PoE/PoE+ ports
		16	16 × 10/100/1000 Mbit/s PoE/PoE+ ports
		24	24 × 10/100/1000 Mbit/s PoE/PoE+ ports
14 ... 15	Number: 10 ^a /100 Mbit/s ports	00	0 × 10/100 Mbit/s ports
		08	8 × 10/100 Mbit/s ports
		16	16 × 10/100 Mbit/s ports
16 ... 17	Number: 10 ^a /100/1000 Mbit/s ports	08	8 × 10/100/1000 Mbit/s ports
		16	16 × 10/100/1000 Mbit/s ports
		24	24 × 10/100/1000 Mbit/s ports
18 ... 19	Number: Ports >1000 Mbit/s	00	0 × 10000 Mbit/s ports
20 ... 21	First uplink port pair	T6	2 × 1GE M12 "X"-coded
		R6	2 × 1GE M12 "X"-coded, with Bypass relay
22 ... 23	Second uplink port pair	T6	2 × 1GE M12 "X"-coded
		R6	2 × 1GE M12 "X"-coded, with Bypass relay
24	(hyphen)	-	
25	Temperature range	V	Standard -40 °F ... +140 °F (-40 °C ... +60 °C)
		T	Extended -40 °F ... +158 °F (- 40 °C ... +70 °C)

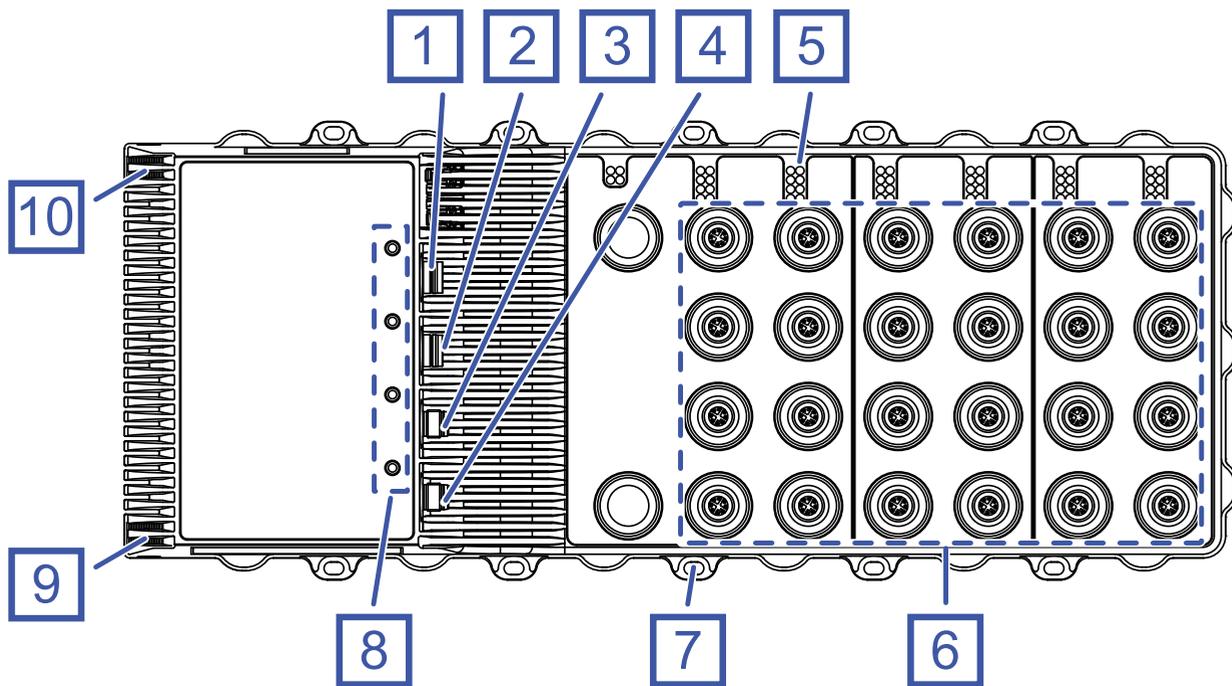
Table 1: Device name and product code

Item	Characteristic	Characteristic value	Description	
26 ... 27	Supply voltage	BB	2 voltage inputs for redundant power supply	
			Rated voltage	24 V DC
			Rated voltage range	16.8 V DC ... 32 V DC
			Connection type	5-pin M12 connector
		HH	2 voltage inputs for redundant power supply	
			Rated voltage	36 V DC ... 48 V DC
			Rated voltage range	25.2 V DC ... 60 V DC
			Connection type	5-pin M12 connector
		PP	2 voltage inputs for redundant power supply	
			PoE	
			Rated voltage range	47 V DC ... 57 V DC
			PoE+	
		QQ	Rated voltage range	53 V DC ... 57 V DC
			Connection type	5-pin M12 connector
			2 voltage inputs for redundant power supply	
			Rated voltage	24/36/48 V DC
M9	Rated voltage range	16.8 V DC ... 60 V DC		
	Connection type	5-pin M12 connector		
	Rated voltage	100 V AC ... 240 V AC, 50 Hz ... 60 Hz		
	Rated voltage range	88 V AC ... 265 V AC, 47 Hz ... 63 Hz		
N9	Connection type	5-pin M12 connector		
	Rated voltage	72 V DC ... 110 V DC		
	Rated voltage range	50.4 V DC ... 138 V DC		
	Connection type	5-pin M12 connector		
28 ... 29	Certificates and declarations	Z9	CE, FCC, EN 61131, EN 62368-1	
		Y9	Z9 + cUL 61010	
		S9	Z9 + EN 50121-4 + EN 50155	
30 ... 31	Software packages	99	Reserved	
		UR	Unicast Routing	
		MR	Unicast + Multicast Routing	
32 ... 33	Customer-specific version	HH	Hirschmann standard	
34	Hardware configuration	S	Standard	
35	Software configuration	E	Entry (Hirschmann Standard)	
		B	Diagnostic User (BDEW)	
		I	Ethernet/IP	
		P	PROFINET/IO	
36 ... 37	Software level	2A	HiOS Layer 2 Advanced	
		3A	HiOS Layer 3 Advanced	
38 ... 42	Software version	08.0.	Software version 08.0.	
		XX.X	Current software version	
43 ... 44	Maintenance version	00	Maintenance version 00	
		XX	Current maintenance version	

Table 1: Device name and product code

1.3 Device views

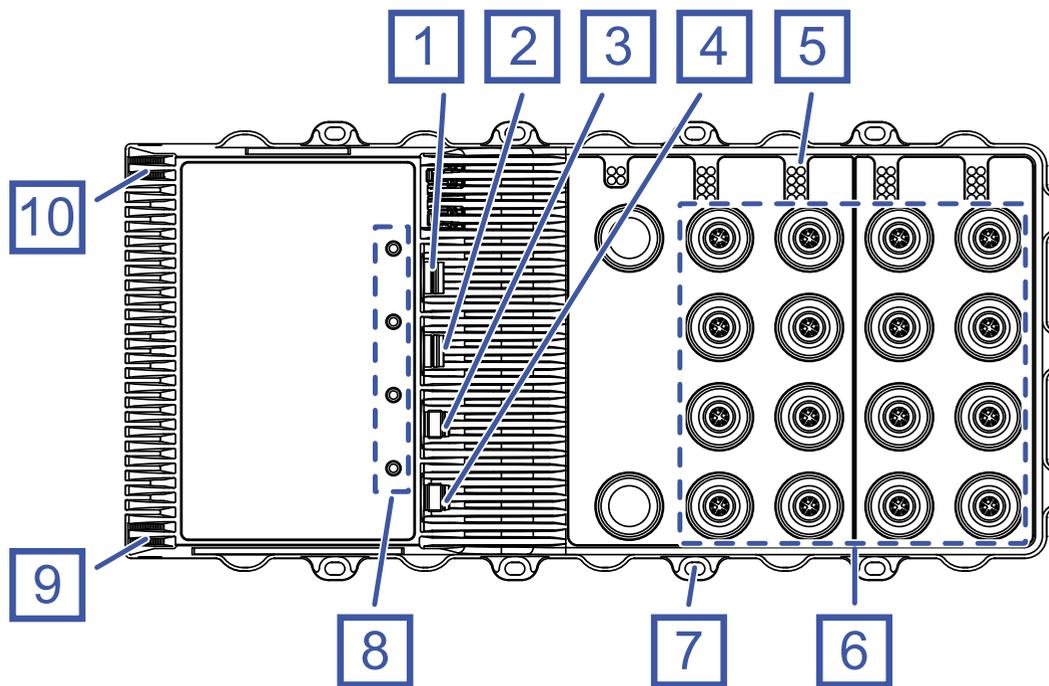
1.3.1 Device variants with 24 × Ethernet ports



1	V.24 interface	4-pin, "A"-coded M12 socket
2	USB interface	5-pin, "A"-coded M12 socket
3	Signal contact	5-pin, "A"-coded M12 plug
4	Supply voltage connection	5-pin, "K"- or "L"-coded M12 plug
5	LED display elements for port status	
6	24 × 10/100/1000 Mbit/s twisted pair port	Device variants: OS3-3x... 8-pin, "X"-coded M12 socket or 4-pin, "D"-coded M12 socket Device variants: OS3-4x... 8-pin, "X"-coded M12 socket
7	Slot hole for mounting on a flat surface	
8	LED display elements for device status	
9	Ground connection	
10	Ground connection (alternatively)	

Table 2: Front view (using the example OCTOPUS3-40-...)

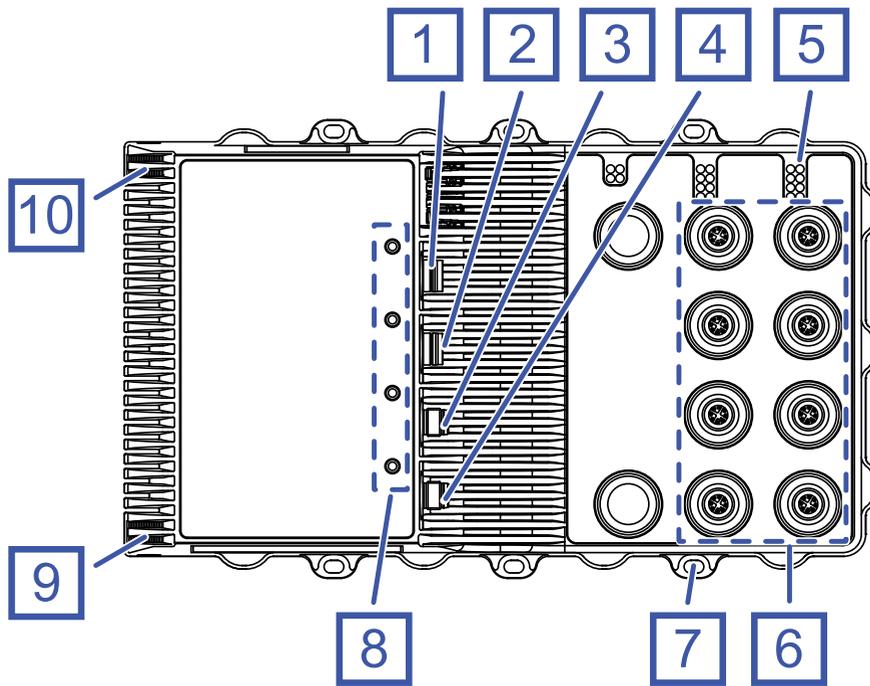
1.3.2 Device variants with 16 × Ethernet ports



1	V.24 interface	4-pin, "A"-coded M12 socket
2	USB interface	5-pin, "A"-coded M12 socket
3	Signal contact	5-pin, "A"-coded M12 plug
4	Supply voltage connection	5-pin, "K"- or "L"-coded M12 plug
5	LED display elements for port status	
6	16 × 10/100/1000 Mbit/s twisted pair port	Device variants: OS3-3x... 8-pin, "X"-coded M12 socket or 4-pin, "D"-coded M12 socket
		Device variants: OS3-4x... 8-pin, "X"-coded M12 socket
7	Slot hole for mounting on a flat surface	
8	LED display elements for device status	
9	Ground connection	
10	Ground connection (alternatively)	

Table 3: Front view (using the example OCTOPUS3-40-...)

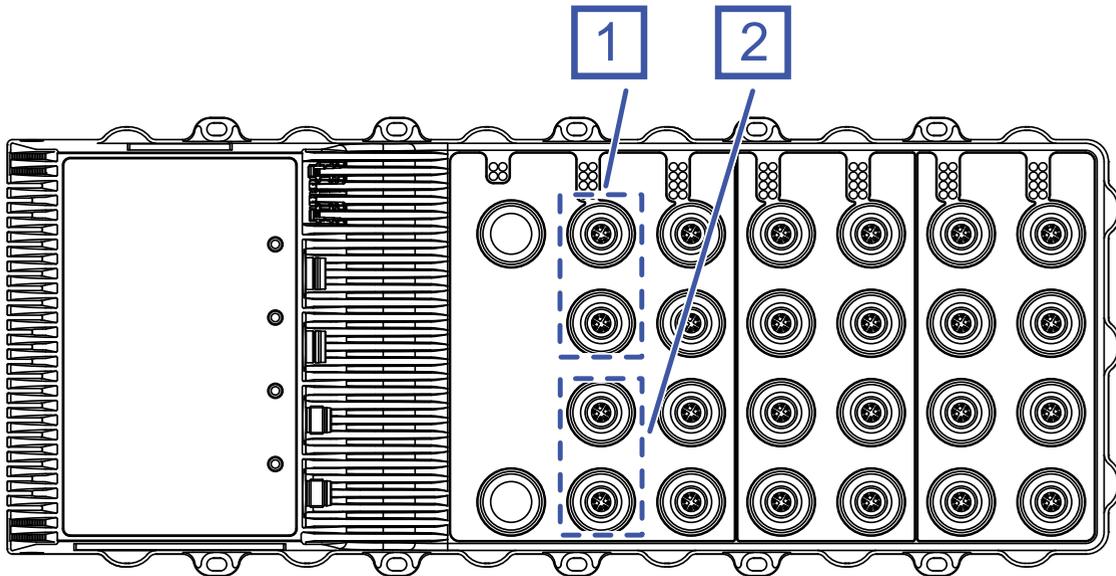
1.3.3 Device variants with 8 × Ethernet ports



1	V.24 interface	4-pin, "A"-coded M12 socket
2	USB interface	5-pin, "A"-coded M12 socket
3	Signal contact	5-pin, "A"-coded M12 plug
4	Supply voltage connection	5-pin, "K"- or "L"-coded M12 plug
5	LED display elements for port status	
6	8 × 10/100/1000 Mbit/s twisted pair port	Device variants: OS3-3x... 8-pin, "X"-coded M12 socket or 4-pin, "D"-coded M12 socket Device variants: OS3-4x... 8-pin, "X"-coded M12 socket
7	Slot hole for mounting on a flat surface	
8	LED display elements for device status	
9	Ground connection	
10	Ground connection (alternatively)	

Table 4: Front view (using the example OCTOPUS3-40-...)

1.3.4 Device variants with Uplink ports/Bypass function



1	First uplink port pair	Port 5 and 6	Bypass functionality for device variants OS3-.....R6R6...
2	Second uplink port pair	Port 7 and 8	Bypass functionality for device variants OS3-.....R6R6...

Table 5: Front view (using the example OCTOPUS3-40-...)

In the case of a power supply failure, Uplink ports are connected with each other. Thus signals can also be transmitted in a voltage-free state via Uplink port pairs.

1.3.5 Port assignment

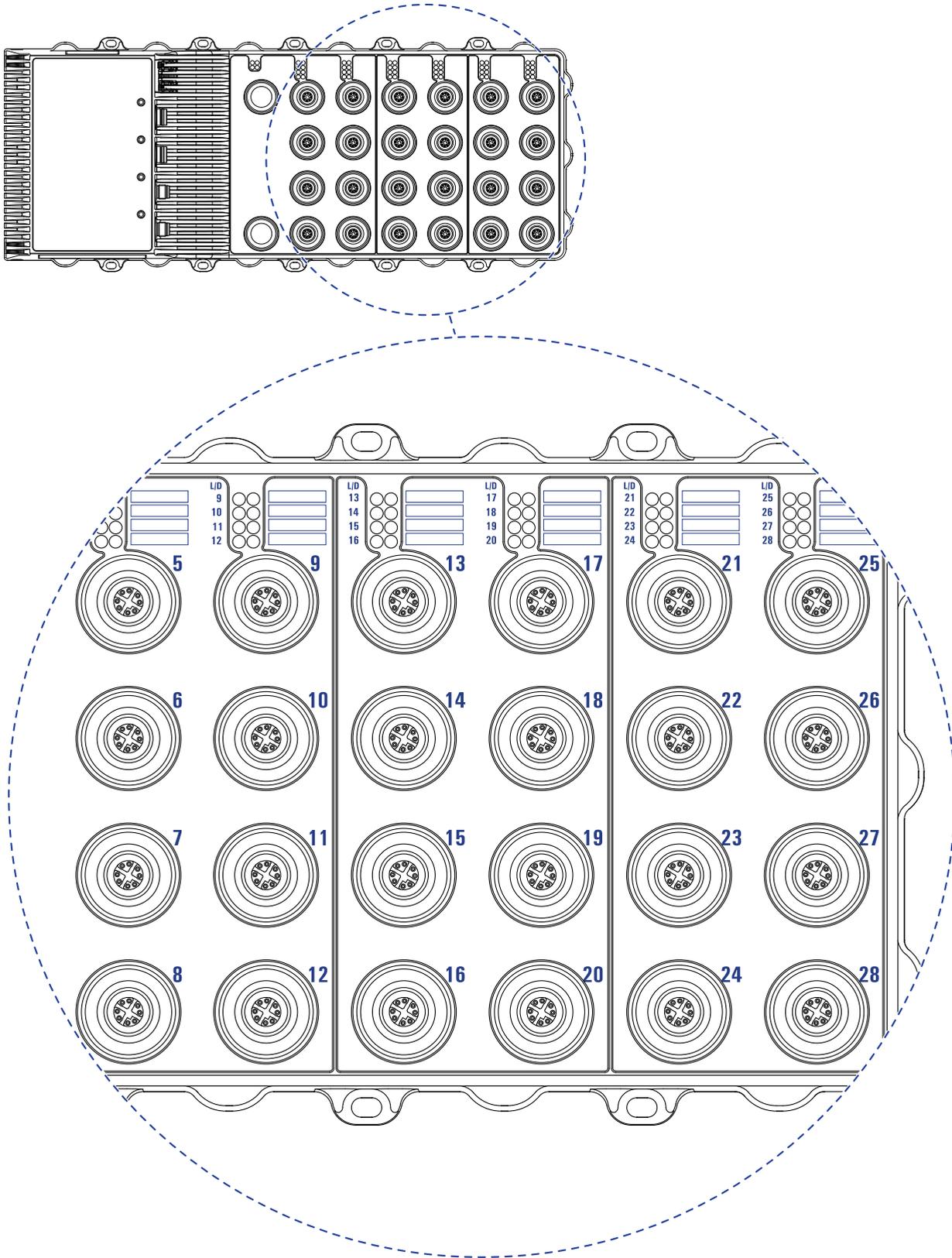


Figure 1: Port assignment: Port assignment OCTOPUS OS3

Note: The numerical sequence of the port assignment is identical for every device variant.

1.4 Power supply

1.4.1 Supply voltage with the characteristic value BB

In device variants with 2 power supply inputs, the supply voltage can be connected redundantly. Both inputs are uncoupled. 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.

A 5-pin, "L"-coded M12 plug is available for the redundant supply of the device.

[See "Device name and product code" on page 14.](#)

1.4.2 Supply voltage with characteristic value HH

In device variants with 2 power supply inputs, the supply voltage can be connected redundantly. Both inputs are uncoupled. 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.

A 5-pin, "L"-coded M12 plug is available for the redundant supply of the device.

[See "Device name and product code" on page 14.](#)

1.4.3 Supply voltage with characteristic value PP

The device supports Power over Ethernet Plus in accordance with IEEE 802.3at (PoE+) and enables you to supply current to terminal devices such as IP phones via the twisted-pair cable.

The Power over Ethernet Plus function is activated both globally and on the PoE-capable ports on delivery.

A 5-pin, "L"-coded M12 plug is available for the redundant supply of the device.

[See "Device name and product code" on page 14.](#)

Note: With redundant power supply: A positive grounding is prohibited.

1.4.4 Supply voltage with the characteristic value QQ

In device variants with 2 power supply inputs and without PoE, the supply voltage can be connected redundantly. Both inputs are uncoupled. 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.

A 5-pin, "L"-coded M12 plug is available for the redundant supply of the device.

[See "Device name and product code" on page 14.](#)

1.4.5 Supply voltage with the characteristic value N9

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

For information about the position on the device see chapter [“Device views” on page 16](#).

Further information:

See [“Device name and product code” on page 14](#).

1.4.6 Supply voltage with the characteristic value M9

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

For information about the position on the device see chapter [“Device views” on page 16](#).

Further information:

See [“Device name and product code” on page 14](#).

1.5 Ethernet ports

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

You find information on pin assignments for making patch cables here: [“Pin assignments” on page 23](#)

■ 10/100 Mbit/s twisted pair port

This port is a 4-pin, “D”-coded M12 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:

- ▶ 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode
- ▶ 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
- ▶ Autocrossing (if autonegotiation is activated)
- ▶ Autonegotiation
- ▶ Autopolarity
- ▶ The PoE power is supplied via the wire pairs transmitting the signal (phantom voltage).
Delivery state: Autonegotiation activated
- ▶ The pin assignment corresponds to MDI-X.

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

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

The 10/100/1000 Mbit/s twisted pair port allows you to connect network components according to the IEEE 802.3 10BASE-T/100BASE-TX/1000BASE-T standard.

This port supports:

- ▶ 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode
- ▶ 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
- ▶ 1000 Mbit/s full duplex
- ▶ Autocrossing (if autonegotiation is activated)
- ▶ Autonegotiation
- ▶ Autopolarity
- ▶ The pin assignment corresponds to MDI-X.

1.6 Pin assignments

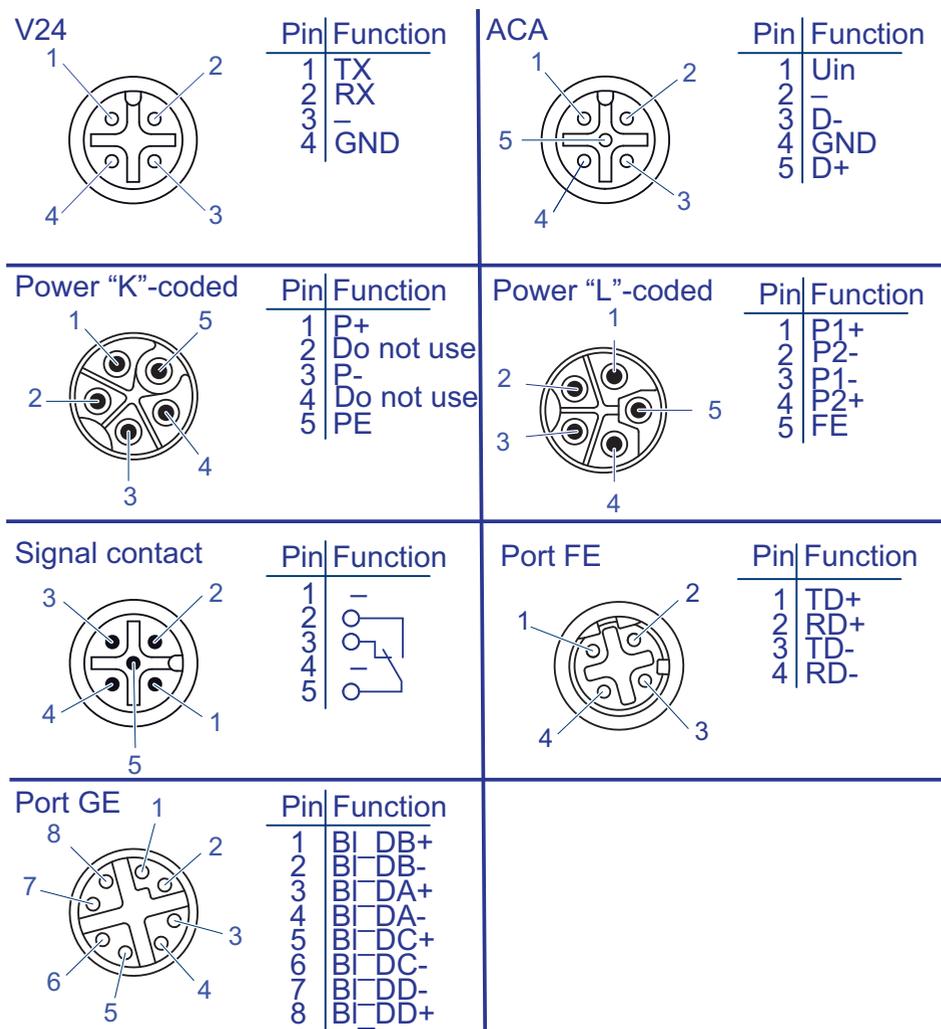


Figure 2: Pin assignments: Interfaces and ports

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.

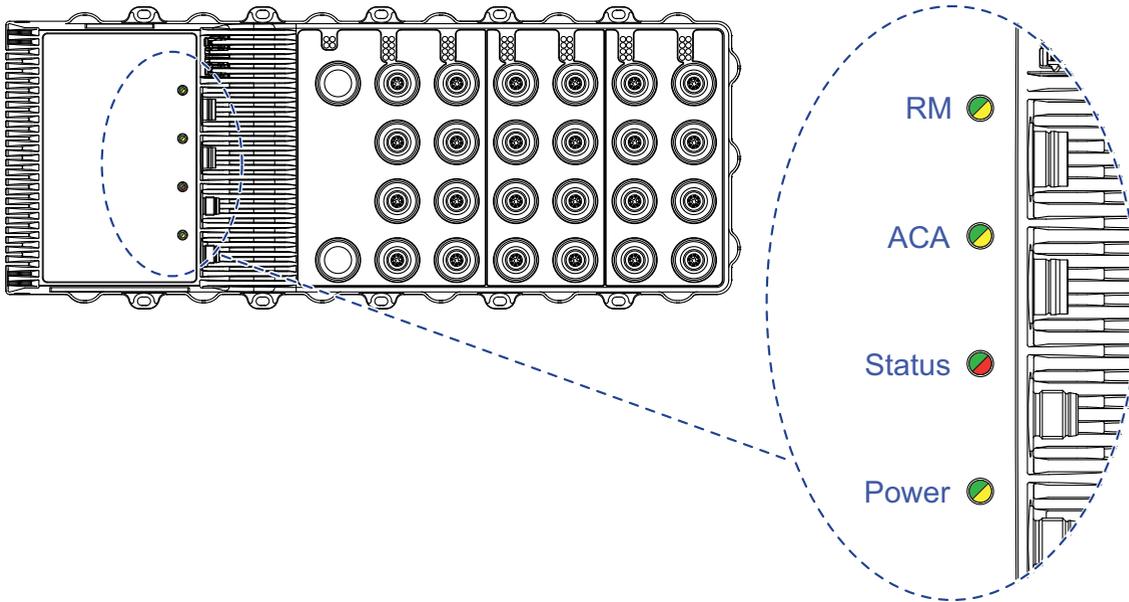


Figure 3: Device status: location of the display elements on the device (front side of the device)

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

Table 6: Device Status

LED	Display	Color	Activity	Meaning
Status	Device Status	—	none	Device is starting and/or is not ready for operation.
		green	lights up	Device is ready for operation. Characteristics can be configured
		red	lights up	Device is ready for operation. Device has detected at least one error in the monitoring results
			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.
			flashes 4 times a period	Device has detected a multiple IP address
RM	Ring Manager	—	none	No redundancy configured
		green	lights up	Redundancy exists
			flashes 1 time a period	Device is reporting an incorrect configuration of the RM function
		yellow	lights up	No redundancy exists
ACA	Storage medium ACA	—	none	ACA storage medium not 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

Table 6: Device Status

1.7.2 Port Status

Note: The port status is displayed via the left side port LED.

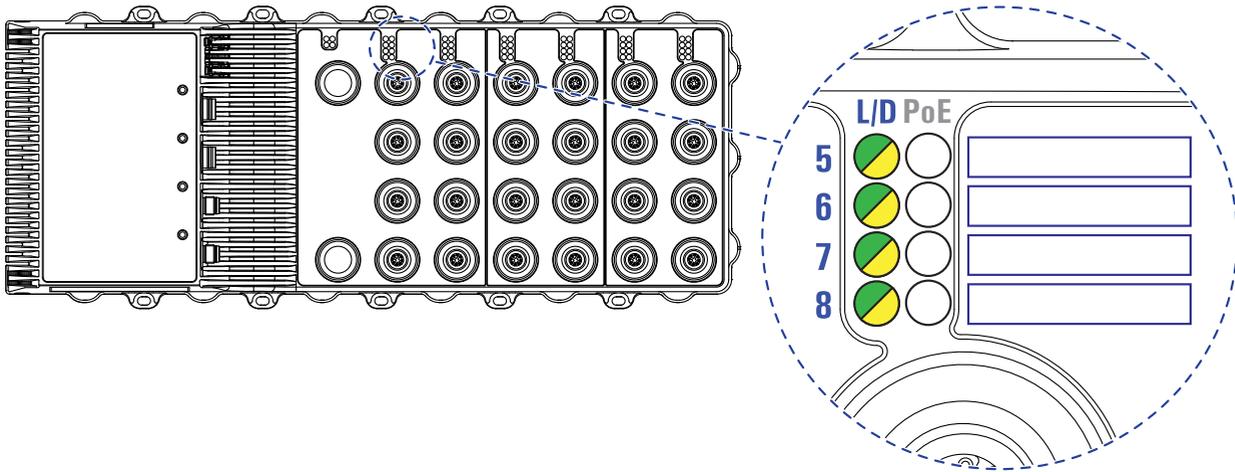


Figure 4: Port status: location of the display elements on the device (front side of the device)

LED	Display	Color	Activity	Meaning
L/D	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	lights up	Device detects a data rate that is not supported
			flashing	Device is transmitting and/or receiving data
flashes 1 time a period	Device detects at least one unauthorized MAC address (Port Security Violation)			
		flashes 3 times a period	The port is switched to Standby mode or switched off by the device (auto switch off).	

Table 7: Port status

1.7.3 PoE status

Note: Only PoE ports have these LEDs. The LED is on the right of the respective link state LED.

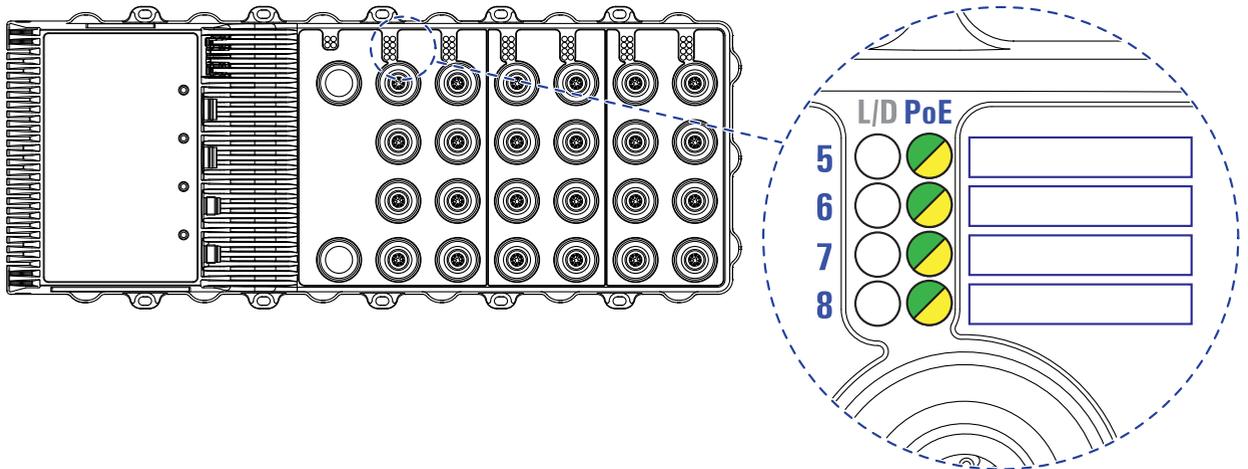


Figure 5: PoE status: Location of the display elements on the device (front side of the device)

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

Table 8: PoE status

1.8 Management interfaces

1.8.1 V.24 interface (external management)

This interface is a 4-pin, “A”-coded M12 socket.

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

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

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

1.8.2 USB interface

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

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

The USB interface has the following properties:

- ▶ Supplies current of max. 500 mA
- ▶ Voltage not potential-separated
- ▶ Supports the USB master mode
- ▶ Supports USB 2.0

Note: Devices of type OCTOPUS OS3 are exclusively compatible with the storage medium ACA22-M12 EEC in hardware revision 02. You find the hardware revision of your ACA storage medium on the device label.

1.9 Input/output interfaces

1.9.1 Signal contact

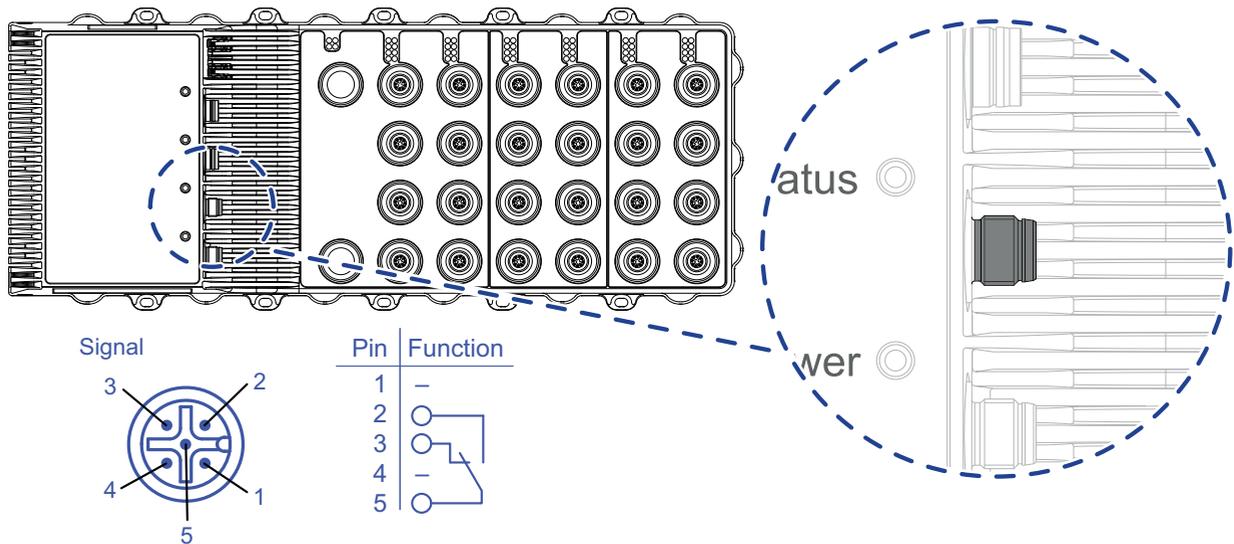


Figure 6: Signal contact: 5-pin, "A"-coded M12 plug; position on the device (front side of the device)

Signal contact

1	-	Not used
2	NO	Normally open contact
3	NC	Normally closed contact
4	-	Not used
5	CO	Changeover contact

The signal contact is a potential-free changeover contact. If the device is not connected to a power supply, the changeover contact (5) is connected to the normally closed contact (3) (see figure 6).

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

In the configuration, you specify how the device uses the signal contact. You find detailed information on possible applications and the configuration of the signal contact in the software user documentation. You find the software user documentation available as download on the Internet at: <https://www.doc.hirschmann.com>

2 Installation

The devices have been developed for practical application in a harsh industrial environment.

Hirschmann supplies the device ready for operation.

Perform the following steps to install and configure the device:

- ▶ [Checking the package contents](#)
- ▶ [Installing and grounding the device](#)
- ▶ [Connecting the supply voltage](#)
- ▶ [Connecting data cables](#)

2.1 Checking the package contents

- Check whether the package includes all items named in the section [“Scope of delivery” on page 51](#).
- Check the individual parts for transport damage.

2.2 Installing and grounding the device



CAUTION

BURNING HAZARD

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

If ambient temperatures are $\geq 113\text{ °F}$ ($\geq 45\text{ °C}$), exclusively install the device in “restricted access locations” according to EN 62368.

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

- When you are selecting the installation location, make sure you observe the climatic threshold values specified in the technical data.
Prevent heat from the surroundings from affecting the device.
- Verify that there is at least 4 in (10 cm) of space above and below the device.
- Remove the provided transport protection caps and the transport protection screws from the device.

2.2.1 Mounting on a flat surface

Proceed as follows:

- You will find the drilling dimensions for mounting the device in the chapter “[Dimension drawings](#)” on page 45.
- Install the device with screws on a flat metal surface. Completely screw the device to the flat surface using screws through each mounting hole. Exclusively use screws suitable for the installation and application case to ensure flawless operation of the device.

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.

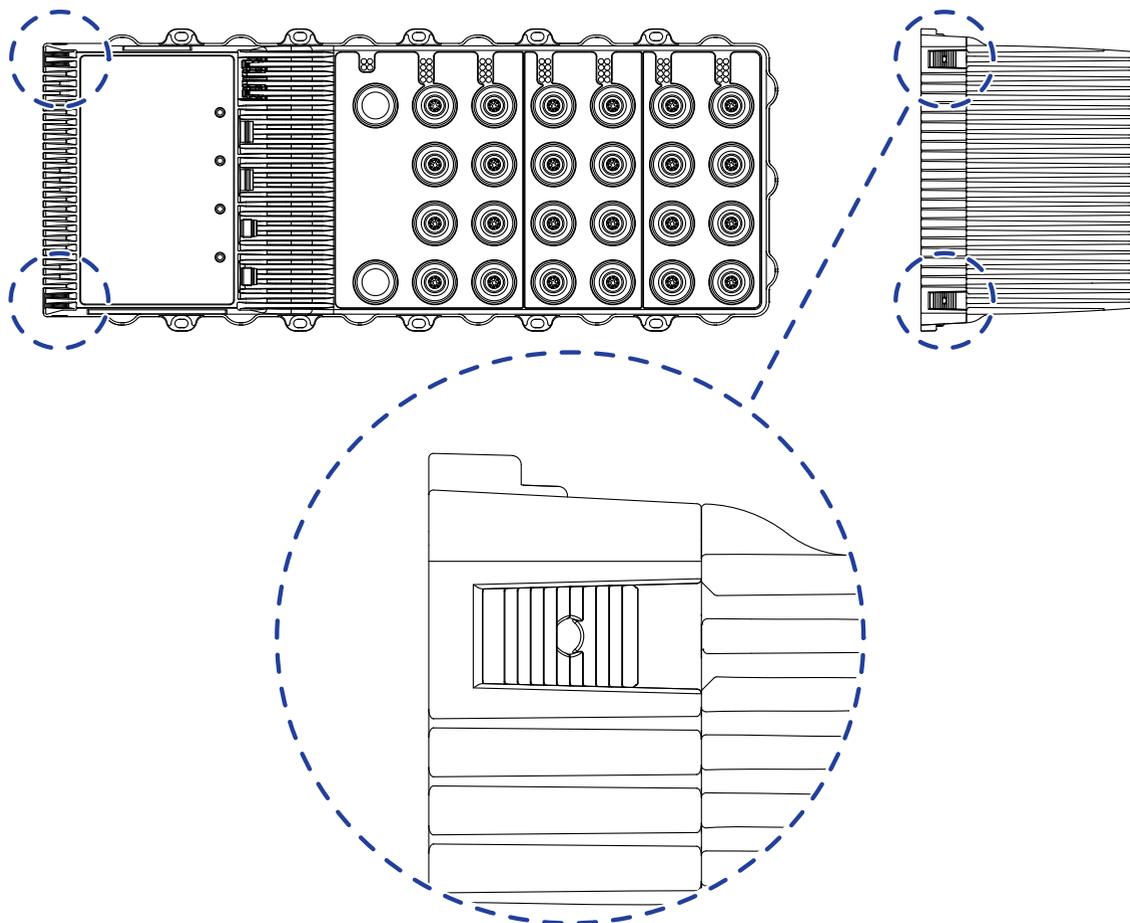


Figure 7: Grounding: location of ground connections on the device (left side of the device)

For the position of the ground connection on the device see [figure 7](#).

- Ground the device via the ground screw.
You find the prescribed tightening torque in [table “Ground connection” on page 42](#)

Note: Depending on the characteristic value of the supply voltage, the device either has connections for functional ground or protective ground.

2.3 Connecting the ferrite

Note: Exclusively for device variants featuring supply voltage with characteristic value PP:

To adhere to EMC conformity, connect the supplied ferrites to the voltage input via the power supply cable.

Note: To open the ferrites use the key supplied.

- Insert the power supply cable through each ferrite 1 time.
- Place the ferrites between the external front end power supply unit and the power supply input of the device (max. 19.7 in (50 cm) distance from the power supply input of the device or the output of the external front end power supply unit).
- Lock the ferrites.

2.4 Connecting the supply voltage



WARNING

ELECTRIC SHOCK

Connect only a supply voltage that corresponds to the type plate of your device.

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

- Mount the power supply cable to the power supply connector of the device.
You find the prescribed tightening torque in chapter:
[“General data” on page 39](#)
- Enable the supply voltage.

Note: Applies to device variants featuring supply voltage with characteristic value PP:

Exclusively use a PoE power supply unit with galvanic isolation.

Hirschmann has tested the power supply unit PC150/110V/54V and recommends its use. You find the order number for the power supply unit, which is available as accessory, under:

[“Accessories” on page 51](#)

Note: For use cases according to EN 50155, exclusively use external front end power supply units of type PC150/110V/54V, or else the suitability of the device for this use case is void.

2.5 Connecting data cables

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

- Keep the length of the data cables as short as possible.
- When using copper cables, provide a sufficient separation between the power supply cables and the data cables. Ideally, install the cables in separate cable channels.
- Verify that power supply cables and data cables do not run parallel over longer distances. If reducing the inductive coupling is necessary, verify that the power supply cables and data cables cross at a 90° angle.
- Use shielded data cables for gigabit transmission via copper cables. Only use shielded data cables to meet EMC requirements according to EN 50121-4 and marine applications.
[See “Electromagnetic compatibility \(EMC\)” on page 49.](#)
- Connect the data cables according to your requirements.
[See “Ethernet ports” on page 22.](#)
- Seal all unused connections and ports with protection screws.

Note: To sustain the IP65/67 suitability for your device, seal all unused connections and ports with the provided plastic protection screws. See [“Scope of delivery” on page 51](#). See [“Accessories” on page 51](#) in case of an additional demand.

To sustain the IP65/67 suitability for your device, exclusively connect components with degree of protection IP65/67.

The torque for tightening the protection screws on the device is 5.3 lb-in (0.6 Nm).

Note: For operation according to EN 45545: Seal all unused connections and ports exclusively with metal protection screws and metal screw caps. The use of plastic protection screws is prohibited.

Protection screws and screw caps made of metal are available as an accessory.

[See “Accessories” on page 51.](#)

3 Basic Settings



CAUTION

DAMAGE TO THE USB INTERFACE

Exclusively use a Hirschmann AutoConfiguration Adapter (ACA) to configure the device via the USB interface. Other connectors may cause damage to the interface or result in a faulty configuration.

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

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:

- ▶ AutoConfiguration Adapter
- ▶ 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>

- ▶ Input via the V.24 interface
- ▶ Configuration via BOOTP
- ▶ Configuration via DHCP (Option 82)

You will find more information in the “Basic Configuration User Manual”.

■ **Default settings**

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

4 Monitoring the ambient air temperature

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

See [“General data” on page 39](#).

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.

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.
- ▶ Hirschmann is continually working on improving and developing their software. Check regularly whether there is an updated version of the software that provides you with additional benefits. You find information and software downloads on the Hirschmann product pages on the Internet (<http://www.hirschmann.com>).
- ▶ Depending on the pollution degree of the operating environment, check regularly whether the cooling fins and surfaces of the device are freely accessible.
- ▶ Internal fuses are triggered only in the case of a detected error in the device. In case of damage or malfunction of the device, turn off the supply voltage and return the device to the plant for inspection.

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

6 Disassembly

6.1 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.

Proceed as follows:

- Disable the supply voltage.
- Disconnect the data cables.
- Disconnect the power supply cable.
- Disconnect the grounding.
- Remove the screws.

7 Technical data

7.1 General data

OCTOPUS OS3		
Dimensions W × H × D	See "Dimension drawings" on page 45.	
Weight (values vary depending on characteristic value of the supply voltage)	Device variants with 8 × Ethernet ports OS3-..-.....0008...	11.7 lbs ... 12.4 lbs (5.3 kg ... 5.6 kg)
	Device variants with 16 × Ethernet ports OS3-..-.....0808...	13.9 lbs ... 15.0 lbs (6.3 kg ... 6.8 kg)
	OS3-..-.....0016...	
	Device variants with 24 × Ethernet ports OS3-..-.....0816...	16.1 lbs ... 17.6 lbs (7.3 kg ... 8.0 kg)
	OS3-..-.....1608...	
	OS3-..-.....0024...	
Mounting	See "Mounting on a flat surface" on page 31.	
Pollution degree	2	
Degree of protection	IP65/67	

Table 9: General data: OCTOPUS OS3

7.2 Supply voltage

Supply voltage with the characteristic value BB		
Rated voltage	24 V DC	
Voltage range including maximum tolerances	16.8 V DC ... 32 V DC	
Connection type	5-pin, "L"-coded M12 plug	
	Tightening torque	5.3 lb-in (0.6 Nm)
	Wire diameter	AWG16 (1.5 mm ²) ^a
Power loss buffer	> 20 ms	
Overload current protection on the device	Non-replaceable fuse	
Back-up fuse for each voltage input	Nominal rating:	max. 20 A
	Characteristic:	slow blow
Peak inrush current	1.5 A	
Connection for functional ground	See "Grounding the device" on page 31.	
Current integral I ² t	< 0.2 A ² s	

Table 10: Supply voltage with characteristic value BB

a. When using the supplied plug.

Supply voltage with the characteristic value HH		
Rated voltage	36 V DC ... 48 V DC	
Voltage range including maximum tolerances	25.2 V DC ... 60 V DC	
Connection type	5-pin, "L"-coded M12 plug	
	Tightening torque	5.3 lb-in (0.6 Nm)
	Wire diameter	AWG16 (1.5 mm ²) ^a
Power loss buffer	> 16 ms at 48 V	
Overload current protection on the device	Non-replaceable fuse	
Back-up fuse for each voltage input	Nominal rating:	max. 20 A
	Characteristic:	slow blow
Peak inrush current	8 A	
Connection for functional ground	See "Grounding the device" on page 31.	
Current integral I ² t	< 1.5 A ² s	

Table 11: Supply voltage with characteristic value HH

a. When using the supplied plug.

Supply voltage with the characteristic value PP		
Rated voltage	PoE	48 V DC
	PoE+	54 V DC
Rated voltage range	PoE	47 V DC ... 57 V DC
	PoE+	53 V DC ... 57 V DC
Connection type	5-pin, "L"-coded M12 plug	
	Tightening torque	5.3 lb-in (0.6 Nm)
	Wire diameter	AWG16 (1.5 mm ²) ^a
Power loss buffer	> 10 ms	
Overload current protection on the device	Non-replaceable fuse	
Back-up fuse for each voltage input	Nominal rating:	6.3 A
	Characteristic:	slow blow
Peak inrush current	3.5 A	
Connection for functional ground	See "Grounding the device" on page 31.	
Current integral I ² t	< 0.4 A ² s	

Table 12: Supply voltage with characteristic value PP

a. When using the supplied plug.

Supply voltage with characteristic value QQ		
Rated voltage	24/36/48 V DC	
Voltage range including maximum tolerances	16.8 V DC ... 60 V DC	
Connection type	5-pin, "L"-coded M12 plug	
	Tightening torque	5.3 lb-in (0.6 Nm)
	Wire diameter	AWG16 (1.5 mm ²) ^a
Power loss buffer	> 10 ms at 24 V	
	> 16 ms at 48 V	
Overload current protection on the device	Non-replaceable fuse	
Back-up fuse for each voltage input	Nominal rating:	max. 20 A
	Characteristic:	slow blow
Peak inrush current	8 A	
Connection for functional ground	See "Grounding the device" on page 31.	
Current integral I ² t	< 1.5 A ² s	

Table 13: Supply voltage with characteristic value QQ

a. When using the supplied plug.

Supply voltage with the characteristic value M9		
Rated voltage range	100 V AC ... 240 V AC, 50 Hz ... 60 Hz	
Voltage range including maximum tolerances	88 V AC ... 265 V AC, 47 Hz ... 63 Hz	
Connection type	5-pin, "K"-coded M12 plug	
	Tightening torque	5.3 lb-in (0.6 Nm)
	Wire diameter	AWG16 (1.5 mm ²) ^a
Power loss buffer	PoE:	> 13 ms
	110 V non-PoE:	> 50 ms
	230 V non-PoE:	> 110 ms
Overload current protection on the device	Non-replaceable fuse	
Back-up fuse for each voltage input	Nominal rating:	max. 20 A
	Characteristic:	slow blow
Peak inrush current	3.5 A	
Connection for protective grounding	See "Grounding the device" on page 31.	
Current integral I ² t	non-PoE	< 1.5 A ² s
	PoE	< 1 A ² s

Table 14: Supply voltage with characteristic value M9

a. When using the supplied plug.

Supply voltage with the characteristic value N9		
Rated voltage	72 V DC ... 110 V DC	
Voltage range including maximum tolerances	50.4 V DC ... 138 V DC	
Connection type	5-pin, "K"-coded M12 plug	
	Tightening torque	5.3 lb-in (0.6 Nm)
	Wire diameter	AWG16 (1.5 mm ²) ^a
Power loss buffer	PoE:	> 11 ms
	72 V non-PoE:	> 16 ms
	110 V non-PoE:	> 40 ms
Overload current protection on the device	Non-replaceable fuse	
Back-up fuse for each voltage input	Nominal rating:	max. 20 A
	Characteristic:	slow blow
Peak inrush current	3.5 A	
Connection for protective grounding	See "Grounding the device" on page 31.	
Current integral I ² t	non-PoE	< 1.5 A ² s
	PoE	< 1 A ² s

Table 15: Supply voltage with characteristic value N9

a. When using the supplied plug.

Ground connection		
Ground connection	See "Grounding the device" on page 31.	
Connection type	M4 screw	
	Tightening torque	min. 0.5 Nm max. 1.0 Nm
	min. conductor diameter	The cross-section of the protective conductor is the same size as or bigger than the cross-section of the power supply cables.

Table 16: Ground connection

7.3 Signal contact

Signal contact		
Connection type	5-pin, "A"-coded M12 plug	
	Tightening torque	4.5 lb-in (0.51 Nm)
Nominal value	$I_{\max} = 1 \text{ A at } U_{\max} = 30 \text{ V AC}$	
	$I_{\max} = 1 \text{ A at } U_{\max} = 60 \text{ V DC}$	

Table 17: Signal contact

7.4 Power consumption/power output

Device name	Supply voltage variants	Maximum power consumption	Maximum power output
OS3-30.....16... (16 ports)	all variants	24 W	80 Btu (IT)/h
OS3-30.....24... (24 ports)	all variants	30 W	103 Btu (IT)/h
OS3-40.....08... (8 ports)	all variants	20 W	67 Btu (IT)/h
OS3-40.....16... (16 ports)	all variants	26 W	88 Btu (IT)/h
OS3-40.....24... (24 Ports)	all variants	32 W	111 Btu (IT)/h
OS3-34.....16... (16 ports)	PP	155 W	83 Btu (IT)/h
OS3-34.....16... (16 ports)	M9, N9, QQ	100 W	118 Btu (IT)/h
OS3-34.....24... (24 ports)	PP	160 W	102 Btu (IT)/h
OS3-34.....24... (24 ports)	M9, N9, QQ	106 W	138 Btu (IT)/h
OS3-44.....08... (8 ports)	PP	149 W	65 Btu (IT)/h
OS3-44.....08... (8 ports)	M9, N9, QQ	94 W	99 Btu (IT)/h
OS3-44.....16... (16 ports)	PP	156 W	87 Btu (IT)/h
OS3-44.....16... (16 ports)	M9, N9, QQ	101 W	122 Btu (IT)/h
OS3-44.....24... (24 ports)	PP	162 W	109 Btu (IT)/h
OS3-44.....24... (24 ports)	M9, N9, QQ	108 W	146 Btu (IT)/h
OCTOPUS 24GE-HV-Trainrouter		32 W	110 Btu (IT)/h

Table 18: Power consumption/power output

Note: The values for the maximum power output and the maximum power consumption in [table 18](#) apply to the fully expanded devices. See the type plate of the device for the specifications of your device.

7.5 Climatic conditions during operation

Climatic conditions during operation		
Minimum clearance around the device	Top and bottom device side: 3.94 in (10 cm)	
Ambient air temperature ^a	Devices with operating temperature characteristic value V (standard):	-40 °F ... +140 °F (-40 °C ... +60 °C)
	▶ up to 6562 ft ASL (2000 m ASL)	
	▶ 6562 ft ASL ... 13123 ft ASL (2000 m ASL ... 4000 m ASL)	-40 °F ... +131 °F (-40 °C ... +55 °C)
	Devices with operating temperature characteristic value T (extended):	-40 °F ... +158 °F (-40 °C ... +70 °C)
	▶ up to 6562 ft ASL (2000 m ASL)	
	▶ 6562 ft ASL ... 13123 ft ASL (2000 m ASL ... 4000 m ASL)	-40 °F ... +149 °F (-40 °C ... +65 °C)
Humidity	5 % ... 100 %	(also in condensing atmospheres)
Air pressure	▶ min. 700 hPa (+9842 ft; +3000 m) ▶ max. 1060 hPa (-1312 ft; -400 m)	

Table 19: Climatic conditions during operation

a. Temperature of the ambient air at a distance of 2 in (5 cm) from the device

7.6 Climatic conditions during storage

Climatic conditions during storage		
Ambient temperature	-40 °F ... +185 °F (-40 °C ... +85 °C)	up to 3 months
	-40 °F ... +158 °F (-40 °C ... +70 °C)	up to 1 year
	-40 °F ... +122 °F (-40 °C ... +50 °C)	up to 2 years
	+32 °F ... +86 °F (0 °C ... +30 °C)	up to 10 years
Humidity	5 % ... 100 %	(also in condensing atmospheres)
Air pressure	▶ min. 600 hPa (+13123 ft; +4000 m) ▶ max. 1060 hPa (-1312 ft; -400 m)	

Table 20: Climatic conditions during storage

7.7 Dimension drawings

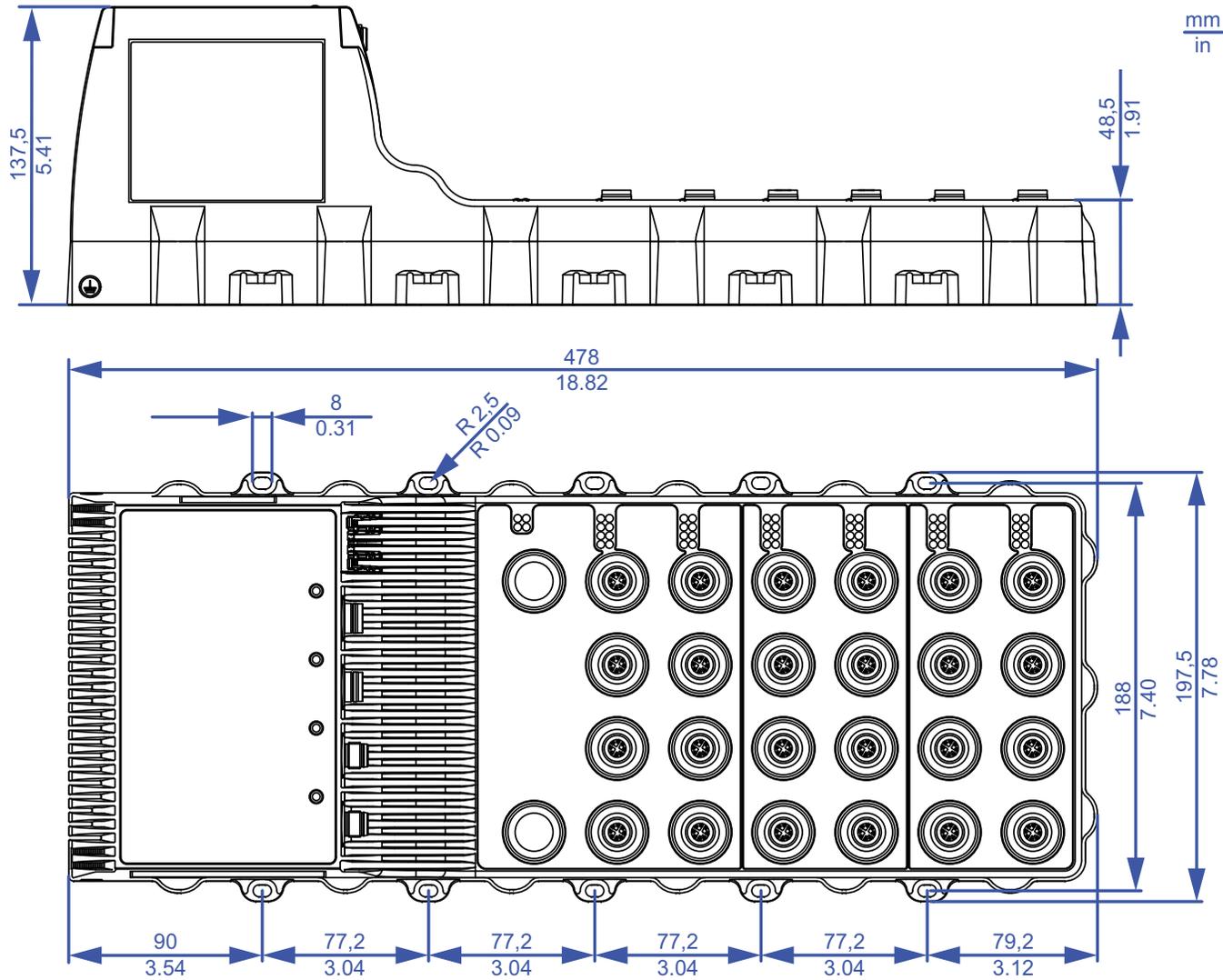


Figure 8: Dimension drawings: Device variants with 24 × 10/100/1000 Mbit/s twisted pair ports

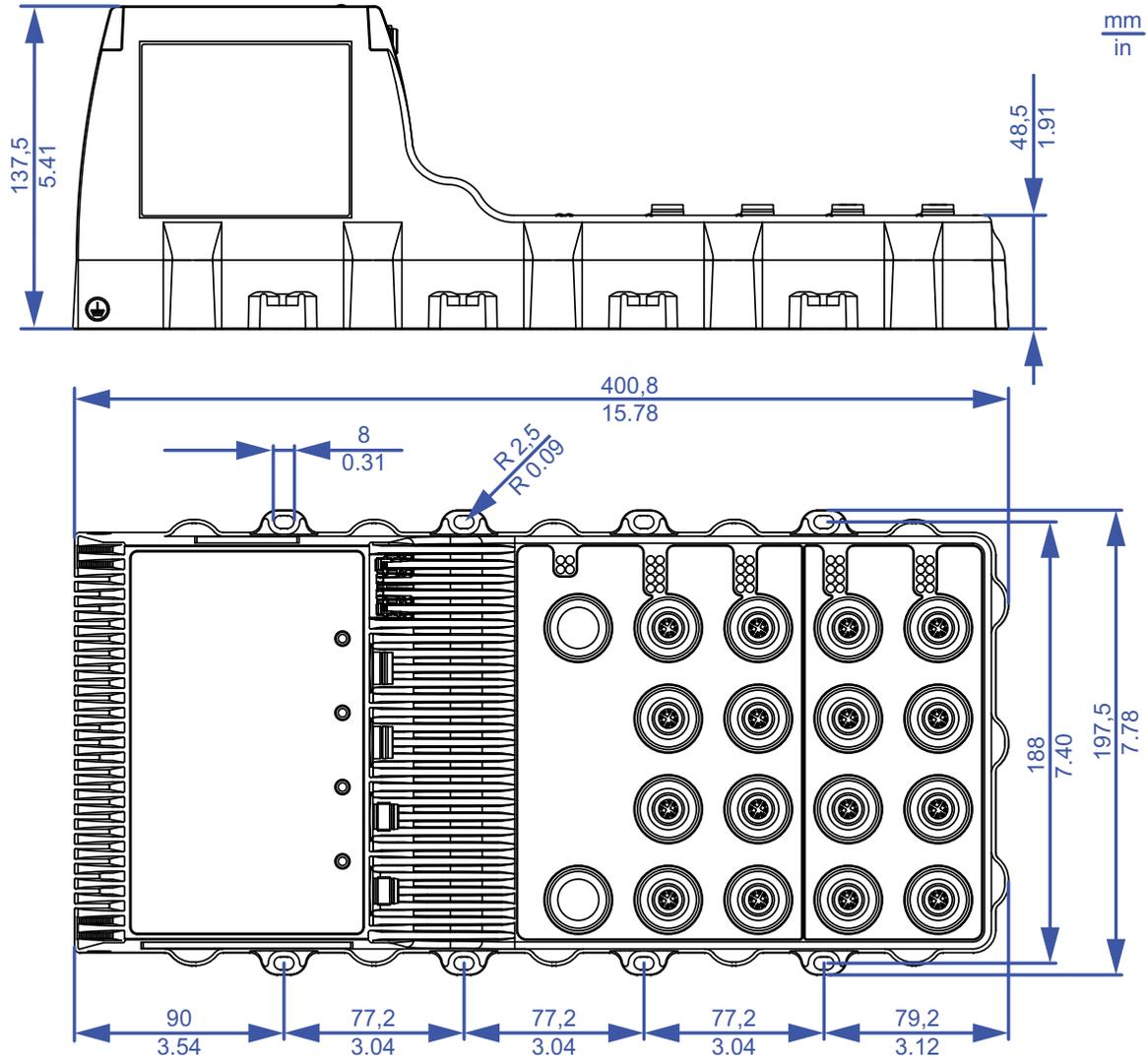


Figure 9: Dimension drawings: Device variants with 16 × 10/100/1000 Mbit/s twisted pair ports

7.8 Immunity

Stability		Standard applications ^a	Railway applications (trackside) ^b	Railway applications (on vehicles) ^c
IEC 60068-2-6, test Fc	Vibration	5 Hz ... 8.4 Hz with 0.14 in (3.5 mm) amplitude	—	Operating 5 Hz ... 150 Hz, Broadband noise vertical: 1.0 m/s ² (rms) horizontal: 0.7 m/s ² (rms)
		8.4 Hz ... 200 Hz with 1 g	—	disabled: 5 Hz ... 150 Hz, Broadband noise vertically: 5.72 m/s ² (rms) horizontally: 3.96 m/s ² (rms)
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms	—	vertical: 30 m/s ² , 30 ms horizontal: 50 m/s ² , 30 ms

Table 21: Immunity

- a. EN 61131-2, CE, FCC – applies to all devices
- b. According to EN 50121-4.
- c. According to EN 50155.

7.9 Electromagnetic compatibility (EMC)

EMC interference emission		Standard applications ^a	Railway applications (trackside) ^b	Railway applications (on vehicles) ^c
Radiated emission				
EN 55032		Class A	Class A	Class A
FCC 47 CFR Part 15		Class A	Class A	Class A
EN 61000-6-4		Fulfilled	Fulfilled	Fulfilled
EMV 06 Rev. 1.0		—	—	Class S1
Conducted emission				
EN 55032	AC and DC supply connections	Class A	Class A	Class A
FCC 47 CFR Part 15	AC and DC supply connections	Class A	Class A	Class A
EN 61000-6-4	AC and DC supply connections	Fulfilled	Fulfilled	Fulfilled
EN 55032	Telecommunication connections	Class A	Class A	Class A
EN 61000-6-4	Telecommunication connections	Fulfilled	Fulfilled	Fulfilled

Table 22: EMC interference emission

- a. EN 61131-2, CE, FCC – applies to all devices
- b. According to EN 50121-4.
- c. According to EN 50155.

7.10 Network range

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

Table 23: Network range: 10/100 Mbit/s twisted pair port

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

Table 24: Network range: 10/100/1000 Mbit/s twisted pair port

8 Scope of delivery, order numbers and accessories

8.1 Scope of delivery

Number	Article
1 ×	Device
1 ×	General safety instructions
1 ×	Field attachable connector for the power supply, M12, “K”-coded or “L”-coded
2 ×	Protection screw for M12 plug, plastic
Device variants with 24 × 10/100/1000 Mbit/s twisted pair ports	
26 ×	Protection screw for M12 socket, plastic
Device variants with 16 × 10/100/1000 Mbit/s twisted pair ports	
18 ×	Protection screw for M12 socket, plastic
Device variants with 8 × 10/100/1000 Mbit/s twisted pair ports	
10 ×	Protection screw for M12 socket, plastic
2 ×	Exclusively for device variants featuring supply voltage with characteristic value PP: Ferrite with key

8.2 Accessories

Designation	Order number
Terminal cable	943 902-001
AutoConfiguration Adapter ACA22-M12 (EEC)	942 125-001
AutoConfiguration Adapter ACA22-M12 (EEC), angled	942 125-002
Field attachable connector for the power supply, M12, “K”-coded	934 935-002
Field attachable connector for the power supply, M12, “L”-coded	934 935-005
Protection screw for M12 socket, metal, IP65/67 (25 pieces)	942 057-001
Protection screw for M12 socket, plastic, IP65/67 (25 pieces)	942 057-002
Protection screw for M12 plug, metal, IP65/67 (10 pieces)	942 115-001
Network management software Industrial HiVision	943 156-xxx
PoE power supply unit (PC150/110V/54V)	942 242-001

Note: Some products recommended as accessories do not support the entire temperature range specified for the device and can thus restrict the possible range of usage for the overall system.

9 Underlying technical standards

Designation	
EMV 06	Regulation No. EMV 06: Technical rules for electromagnetic compatibility – Proof of radio compatibility of rail vehicles with railway radio services
EN 45545-2	Railway applications – Fire protection in railway rolling stock – Part 2: Requirements regarding the reaction to fire of materials and components
EN 50121-4	Railway applications – EMC – Emission and immunity of the signaling and telecommunications apparatus (Rail Trackside)
EN 50155	Railway applications – Electronic equipment on rail vehicles
EN 55032	Electromagnetic compatibility of multimedia equipment – Emission Requirements
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
EN 62368-1	Information technology equipment – Safety – Part 1: General requirements
FCC 47 CFR Part 15	Code of Federal Regulations
IEEE 802.1AB	Station and Media Access Control Connectivity Discovery
IEEE 802.1D	Media Access Control Bridges
IEEE 802.1Q	Virtual Bridged Local Area Networks
IEEE 802.3	Ethernet
UL 61010-1/-2-201	Safety for Industrial Control Equipment

Table 25: List of norms and 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 <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.

Hirschmann Competence Center

The Hirschmann Competence Center is ahead of its competitors on three counts with its complete range of innovative services:

- ▶ Consulting incorporates comprehensive technical advice, from system evaluation through network planning to project planning.
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