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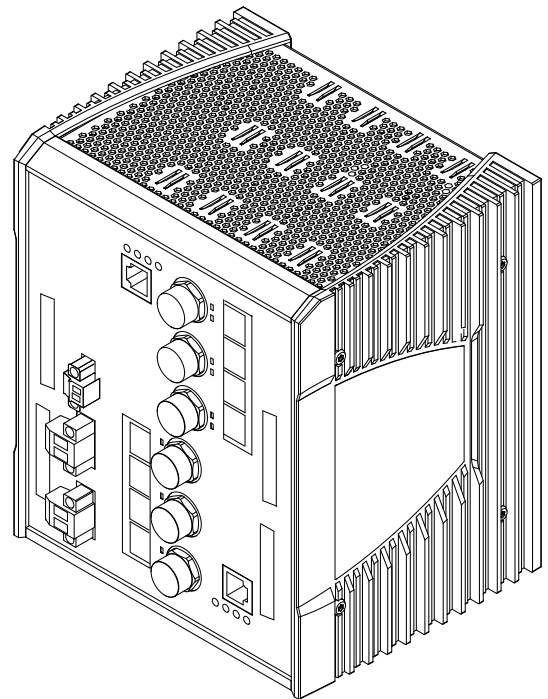
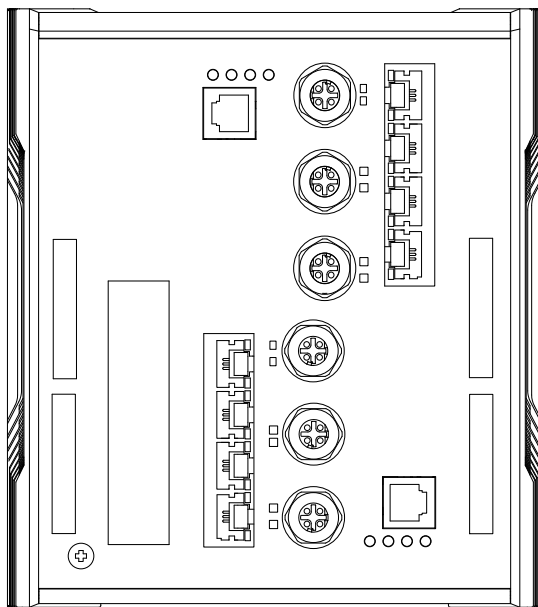
A **BELDEN** BRAND

# User Manual

## Installation

### Rail Data Diode

### RDD20



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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 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 48.](#)
- Connect to the product only components suitable for the requirements of the specific application case.

### ■ **Installation site requirements**

- Install the device in a fire enclosure according to EN 60950-1.
- Install this device solely in a switch cabinet or in an operating site with restricted access, to which maintenance staff have exclusive access.
- Install the device at ambient temperatures greater than +113 °F (+45 °C) in “restricted access locations” based on EN 60950-1 exclusively.

## ■ **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.
- Mount the device in the vertical position.
- At ambient temperatures > +140 °F (+60 °C):  
The surfaces of the device housing may become hot. Avoid touching the device while it is operating.

## ■ **Qualification requirements for personnel**

- Only allow qualified personnel to work on the device.

Qualified personnel have the following characteristics:

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

## ■ **National and international safety regulations**

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

## ■ **Grounding the device**

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

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

## ■ **Shielding ground**

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

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

## ■ Requirements for connecting electrical wires

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

### The following requirements apply without restrictions:

- ▶ The electrical wires are voltage-free.
- ▶ The cables used are permitted for the temperature range of the application case.

Table 1: Requirements for connecting electrical wires

## ■ Requirements for connecting the signal contact

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

### The following requirements apply without restrictions:

- ▶ The voltage connected complies with the requirements for a safety extra-low voltage (SELV) as per IEC/EN 60950-1.
- ▶ The connected voltage is limited by a current limitation device or a fuse. Observe the electrical threshold values for the signal contact.  
[See "Signal contact" on page 50.](#)

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	<p><b>All</b> of the following requirements are complied with:</p> <ul style="list-style-type: none"><li>▶ The supply voltage corresponds to the voltage specified on the type plate of the device.</li><li>▶ The power supply conforms to overvoltage category I or II.</li><li>▶ 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.</li><li>▶ The cross-section of the ground conductor is the same size as or bigger than the cross-section of the power supply cables.</li><li>▶ Use a power supply cable which is suitable for the voltage, the current and the physical load.</li></ul>

Table 3: Requirements for connecting the supply voltage

Device variant	Requirements	
Exclusively for device variants featuring supply voltage with characteristic value UU:	The wire diameter of the power supply cable is at least 0.75 mm <sup>2</sup> (North America: AWG18) on the supply voltage input.	
	The following requirements are <b>alternatively</b> complied with:	
	Alternative 1	The power supply complies with the requirements for a limited power source (LPS) as per EN 60950-1.
	Alternative 2	Relevant for North America: The power supply complies with the requirements according to NEC Class 2.
Alternative 3	<p><b>All</b> of the following requirements are complied with:</p> <ul style="list-style-type: none"> <li>▶ The power supply complies with the requirements for a safety extra-low voltage (SELV) as per IEC/EN 60950-1.</li> <li>▶ A fuse suitable for DC voltage is located in the plus conductor of the power supply. The minus conductor is on ground potential. Otherwise, a fuse is also located in the minus conductor. Regarding the properties of this fuse: <a href="#">See “Technical data” on page 48.</a></li> </ul>	
Exclusively for device variants featuring supply voltage with characteristic value KK:	<p><b>All</b> of the following requirements are complied with:</p> <ul style="list-style-type: none"> <li>▶ Supply with DC voltage: A fuse suitable for DC voltage is located in the plus conductor of the power supply. The minus conductor is on ground potential. Otherwise, a fuse is also located in the minus conductor. Regarding the properties of this fuse: <a href="#">See “Technical data” on page 48.</a></li> </ul>	
	<ul style="list-style-type: none"> <li>▶ Supply with AC voltage: A fuse is located in the outer conductor of the power supply. The neutral conductor is on ground potential at both voltage inputs. Otherwise, a fuse is also located in the neutral conductor. Regarding the properties of this fuse: <a href="#">See “Technical data” on page 48.</a></li> </ul> <p>The wire diameter of the power supply cable is at least 0.75 mm<sup>2</sup> (North America: AWG18) on the supply voltage input.</p>	

*Table 3: Requirements for connecting the supply voltage*



## ■ **Supply voltage**

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

### **Note: For device variants featuring supply voltage with characteristic value UU:**

For the redundant power supply, only use voltage sources whose negative terminal is grounded. The use of different voltage sources can lead to equipment damage.

## ■ **CE marking**

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

2011/65/EU (RoHS)

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

2014/30/EU (EMC)

Directive of the European Parliament and the council for standardizing the regulations of member states with regard 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  
72654 Neckartenzlingen  
www.hirschmann.com

The product can be used in the industrial sector.

- ▶ Interference immunity: EN 61000-6-2
- ▶ Emitted interference: EN 55032
- ▶ Reliability: EN 60950-1

You find more information on technical standards here:

[“Technical data” on page 48](#)

**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 "Installation" user manual that is not supplied with your device in print can be found as PDF download on the Internet at the Hirschmann product pages ([www.hirschmann.com](http://www.hirschmann.com)).

# Key

The symbols used in this manual have the following meanings:

▶	Listing
□	Work step
■	Subheading

# 1 Description

## 1.1 General description

The RDD20 devices are designed for the special requirements of industrial automation. They meet the relevant industry standards, provide very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.

The RDD20 devices consist of 2 independent DATA IN and DATA OUT routers. Within the device there is a continuous unidirectional data connection (100 Mbit/s) from DATA IN to DATA OUT for the data transmission. Due to the security requirements, data transmission is only possible from DATA IN to DATA OUT.

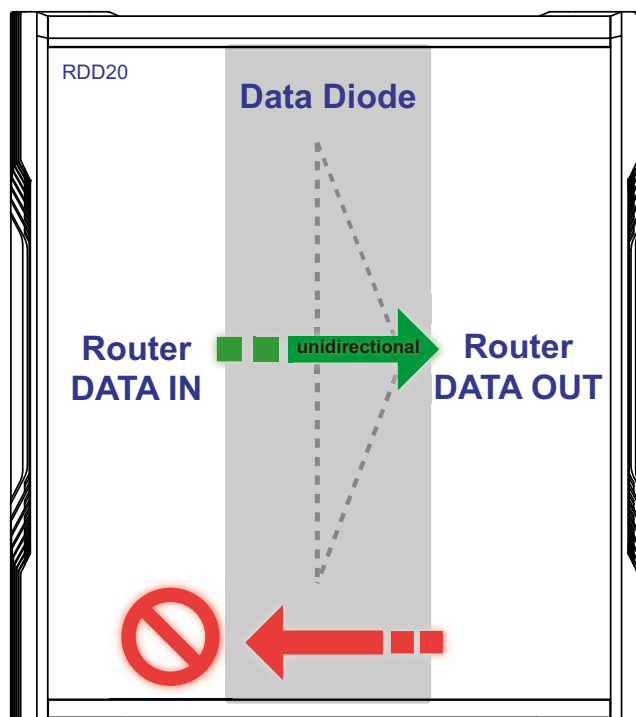


Figure 1: Unidirectional data transmission

The RDD20 device allows you to configure and save the DATA IN and DATA OUT routers independently of each other. See [“Example Configuration” on page 37](#).

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

- ▶ Temperature range
- ▶ Supply voltage range

- ▶ Certifications
- ▶ Software version

Further information:

See “Product code” on page 15.

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

The device is mounted by latching in place on a DIN rail.  
The devices work without a fan.

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

- ▶ Web browser
- ▶ SSH
- ▶ Telnet
- ▶ HiDiscovery (software for putting the device into operation)
- ▶ HiView (software for putting the device into operation)
- ▶ 2 × V.24 interfaces (locally on the device)
- ▶ Network management software (for example Industrial HiVision)

The Industrial HiVision Network Management software provides you with additional options for smooth configuration and monitoring: You find further information on the Internet at the Hirschmann product pages:

[www.hirschmann.com/en/Hirschmann\\_Produnkte/Industrial\\_Ethernet/network-management-software/index.phtml](http://www.hirschmann.com/en/Hirschmann_Produnkte/Industrial_Ethernet/network-management-software/index.phtml)

### 1.1.1 Product code

You have numerous options of combining the device characteristics. You can determine the possible combinations using the Configurator which is available in the Belden E-Catalog ([www.e-catalog.beldensolutions.com](http://www.e-catalog.beldensolutions.com)) on the web page of the device.

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

Item	Characteristic	Character istic value	Description
1 ... 3	Product	RDD	Rail Data Diode
4	Data rate	2	Fast Ethernet ports
5	Hardware type	0	Standard
6	(hyphen)	-	
7 ... 8	Number of 10/100 Mbit/s ports	14	14 × 10/100 Mbit/s ports
9 ... 10	Number of 10/100/1000 Mbit/s ports	00	0 × 10/100/1000 Mbit/s ports
11	Configuration of the ports	A	2 × ▶ 4 × RJ45 sockets for 100 Mbit/s twisted-pair connections ▶ 3 × M12 sockets for 100 Mbit/s twisted-pair connections
12	(hyphen)	-	
13	Temperature range	S	Standard +32 °F ... +140 °F (0 °C ... +60 °C)
		T	Extended -40 °F ... +158 °F (-40 °C ... +70 °C)
		E	Extended with Conformal Coating -40 °F ... +158 °F (-40 °C ... +70 °C)
14 ... 15	Supply voltage	UU	2 × 24 V DC
		KK	2 × 110 V DC 110 V AC ... 230 V AC
16 ... 17	Certificates and declarations	Z9	▶ CE, FCC, EN 61131, EN 60950-1
		Y9	▶ Z9 + cUL61010-2-201
		T9	▶ Z9 + EN 50121-4
		S9	▶ Z9 + EN 50121-4 + EN 50155
		TY	▶ T9 + cUL61010-2-201
		SY	▶ S9 + cUL61010-2-201
18 ... 19	Software packages	99	Reserved
20 ... 21	Customer-specific version	HH	Hirschmann
22	Software configuration	E	Entry (without configuration)
23 ... 24	Software level	3S	HiOS Layer 3 Standard
25 ... 29	Software version	XX.X.	Current software version

Table 4: Device name and product code

## 1.2 Device views

### 1.2.1 Front view

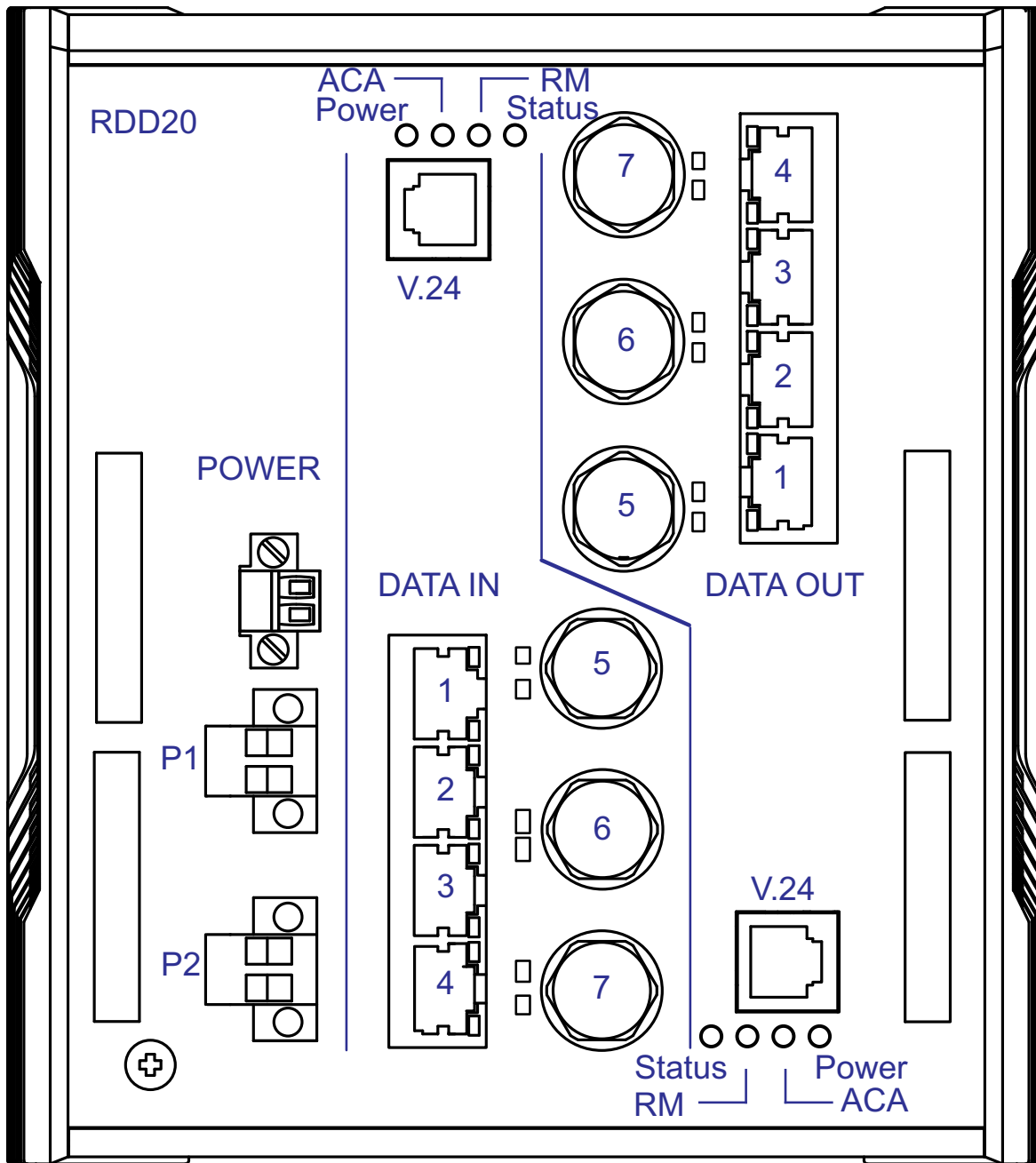
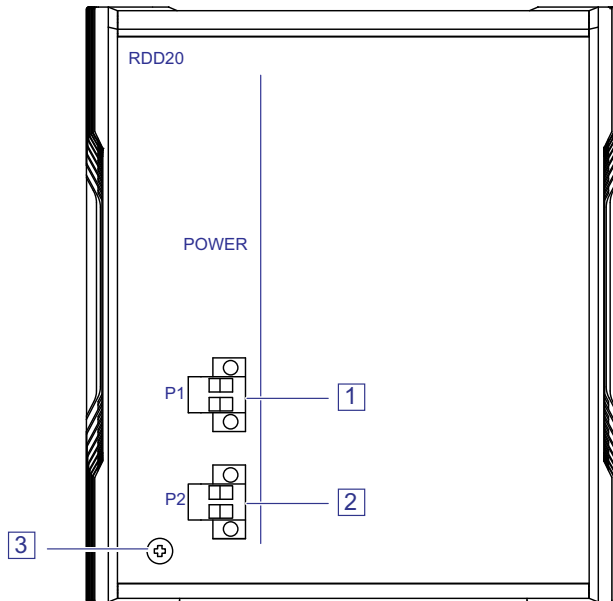


Figure 2: Front view of Rail Data Diode

The following tables provide you with a detailed description of the individual components:

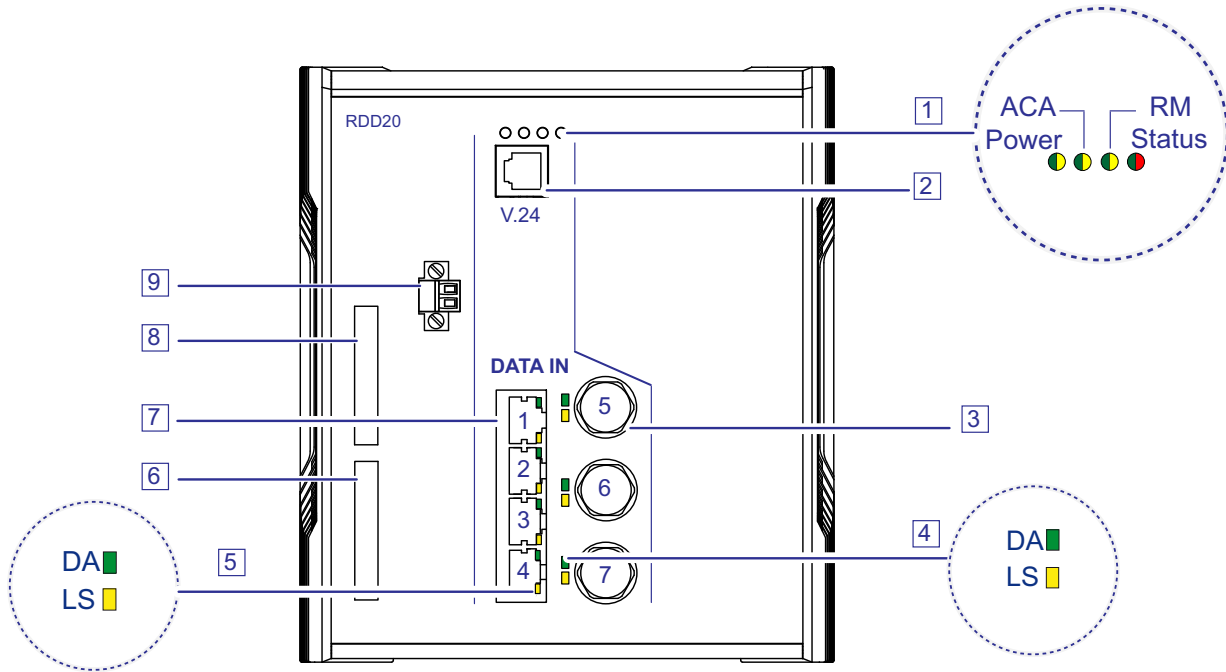
- ▶ [table 5 on page 17](#) describes common components of the DATA IN and DATA OUT routers.
- ▶ [table 6 on page 18](#) describes components of the DATA IN router.
- ▶ [table 7 on page 19](#) describes components of the DATA OUT router.





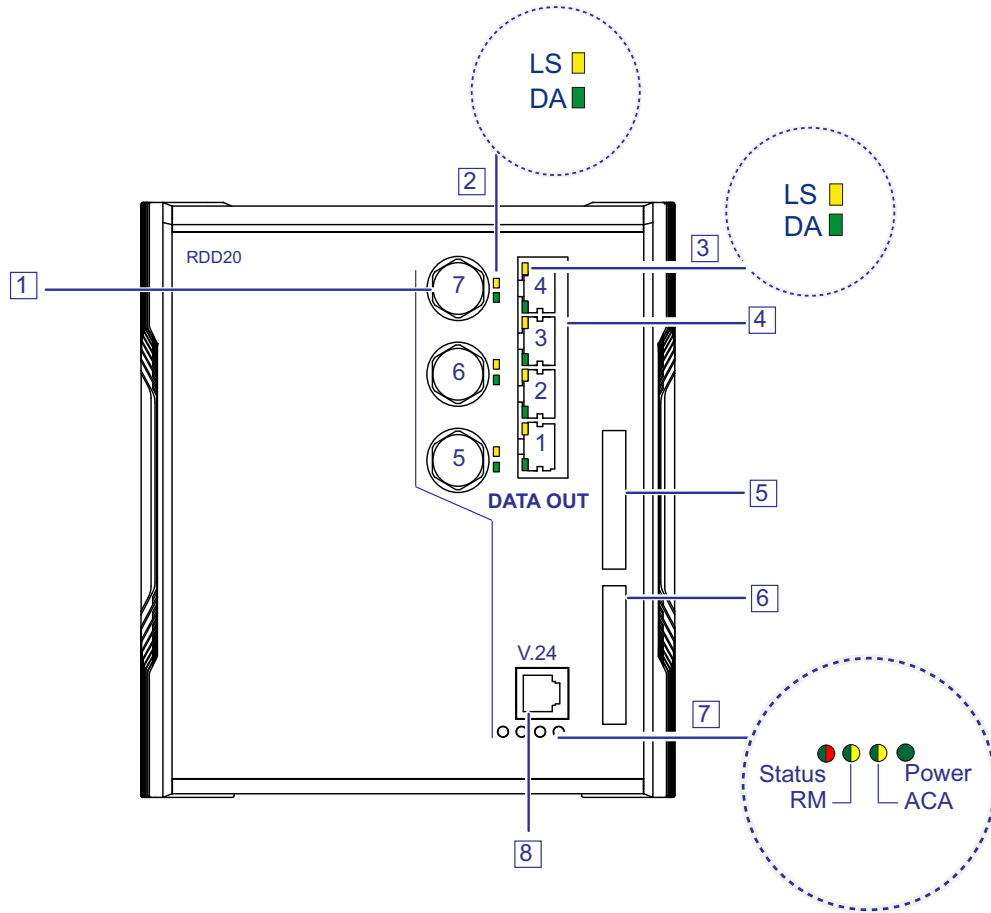
- |   |    |  |
|---|----|--|
| 1 | P1 | 2-pin terminal block for the supply voltage<br>(exclusively for device variants featuring supply voltage with characteristic value UU)<br>3-pin terminal block for the supply voltage<br>(exclusively for device variants featuring supply voltage with characteristic value KK) |
| 2 | P2 | 2-pin terminal block for the supply voltage<br>(exclusively for device variants featuring supply voltage with characteristic value UU)<br>3-pin terminal block for the supply voltage<br>(exclusively for device variants featuring supply voltage with characteristic value KK) |
| 3 |    | Grounding screw  |

*Table 5: Description of common components*



1	LED display elements for device status
2	V.24 interface
3	3 × M12 socket for 10/100 Mbit/s Twisted Pair connections
4	LED display elements for port status (M12 socket)
5	LED display elements for port status (RJ45 socket)
6	Label area for IP address
7	4 × RJ45 socket for 10/100 Mbit/s Twisted pair connections
8	Label area for MAC address
9	Signal contact

*Table 6: Description of the DATA IN router*



1	3 × M12 socket for 10/100 Mbit/s Twisted Pair connections
2	LED display elements for port status (M12 socket)
3	LED display elements for port status (RJ45 socket)
4	4 × RJ45 socket for 10/100 Mbit/s Twisted pair connections
5	Label area for IP address
5	Label for MAC address
7	LED display elements for device status
8	V.24 interface

*Table 7: Description of the DATA OUT router*

## 1.2.2 Rear view

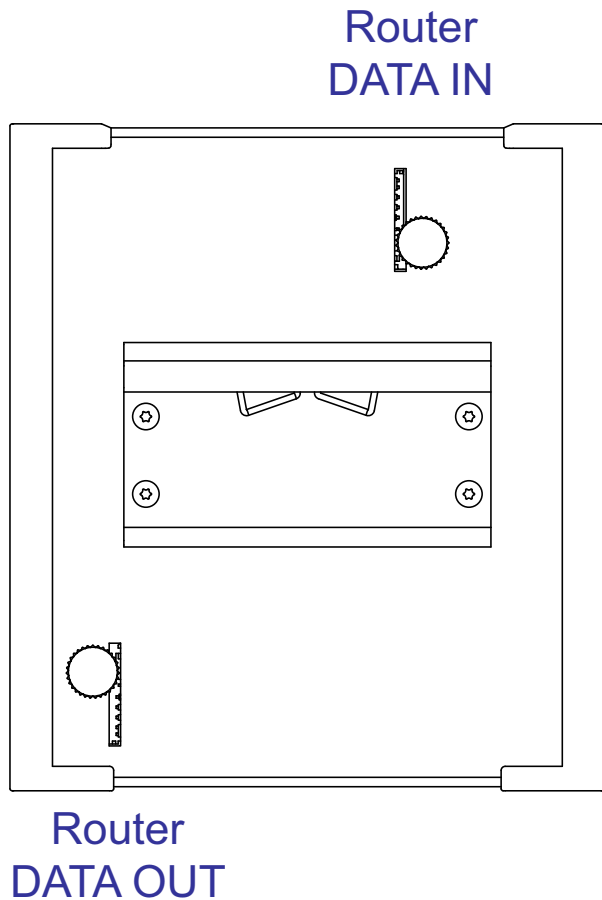
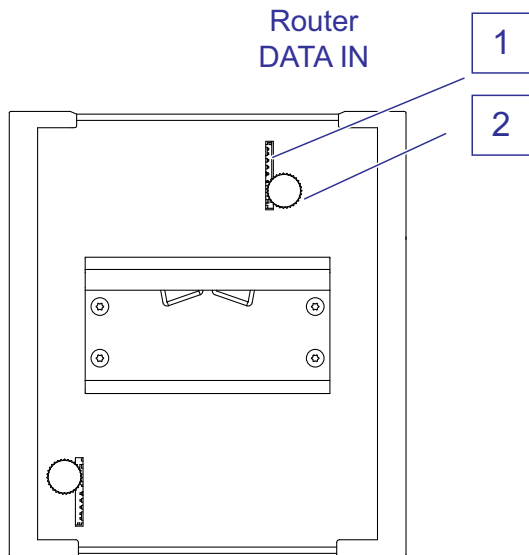


Figure 3: Rear view of Rail Data Diode

The following tables provide you with a detailed description of the individual components:

- ▶ [table 6 on page 18](#) describes components of the DATA IN router.
- ▶ [table 7 on page 19](#) describes components of the DATA OUT router.

## DATA IN router

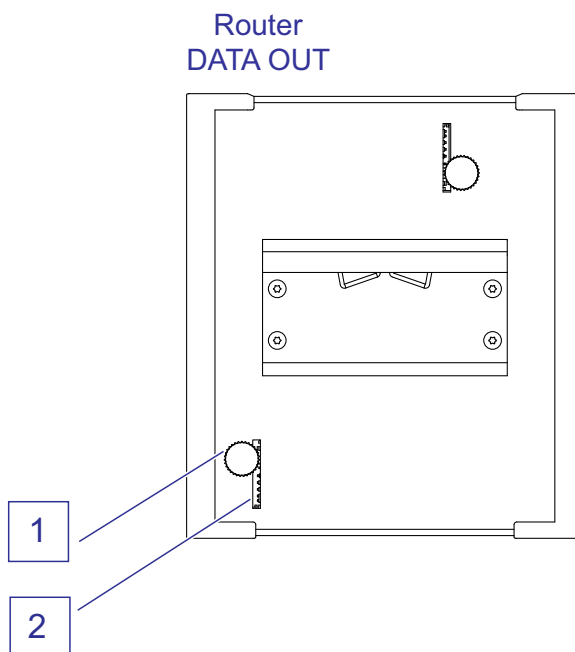


1 Slot for the SD card

2 Thumb screw

Table 8: Description of the DATA IN router

## DATA OUT router



1 Slot for the SD card

2 Thumb screw

Table 9: Description of the DATA OUT router

## 1.3 Power supply

**Note:** The device has 2 independent power sources for the redundant power supply.

### 1.3.1 Supply voltage with characteristic value UU

The following options for redundant power supply are available:

- ▶ 2 × 2-pin terminal block

You will find information on connecting the supply voltage here:

See “Supply voltage with characteristic value UU” on page 33.

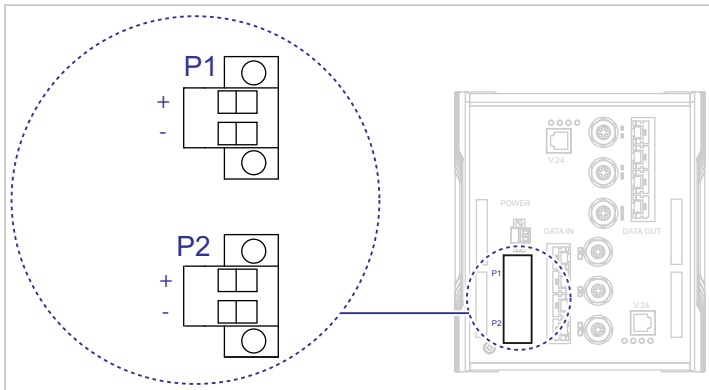


Figure 4: Device variants featuring supply voltage with characteristic value UU

### 1.3.2 Supply voltage with characteristic value KK

The following options for redundant power supply are available:

- ▶ 2 × 3-pin terminal block

You will find information on connecting the supply voltage here:

See “Supply voltage with characteristic value KK” on page 34.

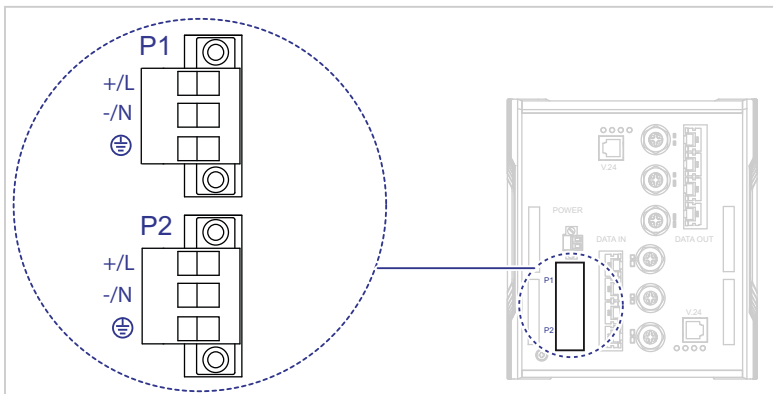


Figure 5: Device variants featuring supply voltage with characteristic value KK

## 1.4 Ethernet ports

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

### 1.4.1 10/100 Mbit/s twisted pair port

This port is an RJ45 or 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:

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

Delivery state: Autonegotiation activated

The port casing is electrically connected to the front panel.

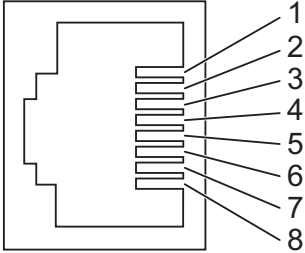
RJ45	Pin	10/100 Mbit/s
	<b>MDI mode</b>	
	1	TX+
	2	TX-
	3	RX+
	4	—
	5	—
	6	RX-
	7	—
8	—	
<b>MDI-X mode</b>		
1	RX+	
2	RX-	
3	TX+	
4	—	
5	—	
6	TX-	
7	—	
8	—	

Table 10: Pin assignment 10/100 Mbit/s twisted pair port, RJ45 socket, MDI-X mode

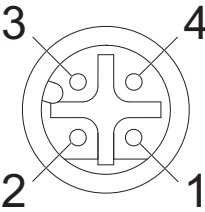
M12 4-pin ("D"-coded)	Pin	Data
	1	TX+
	2	RX+
	3	TX-
	4	RX-

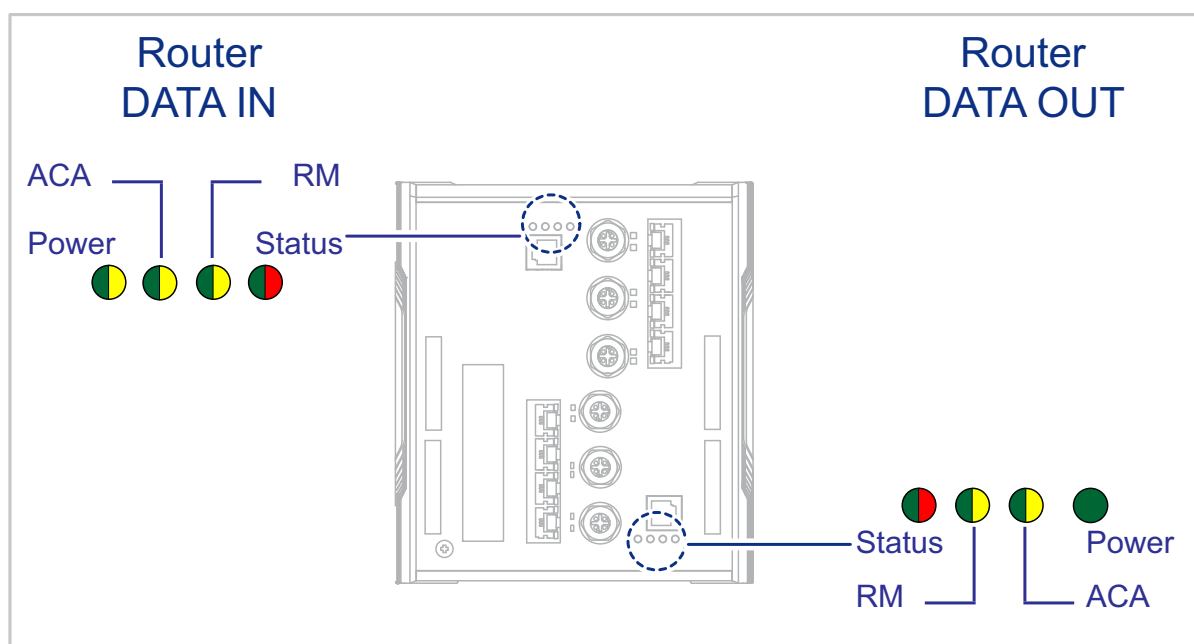
Table 11: Pin assignment of 10/100 Mbit/s twisted pair port, M12 socket

## 1.5 Display elements

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

### 1.5.1 Device state

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

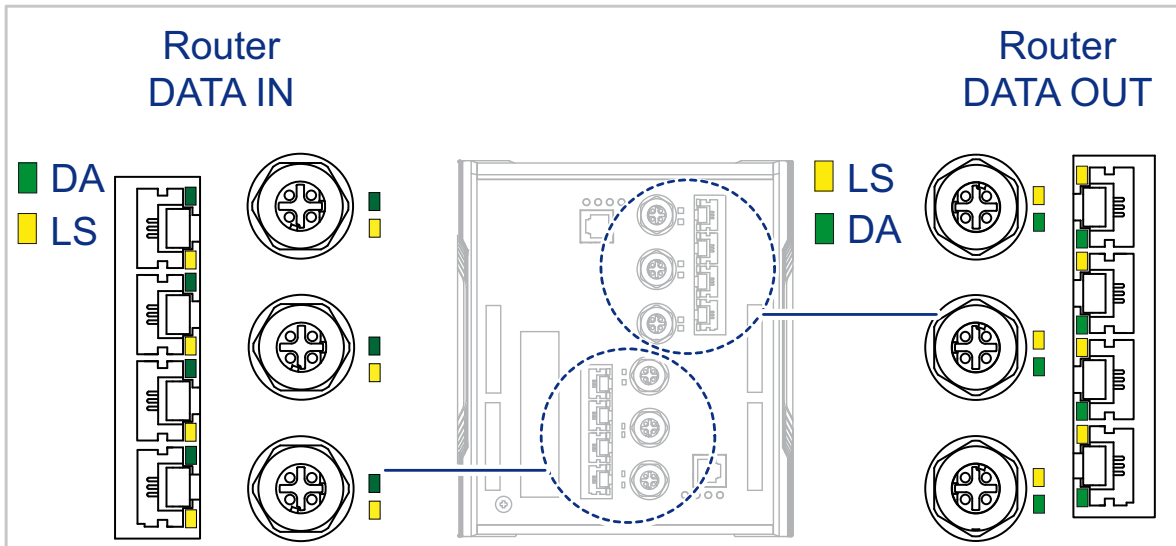




LED	Display	Color	Activity	Meaning
Power	Supply voltage DATA IN router	—	none	Supply voltage is too low
		yellow	lights up	Device variants with redundant power supply: Supply voltage 1 <b>or</b> 2 is on
			flashes 4 times a period	Software update is running. Maintain the power supply.
		green	lights up	Device variants with redundant power supply: Supply voltage 1 <b>and</b> 2 is on.
	Supply voltage DATA OUT router	green	lights up	<ul style="list-style-type: none"> <li>▶ Supply voltage 1 <b>or</b> 2 is on</li> <li>▶ Supply voltage 1 <b>or</b> 2 has the correct level of 5 V.</li> </ul>
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	<ul style="list-style-type: none"> <li>▶ Device is ready for operation</li> <li>▶ Device has detected at least one error in the monitoring results</li> </ul>
			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

## 1.5.2 Port status

These LEDs provide port-related information.  
The LEDs are directly located on the ports.



Display	Color	Activity	Meaning
LS/DA	—	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	
	flashes 1 time a period	Device detects at least one unauthorized MAC address (Port Security Violation)	

## 1.6 Management interfaces

### 1.6.1 V.24 interface (external management)

A serial interface is provided on the RJ11 socket (V.24 interface) for the local connection of an external management station (VT100 terminal or PC with corresponding terminal emulation). This enables you to set up a connection to the Command Line Interface CLI and to the System Monitor.

#### VT100 terminal settings

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

The socket housing is electrically connected to the front panel of the device. The V.24 interface is electrically insulated from the supply voltage.

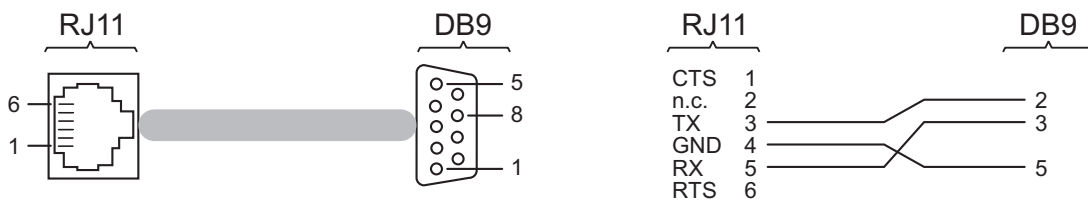


Figure 6: Pin assignment of the V.24 interface and the DB9 plug

**Note:** The Terminal cable is available as an accessory.  
See [“Accessories”](#) on page 57.

## 1.6.2 SD card interface

### Prerequisite:

- Only use the AutoConfiguration Adapter ACA31 storage medium.  
See “Accessories” on page 57.

On the back of the Rail Data Diode device there are 2 SD card interfaces for the DATA IN and DATA OUT routers (see figure 7).

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

On the front of the device there is an LED display that informs you about the status of the interface.

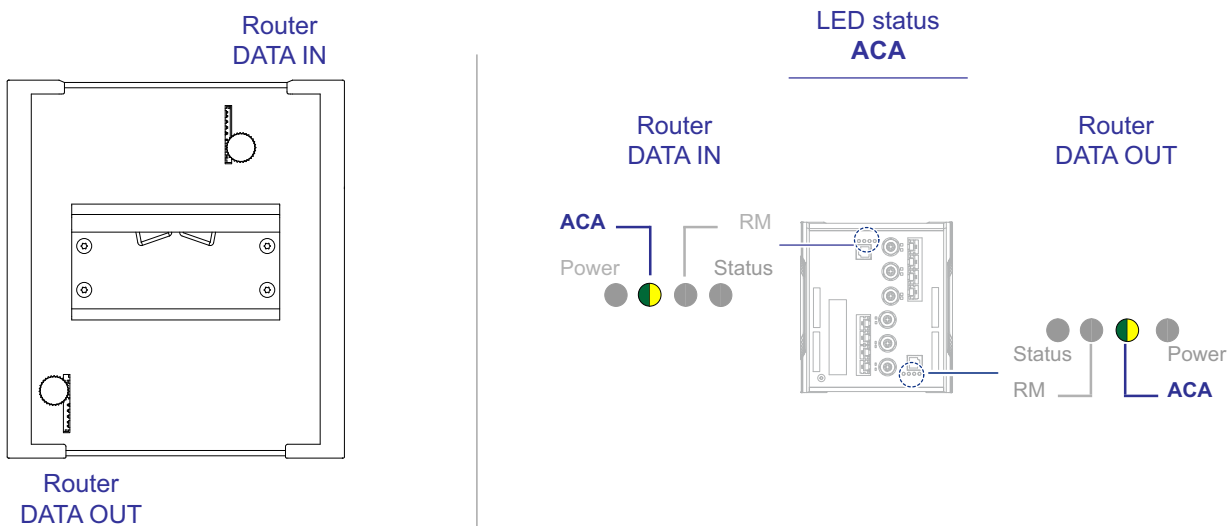


Figure 7: SD card interfaces

## 1.7 Signal contact

The signal contact is a potential-free relay contact. The signal contact is open when the device is not connected to a power supply.

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 regarding possible applications and configuration of the signal contact in the software user documentation on the Hirschmann product pages ([www.hirschmann.com](http://www.hirschmann.com)).

### Note:

- ▶ You will find information on connecting the signal contact here:  
[See “Signal contact” on page 35.](#)
- ▶ The device allows you to control the signal contact using only the DATA IN management.

## 2 Installation

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

On delivery, the device is ready for operation.

Perform the following steps to install and configure the device:

- ▶ [Checking the package contents](#)
- ▶ [Installing the SD card \(optional\)](#)
- ▶ [Installing and grounding the device](#)
- ▶ [Wiring the terminal blocks for the supply voltage and the signal contact](#)
- ▶ [Operating the device](#)
- ▶ [Connecting data cables](#)
- ▶ [Filling out the inscription label](#)

### 2.1 Checking the package contents

**Proceed as follows:**

- Check whether the package includes all items named in the section [“Scope of delivery” on page 56](#).
- Check the individual parts for transport damage.

### 2.2 Installing the SD card (optional)

**Prerequisite:**

- Only use the AutoConfiguration Adapter ACA31 storage medium.  
[See “Accessories” on page 57](#).

**Proceed as follows:**

- Deactivate the write protection on the SD card by pushing the write-protect lock towards the middle of the card.
- Insert an SD card into the DATA IN slot with the beveled corner facing downwards **and/or** insert an SD card into the DATA OUT slot with the beveled corner facing upwards.
- Tighten the thumb screw hand-tight to fix the SD card.

## 2.3 Installing and grounding the device

### **WARNING**

#### **FIRE HAZARD**

Install the device in a fire enclosure according to EN 60950-1.

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

### **WARNING**

#### **ELECTRIC SHOCK**

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

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

### 2.3.1 Installing the device onto the DIN rail

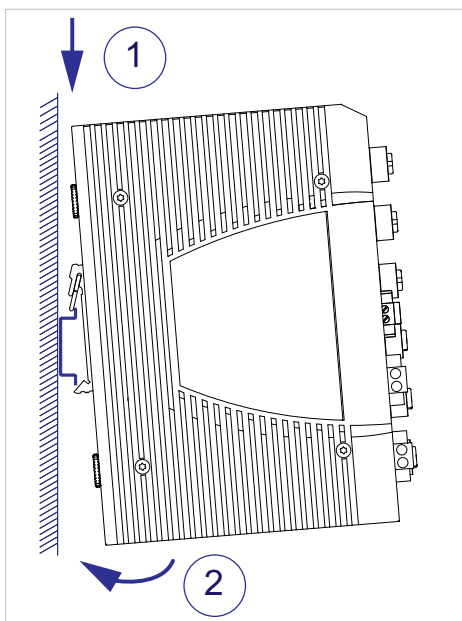
#### **Prerequisite:**

Verify that the device maintains the minimum clearing in order to meet the climatic conditions:

Top and bottom device side: 3.94 in (10 cm)

Left and right device side: 0.79 in (2 cm)

Undercutting the minimum clearing reduces the specified maximum operating temperature.



### 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.

### 2.3.2 Grounding the device

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

The device variants featuring supply voltage with characteristic value KK have a connection for protective earth.

The device variants featuring supply voltage with characteristic value UU have a connection for functional earth.

- Ground the device via the ground screw.

## 2.4 Wiring the terminal blocks for the supply voltage and the signal contact



### WARNING

#### ELECTRIC SHOCK

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

[See “Requirements for connecting the supply voltage” on page 7.](#)

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

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

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



## 2.4.1 Supply voltage with characteristic value UU

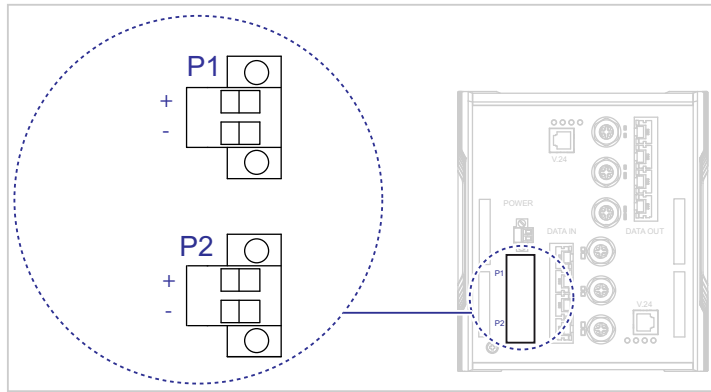


Figure 8: Device variants featuring supply voltage with characteristic value UU

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment
DC voltage	Rated voltage 24 V DC	+ Plus terminal of the supply voltage
	Voltage range incl. maximum tolerances 16.8 V DC ... 32 V DC	- Minus terminal of the supply voltage

Table 12: Supply voltage with characteristic value UU: type and specification of the supply voltage, pin assignment

**Note:** For the redundant power supply, only use voltage sources whose negative terminal is grounded. The use of different voltage sources can lead to equipment damage.

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

- Remove the terminal connector from the device.
- Connect the wires according to the pin assignment on the device with the clamps.
- Fasten the wires connected by tightening the terminal screws.  
You find the prescribed tightening torque in chapter:  
[“Supply voltage” on page 48](#)

## 2.4.2 Supply voltage with characteristic value KK

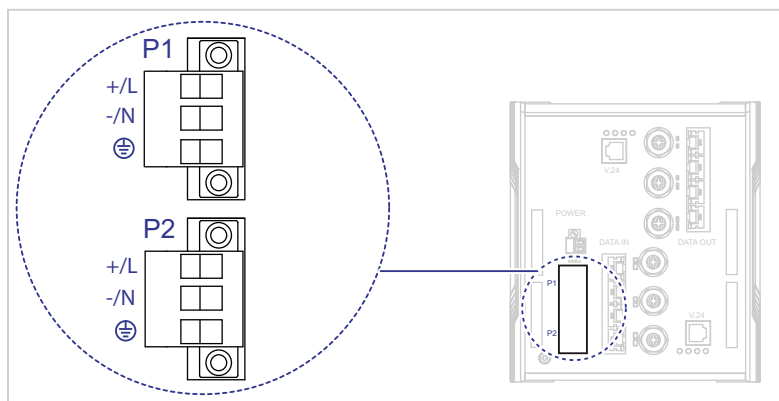


Figure 9: Device variants featuring supply voltage with characteristic value KK



Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment
DC voltage	Rated voltage 110 V DC Voltage range incl. maximum tolerances 77 V DC ... 138 V DC	+/L Plus terminal of the supply voltage
		-/N Minus terminal of the supply voltage
		 Protective conductor
AC voltage	Rated voltage range 110 V AC ... 230 V AC, 50 Hz ... 60 Hz Voltage range including maximum tolerances 93.5 V AC ... 253 V AC, 47 Hz ... 63 Hz	+/L Plus terminal of the supply voltage
		-/N Minus terminal of the supply voltage
		 Protective conductor

Table 13: Supply voltage with characteristic value KK: type and specification of the supply voltage, pin assignment

### **WARNING**

#### **ELECTRIC SHOCK**

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

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

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

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

You find the prescribed tightening torque in chapter:

[“Supply voltage” on page 48](#)

**Note:** With a non-redundant supply of the supply voltage, the device reports the loss of a supply voltage. You can prevent this message by changing the configuration in the Management.

### 2.4.3 Signal contact

For the signal contact lines to be connected, perform the following steps:

- Connect the signal contact lines with the terminal block connections.
- Fasten the wires connected by tightening the terminal screws.

You find the prescribed tightening torque in chapter:

[“Signal contact” on page 50](#)

## 2.5 Operating the device



### WARNING

#### ELECTRIC SHOCK

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

[See “Requirements for connecting electrical wires” on page 7.](#)

Ground the device before connecting any other cables.

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

#### Proceed as follows:

- Use screws to secure the connectors to the device.  
You find the prescribed tightening torque in chapter:  
[“Supply voltage” on page 48](#)
- Enable the supply voltage.

## 2.6 Connecting data cables

### Prerequisite:

- Use a shielded CAT5e cable or better.
- Use shielded cables as per ISO/IEC 11801:2002.
- Use shielded M12 connectors.
- 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.
- Verify that power supply cables and data cables do not run parallel over longer distances, and that ideally they are installed in separate cable channels. If reducing the inductive coupling is necessary, verify that the power supply cables and data cables cross at a 90° angle.

**Note:** To ensure the unidirectional data transmission, only connect Ethernet ports of DATA IN with Ethernet ports of DATA OUT.

### Proceed as follows:

- Connect the data cables according to your requirements.

## 2.7 Filling out the inscription label

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

## 3 Making basic settings

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

- ▶ Input via the V.24 interface
- ▶ Entry via the HiDiscovery protocol in the applications HiDiscovery or Industrial HiVision application
- ▶ Configuration via BOOTP
- ▶ Configuration via DHCP (Option 82)
- ▶ AutoConfiguration Adapter

### ■ Default settings

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

#### Note:

- ▶ You will find more information on the configuration in the “Basic Configuration User Manual”.  
You can download the manual from the Internet on the Hirschmann product pages ([www.hirschmann.com](http://www.hirschmann.com)).

## 3.1 Example Configuration

You have the option to configure the respective router via the V.24 interface using the Command Line Interface (CLI).

#### Prerequisite:

- ▶ Terminal cable for connecting the device to your PC (available as an optional accessory).  
[See “Accessories” on page 57.](#)
- ▶ PC with VT100 terminal emulation (for example, PuTTY program) or serial terminal.

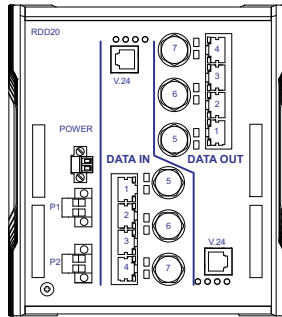
**Note:** The device allows you to configure and save the DATA IN and DATA OUT routers independently of each other.

#### Note:

- Always start with the configuration of the DATA OUT router.

### 3.1.1 Data source and data destination in the same subnetwork

Rail Data Diode  
RDD 20



Use case 1:  
Source and destination  
network in same subnets

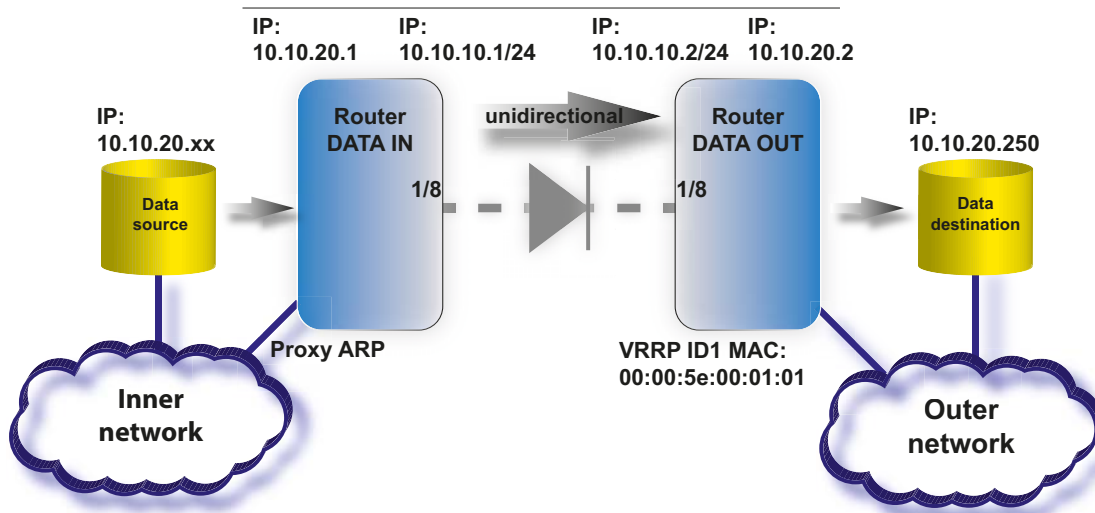


Figure 10: Example configuration: data source and data destination in the same subnetwork

#### Proceed as follows:

- Connect the device to a terminal via V.24. Alternatively connect the device to a “COM” port of your PC using terminal emulation based on VT100 and press any key.
- After the data connection has been set up successfully, the device displays a window for entering the user name.
- Enter the user name. The default user name is **admin**. Press the <Enter> key.
- Enter the password. The default password is **private**. Press the <Enter> key.

```

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[REDACTED] Release 2018-05-01

[REDACTED]

System Name      : [REDACTED]
Management IP   : [REDACTED]
Subnet Mask     : [REDACTED]
1. Router IP    : [REDACTED]
Base MAC        : [REDACTED]
System Time     : [REDACTED]

```

Figure 11: Logging in to the CLI program

```

NOTE: Enter '?' for Command Help. Command help displays all options
      that are valid for the particular mode.
      For the syntax of a particular command form, please
      consult the documentation.

```

Figure 12: CLI screen after login

The following table describes the procedure for configuring the DATA OUT router using the CLI command.

<pre>enable vlan database routing add 1 exit</pre>	<p>Change to the Privileged EXEC mode.  Change to the VLAN configuration mode.  Define VLAN 1 as a routing VLAN.  Change to the Privileged EXEC mode.</p>
<pre>configure ip routing ip vrrp operation</pre>	<p>Change to the Configuration mode.  Activate the routing function globally.  Enables VRRP globally.</p>
<pre>interface 1/8 ip routing</pre>	<p>Change to the interface configuration mode of  the internal diode port of interface 1/8.  Activate the routing function on this interface.</p>

<pre>ip address primary 10.10.10.2 255.255.255.0 ip vrrp add 1 interval 255000</pre>	<p>Assign the interface its primary IP parameters.</p> <p>Activate VRRP on the diode port in order to be able to use the virtual MAC address on the DATA IN side.</p>
<pre>ip vrrp virtual-address add 1 10.10.10.2 exit</pre>	<p>Assign the interface its primary IP parameters.</p> <p>Change to the Privileged EXEC mode.</p>

<pre>interface vlan/1  ip routing ip address primary 10.10.20.2 255.255.255.0 exit exit save</pre>	<p>Change to the interface configuration mode of VLAN routing interface vlan/1.</p> <p>Activate the routing function on this interface.</p> <p>Assign the interface its primary IP parameters.</p> <p>Change to the Configuration mode.</p> <p>Change to the Privileged EXEC mode.</p> <p>Save the settings in the non-volatile memory (nvram) in the “selected” configuration profile.</p>
--	---

After you have successfully configured the DATA OUT router, start configuring the DATA IN router.

The following table describes the procedure for configuring the DATA IN router using the CLI command.

<pre>enable vlan database routing add 1 exit</pre>	<p>Change to the Privileged EXEC mode.</p> <p>Change to the VLAN configuration mode.</p> <p>Define VLAN 1 as a routing VLAN.</p> <p>Change to the Privileged EXEC mode.</p>
--	---

<pre>configure ip routing ip arp add 10.10.10.2 00:00:5e:00:01:01 ip route add 10.10.20.250 255.255.255.255 10.10.10.2</pre>	<p>Change to the Configuration mode.</p> <p>Activate the routing function globally.</p> <p>Create a static ARP entry for the virtual VRRP MAC address.</p> <p>Create a static routing entry for the data destination.</p>
--	---

<pre>interface 1/8  ip routing ip address primary 10.10.10.1 255.255.255.0 exit</pre>	<p>Change to the interface configuration mode of the internal diode port of interface 1/8.</p> <p>Activate the routing function on this interface.</p> <p>Assign the interface its primary IP parameters.</p> <p>Change to the Configuration mode.</p>
---	--



```
interface vlan/1
```

```
ip routing
```

```
ip address primary 10.10.20.1  
255.255.255.0
```

```
ip proxy-arp operation
```

```
exit
```

```
exit
```

```
save
```

Change to the interface configuration mode of VLAN routing interface vlan/1.

Activate the routing function on this interface.

Assign the interface its primary IP parameters.

Activate the proxy ARP function.

Change to the Configuration mode.

Change to the Privileged EXEC mode.

Save the settings in the non-volatile memory (nvram) in the "selected" configuration profile.

### 3.1.2 Data source and data destination in different subnetworks

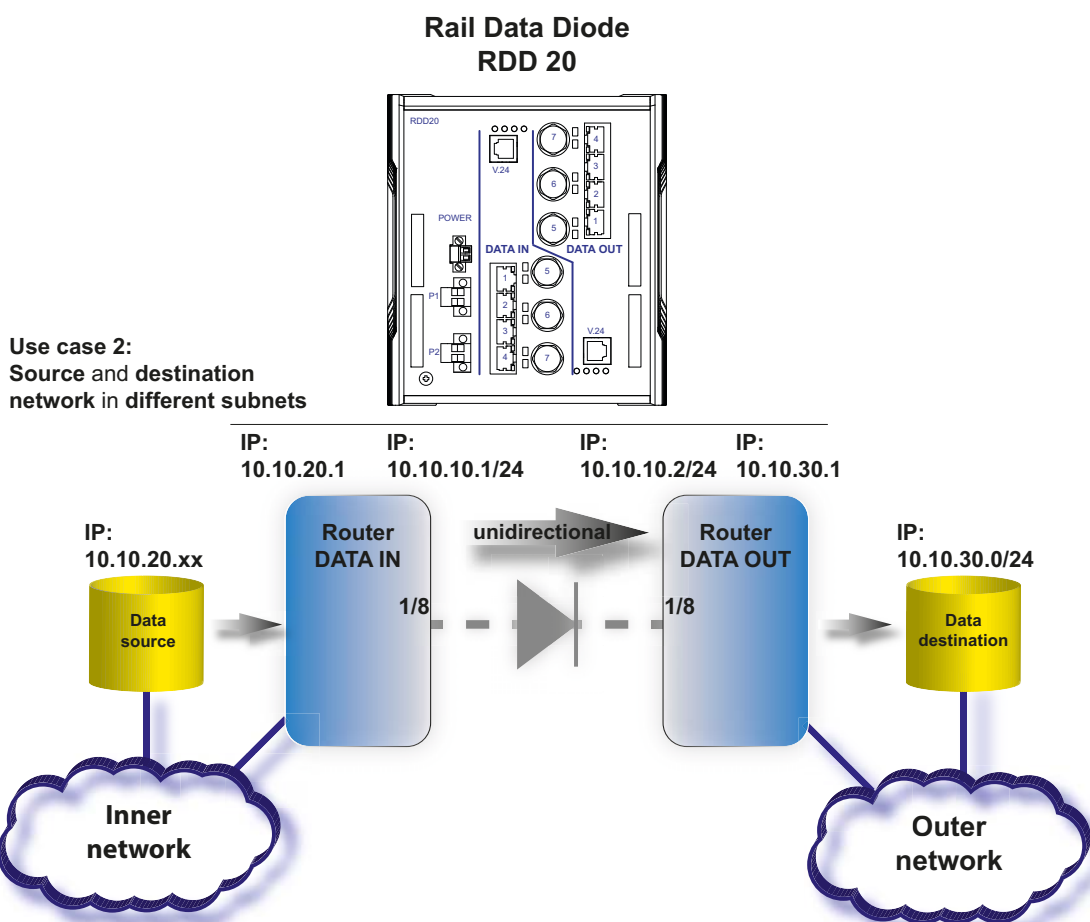
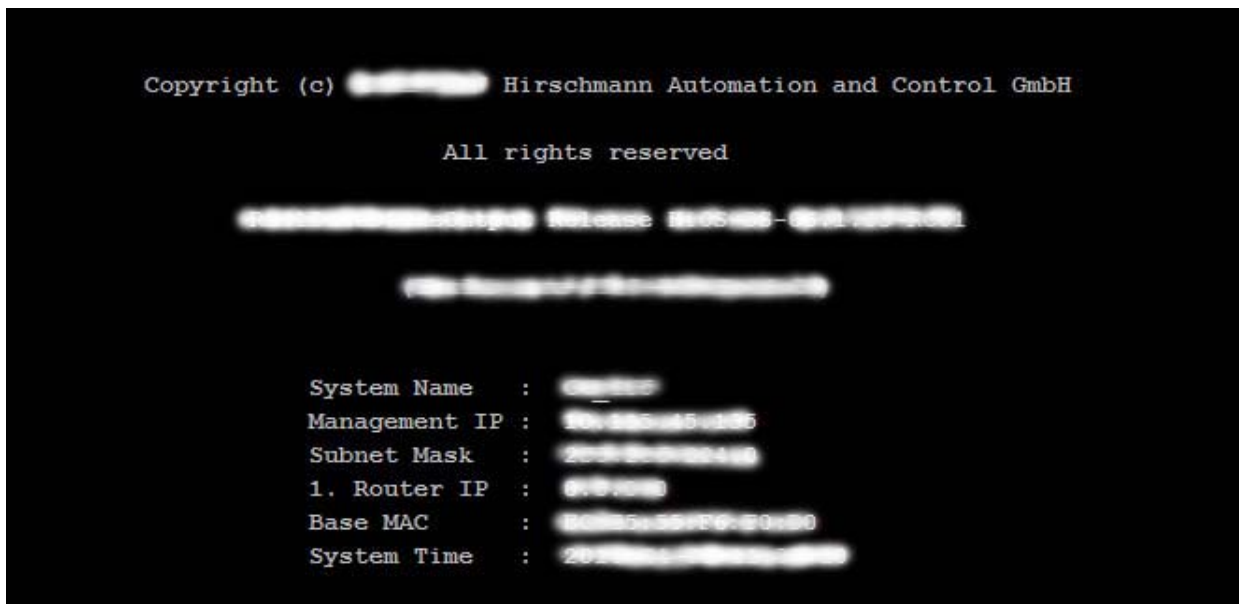


Figure 13: Example configuration: data source and data destination in different subnetworks

## Proceed as follows:

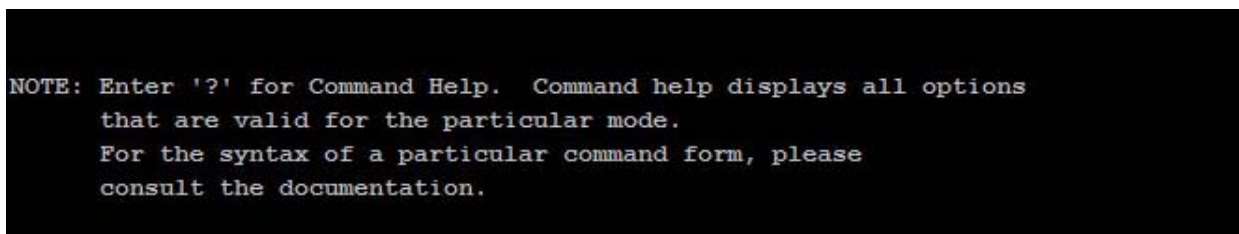
- Connect the device to a terminal via V.24. Alternatively connect the device to a “COM” port of your PC using terminal emulation based on VT100 and press any key.
- After the data connection has been set up successfully, the device displays a window for entering the user name.
- Enter the user name. The default user name is **admin**. Press the <Enter> key.
- Enter the password. The default password is **private**. Press the <Enter> key.



```
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System Name      :
Management IP    :
Subnet Mask      :
1. Router IP     :
Base MAC         :
System Time      :
```

Figure 14: Logging in to the CLI program



```
NOTE: Enter '?' for Command Help. Command help displays all options
that are valid for the particular mode.
For the syntax of a particular command form, please
consult the documentation.
```

Figure 15: CLI screen after login

The following table describes the procedure for configuring the DATA OUT router using the CLI command.

<pre>enable vlan database routing add 1 exit</pre>	<p>Change to the Privileged EXEC mode. Change to the VLAN configuration mode. Define VLAN 1 as a routing VLAN. Change to the Privileged EXEC mode.</p>
<pre>configure ip routing</pre>	<p>Change to the Configuration mode. Activate the routing function globally.</p>
<pre>interface 1/8  ip routing ip address primary 10.10.10.2 255.255.255.0</pre>	<p>Change to the interface configuration mode of the internal diode port of interface 1/8. Activate the routing function on this interface. Assign the interface its primary IP parameters.</p>
<pre>interface vlan/1  ip routing ip address primary 10.10.30.1 255.255.255.0 exit exit</pre>	<p>Change to the interface configuration mode of VLAN routing interface vlan/1. Activate the routing function on this interface. Assign the interface its primary IP parameters.</p> <p>Change to the Configuration mode. Change to the Privileged EXEC mode.</p>
<pre>show ip interface 1/8  save</pre>	<p>Display MAC address and other IP parameters of interface 1/8. Save the settings in the non-volatile memory (nvm) in the “selected” configuration profile.</p>

**Note:** Make a note of the MAC address of interface 1/8.

After you have successfully configured the DATA OUT router, start configuring the DATA IN router.

<pre>enable vlan database routing add 1 exit</pre>	<p>Change to the Privileged EXEC mode. Change to the VLAN configuration mode. Define VLAN 1 as a routing VLAN. Change to the Privileged EXEC mode.</p>
<pre>configure ip routing</pre>	<p>Change to the Configuration mode. Activate the routing function globally.</p>

```
ip arp add 10.10.10.2 <MAC  
address of the interface 1/8  
DATA OUT>  
ip route add 10.10.30.0  
255.255.255.0 10.10.10.2
```

Create a static ARP entry with the MAC address of interface 1/8 of the DATA OUT router.

Create a static routing entry for the data destination.

```
interface 1/8  
  
ip routing  
ip address primary 10.10.10.1  
255.255.255.0  
exit
```

Change to the interface configuration mode of the internal diode port of interface 1/8.

Activate the routing function on this interface.

Assign the interface its primary IP parameters.

Change to the Configuration mode.

```
interface vlan/1  
  
ip routing  
ip address primary 10.10.20.1  
255.255.255.0  
exit  
exit  
save
```

Change to the interface configuration mode of VLAN routing interface vlan/1.

Activate the routing function on this interface.

Assign the interface its primary IP parameters.

Change to the Configuration mode.

Change to the Privileged EXEC mode.

Save the settings in the non-volatile memory (nvm) in the “selected” configuration profile.

## 4 Monitoring the ambient air temperature

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

See [“Climatic conditions during operation” on page 51](#).

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

The temperature displayed in the CLI and the GUI is the internal temperature of the device. It is higher than the ambient air temperature. The maximum internal temperature of the device named in the technical data is a guideline that indicates to you that the maximum ambient air temperature has possibly been exceeded.

## 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 degree of pollution in the operating environment, check at regular intervals that the ventilation slots in the device are not obstructed.

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

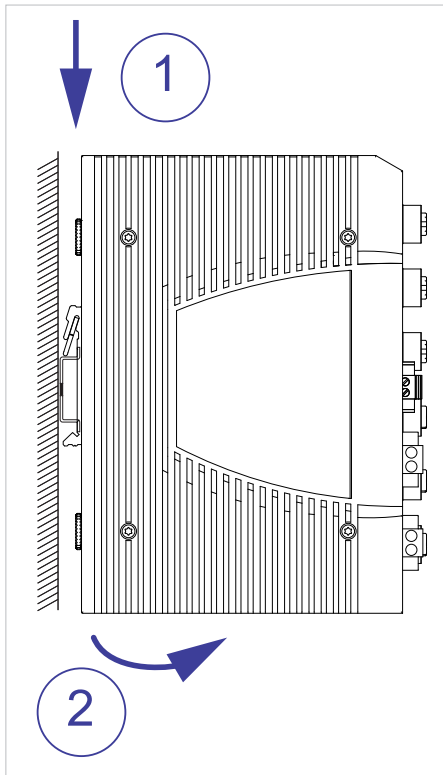
## 6 Disassembly

### **WARNING**

#### **ELECTRIC SHOCK**

Disconnect the grounding only after disconnecting all other cables.

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



#### **Proceed as follows:**

- 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.

# 7 Technical data

## 7.1 General data

Rail Data Diode	
Dimensions W × H × D	See “Dimension drawings” on page 52.
Weight	4.8 lb (2200 g)
Mounting	See “Installing the device onto the DIN rail” on page 31.
Pollution degree	2
Degree of protection	IP20
Laser protection	Class 1 in compliance with IEC 60825-1

Table 14: General data: Rail Data Diode

## 7.2 Supply voltage

Supply voltage with characteristic value UU	
Rated voltage	24 V DC
Voltage range incl. maximum tolerances	16.8 V DC ... 32 V DC
Connection type	2-pin terminal block
	Tightening torque 4.5 lb-in (0.51 Nm)
	min. conductor diameter AWG18 (0.75 mm <sup>2</sup> )
	max. conductor diameter AWG12 (2.5 mm <sup>2</sup> )
Power loss buffer	> 100 ms at 14.4 V DC
Overload current protection at input	Non-replaceable fuse
Back-up fuse for each voltage input	Nominal rating: 2 A
	Characteristic: slow blow
Peak inrush current	< 3.5 A
Connection for functional ground	See “Grounding the device” on page 32.

Table 15: Supply voltage with characteristic value UU

Supply voltage with characteristic value KK	
Rated voltage	110 V DC
Voltage range incl. maximum tolerances	77 V DC ... 138 V DC
Rated voltage range	110 V AC ... 230 V AC, 50 Hz ... 60 Hz
Voltage range including maximum tolerances	93.5 V AC ... 253 V AC, 47 Hz ... 63 Hz

Table 16: Supply voltage with characteristic value KK



<b>Supply voltage with characteristic value KK</b>		
Connection type	3-pin terminal block	
	Tightening torque	4.5 lb-in (0.51 Nm)
	min. conductor diameter	AWG18 (0.75 mm <sup>2</sup> )
	max. conductor diameter	AWG12 (2.5 mm <sup>2</sup> )
Power loss buffer	> 100 ms at 66 V AC > 100 ms at 66 V DC	
Overload current protection at input	Non-replaceable fuse	
Back-up fuse for each voltage input	Nominal rating:	1 A ... 20 A
	Characteristic:	slow blow
Peak inrush current	< 3.5 A	
Connection for protective grounding	<a href="#">See "Grounding the device" on page 32.</a>	

*Table 16: Supply voltage with characteristic value KK*

## 7.3 Signal contact

Signal contact		
Device variants featuring supply voltage with characteristic value UU		
Connection type	2-pin terminal block	
	Tightening torque	3 lb-in (0.34 Nm)
	min. conductor diameter	AWG28 (0.08 mm <sup>2</sup> )
	max. conductor diameter	AWG16 (1.5 mm <sup>2</sup> )
Nominal value	$I_{\max} = 1 \text{ A}$ at $U_{\max} = 30 \text{ V AC}$	
	$I_{\max} = 1 \text{ A}$ at $U_{\max} = 60 \text{ V DC}$	
	<b>according to the UL Standards:</b>	
	$I_{\max} = 1 \text{ A}$ at $U_{\max} = 30 \text{ V AC}$	
	$I_{\max} = 1 \text{ A}$ at $U_{\max} = 30 \text{ V DC}$	

Table 17: Signal contact: device variants featuring supply voltage with characteristic value UU

Signal contact		
Device variants featuring supply voltage with characteristic value KK		
Connection type	2-pin terminal block	
	Tightening torque	3 lb-in (0.34 Nm)
	min. conductor diameter	AWG28 (0.08 mm <sup>2</sup> )
	max. conductor diameter	AWG16 (1.5 mm <sup>2</sup> )
Nominal value	$I_{\max} = 1 \text{ A}$ at $U_{\max} = 230 \text{ V AC}$	
	$I_{\max} = 0.2 \text{ A}$ at $U_{\max} = 110 \text{ V DC}$	
	$I_{\max} = 0.1 \text{ A}$ at $U_{\max} = 250 \text{ V DC}$	
	<b>according to the UL Standards:</b>	
	$I_{\max} = 1 \text{ A}$ at $U_{\max} = 30 \text{ V AC}$	
$I_{\max} = 1 \text{ A}$ at $U_{\max} = 60 \text{ V DC}$		

Table 18: Signal contact: device variants featuring supply voltage with characteristic value KK

## 7.4 Power consumption/power output

Device name	Maximum power consumption	Power output
Rail Data Diode Supply voltage with characteristic value UU	23 W	78 Btu (IT/h)
Rail Data Diode Supply voltage with characteristic value KK	21 W	72 Btu (IT/h)

Table 19: Power consumption/power output

## 7.5 Climatic conditions during storage

Climatic conditions during storage	
Ambient air temperature <sup>a</sup> .	-40 °F ... +185 °F (-40 °C ... +85 °C)
Humidity	5 % ... 95 % <sup>b</sup>
Air pressure	min. 700 hPa (+9842 ft; +3000 m) max. 1060 hPa (-1312 ft; -400 m)

Table 20: Climatic conditions during storage

- a. Temperature of the ambient air at a distance of 2 in (5 cm) from the device  
 b. According to EN 60068-2-30, temperature changes can cause condensation.

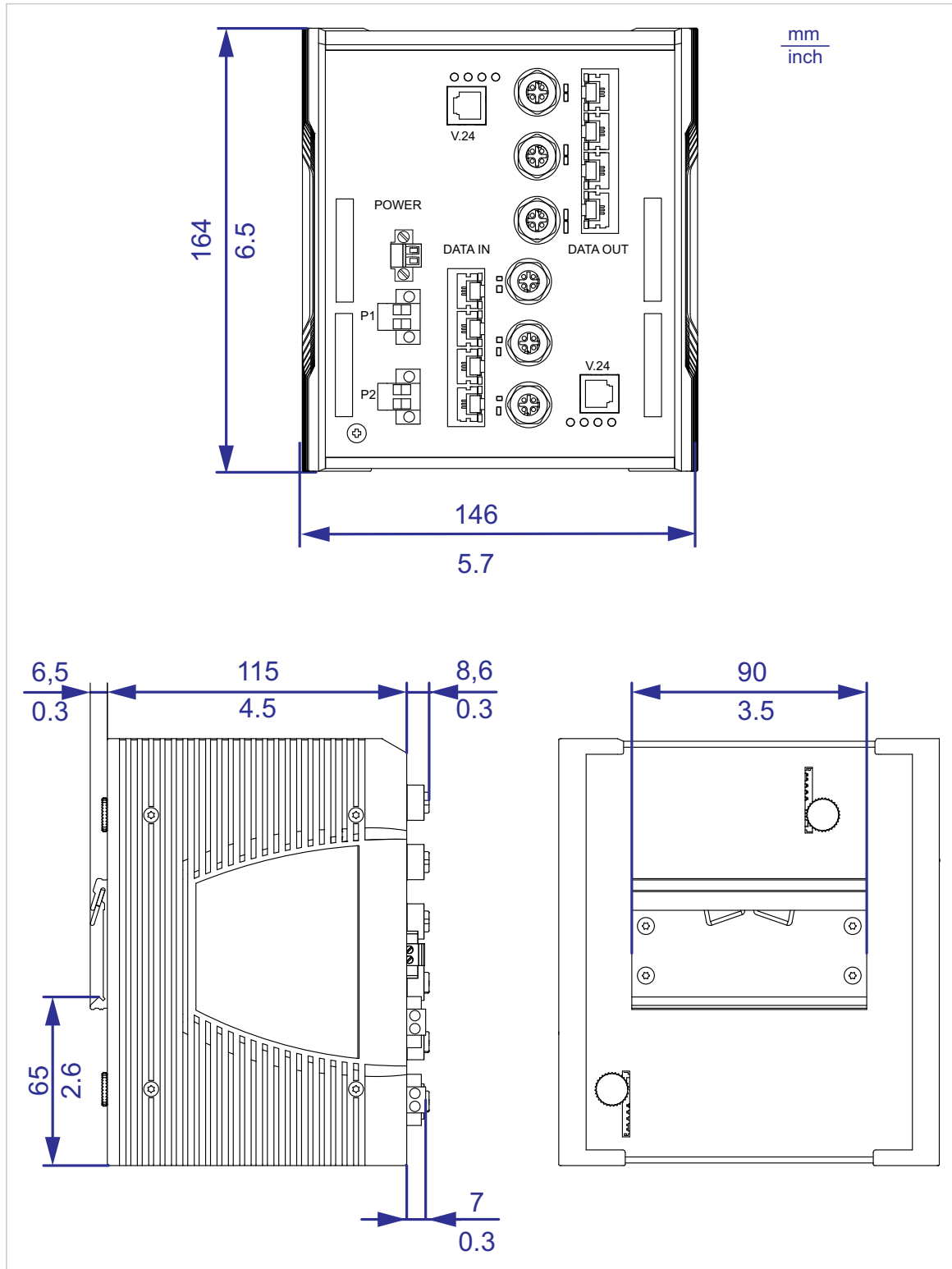
## 7.6 Climatic conditions during operation

Climatic conditions during operation	
Minimum clearance around the device	Top and bottom device side: 3.94 in (10 cm) Left and right device side: 0.79 in (2 cm)
Ambient air temperature <sup>a</sup> .	<ul style="list-style-type: none"> <li>▶ Devices with operating temperature characteristic value S (standard): +32 °F ... +140 °F (0 °C ... +60 °C)</li> <li>▶ Devices with operating temperature characteristic value E and T (extended): -40 °F ... +158 °F (-40 °C ... +70 °C)</li> </ul>
Maximum inner temperature of device (guideline)	<ul style="list-style-type: none"> <li>▶ Devices with operating temperature characteristic value S (standard): +86 °C</li> <li>▶ Devices with operating temperature characteristic value E and T (extended): +91 °C</li> </ul>
Humidity	5 % ... 95 % <sup>b</sup>
Air pressure	min. 700 hPa (+9842 ft; +3000 m) max. 1060 hPa (-1312 ft; -400 m)

Table 21: Climatic conditions during operation

- a. Temperature of the ambient air at a distance of 2 in (5 cm) from the device  
 b. According to EN 60068-2-30, temperature changes can cause condensation.

## 7.6.1 Dimension drawings



## 7.6.2 Stability

Stability		Standard applications	Railway applications (trackside)	Railway applications (in vehicles)
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 <sup>2</sup> (rms) horizontal: 0.7 m/s <sup>2</sup> (rms)
		5 Hz ... 150 Hz	—	Not operating: 5 Hz ... 150 Hz, Broadband noise vertical: 7.9 m/s <sup>2</sup> (rms) horizontal: 5.5 m/s <sup>2</sup> (rms)
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms	—	vertical: 30 m/s <sup>2</sup> , 30 ms horizontal: 50 m/s <sup>2</sup> , 30 ms

Table 22: Immunity

## 7.6.3 Electromagnetic compatibility (EMC)

EMC interference emission		Standard applications	Railway applications (trackside) EN 50121-4	Railway applications (in vehicles) EN 50155
<b>Radiated emission</b>				
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

Table 23: EMC interference emission

EMC interference emission		Standard applications	Railway applications (trackside) EN 50121-4	Railway applications (in vehicles) EN 50155
<b>Conducted emission</b>				
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 23: EMC interference emission

EMC interference immunity		Standard applications	Railway applications (trackside) EN 50121-4	Railway applications (in vehicles) EN 50155
<b>Electrostatic discharge</b>				
EN 61000-4-2	Contact discharge	±4 kV	±6 kV	±6 kV
EN 61000-4-2	Air discharge	±8 kV	±8 kV	±8 kV
<b>Electromagnetic field</b>				
EN 61000-4-3	80 MHz ... 800 MHz	10 V/m	10 V/m	20 V/m
	800 MHz ... 1000 MHz	10 V/m	20 V/m	20 V/m
	1400 MHz ... 2000 MHz	3 V/m	10 V/m	10 V/m
	2000 MHz ... 2700 MHz	1 V/m	5 V/m	5 V/m
	5100 MHz ... 6000 MHz	—	3 V/m	3 V/m
<b>Fast transients (burst)</b>				
EN 61000-4-4	AC and DC supply connections	±2 kV	±2 kV	±2 kV
EN 61000-4-4	Data line	±4 kV	±2 kV	±2 kV
<b>Voltage surges - DC supply connection</b>				

Table 24: EMC interference immunity

<b>EMC interference immunity</b>		<b>Standard applications</b>	<b>Railway applications (trackside) EN 50121-4</b>	<b>Railway applications (in vehicles) EN 50155</b>
EN 61000-4-5	line/ground	±2 kV	±2 kV	±2 kV
EN 61000-4-5	line/line	±1 kV	±1 kV	±1 kV
<b>Voltage surges - data line</b>				
EN 61000-4-5	line/ground	±1 kV	±2 kV	±2 kV
<b>Conducted disturbances</b>				
EN 61000-4-6	150 kHz ... 80 MHz	10 V	10 V	10 V
<b>Pulse magnetic field</b>				
EN 61000-4-9		—	300 A/m	300 A/m

Table 24: EMC interference immunity

## 7.6.4 Network range

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

Table 25: Network range: 10/100/1000 Mbit/s twisted pair port

## 8 Scope of delivery

Number	Article
1 ×	Device
1 ×	General safety instructions
1 ×	2-pin terminal block for signal contact
2 ×	2-pin terminal block for the supply voltage (exclusively for device variants featuring supply voltage with characteristic value UU)
2 ×	3-pin terminal block for the supply voltage (exclusively for device variants featuring supply voltage with characteristic value KK)

*Table 26: Scope of delivery*



## 9 Accessories

Name	Order number
Terminal cable	943 301-001
AutoConfiguration Adapter ACA31	942 074-001
Network management software Industrial HiVision	943 156-xxx
For device variants featuring supply voltage with characteristic value KK: 3-pin terminal block for supply voltage (50 pieces)	943 845-008
For device variants featuring supply voltage with characteristic value UU: 2-pin terminal block for supply voltage (50 pieces)	943 845-009
2-pin terminal block for signal contact (50 pieces.)	943 845-010
Power Cord	942 000-001
Protection cap for RJ45 socket (50 pieces)	943 936-001

*Table 27: General accessories*

# 10 Underlying technical standards

Name	
EN 60950-1	Information technology equipment – Safety – Part 1: General requirements
EN 61131-2	Programmable controllers – Part 2: Equipment requirements and tests
EN 50121-3-2	Railway applications – Electromagnetic compatibility – Part 3-2: railway vehicles – Devices.
EN 50121-4	Railway applications – EMC – Emission and immunity of the signaling and telecommunications apparatus (Rail Trackside)
EN 50124-1	Railway applications – Insulation coordination – Part 1: Basic requirements – Air and creepage distances for all electrical and electronic devices.
EN 50155	Railway applications – Electronic equipment used on rolling stock
EN 45545-2	Railway applications - Fire protection on railway vehicles - Part 2: Requirements for fire behavior of materials and components.

*Table 28: List of the technical standards*

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

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

# A Further support

## Technical questions

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

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

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

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