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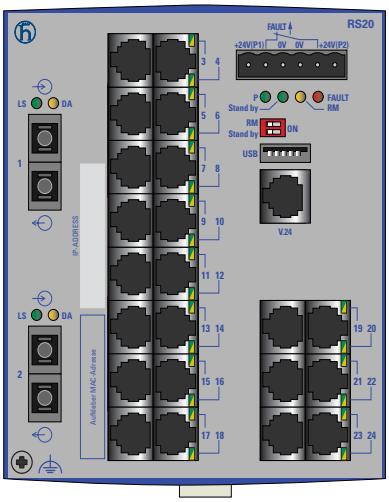
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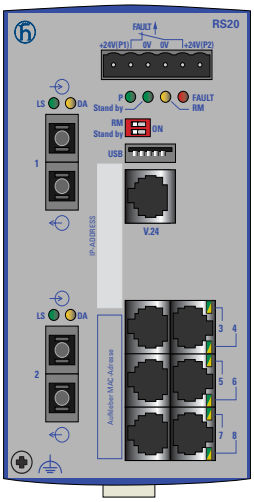
Find the *Hirschmann RS20-0400T1T1SDAEHH05.0.02* at our website: *Click HERE*

User Manual

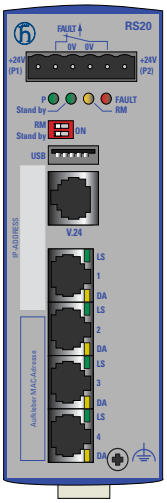
Installation
Industrial ETHERNET Rail Switch
RS20/RS30 Family



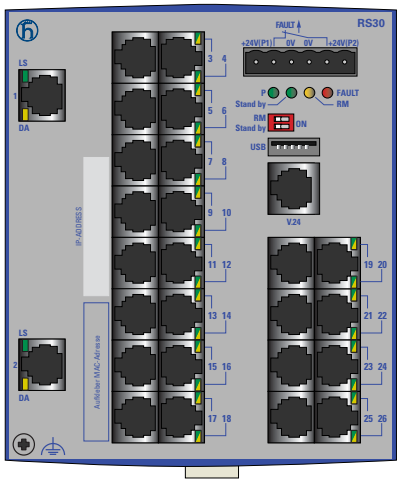
RS20 with 24 ports



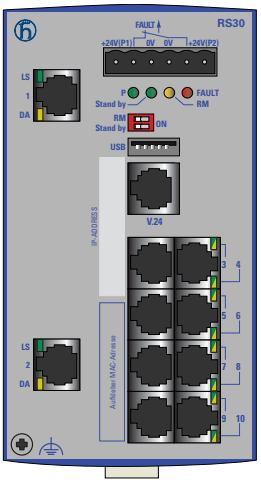
RS20 with 8 ports



RS20 with 4 ports



RS30 with 26 ports



RS30 with 10 ports

Technical support
HAC-Support@hirschmann.de

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Safety instructions

This manual contains instructions which must be observed to ensure your own personal safety and to avoid damage to devices and machinery.

Certified usage

Please observe the following: The device may only be employed for the purposes described in the catalog and technical description, and only in conjunction with external devices and components recommended or approved by Hirschmann. The product can only be operated correctly and safely if it is transported, stored, installed and assembled properly and correctly. Furthermore, it must be operated and serviced carefully.

Supply voltage

The devices are designed for operation with a safety extra-low voltage.Thus, they may only be connected to the supply voltage connections and to the signal contact with PELV circuits or alternatively SELV circuits with the voltage restrictions in accordance with IEC/EN 60950. The supply voltage is electrically isolated from the housing.

- ☐ Use only undamaged parts!
- ☐ Relevant for North America:
  The subject unit is to be suppplied by a Class 2 power source complying with the requirements of the National Electrical Code, table 11(b). If power is redundant supplied (two individual power sources) the power sources together should comply with the requirements of the National Electrical Code, table 11 (b).
- ☐ Relevant for North America:
  Use 60/75°C or 75°C copper(CU)wire only.
- ☐ Relevant for North America
  for devices certified for hazardous locations:
  Power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods [Article 501-4(b) of the National Electrical Code, NFPA 70] and in accordance with the authority having jurisdiction.

Shielding ground

The shielding ground of the connectable twisted pairs lines is connected to the front panel as a conductor.

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

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Housing

Only technicians authorized by Hirschmann are permitted to open the housing.

The device is grounded via the separated ground screw. It is located on the left under the front panel.

- ☐ Make sure that the electrical installation meets local or nationally applicable safety regulations.
- ☐ The ventilation slits must not be covered to ensure free air circulation.
- ☐ The distance to the ventilation slots of the housing has to be a minimum of 10 cm.
- ☐ Never insert pointed objects (thin screwdrivers, wires, etc.) into the inside of the subrack! Failure to observe this point may result in injuries caused by electric shocks.
- ☐ The device has to be mounted in an upright position.
- ☐ If installed in a living area or office environment, the device must be operated exclusively in switch cabinets with fire protection characteristics according to EN 60950.

Environment

The device may only be operated in the listed maximum surrounding air temperature range at the listed relative air humidity range (non-condensing).

- ☐ The installation location is to be selected so as to ensure compliance with the climatic limits listed in the Technical Data.
- ☐ To be used in a Pollution Degree listed in the Technical Data.

Qualification requirements for personnel

Qualified personnel as understood in this manual and the warning signs, are persons who are familiar with the setup, assembly, startup, and operation of this product and are appropriately qualified for their job. This includes, for example, those persons who have been:

- ▶ trained or directed or authorized to switch on and off, to ground and to label power circuits and devices or systems in accordance with current safety engineering standards;
- ▶ trained or directed in the care and use of appropriate safety equipment in accordance with the current standards of safety engineering;
- ▶ trained in providing first aid.

General Safety Instructions

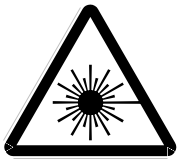
This device is electrically operated. Adhere strictly to the safety requirements relating to voltages applied to the device as described in the operating instructions!

Failure to observe the information given in the warnings could result in serious injury and/or major damage.

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- ☐ Only personnel that have received appropriate training should operate this device or work in its immediate vicinity. The personnel must be fully familiar with all of the warnings and maintenance measures in these operating instructions.
- ☐ Correct transport, storage, and assembly as well as careful operation and maintenance are essential in ensuring safe and reliable operation of this device.
- ☐ Only use umdamaged parts!
- ☐ These products are only to be used in the manner indicated in this version of the manual.
- ☐ Any work that may have to be performed on the electrical installation should be performed by fully qualified technicians only.

Warning!
LED- or LASER components according to IEC 60825-1 (2001):
CLASS 1 LASER PRODUCT.
LIGHT EMITTING DIODE - CLASS 1 LED PRODUCT.



Warning
LED LIGHT
DO NOT STARE INTO THE BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS (e.g. lens, microscope). Failure to observe this warning within a distance of 100 mm can endanger your eyes. Light is emitted from the optical connections or from the ends of the optical fibers that are connected to them. Light Emitting Diode CLASS 2M, Wave length 650 nm, Power <2 mW, according to IEC/CEI 60825-1:2003-10.

National and international safety regulations

- ☐ Make sure that the electrical installation meets local or nationally applicable safety regulations.

Note on the CE marking

The devices comply with the regulations contained in the following European directives:

89/336/EEC
Directive of the council for standardizing the regulations of member states on electromagnetic compatibility (changed by RL 91/263/EEC, 92/31/EEC and 93/68/EEC).
In accordance with the above-named EU directives, the EU conformity declaration will be at the disposal of the relevant authorities at the following address:

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Hirschmann Automation and Control GmbH
Stuttgarter Straße 45-51
D-72654 Neckartenzlingen
Germany
Phone ++49 7127 14 1480

The product can be used in living areas (living area, place of business, small business) and in industrial areas.

- Interference immunity: EN 61000-6-2:2001
- Emitted interference: EN 55022:1998 + A1 2000 + A2 2003, Class A

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

FCC note:

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 where the device is being used in a business environment. The device creates and uses high frequencies and can radiate same, and 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 living 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 product must be disposed of properly as electronic waste in accordance with the current disposal regulations of your county / state / country.

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About this manual

The following manuals are included as PDF files on the enclosed CD ROM:

- User manual „Installation“
- User manual „Basic configuration“
- User manual „Redundancy configuration“
- Reference manual „Web-based Interface“ and
- Reference manual „Command Line Interface“

If you use Network Management Software HiVision you have further opportunities to:

- have an event logbook.
- configure the „System Location“ and „System Name“.
- configure the network address range and SNMP parameters.
- save the configuration on the Switch.
- simultaneous configuration of several Switches.
- configure the relevant ports to be displayed red if there is no link state.

Legend

The commendations used in this manual have the following meanings:

- Listing
- Work step

Subheading

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1 Device description

The Open Rail Family RS20/RS30 offers you a variety of more than 450 switch models. You set up your own switch according to your requirements regarding the number of ports, transmission speed, media type, connector type, temperature range, certifications and software variant.

The RS20/RS30 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 devices operate without fans and have a redundant voltage supply. The switches are very quickly mounted by snapping them onto a hat rail.

The HIPER-Ring redundancy concept enables you to quickly carry out a reconfiguration, and also a simple configuration with only one additional connection. The diagnosis display and the display of the operating parameters and IP address information field provide a quick overview.

It can be easily managed via a Web browser, via Telnet, with a management software product (such as HiVision) or locally on the switch (V.24 interface).

The RS20/RS30 allows you to construct switched industrial ETHERNET networks that conform to the IEEE 802.3 and 802.3u standards using copper wires or optical fibers in a bus or ring topology. You can connect terminal devices and other infrastructure components via twisted pair cables, multi-mode LWL and single-mode LWL. The twisted pair ports support autocrossing, autonegotiation and autopolarity.

Depending on the software you choose, the devices provide you with a large range of functions:

- Redundancy functions
  (Rapid Spanning Tree, Redundant Ring Structure, HIPER-Ring, Redundant Coupling, Link Aggregation, Redundant Power Supply)
- Protection from unauthorized access
- Synchronized system time in the network
- Network load control
- Function diagnosis
- Diagnostics (hardware self-testing)
- Reset
- Priority
- VLAN
- Topology recognition
- Web-based interface
- Command Line Interface - CLI
- SNMP

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- 802.1x port authentication
- Real Time Clock (Professional software variant)

The addition, to the RS20/RS30 Open Rail range, of the MICE range of switches, the MACH range of backbone switches, the BAT wireless transmission system, the EAGLE security system, and products for the LION control room, provides continuous communication across all levels of the company.

1.1 Description of the device variants

The devices differ with regard to the range of software functions, the number of interfaces, and the media type for connecting segments.

- The RS20-... device variants are rail switches with 4, 8, 16 or 24 * 10/100 Mbit Ethernet ports. You can choose the media for ports 1 and 2. The other 2, 6, 14 or 22 ports are 10/100 Mbit Ethernet ports with twisted pair connections via RJ45 connectors.
- In the RS30-... device variants, ports 1 and 2 are gigabit ports (1000 Mbit Ethernet, FX or TX). You can choose the media for ports 1 and 2. The other 8, 16 or 24 ports are 10/100 Mbit Ethernet ports with twisted pair connections with RJ45 connectors.

The devices also provide you with the following options for selecting the variant you desire:

- Temperature range:
  - Standard (0 °C to 60 °C) or
  - Extended (-40 °C to +70 °C) without conformal coating
  - Extended (-40 °C to +70 °C) with conformal coating
- Certifications:
  - CE, UL
  - CE, UL, German Lloyd (GL), IEC 61850 Declaration (Sub Station), IEEE 1613 (Sub Station), EN 50121-4 Railway (along track)
  - CE, UL, German Lloyd (GL), IEC 61850 Declaration (Sub Station), IEEE 1613 (Sub Station), EN 50121-4 Railway (along track), EN 50155 Declaration (Railway) and ATEX 100a (Hazardous Location)
- Software variant: Enhanced or Professional

The devices comply with the specifications of the standards:
ISO/IEC 8802-3u 100BASE-TX/-1000BASE-T,
ISO/IEC 8802-3 100BASE-FX and
ISO/IEC 8802-3 1000BASE-SX/LX.

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1.1.1 RS20/RS30 combination options

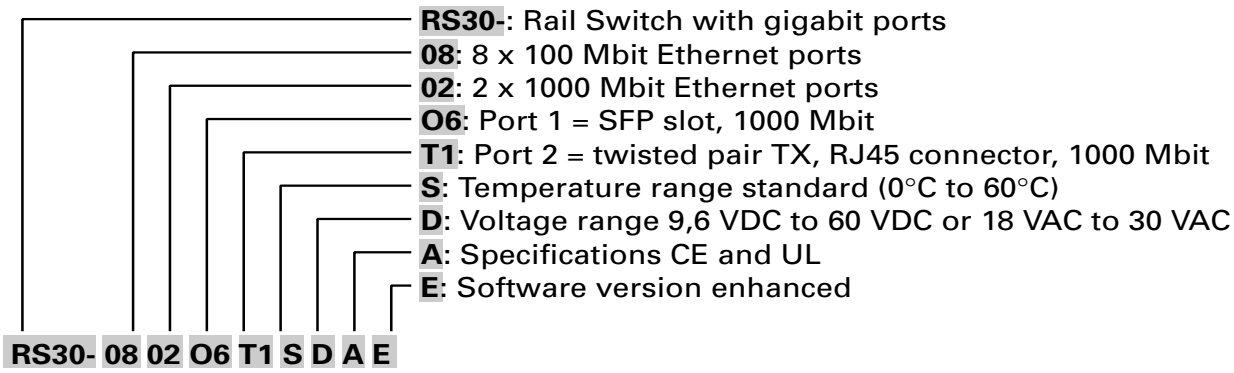
The product designation of your device is made from combining the desired product characteristics in accordance with the following table. The short designation is in column 3.

Position	Attribute	Ident.	Feature
1 to 4	Product	RS20	Rail switch without gigabit ports
		RS30	Rail Switch with gigabit ports
5	- (hyphen)	-	
6 to 7	Number of 10/100	04	4 * 10/100 Mbit Ethernet
	Mbit ports	08	8 * 10/100 Mbit Ethernet
		16	16 * 10/100 Mbit Ethernet
		24	24 * 10/100 Mbit Ethernet
8 and 9	Number of 1000	00	0 * 1000 Mbit Ethernet
	Mbit ports	02	2 * 1000 Mbit Ethernet (without 4 port devices)
10 and 11	Port 1 (ring port)	T1	Twisted pair TX, RJ45
		M2	Multimode FX, DSC, 10/100 Mbit
		M4	Multimode FX, ST, 10/100 Mbit
		S2	Singlemode FX, DSC, 10/100 Mbit
		L2	Singlemode longhaul, DSC, 10/100 Mbit
		O6	SFP slot, 1000 Mbit
12 and 13	Port 2 (ring port)	T1	Twisted pair TX, RJ45
		M2	Multimode FX, DSC, 10/100 Mbit
		M4	Multimode FX, ST, 10/100 Mbit
		S2	Singlemode FX, DSC, 10/100 Mbit
		L2	Singlemode longhaul, DSC, 10/100 Mbit
		O6	SFP slot, 1000 Mbit
14	Temperature range	S	Standard 0 °C to +60 °C
		T	Extended -40 °C to +70 °C
		E	Extended -40 °C to +70 °C, conformal coating
15	Voltage range	D	9,6 VDC to 60 VDC or 18 VAC to 30 VAC
16	Specifications	A	CE, UL
		H	CE, UL, GL, railway (along track), sub station
		B	CE, UL, GL, railway (along track), sub station, hazardous location (ATEX), railway (train)
17	Software variant	E	Enhanced
		P	Professional

Table 1: Combination options of the RS20/RS30 device version

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Example: RS30-0802O6T1SDAE



1.1.2 RS20-... number of ports and media

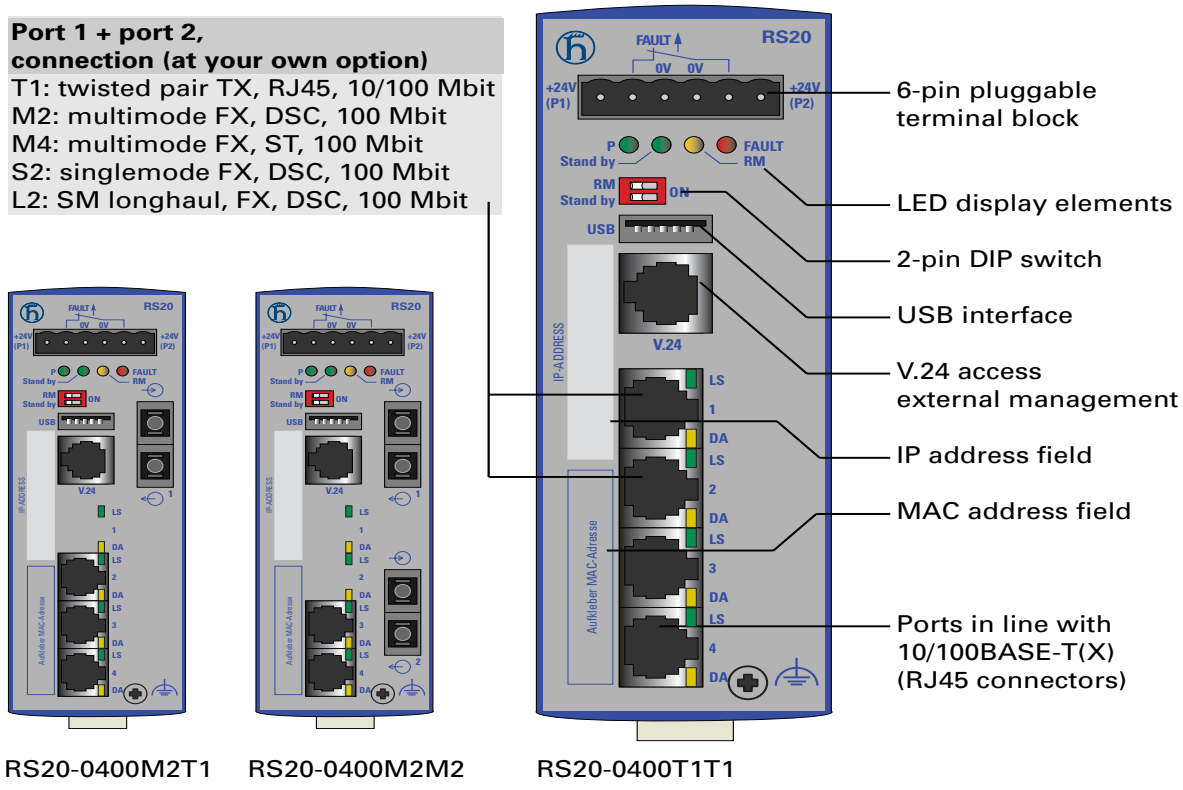


*Fig. 1: Models with 4 * 10/100 MBit ports (RS20-0400...)*

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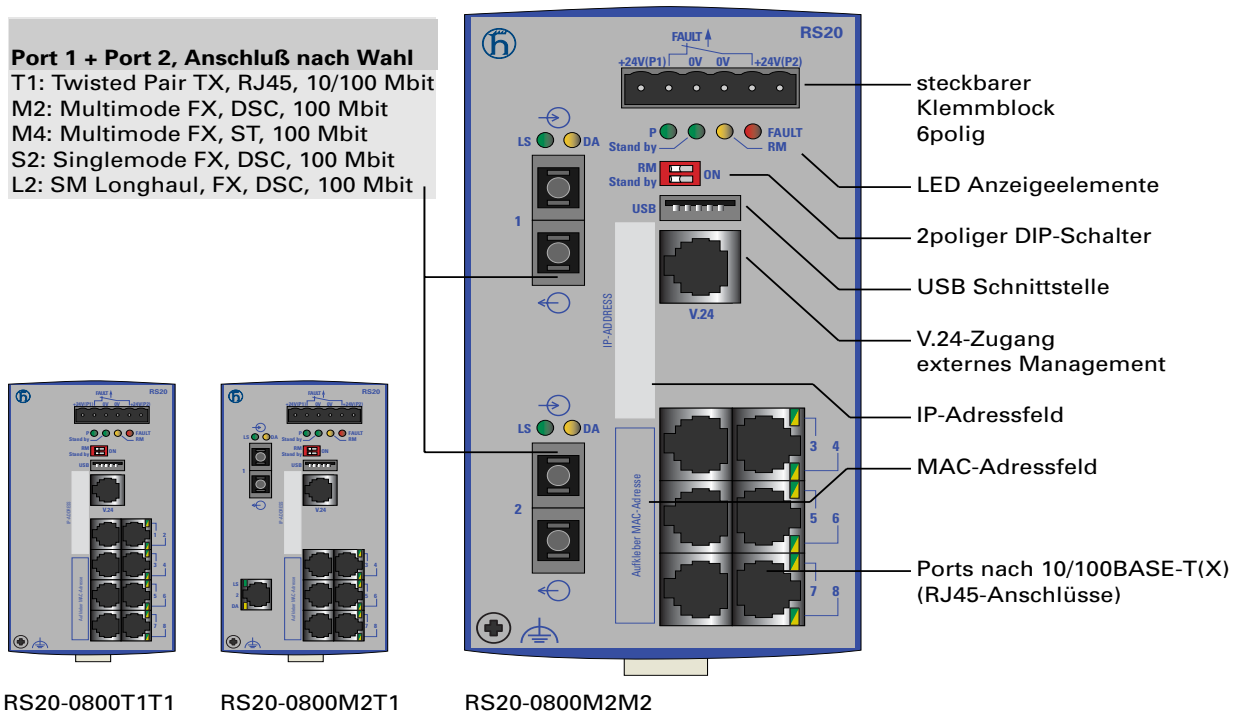


*Fig. 2: Models with 8 * 10/100 MBit ports (RS20-0800...)*

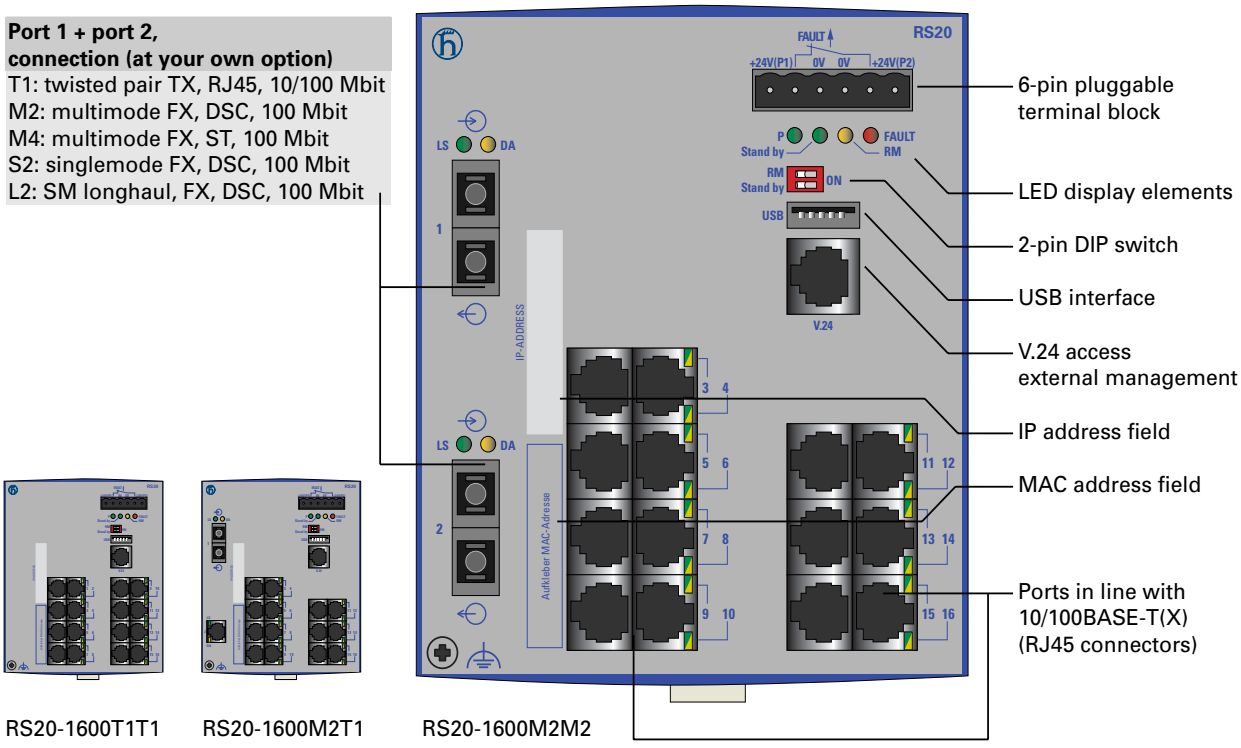


*Fig. 3: Models with 16 * 10/100 MBit ports (RS20-1600...)*

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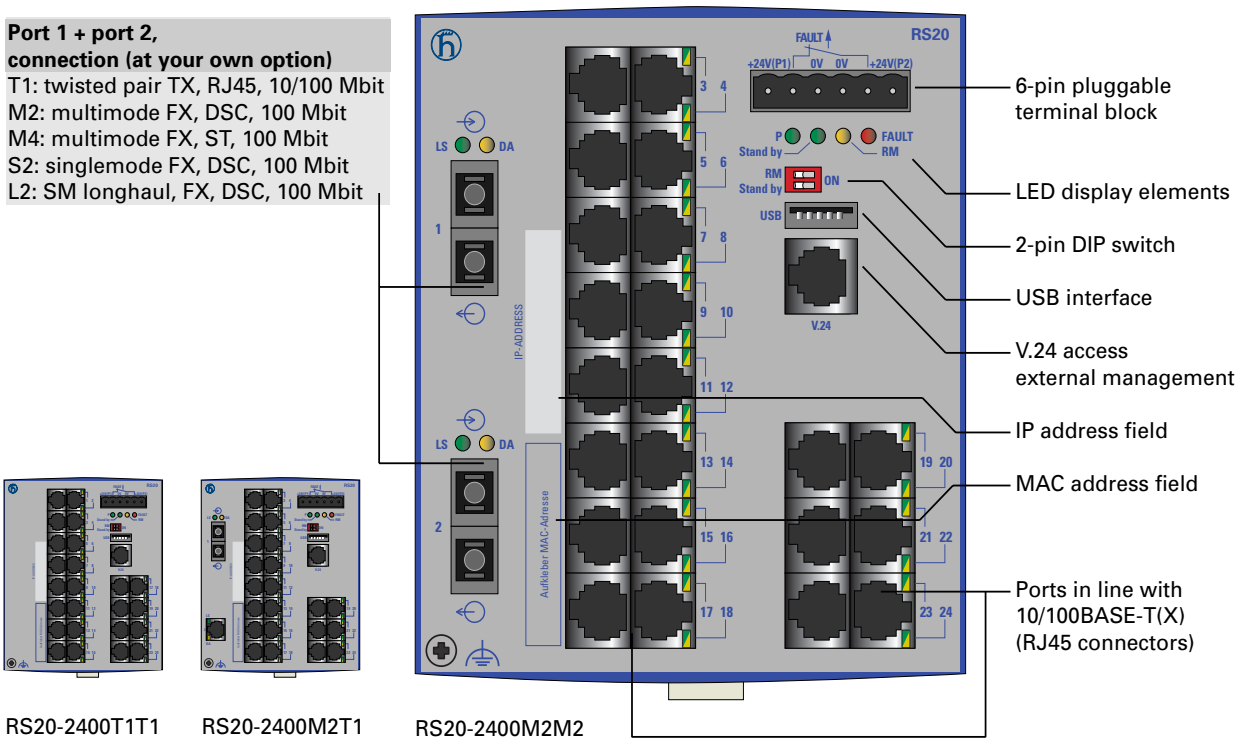


*Fig. 4: Models with 24 * 10/100 MBit ports (RS20-2400...)*

1.1.3 RS30-... number of ports and media

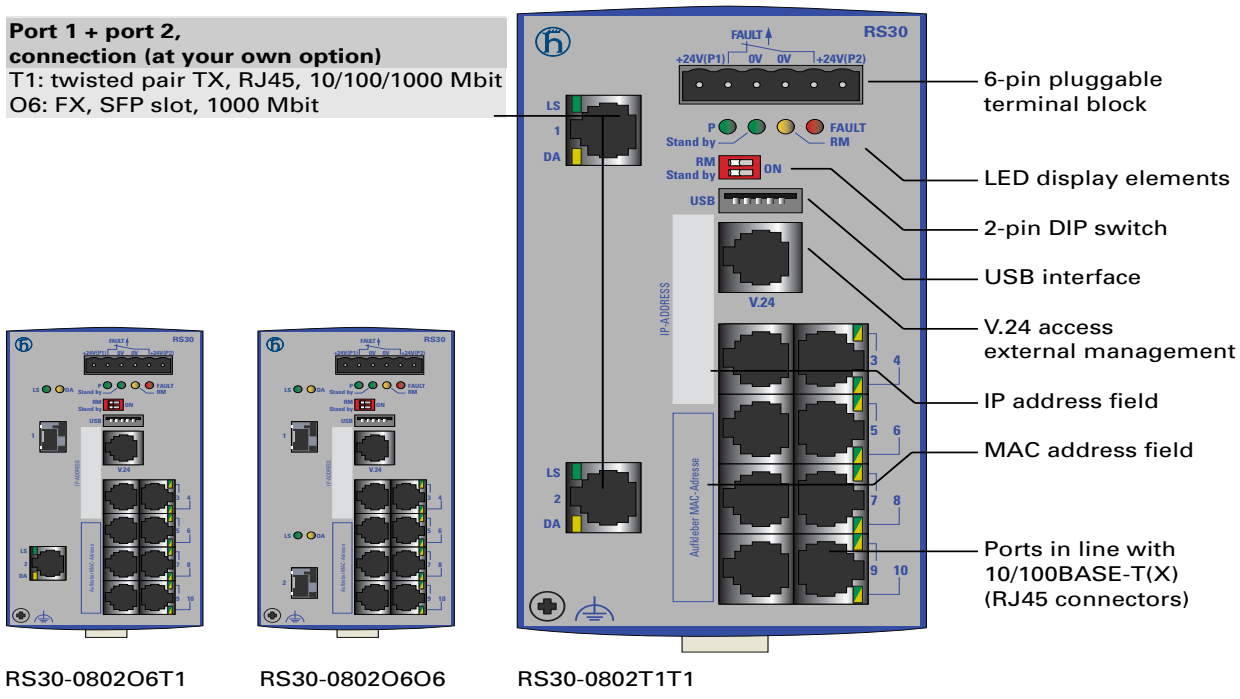


*Fig. 5: Models with 2 * 1000 Mbit ports and 8 * 10/100 MBit ports (RS30-0802...)*

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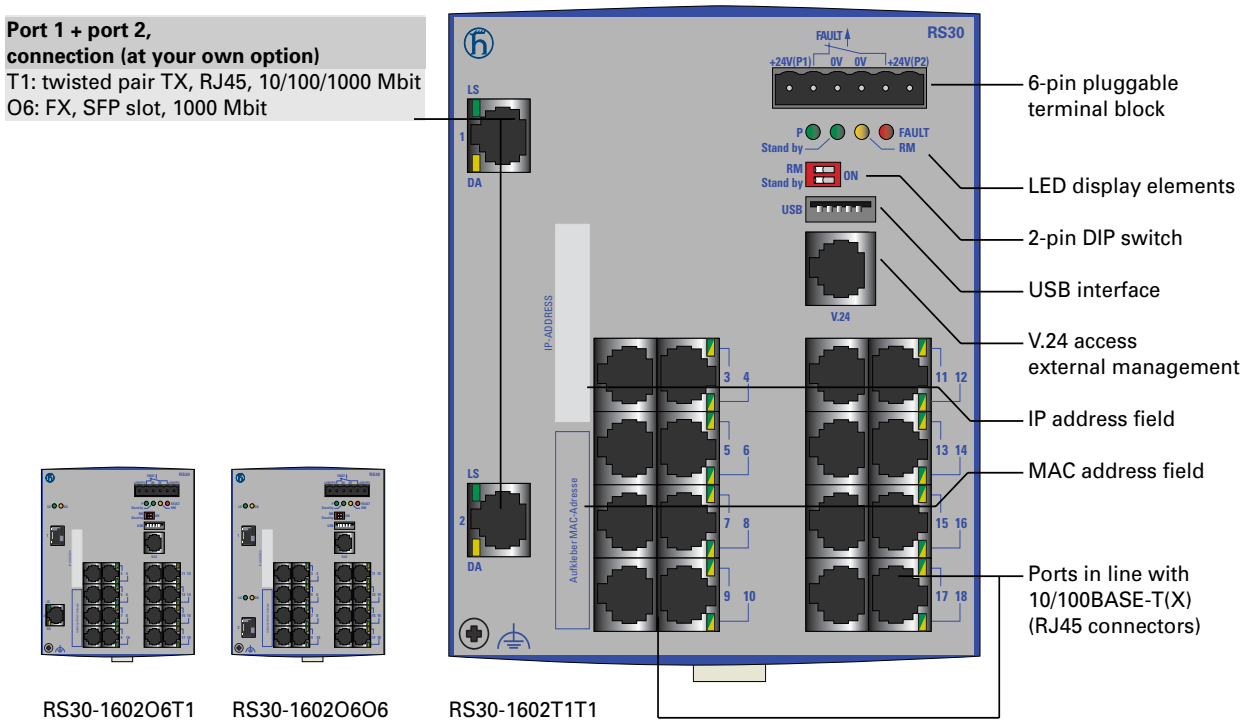


*Fig. 6: Models with 2 * 1000 Mbit ports and 16 * 10/100 MBit ports (RS30-1602...)*

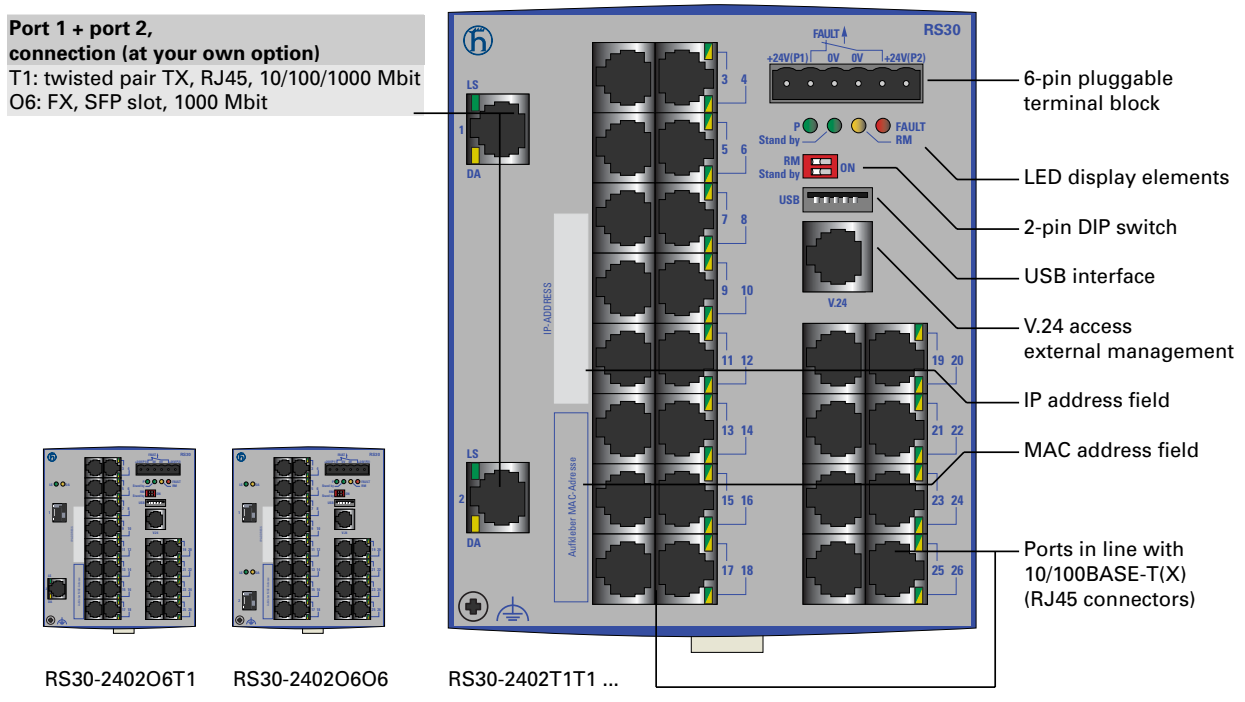


*Fig. 7: Models with 2 * 1000 Mbit ports and 24 * 10/100 MBit ports (RS30-2402...)*

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2 Assembly and startup procedure

The device has been developed for practical application in a harsh industrial environment. Accordingly, the installation process has been kept simple. On delivery, the device is ready for operation.

The following procedure is appropriate for assembly:

- Unpacking and checking
- Filling out the labeling field
- Adjusting the DIP switch settings
- Connecting the terminal block for supply voltage and signal contact
- Fitting the device on the ISO/DIN rail, grounding
- Fitting the terminal block, startup procedure
- Connecting the data lines

2.1 Device installation

2.1.1 Unpacking and checking

☐ Check whether the package was delivered complete
see “Scope of delivery” on page 28.
☐ Check the individual parts for transport damage.

2.1.2 Filling out the labeling field

The information field for the IP address on the front of the device helps you to structure your network installation clearly.

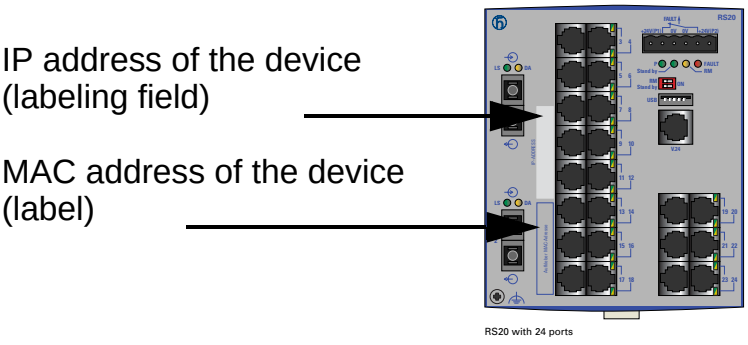


Fig. 8: Labeling field for the IP address of the device

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2.1.3 Adjusting the DIP switch settings

The 2-pin DIP switch on the front panel of the device offers you the following possibilities:

RM switch	Stand by switch	Ring redun-dancy	Ring coupling	Redun-dancy Manager	Ring port	Control port	Coupling port
OFF	OFF	on	off	off	1 + 2		
ON	OFF	on	off	on	1 + 2		
OFF	ON	on	on	off	1 + 2	3	4
ON	ON	off	off	off			



Fig. 9: 2-pin DIP switch

☐ Check whether the switch default settings match your requirements before starting the device.

2.1.4 Connecting the terminal block for supply voltage and signal contact

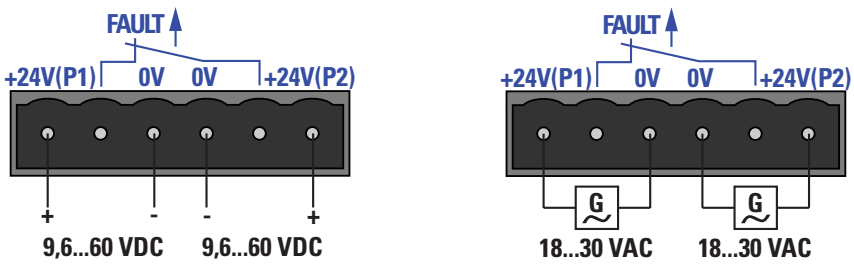
The supply voltage and the signal contacts are connected via a 6-pin terminal block with snap locking.

■ Supply voltage

The supply voltage can be connected redundantly. Both inputs are uncoupled. With redundant supply, the transformer supplies the device alone with the higher output voltage. The supply voltage is electrically isolated from the housing.

You can choose between DC or AC voltage when connecting the supply voltage. You use the +24V and 0V pins to connect the AC voltage (see Fig. 10).

.



DC voltage AC voltage

Fig. 10: Connection of the supply voltage on the 6-pin terminal block

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Note: With non-redundant supply of the mains voltage, the device reports a power failure. You can prevent this message by applying the supply voltage over the two inputs or by changing the configuration via management.

Signal contact

- The signal contact ("FAULT", pin assignment of the terminal block see Fig.“Connection of the supply voltage on the 6-pin terminal block” on page 17) monitors proper functioning of the device, thus enabling remote diagnostics. You can specify the type of function monitoring in the Management.
- You can also use the Management to switch the signal contact manually and thus control external devices.

A break in contact is reported via the potential-free signal contact (relay contact, closed circuit):

- The failure of at least one of the two supply voltages (supply voltage 1 or 2 < 9,6 V).
- A continuous malfunction in the device (internal 3.3 VDC voltage).
- The defective link status of at least one port. With the device, the indication of link status can be masked by the management for each port. Link status is not monitored in the delivery condition.
- The loss of Redundancy guarantee.
- Error during self-test.

The following conditions are reported in stand-by mode

- Control cable disrupted
- Control cable shorted
- Partner device is in stand-by mode

The following conditions are reported in normal mode:

- Control cable shorted
- Partner device is in normal mode

The following condition is reported in RM mode additionally:

- Ring redundancy guaranteed. Ring redundancy is not monitored in the delivery condition.

☐ Pull the terminal blocks off the device and connect the power supply and signal lines.

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2.1.5 Fitting the device on the ISO/DIN rail, grounding

☐ You mount the device on a 35 mm hat rail according to DIN EN 60175. Attach the upper snap-in guide of the device into the hat rail and press it down against the hat rail until it snaps into place.

Note: The shielding ground of the connectable twisted pair lines is connected to the front panel as a conductor.

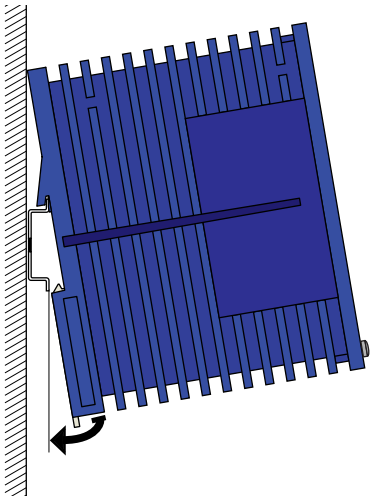


Fig. 11: Assembly

■ Ground
The front panel of the device is grounded via a separate ground screw.

2.1.6 Fitting the terminal block, startup procedure

☐ Mount the terminal block for the supply voltage and the signal contact on the front of the device. Make sure that the snap lock snaps into place.

By connecting the supply voltage at the terminal block, you start the operation of the device.

2.1.7 Connecting the data lines

You can connect terminal devices and other segments at the ports of the device via twisted pair cables and LWL cables.

■ 10/100 Mbit/s twisted pair connection
10/100 Mbit/s ports (R45 socket) enable the connection of terminal devices or independent network segments in compliance with the IEEE 802.3 100BASE-TX / 10BASE-T standards. These ports support:
- ▶ autonegotiation
- ▶ autopolarity
- ▶ autocrossing (when autonegotiation is switched on)

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- 100 Mbit/s half duplex mode, 100 Mbit/s full duplex mode
- 10 Mbit/s half duplex mode, 10 Mbit/s full duplex mode

State on delivery: autonegotiation is activated with exception of the HIPER-Ring ports: 100 Mbit/s full duplex.
The socket housings are electrically connected to the lower covering.

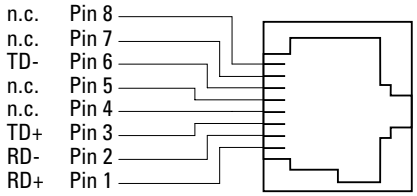


Fig. 12: Pin assignment of a TP/TX interface in MDI-X mode, RJ45 socket

10/100/1000 Mbit/s twisted pair connection

1000 Mbit/s twisted pair connection 1000 MBit/s twisted pair ports (RJ45 sockets) enable the connection of terminal devices or independent network segments in compliance with the IEEE 802-3, 2000 Edition 1000BASE-T standard. These ports support:

- autonegotiation
- autopolarity
- autocrossing (when autonegotiation is switched on)
- 1000 Mbit/s full duplex
- 100 Mbit/s half duplex, 100 Mbit/s full duplex,
- 10 Mbit/s half duplex, 10 Mbit/s full duplex.

State on delivery: autonegotiation.
The socket housing is electrically connected to the front panel.
The pin assignment corresponds to MDI-X.

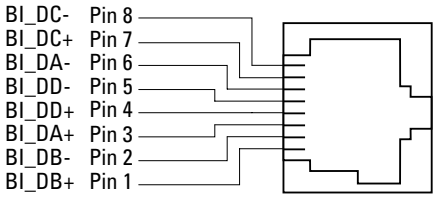


Fig. 13: Pin assignment of a 1000 MBit/s twisted pair interface

100 Mbit/s F/O connection

100 MBit/s F/O ports (ST- or DSC) enable the connection of terminal devices or independent network segments in compliance with the IEEE 802.3 100BASE-FX standard. These ports support:

- full and half duplex mode

State on delivery: full duplex.

Note: Make sure, that you conncet LH ports only to LH ports, SM ports only to SM ports and MM ports only to MM ports.

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1 Gbit/s F/O connection

1 Gbit/s F/O ports (DSC sockets) enable the connection of terminal devices or independent network segments in compliance with the IEEE 802.3-2000 (ISO/IEC 8802-3:2000) 1000BASE-SX or 1000BASE-LX standard. These ports support:

- autonegotiation,
- full duplex mode

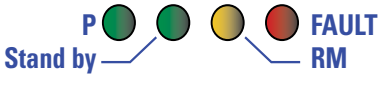
State on delivery: autonegotiation.

Note: Make sure, that you conncet LH ports only to LH ports, SX ports only to SX ports and LX ports only to LX ports.

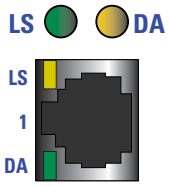
☐ Connect the data lines according to your requirements.

2.2 Displays

After applying the operating voltage, the software starts and initializes itself. The device then performs a selftest. Various LEDs light up in the process. The process lasts approximately 60 seconds.



Device status



Port status

Device status

These LED's provide information about conditions which affect the operation of the whole device.

P- Power (green/yellow LED)	Meaning
lit green	both supply voltages on
lit yellow	only one supply voltage is on (P1 or P2)
not lit	supply voltage is too low
FAULT – Error [1)]	**Meaning**
lit red	the signal contact is open, i.e. it reports an error
not lit	the signal contact is closed, i.e. it does not report an error

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RM - Redundancy Manager (green/yellow LED)	Meaning
lit green	RM function active, redundant port not active
lit yellow	RM function active, redundant port active
not lit	RM function not active
flashes green	Incorrect configuration of HIPER-Ring (e.g. ring not connected to ring port
Stand by	**Meaning**
lit green	Stand by opeartion active
not lit	Stand by operation not active

[1)] If the manual adjustment is active on the signal contact, then the error display is independent of the signal contact setting.

- Port status

The green and yellow LEDs on the specific ports display port-related information. During the boot phase, the status of the boot procedure is displayed with these LEDs: .

LS (Link status, green LED)	Meaning
not lit	no valid connection
lit green	valid connection
flashes green (1 time per second)	port is switched to stand-by
flashes green (3 times per second)	port is disabled
DA (Data, yellow LED),	**Meaning**
not lit	no data reception at the specific port
flashes yellow	data reception at the specific port

2.3 Carrying out basic settings

IP addresses must be entered when the device is installed for the first time. The device provides 6 options for configuring the IP addresses:

- Entry via the V.24 connection.
- Entry by HiDiscovery protocol
- Configuration via BOOTP
- Configuration via DHCP
- Configuration via DHCP Option 82
- The AutoConfiguration Adapter

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State of delivery

- IP address: The device looks for the IP address using DHCP
- Password for management:
  user, password: public (read only)
  admin, password: private (read and write)
- V.24 data rate: 9.600 baud
- Ring redundancy: on
  Ring ports on 100 Mbit full duplex or 1000 Mbit autonegotiation
- Ethernet ports: Link status is not evaluated (signal contact)
- Optical 100 Mbit ports: 100 Mbit full duplex
  All other ports: autonegotiation
- Redundancy manager switched off (DIP switch RM: OFF)
- Stand-by coupling off (DIP switch Stand-by: OFF)
  Port 4 = control port, port 3 = coupling port for red. ring coupling

USB interface

The USB socket offers an interface for the local connection of an Auto-Configuration Adapter ACA 21-USB. It is a device for saving/loading the configuration and for loading the software.

Pin number	Signal name
1	VCC
2	- Data
3	+ Data
4	Ground

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 appropriate terminal emulation) or an AutoConfiguration Adapter ACA 11. This makes it possible to establish a connection to the Command Line Interface CLI and to the system monitor.

VT 100 terminal settings	
Speed	9.600 baud
Data	8 bit
Stopbit	1 bit
Handshake	off
Parity	none

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

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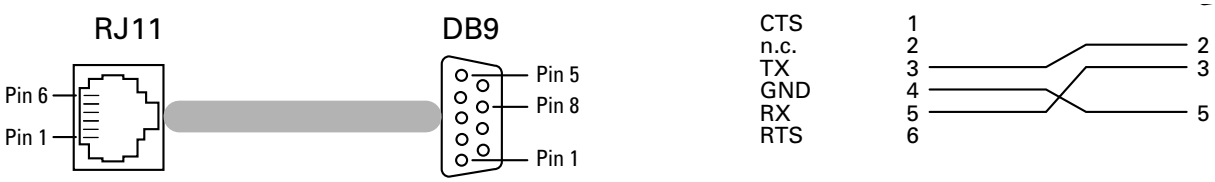


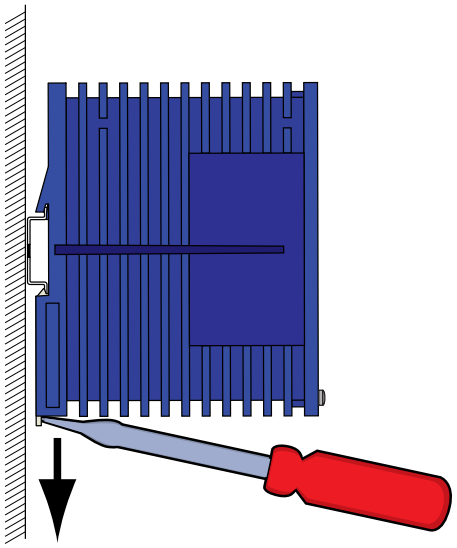
Fig. 14: Pin assignment of the V24 interface

Note: You will find the order number for the terminal cable, which is ordered separately, in the chapter “Technical data” on page 25.

You will find a detailed description of the configuration in the “Basic Configuration User Manual” on the CD-ROM.

2.4 Disassembling the device

☐ To take the device off the ISO/DIN rail, insert a screwdriver horizontally under the housing into the locking slide, pull it (without tipping the screwdriver) downwards and lift the device upwards.



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3 Technical data

General data

Dimensions W x H x D	RS20-0400...	47 mm x 131 mm x 111 mm
	RS20-0800-... / RS30-0802-...	74 mm x 131 mm x 111 mm
	RS20-1600-... / RS30-1602-...	110 mm x 131 mm x 111 mm
	RS20-2400-... / RS30-2402-...	110 mm x 131 mm x 111 mm
Weight	RS20-0400...	400 g
	RS20-0800-... / RS30-0802-...	410 g
	RS20-1600-... / RS30-1602-...	600 g
	RS20-2400-... / RS30-2402-...	650 g
Voltage supply	Operating voltage	9,6 to 60 V DC safety extra-low voltage (SELV/ PELV), redundant inputs decoupled. Relevant for North America: Nec Class 2 power source 5 A maximum. or 18 to 30 V AC
Overload current protection at input		non-changeable fuse
Isolation voltage between operating voltage and housing		800 V
Surrounding	Storage temperature (surrounding air)	Standard: -40 °C to +70 °C Extended: -40 °C to +85 °C
	Humidity	10% to 95% (non condensing)
	Atmospheric pressure	up to 2.000 m (795 hPa), higher altitudes on demand
Operating temperature	Standard	0 °C to +60 °C
	Extended	-40 °C to +70 °C
Pollution degree		2
Protection types	Laser protection	Class 1 conforming to EN 60825-1 (2001)
	Protection types	IP 20

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EMV and stability

EMV interference proof		A [1]	B [1]
EN 61000-4-2	Discharge of static electricity		
	Contact discharge: test level 3	4 kV	8 kV
	Air discharge: test level 3	8 KV	15 kV
EN 61000-4-3	Electromagnetic fields		
	Test level 3 (80 - 2000 MHz)	10 V/m	20 V/m
EN 61000-4-4	Fast transients (burst), test level 3, x		
	- Power line	2 kV	4 kV
	- Data line	1 kV	4 kV
EN 61000-4-5	Surge voltage		
	- Power line, line/line: test level 2	0,5 kV	1 kV
	- Power line, line/earth: test level 3	1 kV	2 kV
	- Data line: test level 3	1 kV	2 kV
EN 61000-4-6	Cable-based RF faults, test level 3		
	10 kHz - 150 kHz	3 V	3 V
	150 kHz - 80 MHz	10 V	10 V
EN 61000-4-9	Impulse-shaped magnetic fields; test level 4	-	300 A/m
EMV emitted immunity			
EN 55022	Class A	Yes	Yes
FCC 47 CFR Part 15	Class A	Yes	Yes
Germanischer Lloyd	Rules for Classification and Construction VI - 7 - 3 Part 1, Ed. 2001	-	Yes
Stability			
Vibration	IEC 60068-2-6 Test FC, testing level in line with IEC 61131-2	Yes	Yes
	Germanischer Lloyd Guidelines for the Performance of Type Tests Part 1	-	Yes
	IEC 870-2-2 Table 3 Normal Installation in line with EN61850-3	-	Yes
Shock	IEC 60068-2-27 Test Ea, testing level in line with IEC 61131-2	Yes	Yes
	IEC 870-2-2 Table 3 Normal Installation in line with EN61850-3	-	Yes

[1] Product code A: Certification = CE, UL
Product code B: Certification = CE, UL, GL, Railway, Sub Station, see
“Combination options of the RS20/RS30 device version” on page 11

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Length of a twisted pair segment	
100 m approx.	cat5e cable with 1000BASE-TX

Table 2: TP port 10BASE-T / 100BASE-TX / 1000BASE-T

Product code		Wave length	Fiber	System attenuation	Expansion	Fiber data
-M2, -M4	MM	1300 nm	50/125 µm	0-8 dB	0-5 km	1,0 dB/km, 800 MHz*km
-M2, -M4	MM	1300 nm	62,5/125 µm	0-11 dB	0-4 km	1,0 dB/km, 500 MHz*km
-S2	SM	1300 nm	9/125 µm	0-16 dB	0-30 km	0,4 dB/km; 3,5 ps/(nm*km)
-L2	LH	1550 nm	9/125 µm	7-29 dB	24-86 km	0,3 dB/km; 19 ps/(nm*km)

Table 3: F/O port 100BASE-FX

Product code		Wave length	Fiber	System attenuation	Expansion	Fiber data
-SX/LC	MM	850 nm	50/125 µm	0-7,5 dB	0-550 m	3,0 dB/km, 400 MHz*km
-LX/LC	MM	1310 nm [1)]	50/125 µm	0-11 dB	0-550 m	1,0 dB/km, 800 MHz*km
-SX/LC	MM	850 nm	62,5/125 µm	0-7,5 dB	0-275 m	3,2 dB/km, 200 MHz*km
-LX/LC	MM	1310 nm [1)]	62,5/125 µm	0-11 dB	0-550 m	1,0 dB/km, 500 MHz*km
-LX/LC	SM	1310 nm	9/125 µm	0-11 dB	0-20 km	0,4 dB/km; 3,5 ps/(nm*km)
-LH/LC	LH	1550 nm	9/125 µm	6-22 dB	24-72 km	0,25 dB/km; 19 ps/(nm*km)
-LH+/LC	LH	1550 nm	9/125 µm	15-32 dB	60-120 km	0,25 dB/km; 19 ps/(nm*km)

Table 4: F/O port 1000BASE-FX

MM = multimode
SM = singlemode
LH = singlemode longhaul

[1)] with F/O adapter in line with IEEE 802.3-2002 clause 38 (single-mode fiber offset-launch mode conditioning patch cord)

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Power consumption/power output

Name	Power consumption	Power output
RS20-0400..., 2xTX port	5.3 W	18.1 Btu (IT)/h
RS20-0400..., 1xFX port. 1xTX port	6.5 W	22.2 Btu (IT)/h
RS20-0400..., 2xFX port	7.7 W	26.3 Btu (IT)/h
RS20-0800..., 2xTX port	5.3 W	18.1 Btu (IT)/h
RS20-0800..., 1xFX port, 1xTX port	6.5 W	22.2 Btu (IT)/h
RS20-0800..., 2xFX port	7.3 W	26.3 Btu (IT)/h
RS20-1600..., 2xTX port	9.4 W	32.1 Btu (IT)/h
RS20-1600..., 1xFX port, 1xTX port	10.6 W	36.2 Btu (IT)/h
RS20-1600..., 2xFX port	11.8 W	40.3 Btu (IT)/h
RS20-2400-..., 2xTX port	12.1 W	41.3 Btu (IT)/h
RS20-2400-..., 1xFX port, 1xTX port	13.3 W	45.4 Btu (IT)/h
RS20-2400-..., 2xFX port	15.5 W	52.9 Btu (IT)/h
RS30-0802-..., 2xTX port	8.9 W	30.4 Btu (IT)/h
RS30-0802-..., 1xFX port, 1xTX port	8.6 W	29.4 Btu (IT)/h
RS30-0802-..., 2xFX port	8.3 W	28.4 Btu (IT)/h
RS30-1602-..., 2xTX port	13.0 W	44.4 Btu (IT)/h
RS30-1602-..., 1xFX port, 1xTX port	12.7 W	43.4 Btu (IT)/h
RS30-1602-..., 2xFX port	12.4 W	42.4 Btu (IT)/h
RS30-2402-..., 2xTX port	15.7 W	53.6 Btu (IT)/h
RS30-2402-..., 1xFX port, 1xTX port	15.4 W	52.6 Btu (IT)/h
RS30-2402-..., 2xFX port	15.1 W	51.6 Btu (IT)/h

Scope of delivery

Device	Scope of delivery
RS20-... or RS30-...	RS20-... or RS30-... device terminal block for supply voltage and indicator contact description and operating instructions CD-ROM

Order numbers/product name

See table “Combination options of the RS20/RS30 device version” on page 11

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Accessories

Name	Order no.
Manual Basics Industrial ETHERNET and TCP/IP	280 720-834
AutoConfiguration Adapter ACA 11	943 751-001
AutoConfiguration Adapter ACA 21-USB	943 271-001
Terminal access cable	943 301-001
6-pin terminal block (50 units)	943 845-002
Rail Power Supply RPS 30	943 662-003
Rail Power Supply RPS 60	943 662-001
Rail Power Supply RPS 120	943 662-011
Netzwork management software HiVision	943 471-100
OPC server software HiOPC	943 055-001
M - SFP - SX / LC	943 014-001
M - SFP - LX / LC	943 015-001
M - SFP - LH / LC	943 042-001
M - SFP - LH+ / LC	943 049-001

Based specifications and standards

EN 61000-6-2:2001	Generic standards – Immunity for industrial environments
EN 55022:1998 + A1 2000 + A2-2003	Information technology equipment – Radio disturbance characteristics
EN 60950:2001	Safety of Information Technology Equipment (ITE)
EN 61131-2:2000	Programmable Controllers
EN 50121-4:2000	Railway applications - EMC - emitted interference and interference immunity for signal and telecommunication systems
FCC 47 CFR Part 15:2003	Code of Federal Regulations
Germanischer Lloyd	Rules for Classification and Construction VI - 7 - 3 Part 1, Ed. 2001
cUL 508:1998	Safety for Industrial Control Equipment
cUL 1604	Electrical Equipment for Use in Class I and Class II, Div.2 and Class III Hazardous (Classified) Locations
EN 50155	Declaration (Railway)
EN 61850-3	Communications networks and systems in stations
IEEE 1613	Standard Environment and Testing Requirements for Communication Networking Devices in Electric Power Substations

Table 5: List of based specifications and standards
Certified devices are marked with a certification identifier.

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RFC 768	UDP	RFC 1769	SNTP
RFC 783	TFTP	RFC 1907	MIB2
RFC 791	IP	RFC 1945	HTTP/1.0
RFC 792	ICMP	RFC 2131	DHCP
RFC 793	TCP	RFC 2132	DHCP-Options
RFC 826	ARP	RFC 2236	IGMPv2
RFC 951	BOOTP	RFC 2239	MAU-MIB
RFC 1112	IGMPv1	RFC 3411	SNMP Framework
RFC 1157	SNMPv1	RFC 3412	SNMP MPD
RFC 1155	SMIv1	RFC 3413	SNMP Applications
RFC 1213	MIB2	RFC 3414	SNMP USM
RFC 1493	Dot1d	RFC 3415	SNMP VACM
RFC 1542	BOOTP-Extensions	RFC 2613	SMON
RFC 1757	RMON	RFC 2674	Dot1p/Q

Table 6: List of RFCs

IEEE 802.1 D	Switching, GARP, GMRP, Spanning Tree
IEEE 802.1 D-1998	Media access control (MAC) bridges (includes IEEE 802.1p Priority and Dynamic Multicast Filtering, GARP, GMRP)
IEEE 802.1 Q	Tagging
IEEE 802.1 Q-1998	Virtual Bridged Local Area Networks (VLAN Tagging, GVRP)
IEEE 802.1 w.2001	Rapid Reconfiguration
IEEE 802.3-2002	Ethernet

Table 7: List of IEEE standards

Certifications

Standard	MS20 / MS30
cUL 508 / CSA C22.2 No.142	pending
cUL 1604 / CSA C22.2 No.213	pending
Germanischer Lloyd	pending

Table 8: Certifications, actual state see www.hirschmann.com

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4 Further support

Technical questions and training courses

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