

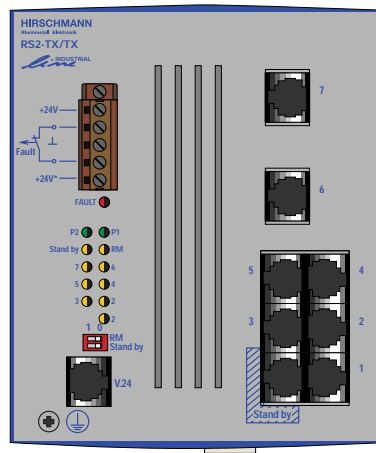
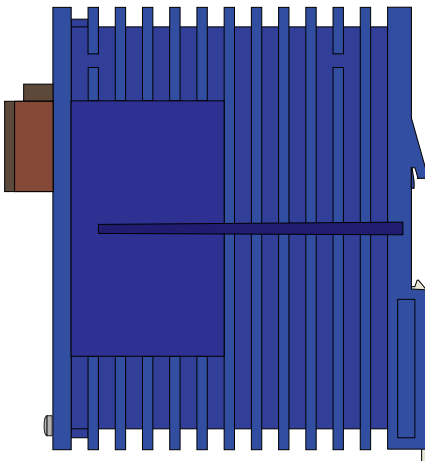
Description and operating instructions

INDUSTRIAL
line Rail Switch 2 Family

RS2-.../...

Bestell-Nr.

943 ...-001



The Rail Switch RS2 is a switch to be used especially in industrial environments. It supports ETHERNET 10 Mbit/s and Fast ETHERNET 100 Mbit/s.

The RS2.../... modules (RS2-TX/TX, RS2-FX/FX, RS2-FX-SM/FX-SM) in addition are manageable. They support SNMP- and Web based management.

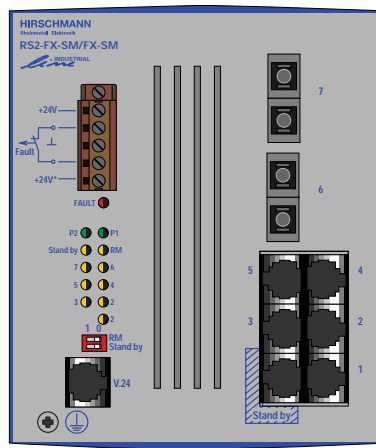
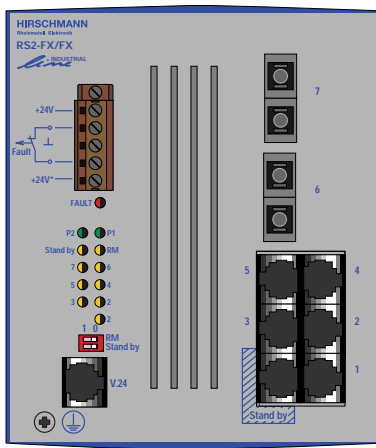
The Rail Switch modules allow switched Ethernet networks in accordance with IEEE standard 802.3 using copper technology and backbones in accordance with IEEE standard 802.3u using copper technology or optical waveguide (F/O) in line and ring structure to be constructed. The switch modules are plugged onto the standard bar.

The RS2.../... modules have five 10/100 Mbit/s twisted pair (TP/TX) ports (RJ45-connectors) and two backbone ports (100 Mbit/s Ports). Depending on the type of RS2-.../... The backbone ports to attach further more RS2-.../... are supplied with FX- or TX interfaces (SC- or RJ-45 connectors).

It is possible to connect up to five pieces of terminal equipment or other TP/TX segments to the 10/100 Mbit/s ports using TPs. The ports support auto negotiation and autopolarity.

The RS2.../... modules in addition have one V.24 interface for external management and one stand by port (RJ45 connector).

The built-in control intelligence allows the redundant coupling of several network segments to a higher network segment.



We have checked that the contents of the technical publication agree with the hardware and software described. However, it is not possible to rule out deviations completely, so we are unable to guarantee complete agreement. However, the details in the technical publication are checked regularly. Any corrections which prove necessary are contained in subsequent editions. We are grateful for suggestions for improvement.

We reserve the right to make technical modifications.

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General

Electricity is used to operate this equipment. Comply in every detail with the safety requirements specified in the operating instructions regarding the voltages to apply!



Warning!
If warning notes are ignored, it is therefore possible for severe injuries and/or material damage to occur.

Only appropriately qualified staff should work on or near this equipment. Such staff must be thoroughly acquainted with all the warnings and maintenance measures contained in these operating instructions.

The proper and safe operation of this equipment assumes proper transport, appropriate storage and assembly and careful operation and maintenance.

Staff qualification requirements

Qualified staff within the meaning of these operating instructions or the warning notes are persons familiar with setting up, assembling, starting up and operating this product and who have appropriate qualifications to cover their activities, such as:

- training or instruction/entitlement to switch circuits and equipment/systems on and off, earth them and identify them in accordance with current safety standards;
- training or instruction in accordance with current safety standards in looking after and using appropriate safety equipment;
- first aid training.

Safety guidelines



Warning!
The RS2-.../... units are designed for operation with safety extra-low voltage. Accordingly, only safety extra-low voltages (SELV) to IEC950/EN60950/VDE0805 may be connected to the supply voltage connections.

ESD protection

The modules contain components highly sensitive to electrostatic fields. These components can be easily destroyed or have their lives shortened by an electrical field or by a discharge caused by touching the card. For these reasons, the modules are delivered in a conducting ESD protective bag. This packing can be reused.

Be sure to observe the following precautions for electrostatic sensitive devices when handling the components:

- Establish electrical potential equality between yourself and your surroundings, e.g. with the aid of a wrist bracelet.
- Only then remove the modules from the conducting bag.
- Store the modules in its conducting bag whenever it is not in the chassis.

ESD protective field kits are available for working with electrostatic sensitive devices.

You can find more information about devices vulnerable to electrostatic fields in DIN/IEC 47 (Sec) 1330; February 1994 Edition and DIN EN 100 015.

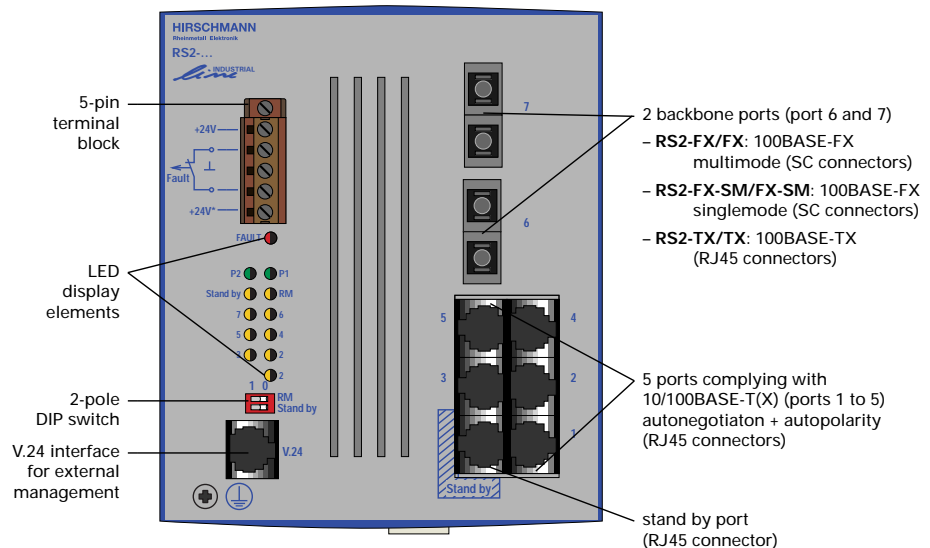


Fig. 1: Overview interfaces, display elements and controls of the RS2-.../...

1. Functional description

The 10/100BASE-T(X) ports of an RS2-.../... represent a terminal connection for the connected LAN segment. You can connect single devices or complete network segments.

1.1 FRAME-SWITCHING FUNCTIONS

Store and Forward

All data received by the RS2-.../... from the system bus or at the ports are stored and checked for validity. Invalid and defective frames as well as fragments are discarded. The RS2-.../... forwards the valid frames.

Multi address capability

An RS2-.../... learns all source addresses per port. Only packets with
– unknown addresses
– this address or
– a multi/broadcast address
in the destination address field are sent to this port.

An RS2-.../... learns up to 2.000 addresses. This becomes necessary if more than one terminal device is connected to one or more ports. In this way several independent sub-networks can be connected to an RS2-.../....

Learn addresses

An RS2-.../... monitors the age of the learned addresses. The RS2-.../... deletes address entries from the address table which exceed a certain age (30 seconds). Note: Restarting deletes the learned address entries.

Traffic Classes complying with IEEE 802.1D

The RS2-.../... supports two priority queues. The classification of received data packets to these classes is done by
– the pre-defined classification in statistical address entries.
– the priority of the data packet included in the VLAN tag.

VLAN-Tag complying with IEEE 802.1Q

On data packets with VLAN tag the RS2-.../... analyses the 3 bit priority field.
– Data packets with VLAN tag and a maximum long data field will be transmitted
– Data packets being received without VLAN tag will be transmitted without VLAN tag, too.

1.2 SPECIFIC FUNCTIONS OF THE TP/TX INTERFACE

Link control

The RS2-.../... monitors the connected TP/TX line segments for short-circuit or interrupt using regular link test pulses in accordance with IEEE standard 802.3 10/100BASE-TP/TX. The RS2-.../... does not transmit any data in an TP/TX segment from which it does not receive a link test pulse.

Note: A non-occupied interface is assessed as a line interrupt. The TP/TX line to terminal equipment which is switched off is likewise assessed as a line interrupt as the de-energised bus coupler cannot transmit link test pulses.

Auto polarity exchange

If the reception line pair is incorrectly connected (RD+ and RD- switched) polarity is automatically reversed.

1.3 SPECIFIC FUNCTIONS OF THE F/O INTERFACE

Link control

According to IEEE 802.3 standard 100BASE-FX an RS2-.../... monitors the attached F/O lines for open circuit conditions.

1.4 REDUNDANCY FUNCTIONS

Backbone as a ring

With a RS2-.../... with redundancy manager or with a RM1 you can close a line structured RS2-.../... backbone to a redundant ring. If one section fails the ring structure changes itself back into a line structure within 0.5 seconds at up to 50 RS2-.../....

Redundant coupling of segments

The built-in control intelligence of the RS2-.../... allows the redundant coupling of 10/100 MBit/s network segments. Within 0.5 seconds an error is detected and eliminated.

1.5 FURTHER FUNCTIONS AND FEATURES

Reset

The RS2-.../... will be reset by the following actions:

- management
- input voltage falls below a tag
- watchdog

After a reset the following actions are carried through:

- self test
- initialization

1.6 DISPLAY ELEMENTS

Equipment status

These LEDs provide information about statuses which affect the function of the entire RS2-.../....

P1 – Power 1 (green LED)

- lit: – supply voltage 1 present
- lit not: – supply voltage 1 is less than 18 V

P2 – Power 2 (green LED)

- lit: – supply voltage 2 present
- lit not: – supply voltage 2 is less than 18 V

FAULT – Fehler (red LED)

- lit: – The indicator contact is open, i.e. it indicates an error.
- lit not: – The indicator contact is closed, i.e. it does not indicate an error.

Stand by – (green LED)

- lit: – The standby function is enabled.
- lit not: – The standby function is disabled.

RM – Redundancy Manager (green/yellow LED)

- lit green: – RM function active, redundant port not active
- lit yellow: – RM function active, redundant port active
- lit not: – RM function not active

Port Status

These LEDs display port-related information.

1 to 7 – Data, Link status (green/yellow LED)

- lit not: – no valid link
- lit green: – valid link
- blinking green (1 time in periodical interval) – port is switched to standby (port 1)
- blinking green (3 times in periodical interval) – port is disabled
- flashes yellow: – receiving data

1.7 CONTROLS

2-pin DIP switch (RS2-.../...)

Using the 2-pin DIP switch on the RS2-.../... front panel

- on RS2-.../... the standby function can be enabled or disabled with the switch
Stand by . State of delivery: position 0 (Off), i.e. normal function. In the redundant link run the RS2-.../... in the standby mode for redundant coupling of 10/100 MBit/s network segments.
- with the RM switch the RM functionality (Redundancy Manager) can be switched on or off. State of delivery: switch in position 0 (Off), i.e. RM function not active.

Note: You should activate only one of the two functions stand by and RM each. Activating both functions simultaneously produces a reset of the device.

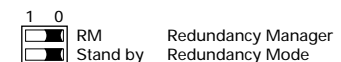


Fig. 2: 2-pin DIP switch on RS2-.../...

1.8 INTERFACES

10/100 MBit/s connection

Five 10/100 Mbit Ports (Port 1 bis Port 5, 8-pin RJ45 sockets) on RS2-.../... allow terminal equipments or five independent network segments complying with the standards IEEE 802.3 100BASE-TX / 10BASE-T to be connected. These ports support auto-negotiation and the autopolarity function.

Factory settings: autonegotiation active for port 1 to port 5.

The socket casings are electrically connected to the front panel of the RS2-.../....The pin configuration complies with MDI-X.

- Pin configuration of the RJ45 socket:
 - TD+: pin 3, TD-: pin 6
 - RD+: pin 1, RD-: pin 2
 - remaining pins: not configured.

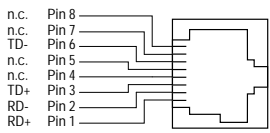


Fig. 3: Pin configuration of an TP/TX interface

100 Mbit/s connection (backbone port)
Two ports (port 6 and 7) allow a 100 Mbit/s backbone to be constructed.

- RS2-FX/FX: two ports complying with 100BASE-FX (SC sockets, multimode)
- RS2-FX-SM/FX-SM: two ports complying with 100BASE-FX (SC sockets, singlemode)
- RS2-TX/TX: two ports complying with 10/100BASE-T(X) (RJ45 sockets)

Factory settings: The backbone ports are pre-configured on 100 Mbit/s full duplex. This configuration is necessary to build redundant structures.

The backbone ports support full duplex and half duplex mode. The TX ports in addition support autonegotiation and the autopolarity function. Factory settings: Port 6 and port 7 are pre-configured on 100 Mbit/s, full duplex.

Standby-Port

A 8-pin RJ45 socket (Stand by) serves for connecting the control line for the mode for redundant coupling of RS2-.../.../RS1 ring structures. The socket casing is electrically connected to the front panel of the RS2-.../... The Stby_Out+ and Stby_Out- pins are electrically separated from the operating voltage and the chassis (relay contact).

- Pin configuration of the RJ45 socket:
 - Stby_Out+: Pin 3, Stby_Out-: Pin 6
 - Stby_In+: Pin 1, Stby_In-: Pin 2
 - remaining pins: not configured.

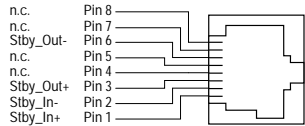


Fig. 4: Pin configuration of the standby interface

V.24 interface (external management)
A serial interface for local connection of an external management station (VT100 terminal or a PC with corresponding terminal emulation) is available on the RJ11 socket (V.24 interface). A link can thus be established with the User Interface UI

VT-100 terminal settings:

- Speed: 19.200 Baud
- Data: 8 bit
- Stopbit: 1 bit
- Handshake: off
- Parity: none

The V.24 interface can be with the baud rates 9600, 19200, 38400, 57600 angesteuert werden. Die Einstellung nach Systemstart ist 19200 Baud. Es wird das Xon/Xoff-Protokoll verwendet.

The socket casing is electrically connected to the front panel of the device.

Note: Once a link has been established, data cannot be transmitted by way of the console whilst the modem or Telnet is using the UI. Entering the exit command by way of the telnet link frees the UI.

- Pin configuration of the V.24 interface:
 - TX: Pin 3, RX: Pin 5
 - CTS: Pin 1, RTS: Pin 6
 - GND: Pin 4
 - Pin 2: not configured.

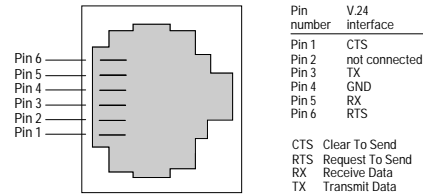


Fig. 5: Pin configuration of the V.24 interface

5-pin terminal block
The supply voltage and the indicator contact are connected via a 5-pin terminal block with screw locking mechanism.



Warning!
The RS2-.../... equipment is designed for operation with SELV. Only safety extra-low voltages to IEC950/EN60950/VDE0805 may therefore be connected to the supply voltage connections and to the indicator contact.

- Voltage supply: The voltage supply can be connected to be redundant. Both inputs are decoupled. There is no load distribution. With redundant supply, the power pack supplies the RS2-.../... alone with the higher output voltage. The supply voltage is electrically isolated from the housing.

- Indicator contact: The indicator contact serves for supervising the functions of the RS2-.../... and thus facilitates a remote diagnosis. Contact interrupt indicates the following by means of a potential-free indicator contact (relay contact, closed circuit):
 - the failure of at least one of the two supply voltages.
 - a permanent fault in the RS2-.../... (internal 3,3 V DC voltage, supply voltage 1 or 2 < 18 V, ...).
 - the faulty link status of at least one port. The indication of the link state on the RS2-.../... might be masked on a port-by-port basis using the management software.
- self test error

The RS2-.../... in stand by mode indicates the following states:

- interrupted control line
- short-circuited control line
- partner device runs in standby mode

The RS2-.../... in normal mode indicates the following states:

- short-circuited control line
- partner device runs in normal mode

The RS2-.../... in RM mode indicates the following states:

- Ring monitoring is not possible, e.g. during software initializing.

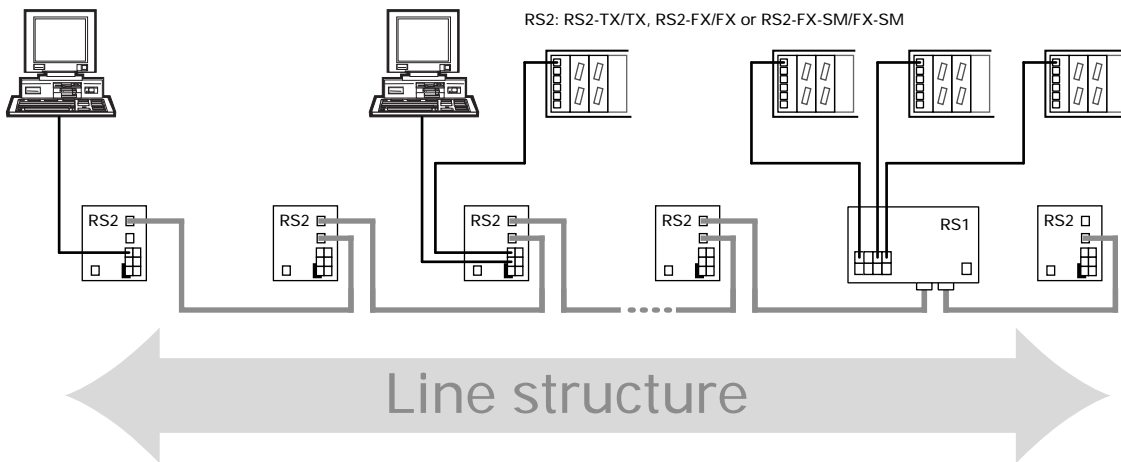


Fig. 6: Line structure

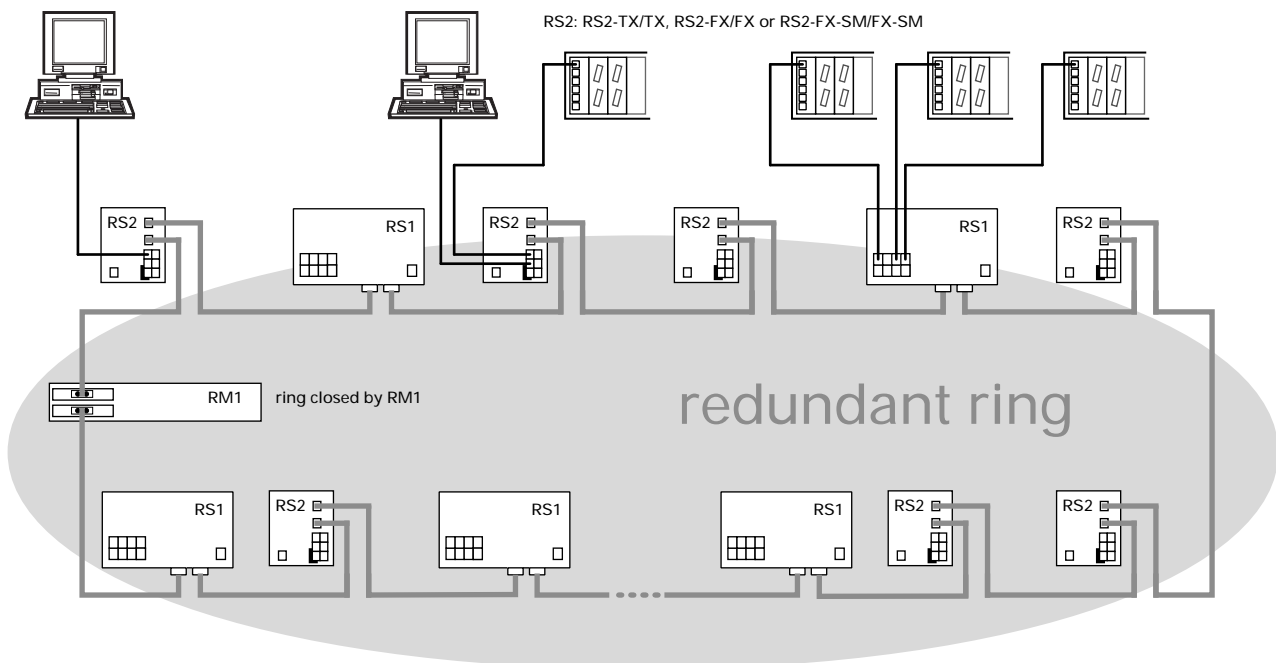


Fig. 7: Redundant ring structure

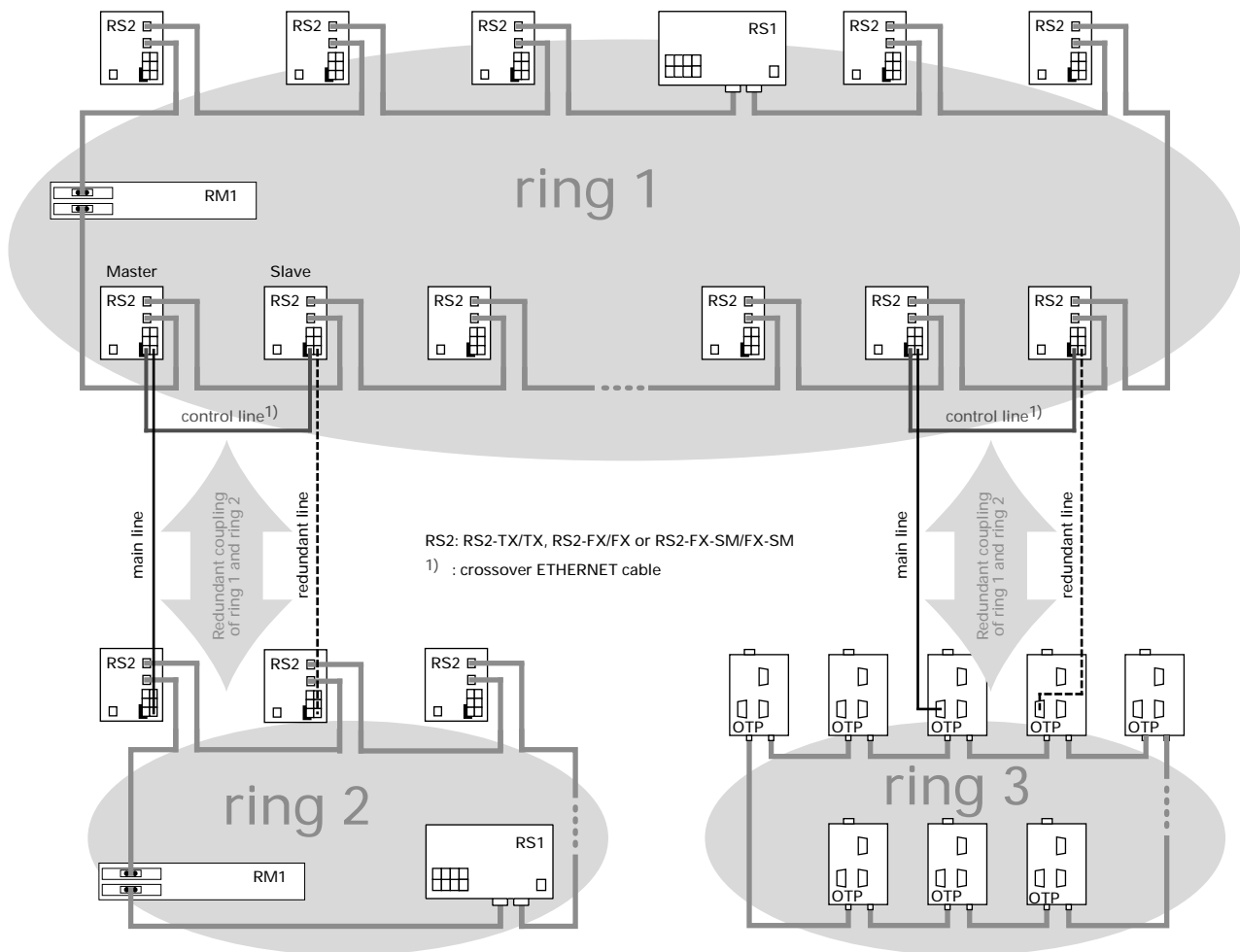


Fig. 8: Redundant coupling of rings

Note: In the case of the voltage supply being routed without redundancy, the RS2-.../... indicates the failure of a supply voltage. You can prevent this message by feeding in the supply voltage through both inputs.

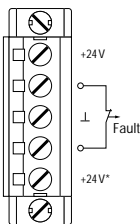


Fig. 9: Pin configuration of 5-pin terminal block

Ground connection
The RS2-.../... is grounded via a separate screw connection.

2. Configuration

2.1 LINE STRUCTURE

The RS2-.../... enables backbones in line structures to be built up. Cascading is effected using the backbone ports (see Fig. 6).

2.2 REDUNDANT RING STRUCTURE

With the redundancy manager function of the RS2-.../... you can close the two ends of a line structured backbone to a redundant ring (see Fig. 7). The RS2-.../... is integrated into the ring via the backbone ports (ports 6 and 7). Within a redundant ring any mixture of RS1 and RS2-.../... is possible. If one section fails the reaction time comes to less than 0.5 seconds at up to 50 RS1/RS2-.../... being cascaded.

2.3 REDUNDANT COUPLING OF NETWORK SEGMENTS

The built-in control intelligence of the RS2-.../... allows the redundant coupling of network segments (see Fig. 8). The connection of two network segments is realized via two separate paths. The RS2-.../... in the redundant line gets the redundancy function assigned by the DIP switch setting standby. The RS2-.../... in the redundant line and the RS2-.../... in the main line share their operating states via the control line (cross over ETHERNET cable). After the failure of the main line the redundant RS2-.../... enables the redundant line immediately. If the main line is okay again, the RS2-.../... in the main line informs the redundant RS2-.../... about this. The main line will be enabled and the redundant line will be disabled.

3. Assembly, startup procedure and dismantling

3.1 UNPACKING, CHECKING

- Check whether the package was delivered complete (see scope of delivery).
- Check the individual parts for transport damage.



Warning!
Use only undamaged parts!

3.2 ASSEMBLY

The equipment is delivered in a ready-to-operate condition. The following procedure is appropriate for assembly:

- Check whether the switch pre-setting suits your requirements (see chap. 1.7).
- Pull the terminal block off the RS2-.../... and wire up the supply voltage and indicator lines.
- Fit the RS2-.../... on a 35 mm standard bar to DIN EN 50 022.
- Suspend the upper snap-on slide bar of the RS2-.../... in the standard bar and press it down towards the standard bar until it locks in position.
- Fit the signal lines and if required the control line.
- Always connect the main line and the redundant line to port 1 of the RS-.../... for the redundant coupling of ring structures.

Notes:

- The front panel of the RS2-.../... is grounded via a separate ground connection.
- Do not open the housing.
- The shielding ground of the twisted pair lines which can be connected is electrically connected to the front panel.

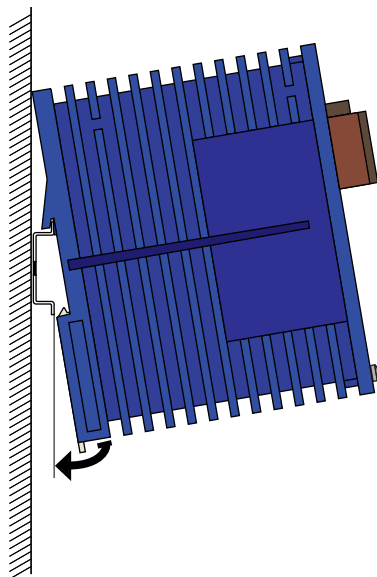


Fig. 10: Assambling the RS2-.../...

3.3 STARTUP PROCEDURE

You start up the RS2-.../... by connecting the supply voltage via the 5-pin terminal block. Lock the terminal block with the locking screw at the side.

3.4 DISMANTLING

- To take the RS2-.../... off the ISO/DIN rail, insert a screwdriver horizontally under the housing into the locking slide, pull it (without tipping the screwdriver) downwards and fold the RS2-.../... upwards.

4. Management

4.1 INTRODUCTION

The RS2-.../... supports SNMP- and Web-based management and thus serves for an extensive diagnosis and configuration functions for an easy startup procedure and extensive network- and device information. The RS2-.../... supports the TCP/IP protocol family.

You will find detailed descriptions regarding the SNMP management, functionality of the User Interface, web interface, system monitors, software update and Management Information Base MIB in the RS2-.../... manual.

4.2 SNMP-MANAGEMENT

- Factory settings: All parameters which can be adjusted via management are pre-setted to default values. You will find detailed descriptions in the RS2-.../... manual.

4.3 USER INTERFACE

The User Interface (UI) can be used in addition to the web interface. The functionality of the RS2-.../...s UI contains the following menus:

- Logout
Selecting Exit terminates the User Interface program.
- Systemparameter
Various addresses can be entered in the window presented on the screen (ip-address, gateway ip-address, netmask).
- Configuration
The User Interface gives you the possibility to save a configuration. A saved configuration can be restored. You can adjust whether a saved configuration is to be restored automatically after a reset.
- Update
The Uniform Resource Locator URL which indicates the protocol, the IP address and the path to the update file can be adjusted in this menu in case of a software update. To start the update, a reset is necessary.
- Ping
The command "ping" is used to test connections in the network. For this command, the management agent needs the IP address of the host which is to be requested, via the network, to respond. You receive a message indicating whether or not a connection exists.
- Password
You can change the password, which is synonymous with the first community, in this menu.

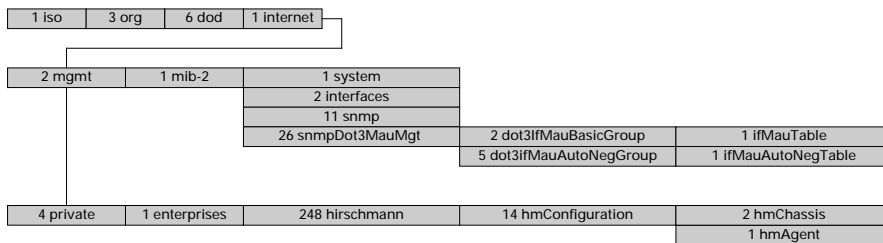


Fig. 11: MIBs supported by the RS2-.../...

4.4 WEB INTERFACE

The web interface serves for accessing easily to the object classes of the MIBs (ref. fig. 11) via a standard web browser. The access to the web interface is protected by a password. If you do not enter a password, only reading accesses to the RS2-.../... are possible.

– Factory setting: password „private“

4.5 SYSTEM MONITORS

System monitor 1

The system monitor 1 serves for loading the operating system via the V.24 interface. It is required only for service purposes. The system monitor 1 is available immediately after the system start (on 9600 baud).

It offers the following functions:

- Update Operating System: Update the operating system via X modem/CRC protocol
- Start System: Start operating system and applications
- Change Baudrate
- End: Quit the monitor program and restart the system.

System monitor 2

The system monitor 2 serves for updating the complete operating software of the RS2-.../... via V.24 or via the network. It is available after loading the operating system (on 19200 baud).

In case of the software update being started via the User Interface the monitor is opened directly.

It offers the following functions:

- Software Update V.24: Update of the operating software
- Software Update tftp: Update of the operating software.
- Note: The tftp-Pfad has to be defined correctly before the update.
- Cancel Automatic Update: Cancel the update process
- Change Baudrate
- Set Factory Settings: The factory settings (without system parameters) replace a possibly saved configuration.
- Reset: RS2-.../... boot again
- End: Quit the monitor program, causes the start of the management.

4.6 MIB

The Management Information Base MIB is designed in the form of an abstract tree structure. The branching points are the object classes. The "leaves" of the MIB are called generic object classes. Wherever necessary for unambiguous identification, the generic object classes are instantiated, i.e. the abstract structure is imaged on the reality, by specifying the port address or the source address. Values (integers, timeticks, counters, gauges or octet strings) are assigned to these instances; these values can be read and, in some cases, modified. The object description or object ID (OID) identifies the object class. The subidentifier (SID) is used for instantiation.

Example: The generic object class ifSpeed (OID = 1.3.6.1.2.1.2.2.1.5) is the description of the abstract information „interface speed“. It is, however, not possible to read any information from this, as the system does not know which interface is meant.

Specification of the subidentifier (1) images this abstract information on the reality (instantiates it), which means that it refers to the operational status of interface 1. A value is assigned to this instance and can then be read. The instance „get 1.3.6.1.2.1.2.2.1.5.1“, for example, returns the response „10 000 000“, which means that the speed of interface 1 is 10 MBit/s.

Note: Not all devices support all object classes. The value "not supported" is given in response to a non-supported object class request. Any attempt to alter a non-supported object class produces the message "badValue".

The MIBs supported by the RS2-.../... are illustrated in the MIB tree in figure 11.

The supported MIBs are itemized in details in the following lists. There are up to four details following every object class, each separated with a comma.

– Object class number in the MIB tree

– Objekt class syntax:

COU counter
IPADR IP address
INT integer
OID object identifier
OS octet string
STR string
TT time tick

– Access:

RO read only
WO write only
RW read/write

Private MIB

hmConfiguration (1.3.6.1.4.1.248.14)

hmChassis (1)

```

+-- ..hmSystemTable (1)
+-- hmSysProduct (1), INT,RO
+-- hmSysVersion (2), OS,RO
+-- hmSysGroupCapacity (3), INT,RO
+-- hmSysGroupMap (4), OS,RO
+-- hmSysMaxPowerSupply (5), INT,RO
+-- hmSysMaxFan (6), INT,RO
+-- hmSysGroupModuleCapacity (7), INT,RO
+-- hmSysModulePortCapacity (8), INT,RO
+-- ..hmPSTable (2)
+-- hmPSEntry (1)
+-- hmPSSysID (1),INT,RO
+-- hmPSID (2),INT,RO
+-- hmPSState (3),INT,RO
+-- ..hmRS2ext (10)
+-- hmRS2OperMode (1),INT,RO
+-- hmRS2ConfigError (2),INT,RO
+-- hmRS2SigRelayState (3),INT,RO
+-- hmSigLinkTable (4),INT,RO
+-- hmSigLinkEntry (1)
+-- hmSigLinkID (1),INT,RO
+-- hmSigLinkAlarm (2),INT,RW
+-- hmSigTrapReason (5),OID,RO
+-- hmSigReasonIndex (6),INT,RO

```

hmAgent (2)

```

+-- ..hmAction (1),INT,RW
+-- ..hmActionResult (2),INT,RO
+-- ..hmNetwork (3)
+-- hmNetLocalIPAddr (1),IPADR,RW
+-- hmNetLocalPhysAddr (2),OS,RO
+-- hmNetGatewayIPAddr (3),IPADR,RW
+-- hmNetMask (4),IPADR,RW
+-- ..hmFSTable (4)
+-- hmFSUpdFileName (1),OS,RW
+-- hmFSConfFileName (2),OS,RW
+-- hmFSLogFileName (3),OS,RW
+-- hmFSUserName (4),OS,RW
+-- hmFSTPPassword (5),OS,WO
+-- hmFSAction (6),INT,RW
+-- hmFSActionResult (8),INT,RO
+-- hmFSConfigState (9),INT,RW
+-- ..hmAuthGroup (7)
+-- hmAuthHostTableEntriesMax (1),INT,RO
+-- hmAuthCommTableEntriesMax (2),INT,RO
+-- hmAuthCommTable (3)
+-- hmAuthCommEntry (1)
+-- hmAuthCommIndex (1),INT,RO
+-- hmAuthCommName (2),OS,WO
+-- hmAuthCommPerm (3),INT,RO
+-- hmAuthCommState (4),INT,RW
+-- hmAuthHostTable (5)
+-- hmAuthHostEntry (1)
+-- hmAuthHostIndex (1),INT,RO
+-- hmAuthHostName (2),OS,RW
+-- hmAuthHostCommIndex (3),INT,RW
+-- hmAuthHostIPAddress (4),IPADR,RW
+-- hmAuthHostIPMask (5),IPADR,RW
+-- hmAuthHostState (6),INT,RW
+-- ..hmTrapGroup (8)
+-- hmTrapCommTableEntriesMax (1),INT,RO
+-- hmTrapDestTableEntriesMax (2),INT,RO
+-- hmTrapCommTable (3)
+-- hmTrapCommEntry (1)
+-- hmTrapCommIndex (1),INT,RO
+-- hmTrapCommCommIndex (2),INT,RW
+-- hmTrapCommColdStart (3),INT,RW
+-- hmTrapCommLinkDown (4),INT,RW
+-- hmTrapCommLinkUp (5),INT,RW
+-- hmTrapCommAuthentication (6),INT,RW
+-- hmTrapCommBridge (7),INT,RW
+-- hmTrapCommRMON (8),INT,RW
+-- hmTrapCommUsergroup (9),INT,RW
+-- hmTrapCommDualHoming (10),INT,RW
+-- hmTrapCommChassis (11),INT,RW
+-- hmTrapCommState (12),INT,RW
+-- ..hmTrapDestTable (4)
+-- hmTrapDestEntry (1)
+-- hmTrapDestIndex (1),INT,RO
+-- hmTrapDestName (2),OS,RW

```

```

+-- hmTrapDestCommIndex (3),INT,RW
+-- hmTrapDestIpAddress (4),IPADR,RW
+-- hmTrapDestIpMask (5),IPADR,RW
+-- hmTrapDestState (6),INT,RW
+-- ..hmLastAccessGroup (9)
+-- hmLastIpAddr (1), IPADR,RO
+-- hmLastPort (2), INT,RO
+-- hmLastCommunity (3), OS,RO

```

MIB II complying with RFC1213

mib-2 (1.3.6.1.2.1)

system (1)

```

+-- sysDescr (1),OS,RO,m
+-- sysObjectID (2),OID,RO,m
+-- sysUpTime (3),TT,RO,m
+-- sysContact (4),OS,RW,m
+-- sysName (5),OS,RW,m
+-- sysLocation (6),OS,RW,m
+-- sysServices (7),INT,RO,m

```

interfaces (2)

```

+-- ifNumber (1),INT,RO,m
+-- ..ifTable (2)
+-- ifEntry (1)
+-- ifIndex (1),INT,RO,m
+-- ifDescr (2),OS,RO,m
+-- ifType (3),INT,RO,m
+-- ifMtu (4),INT,RO,m
+-- ifSpeed (5),GAU,RO,m
+-- ifPhysAddress (6),OS,RO,m
+-- ifAdminStatus (7),INT,RW,m
+-- ifOperStatus (8),INT,RO,m
+-- ifLastChange (9),TT,RO,m
+-- ifInOctets (10),COU,RO,m
+-- ifInUcastPkts (11),COU,RO,m
+-- ifInNUcastPkts (12),COU,RO,m
+-- ifInDiscards (13),COU,RO,m
+-- ifInErrors (14),COU,RO,m
+-- ifInUnknownProtos (15),COU,RO,m
+-- ifOutOctets (16),COU,RO,m
+-- ifOutUcastPkts (17),COU,RO,m
+-- ifOutNUcastPkts (18),COU,RO,m
+-- ifOutDiscards (19),COU,RO,m
+-- ifOutErrors (20),COU,RO,m
+-- ifOutQLen (21),GAU,RO,m
+-- ifSpecific (22),OID,RO,m

```

snmp (11)

```

+-- snmplnPks (1),COU,RO,m
+-- snmpOutPkts (2),COU,RO,m
+-- snmplnBadVersions (3),COU,RO,m
+-- snmplnBadCommunityNames (4),COU,RO,m
+-- snmplnBadCommunityUses (5),COU,RO,m
+-- snmplnASNParseErrs (6),COU,RO,m
+-- snmplnTooBig (8),COU,RO,m
+-- snmplnNoSuchNames (9),COU,RO,m
+-- snmplnBadValues (10),COU,RO,m
+-- snmplnReadOnly (11),COU,RO,m
+-- snmplnGenErrs (12),COU,RO,m
+-- snmplnTotalReqVars (13),COU,RO,m
+-- snmplnTotalSetVars (14),COU,RO,m
+-- snmplnGetRequests (15),COU,RO,m
+-- snmplnGetNexts (16),COU,RO,m
+-- snmplnSetRequests (17),COU,RO,m
+-- snmplnGetResponses (18),COU,RO,m
+-- snmplnTraps (19),COU,RO,m
+-- snmpOutTooBig (20),COU,RO,m
+-- snmpOutNoSuchNames (21),COU,RO,m
+-- snmpOutBadValues (22),COU,RO,m
+-- snmpOutGenErrs (24),COU,RO,m
+-- snmpOutGetRequests (25),COU,RO,m
+-- snmpOutGetNexts (26),COU,RO,m
+-- snmpOutSetRequests (27),COU,RO,m
+-- snmpOutGetResponses (28),COU,RO,m
+-- snmpOutTraps (29),COU,RO,m
+-- snmpEnableAuthenTraps (30),INT,RW,m
Traps:
+-- coldStart (0)
+-- authenticationFailure (4)

```

MIB II Maumanagement (Auto Negotiation) nach RFC 2239

mib-2 (1.3.6.1.2.1)
snmpDot3MauMgt (26)

dot3IfMauBasicGroup (2)

```

+-- ..ifMauTable (1)
+-- ifMauEntry (1)
+-- ifMauIfIndex (1),INT,RO,cur
+-- ifMauIndex (2),INT,RO,cur
+-- ifMauType (3),OID,RO,cur
+-- ifMauStatus (4),INT,RW,cur
+-- ifMauMediaAvailable (5),INT,RO,cur
+-- ifMauMediaAvailableStateExits (6),COU,RO,cur
+-- ifMauJabberState (7),INT,RO,cur
+-- ifMauJabberingStateEnters (8),COU,RO,cur
+-- ifMauFalseCarriers (9),COU,RO,cur
+-- ifMauTypeList (10),INT,RO,cur
+-- ifMauDefaultType (11),OID,RW,cur
+-- ifMauAutoNegSupported (12),INT,RO,cur
dot3IfMauAutoNegGroup (5)
+-- ..ifMauAutoNegTable (1)
+-- ifMauAutoNegEntry (1)
+-- ifMauAutoNegAdminStatus (1),INT,RW,cur
+-- ifMauAutoNegRemoteSignaling
(2),INT,RO,cur
+-- ifMauAutoNegConfig (4),INT,RO,cur
+-- ifMauAutoNegCapability (5),INT,RO,cur
+-- ifMauAutoNegCapAdvertised
(6),INT,RW,cur
+-- ifMauAutoNegCapReceived (7),INT,RO,cur
+-- ifMauAutoNegRestart (8),INT,RW,cur

```

5. Further support

In the event of technical queries, please talk to the Hirschmann contract partner responsible for looking after you or directly to the Hirschmann office. You can find the addresses of our contract partners – on the Internet (<http://www.hirschmann.de>).

Our hotline is also at your disposal:
Tel. +49(7127) 14-1538 (Fax -1542)

6. Technical data

General data

Operating voltage	DC 24 V -25% +33% safety extra-low voltage (SELV) (redundant inputs decoupled)	
Current consumption	0,8 A maximum, at 24 VDC	
Overload current protection at input	non-changeable thermal fuse	
Dimensions W x H x D	110 mm x 131 mm x 111 mm	4,3 in x 5,2 in x 4,4 in
Mass	850 g	1,87 lb
Ambient temperature	0 °C to + 50 °C	
Storage temperature	- 20 °C to + 80 °C	
Humidity	10% to 90% (not-condensing)	
Laser protection	Class 1 conform to EN 60825	
Protection class	IP 20	
Interference immunity	EN 50082-2	
Radio interference level		
Conducted Emission	EN 55022 Class B	
Radiated Emission	EN 55022 Class A	
	Warning! This is a Class A Equipment. This equipment may cause radio interference if used in a residential area; in this case it is the operator's responsibility to take appropriate measures.	

Network size

Control line		
for the redundant coupling of rings	< 10 Ohm (back and forth direction together)	
TP port 10BASE-T		
Length of a twisted pair segment	100 m (328 ft) maximum	
TX port 100BASE-TX (RS2-TX/TX, RS2-FX/FX, RS2-FX-SM/FX-SM)		
Length of a twisted pair segment	100 m (328 ft) maximum	
F/O port 100BASE-FX (RS2-FX/FX, RS2-FX-SM/FX-SM)		
According to IEEE 802.3u 100BASE-FX		
System attenuation		
50/125 µm fiber (multimode)	8 dB	(RS2-FX/FX)
62,5/125 µm fiber (multimode)	11 dB	(RS2-FX/FX)
10/125 µm fiber (singlemode)	11 dB	(RS2-FX-SM/FX-SM)
Wave length	1300 nm	
F/O line length (example)		
50/125 µm fiber (multimode)	3000 m (9843 ft) maximum	(data of fiber: 1,6 dB/km, 500 Mhz*km)
62,5/125 µm fiber (multimode)	3000 m (9843 ft) maximum	(data of fiber: 2,6 dB/km, 500 Mhz*km)
10/125 µm fiber (singlemode)	40 km (131.234 ft) maximum	(data of fiber: 0,2 dB/km)

Interfaces

RS2-.../...	5 TP/TX ports V.24 port Stand by port	(RJ45 sockets, 10/100 MBit/s), external management, (RJ45 socket),
in addition on RS2-.../... 2 backbone ports each:		
– RS2-TX/TX	2 TX ports	(RJ45 sockets, 10/100 MBit/s)
– RS2-FX/FX	2 FX ports	(SC sockets, multimode, 100 MBit/s)
– RS2-FX-SM/FX-SM	2 FX ports	(SC sockets, singlemode, 100 MBit/s)
Indicator contact	1 A maximum, 24 V	

Displays

Equipment status	1 x green LED 1 x green LED 1 x red LED 1 x green LED 1 x green/yellow LED	P1 – power 1, supply voltage 1 present P2 – power 2, supply voltage 2 present FAULT – indicator contact is open and indicates error Stand by – stand by function RM – redundancy manager
Port status	7 x green/yellow LED	1 bis 7 – data, link status

Controls

2-pole DIP switch	RM – activate redundancy manager functionality Stand by – activate stand by function
-------------------	---

Scope of delivery

Rail Switch RS2-.../... incl.	terminal block for supply voltage description and operating instructions manual RS2-.../... on CD-ROM
-------------------------------	---

Order number	
Rail Switch RS2-FX/FX	943 653-001
Rail Switch RS2-FX-SM/FX-SM	943 655-001
Rail Switch RS2-TX/TX	943 654-001

Accessories

Ethernet manual	943 320-011
Terminal access cable	943 301-001



Notes on CE identification
The devices comply with the regulations of the following European directive:

89/336/EEC

Council Directive on the harmonisation of the legal regulations of member states on electromagnetic compatibility (amended by Directives 91/263/EEC, 92/31/EEC and 93/68/EEC).

Area used	Requirements for emitted interference	interference immunity
Industrial	EN 50081-2: 1993 EN 55022 Class A: 1998	EN 50082-2: 1995

The EU declaration of conformity is kept available for the responsible authorities in accordance with the above-mentioned EU directives at:

Richard Hirschmann GmbH & Co.
Automation and Networking Solutions
Stuttgarter Straße 45-51
D-72654 Neckartenzlingen
Telephone ++49-7127-14-1538

The product can be used in the residential sphere (residential sphere, business and trade sphere and small companies) and in the industrial sphere.

The precondition for compliance with EMC limit values is strict adherence to the construction guidelines specified in this description and operating instructions.



FCC Note:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and

used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



Recycling Note:

After its use, this product has to be processed as electronic scrap to a proper disposal according to the prevailing waste disposal regulations of your community / district / country / state.

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