

# RLM02

## Redundancy Link Module for PROFIBUS DP/FMS



The RLM02 converts a non-redundant PROFIBUS line to two redundant RS485 lines or vice versa.

### Benefits

- Conversion of one simple, non-redundant PROFIBUS line into two reciprocally redundant lines A/B
- Use on PROFIBUS DP/FMS lines
- Automatic line selection
- Transmission rate 9.6 kbit/s... 12 Mbit/s
- Monitoring of communication
- Repeater functionality
- Redundant power supply
- Status and error display
- Monitoring of the power supply
- Potential-free alarm contact
- Simple assembly on DIN mounting rail

### Features

You can position the module directly after a master, before a bus segment with several slaves or before an individual slave. PROFIBUS stations with redundant couplers [K] can be directly connected to the PROFIBUS set redundant by RLM02.

Stations with only one interface can be optionally assigned to the A or B line. Each RLM02 PROFIBUS interface can serve up to 31 PROFIBUS stations. Using repeaters [R] and media converters [O/E] makes it possible to increase the length of the PROFIBUS lines and the number of stations.

### Function

The three RS 485 interfaces of the module support all transmission rates specified in IEC 61158-2 for the PROFIBUS from 9.6 kbit/s to 12 Mbit/s. The module has repeater functionality, i.e., it regenerates the signal shape and the amplitude of received data. RLM02 monitors all three lines A, B and M for activity and error states.

Detected errors are signalled by LEDs (light emitting diodes) on the front panel. The potential-free alarm contact activated in parallel to this can be polled for diagnostic purposes by the process control system PCS or by a programmable logic control PLC. The three serial RS 485 interfaces are potential-free relative to each other and to the power supply. This is a functional electrical isolation.

The first data coming in over line A or line B with a correct telegram start are routed to terminal M. With simultaneity, either line A or line B is selected at random. Testing and selection is always based on the first character. In the case of a telegram start with error on A, the control logic switches to the redundant line B. The same procedure applies vice-versa for line B.

Data coming in over line M with a correct telegram start are routed in parallel to the two terminals A and B. The test for data is always based on the first character. In the case of a telegram start with error, the control logic does not output any data to A and B.

Either a single or a redundant power supply with 24 VDC is possible. The distribution of load across L1+ and L2+ is based on the level of the voltages applied. If a voltage source fails, the switch to the redundant supply source is made without interruption. A monitoring logic circuit tests whether both voltages are present.

Note: Further information see the user manual 3BSE092754 Device Management PROFIBUS DP FMS Redundancy Link Module RLM02.

### Construction

Three Sub-D connectors A, B and M are located on the front panel of the RLM02 for connection of the PROFIBUS cable. The 8-pin male multi-pin connector with the associated terminal strip is used to connect the alarm and power supply wires. There are also LEDs for activity/error display, a rotary switch for setting the transmission rate and a reset button (activate transmission rate).

### Connectors / Terminals

Description:	Meaning:	Connection:
A	redundant PROFIBUS lines	9-pin Sub-D connector Open
B		
M	non redundant PROFIBUS line	
Terminal strip	Power supply (L1+, L2+, M), alarm (F1, F2) and earth connection (E)	8 pole terminal strips

### Adjustment and indication

Description:	Meaning:	Remarks:
Act	Bus activity on line A, B or M	yellow LED
Err	Error on line A, B or M	red LED
Power	Power supply o.k.	green LED
Baud rate	Rotary switch for baud rate setting	9.6 kBd ... 12 MBd
Reset	Button for transmission rate activation	-/-

### Technical data

Baud rate settings										
Switch setting:	0	1	2	3	4	5	6	7	8	9
Baud rate:	12	6	3	1.5	500	187.5	93.75	19.2	9.6	No function
Unit:	MBit/s or MBd				kBit/s or kBd					

**Technical data:****Serial interfaces**

• Connections	A, B and M
• Transmission rate	9.6 kBit/s to 12 MBit/s
• Type	RS 485
• Connection	9-pin Sub-D connector
• Electrical isolation	To IEC/EN 61010-1, functionally isolating
• Test voltage	500 Veff
• Device protection class	3

**Line length restriction**

Master ==> M	50 m
• M ==> Slave	50 m
• A/B ==> A/B	According PROFIBUS specification

**Data telegram delay**

• A/B==> M	11 Bit times [μs] + 0.6 μs
• M==> A/B	4 Bit times [μs] + 0.6 μs

**Power supply**

• Operating voltage	24 VDC (+20 ... +33 V)
• Power consumption	120 mA typically at 24 V
• Power loss	Approx. 3.6 W
• Connection	8-pin terminal strip 0.14
• Wire cross section	... 1.5 mm <sup>2</sup>

**Ambient conditions**

• Operating temperature	0 ... 55°C
• Transport / storage temperature	-30 ... 85°C
• Relative humidity	Max. 75% non-condensing in operation
• Altitude	Up to 2000 m

**Alarm contact**

• Function	Normally closed / Open in case of error
• Switching voltage	< 60 VDC
• Switching current	Max. 1 A

**Design**

• Dimensions	134 x 56 x 70 mm (H x W x D)
• Weight	Approx. 330 g
• Attachment	Mounting rail, 35 mm
• Protection	IP 20
• Placement	indoor use (installation in an appropriate enclosure is equivalent)

**Certification**

• Corrosive atmosphere	G3 (ISA-S71.04 Severity level: G3)
• USA	UL-listed
• Canada	CSA
• Europe	CE
• ships and maritime systems	DNV GL, (location class) Temperature B (location class) Humidity B (location class) Vibration B (location class) EMC B (location class) Enclosure A

**Accessories**

(to be ordered separately, see Orderlist)	3 PROFIBUS connectors
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**Ordering Information**

**Pricebook: Freelance, 2PAA118841 / Price list: Freelance, 2PAA108977**

**Pricebook: S900 IO and Fieldbus Network, 2PAA102823 / Price list: Profibus, 3BDD013232**

Description	Article No.	Delivery time
<b>RLM02</b> , PROFIBUS Redundancy Link Module for cable redundancy	3BSE091723R1	
<b>PCO 011</b> , PROFIBUS DP connector with ON/OFF switchable termination resistor, up to 12 MBd connection	3BDZ000371R1	
<b>PCO 012</b> , PROFIBUS DP connector with ON/OFF switchable termination resistor and test equipment jack, up to 12 MBd connection	3BDZ000372R1	

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