

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:	MBd or MBit/s				kBd or kbit/s					

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 ²

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
RLM02 , PROFIBUS Redundancy Link Module for cable redundancy	3BSE091723R1	
PCO 011 , PROFIBUS DP connector with ON/OFF switchable termination resistor, up to 12 MBd connection	3BDZ000371R1	
PCO 012 , PROFIBUS DP connector with ON/OFF switchable termination resistor and test equipment jack, up to 12 MBd connection	3BDZ000372R1	

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