Application on ships and maritime systems

RLM01 is certified for applications on ships and maritime systems by the Germanic Lloyd (GL). To meet the increased requirements regarding EMC and overvoltage, RLM01 must have one or two "24 VDC power supply filters (surge)" depending on the supply (single / redundant). The supply of several RLM01 behind one filter is not admissible. The max. length of the lines between filter and RLM01 must not exceed 1 m. Possibly needed fuse elements have to be arranged before the filter. The electrical connection to ground potential is effected via the module attachment as with RLM01. The following example shows the interconnection in case of a redundant supply of RLM01. For a single supply of RLM01, the L2+ terminal has to be bridged with the second L1+ terminal.

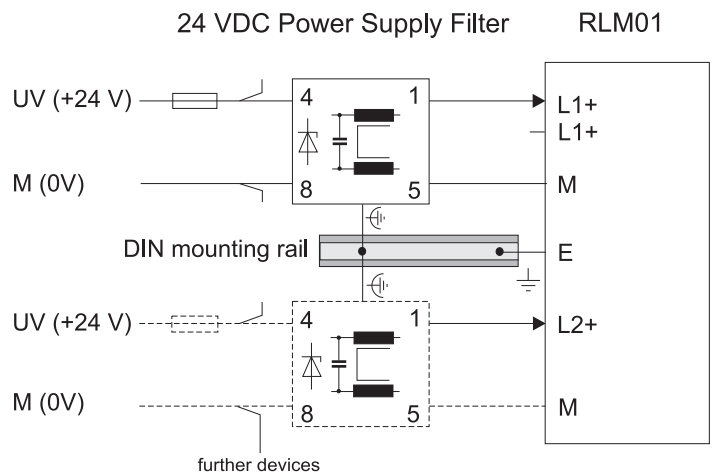

Figure 8. RLM01 with 24 VDC power supply filter

Section 4 Monitoring

The LEDs assigned to lines A, B and M on the front panel are used to indicate bus activity (Act) and possible errors (Err) on the PROFIBUS lines. The monitoring logic in RLM 01 assumes that lines A & B are used for communication during operation. If it is subsequently possible to receive data over only one of the two lines, the non-available line is reported as faulty. If the redundant (second) line also fails, the same state results for the monitoring logic as for a redundant PROFIBUS link A AND B that is not in operation at all. Since the logic has no criterion for making a distinction, no error message is generated by RLM 01. The alarm contact remains closed and the two Act and Err LEDs are unlit. But the condition just described does not go undetected. In this case the PROFIBUS master generates the error message, since it cannot access the slaves either via line A or line B.
An Err LED flashing at an undefined pulse/pause ratio indicates that the line in question has failed AND that there is only sporadic data traffic on the redundant line.

The monitoring logic can only indicate operating and error states correctly if the baud rate is set correctly.

RLM 01 also tests whether the supply voltage is present at inputs L1+ and L2+. A single power supply with L1+ alone always requires a cable jumper from L1+ to L2+ (see Chapter 3). This prevents an unwanted error message.

Section 5 Signalling

The monitoring logic in RLM 01 indicates operating and possible error states via LEDs on the front panel. In normal operation, all yellow Act LEDs (flashing or continuous) and the green Pwr LED are lit. The two red Err LEDs are unlit. Any signalling configuration other than this indicates a communication or power supply error.

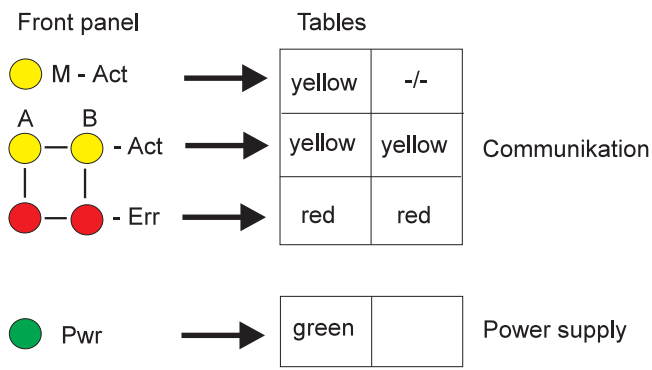

Figure 9. Assignment of LEDs for representation in the table

The text (yellow, red, green) in the two following tables means that the corresponding LED is lit, thus displaying an operating or error state.

Communication

Act/Err LEDs		Alarm contact	Meaning
Yellow	-/-	Closed	Data reception via all three wires (uninterrupted operating status)
Yellow	Yellow		
Unlit	Unlit		
Yellow	-/-	Open	Data reception via line A / M but not via line B
Yellow	Unlit		
Unlit	Red		
Yellow	-/-	Open	Data reception via line B / M but not via line A
Unlit	Yellow		
Red	Unlit		
Unlit	-/-	Closed	Data reception via line A / B but not via line M
Yellow	Yellow		
Unlit	Unlit		
Yellow	-/-	Open	Data reception via line A / M and continuous transmitter on line B
Yellow	Yellow		
Unlit	Red		
Yellow	-/-	Open	Data reception via line B / M and continuous transmitter on line A
Yellow	Yellow		
Red	Unlit		
Unlit	-/-	Closed	No data reception via lines A / B and M
Unlit	Unlit		
Unlit	Unlit		

Redundant power supply

Pwr LED	Act/Err LED's	Alarm contact	Meaning
Green	Depending on status	Closed	RLM 01 is supplied with L1+ and L2+
Unlit	Depending on status	Open	L1+ or L2+ missing
Unlit	All unlit	Open	L1+ and L2+ missing

Simple power supply

Pwr LED	Act/Err LED's	Alarm contact	Meaning
Green	Depending on status	Closed	RLM 01 is supplied with L1+
Unlit	Depending on status	Open	Wire jumper to L2+ missing
Unlit	All unlit	Open	L1+ missing

Section 6 Technical data

Serial interfaces - Connections - Transmission rate - Type - Connection - Electrical isolation - Test voltage - Device protection class	 A, B and M 9.6 kBit/s to 12 MBit/s RS 485 9-pin Sub-D connector To VDE 0110, functionally isolating 500 Veff 3
Line length restriction - Master ==> M - M ==> Slave - A/B ==> A/B	 50m 50m according PROFIBUS specification
Data telegram delay - A/B ==> M - M ==> A/B	 11 Bit times [us] + 0,6 us 4 Bit times [us] + 0,6 us
Power supply - Operating voltage - Power consumption - Power loss - Connection - Wire cross section	 24 VDC (+20 .. +33 V) 150 mA typically at 24 V Approx. 3.6 W 8-pin terminal strip 0.14 ... 1.5 mm2
Ambient conditions - Operating temperature - Transport / storage temperature - Relative humidity - Altitude	 0 ... 50°C -30 ... 85°C Max. 75% non-condensing in operation up to 2000 m
Alarm contact - Function - Switching voltage - Switching current	 Open in case of error < 60 VDC Max. 1A