

M-BUS repeater MBRP-250

M-BUS Series

Instruction Manual

MBRP-250 is microcontroller-based bidirectional **M-bus** to M-bus repeater. It can supply power to maximum of 250 m-bus slave devices. MBRS-250 is used in building and industrial tax meters and/or sensors remote reading networks, where extension of the m-bus network is needed. It is one standard load, has output short circuit protection and is mounted on standard M35 DIN rail.

1. General technical data

- rated m-bus input load
 - 1.5mA – 1.8mA
- max. number of m-bus slave devices powered
 - 250
- max. output current
 - 385 ± 5 mA
- output current protection level
 - 410 ± 5 mA
- nominal output voltage (mark)
 - $35.5 \text{ VDC} \pm 1 \text{ V}$
- zero output voltage '0' (space)
 - 22-25 VDC
- power supply voltage
 - 150-250 VAC (200-350 VDC)
- max. power consumption
 - < 21 W (@ 250 m-bus slaves connected)
- ambient temperature, operating
 - $-20 \div +50$ °C
- ambient temperature, storage
 - $-50 \div +90$ °C
- air humidity
 - 40÷90 %
- dimensions (H/W/D)
 - 105/142/74 mm
- IP protection class
 - IP30
- max. transmissible signal baud rate
 - 4800 bps
- max. distance between master and slave in the network
 - 350 m
- display
 - 7 LEDs (on, protection, mbus in, overload, collision, RX, TX)
- weight
 - 475 g

2. MBRP-250 operation

MBRP-250 begins operation immediately after power-up. The sequence is the following:

Initialization mode (0.8-1.0 s)

- in the first 0.8-1.0s the MBRP-250 initializes. During initialization the output is shut down and therefore output voltage is 0 V. LEDs 'on' and 'prot' (protection) are turned on, if there is m-bus input voltage – led 'in' is also turned on. The led 'IN' is on even if power is off, but there is m-bus input voltage
- the output is enabled and the network current consumption is measured. The 'prot' LED goes out, LED 'TX' (transmitting mark) is turned on. On short circuit the output is shut down, LED 'prot' is turned on and LEDs 'bus' and 'TX' are turned off. Then MBRP-250 waits for some seconds before attempting to power the network again. If the attempt is unsuccessful (i.e. the short circuit is still present) the whole sequence is repeated again. It is possible LED 'coll' to be lit for few minutes after start.

Normal operation

MBRP-250 measures the current consumption of the network. After the consumption exceeds 385mA the 'over' (overload) LED is turned on, in some cases led 'coll'. If the consumption further increases and exceeds 410mA the output is disabled until current consumption level is restored to normal levels. For external converter MBRP it is a standard m-bus load (1.5mA). It translates received m-bus telegrams to its m-bus output to all connected devices and vice-versa. The data is transmitted without any delay. When transmitting data to the network, the 'TX' LED blinks and when transmitting data from the network, the 'RX' LED blinks. Full-duplex communication is possible, but is not used since this depends on the external converter. When collision is detected (simultaneous transmission of more than one slave device in the network), the 'coll' (collision) LED is turned on. However, the data is sent through the serial port and should be recognized as garbage by the master converter or PC program.

3. Mounting and electrical connections

MBRP-250 should be mounted on standard M35 din-rail. All connections should be made with isolated multi-wire cables with cross section $0.5\text{mm}^2 \div 2.5\text{mm}^2$. All the connections are shown in the figure and the tables below (from left to right):

1 'Power' – 3P terminal block

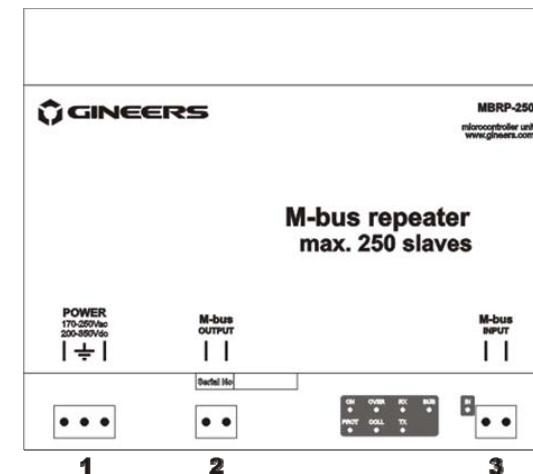
No	Description
1, 3	Power input L, N
2	Power Grounding input PE

2 'M-bus output' – 2P terminal block

No	Description
1	M-bus output, +
2	M-bus output, -

3 'M-bus input' 2P terminal block

No	Description
1	M-bus input, +
2	M-bus input, -



4. Warranty

The warranty of the device is limited to 2 years from the date of sale. If the device shows any defect or malfunctions during that period, the manufacturer is obligated to repair the device in its own service for manufacturer's expense, or, if the repair is impossible, to replace the device with new one. The transportation costs to the manufacturer's service are due to the client. The warranty voids if this manual's instructions are not met, warranty seals are removed or the device was opened by unauthorized by the manufacturer personnel.

Serial number:.....

Date of sale:.....

Signature:.....

5. The package contains

- MBRP-250 - 1 pc.
- Instruction manual - 1 pc.

6. Manufacturer

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