

M-BUS converter **MBRS-250****M-BUS Series****Instruction Manual**

MBRS-250 is microcontroller-based bidirectional full-duplex **M-bus** to **RS-232C** converter. 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. It has output short circuit protection. It is mounted on standard M35 DIN rail.

1. General technical data

- max. number of m-bus slave devices – 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 – 600 m
- display – 7 LEDs (on, protection, transmitting, overload, collision, RX, TX)
- weight – 475 g

2. MBRS-250 operation

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

Initialization mode (0.2-0.3 s)

- In the first 0.2-0.3s the MBRS-250 initializes. During initialization the output is shut down and therefore output voltage is 0 V. LEDs 'on' (turned on) and 'prot' (protection) are turned on.
- Then the output is enabled and the network current consumption is measured. The 'prot' LED goes out, LEDs 'bus' (output enabled) and 'TX' (transmitting mark) are turned on. On short circuit the output is shut down, LED 'prot' is turned on and LEDs 'bus' and 'TX' are turned off. Then MBRS-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

MBRS-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. MBRS-250 can be connected to a computer (or other device such as modem, transceiver, etc.) through its RS-232C interface. Thus it is possible to access the slave devices in the network. The device, connected to the RS-232C port of MBRS-250 can access every slave device in the network, can issue commands and collect data. In this case MBRS-250 connects all the devices in the network to the "reading" device, maintaining all the communication in the network. 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. 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.

3. Mounting and electrical connections

MBRS-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:

C1 'Power' – 3P terminal block

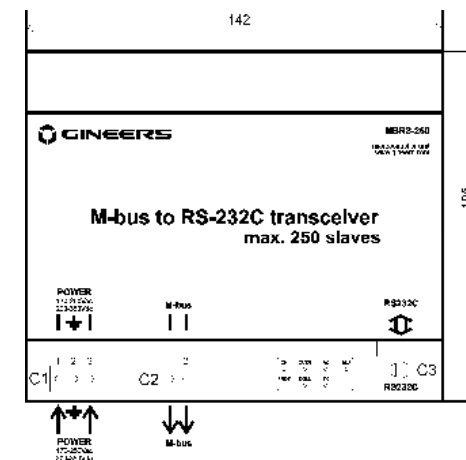
No	Description
1, 3	Power input L, N
2	Power Grounding input PE

C2 'M-bus' – 2P terminal block

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

C3 'RS-232C' – RJ-45

No	Description
1, 4, 6, 7, 8	Not connected
2	RXD
3	TXD
5	GND

**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

- MBRS-250 - 1 pc.
- Instruction manual - 1 pc.
- Data cable (DB9F to RJ-45) 1 m – 1 pc.

6. Manufacturer

Gineers Ltd.
7 Iskarsko shausse blvd, building 4
1528 Sofia, Bulgaria
phone/fax: +359 2 975 81 05
URL: <http://www.gineers.com>
mailto: office@gineers.com