

## M-BUS converter MBRS-10

## M-BUS Series

### Instruction Manual

**MBRS-10** is microcontroller-based bidirectional full-duplex **M-bus** to **RS-232C** converter. It can supply power to maximum of 10 m-bus slave devices. MBRS-10 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 - 10
- max. output current - 35 mA
- output current protection level - 45 mA
- nominal output voltage (mark) - 36 VDC ± 1 V
- zero output voltage '0' (space) - 22-25 VDC
- power supply voltage - 150-250 VAC (200-350 VDC)
- max. power consumption < 3 W (@ 10 m-bus slaves connected)
- ambient temperature, operating - -20÷+50 °C
- ambient temperature, storage - -50÷+90 °C
- air humidity - 40÷90 %
- dimensions (H/W/D) - 75/45/105 mm
- IP protection class - IP30
- max. transmissible signal baud rate - 4800 bps
- max. distance between master and slave in the network - 1200 m
- display - 3 LEDs  
(bus/TX, collision, alarm/overload)
- weight - 200 g

#### 2. MBRS-10 operation

MBRS-10 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-10 initializes. During initialization the output is shut down and therefore output voltage is 0 V. No LED is turned on.
- Then the output is enabled and the network current consumption is measured. LED 'bus/TX' (output enabled/TX) is turned on. On short circuit the output is shut down, LED 'alarm/overload' is turned on. Then MBRS-10 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.

##### Normal operation

MBRS-10 measures the current consumption of the network. After the consumption exceeds 35mA the 'alarm/overload' LED is turned on. If the consumption further increases and exceeds 45mA the output is disabled until current consumption level is restored to normal levels. MBRS-10 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-10 can access every slave device in the network, can issue commands and collect data. In this case MBRS-10 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 'bus/TX' LED blinks. Full-duplex communication is possible. When collision is detected (simultaneous transmission of more than one slave device in the network), the 'collision' (collision) LED is turned on. However, the data is sent through the serial port.

### 3. Mounting and electrical connections

MBRS-10 should be mounted on standard M35 din-rail. All connections should be made with isolated multi-wire cables with cross section 0.5mm<sup>2</sup>÷2.5mm<sup>2</sup>. All the connections are shown in the figure and the tables below:

| No   | Description      |
|------|------------------|
| 1    | M-bus output, +  |
| 2    | M-bus output, -  |
| 3, 4 | Power input L, N |

##### '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' 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-10 - 1 pc.
- Instruction manual - 1 pc.
- Data cable (DB9F to RJ-45) 1 m - 1 pc.

#### 6. Manufacturer

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