

## M-Bus reporting device

### MBD-X250

### USER MANUAL



MBD-X250 is a stand alone device, which is used to read all m-bus/modbus devices in a network. MBD-X250 is equipped with large LCD display, showing information for every device and has big non-volatile memory. MBD can be programmed what to show for every device in the network - user number, address, free text up to 20 symbols (both cyrillic and latin), current consumption, consumption for maximum a year back, etc. It can be connected to other devices such as GPRS transceivers, phone or ethernet modems to send data to a remote location. MBD-X250 is usually used when instant reading 'on place' has to be done repeatable by person and the client do not want to invest in software for reports or modules for transmitting data to a remote central location. Up to 250 devices can be connected via modbus or m-bus convertor to one MBD-X250. Data is shown every six seconds for each device separately, showing measured consumption and programmed info.

MBD is meant to be mount in industrial enclosures either on the front door or inside, maintaining visible access through transparent door.

#### 1. Main technical parameters

- max number of devices to read – 40/120/250
- power supply – 55-250 VAC/ 80-350 VDC
- maximum consumption – < 2W
- display – symbol LCD, 4 rows 20 symbols each
- keyboard – 6 membrane buttons
- interface – 2xRS-232
- data transmission speed – 300/2.4k bps
- initial setup of serial interface – 2.4kbps, even, 8 bit data, 1 stop
- work temperature – -20° C ÷ +55° C
- storage temperature – -50 ÷ +90 °C
- humidity – 40 ÷ 90 %
- dimensions (H/W/D) - 72/144/65 mm
- mounting hole dimensions – 67/137 mm, no rounding
- embedded battery – LiMnO<sub>2</sub> 60mAh
- own weight – 400 g

#### 2. Operation of MBD-X250

MBD-X250 is mounted, set and turn in exploitation from qualified personnel, familiar with this user manual and specialized software for MBD-X250 setup.

In normal mode of operation MBD-X250 shows consequently consumption from all connected tax instruments. Every readout is changed automatically (incremental) every 6 seconds. For a given connected instrument via m-bus or modbus following data is shown on MBD's display:

- user number – from 0 to 999;
- quantity measured – hot/cold water, energy, heat, gas, etc.;
- tax instrument primary m-bus address;

- free user text up to 20 symbols, latin/Cyrillic;
- value and unit of measured quantity (for example 465.8 m<sup>3</sup> or 44556.3 kWh);
- date and time.

This is illustrated on Fig. 1:

```

      2 8 - C o l d   w a t e r / A 0 2 4
A p a r t m e n t   N o   2 8
C o u n t e r :       1 3 6 . 5   m 3
2 8 - M a y - 2 0 1 0           1 2 : 2 3
  
```

Fig. 1. Normal operation of MBD-X250

Data is displayed with accuracy of 0.1 from measured quantity.

Pressing buttons "arrow up" or "arrow down" user can go to previous or next address in the network, instead of waiting for 6 seconds to pass.

MBD-X250 initiate full readout (the whole network) 4 times daily (00:00, 06:00, 12:00 and 18:00h) and last readout is remembered in non-volatile memory. Display shows the recent readout made.

Pressing button "OK" user can see pulse information, not quantity. MBD-X250 shows initial pulse values when set in exploitation and current pulse values. If no button is pressed for 6 seconds MBD-X250 returns to normal mode of operation, showing info for some device in the network list.

Pressing buttons "arrow left" or "arrow right" user can see additional info for the currently displayed tax instrument. In the beginning of every month MBD-X250 remembers in non-volatile memory last readout (1<sup>st</sup> day, 00:00h). So, using this buttons user can see monthly consumption for 12 months back. Data is shown in consumption units, not pulses, with exact time and date readout was taken. If no button is pressed for 6 seconds MBD-X250 returns to normal mode of operation, showing info for the next device in the network list.

If power supply fails MBD-X250 continues to work in power down mode until embedded battery discharges (about 7 days if battery is fully charged). The display does not work to save power. When power supply comes again, display is turned on automatically and MBD-X250 enters normal mode of operation. If power supply fails for very long time (time enough to discharge accumulator battery in MBD), the only thing this will affect is real time clock – i.e. current time and date. Setup of MBD-X250, programmed devices in the network, their parameters and measured information stays intact.

Programming parameters and tax devices in MBD-X250 can only be made using terminal port software and MBD's RS-232 serial port. We have special software, speeding this process, however programming can be done with simple RS-232 terminal program, knowing our command set and protocol for communication.

### 3. Mounting and wiring

MBD is meant to be mount in industrial enclosures either on the front door or inside, maintaining visible access through transparent door. Mounting and cable wiring should be made by experienced technicians.

Cable connectors on the back side of MBD-X250 are shown on Figure 2 and connections are as follows:

No. plug	Description
1	Power supply
2	RS-232C RJ45 – to m-bus master
3	RS-232C DB9 null modem – for programming/readout with personal computer
4*	RS-232C RJ45 – to external communication device such as phone, GPRS, Ethernet modem, etc.

\* may not be present

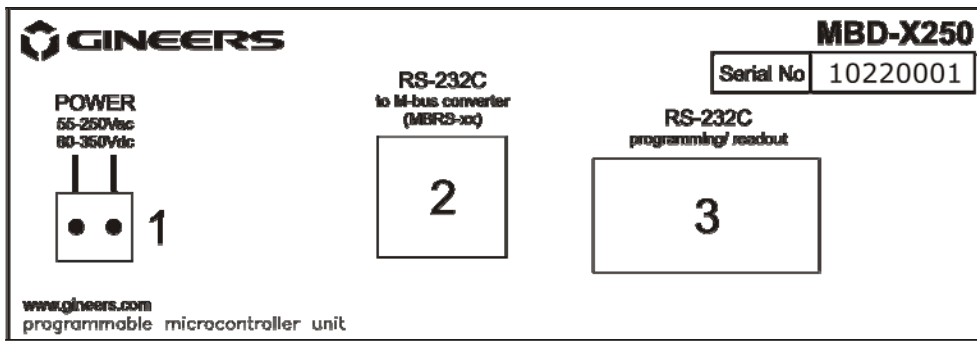


Fig. 2. MBD-X250 back panel

**6. Warranty**

The warranty of the device is limited to 3 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: .....

Sale date: .....

Sign: .....

*(if no date of sale, date sale becomes production date, coded in device serial number. If no serial number – no warranty)*

**7. The package contains**

- MBD-X250 - 1 pcs.
- Mounting parts – 1 complect
- User manual - 1 pcs.

**8. Manufacturer**

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