

**CURRENT STRENGTH TRANSDUCER
 with MODBUS RTU output** **MB-3I-1
 15A**

WARRANTY. The F&F products are covered by a warranty of the 24 months from the date of purchase. Effective only with proof of purchase. Contact your dealer or directly with us. More information how to make a complaint can be found on the website: www.fif.com.pl/reklamacja



CE Do not dispose of this device in the trash along with other waste! According to the Law on Waste, electro coming from households free of charge and can give any amount to up to that end point of collection, as well as to store the occasion of the purchase of new equipment (in accordance with the principle of old-for-new, regardless of brand). Electro thrown in the trash or abandoned in nature, pose a threat to the environment and human health.

Purpose

MB-3I-1 transducer is designed to measure the strength of alternating current or direct current and to transmit the data via RS-485 port using MODBUS RTU protocol.

Operation

The module continuously measures the current flowing through the measurement input. Readout of the recorded current strength and setting of all communication parameters are both carried out through RS-485 port using the MODBUS RTU communication protocol.

Power up is indicated by a green LED U light. Valid data exchange between the module and the second device is indicated by a yellow LED Tx light.

The transducer measures the TrueRMS root mean square of the current strength, which ensures high accuracy even with distorted flows.

Communication parameters of MODBUS RTU protocol

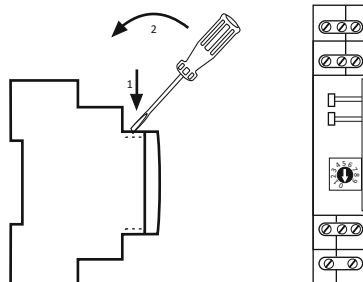
| Communication parameters | |
|---|---|
| Protocol | MODBUS RTU |
| Operation mode | SLAVE |
| Port settings (factory settings) | bits/s: 1200 / 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200 Data bits: 8 Parity: NONE / EVEN / ODD Start bits: 1 Stop bits: 1 / 2 |
| Range of network addresses (factory settings) | 1÷247 (20) |
| Range of base addresses | 1÷238 |
| Range of residual addresses (code switch) | 0÷9 |
| Command codes | 3: Readout of outputs registers values (0×03 - Read Holding Register) 4: Readout of all or a couple of input values registers (0×04 - Read Input Register) 6: Single output value setting (0×06) 16: Setting values of multiple outputs (0×10 - Write Multiple Registers) 17: ID readout (0×11 - Report Slave ID) |
| Maximum frequency of queries (max) | 15Hz |

Registers

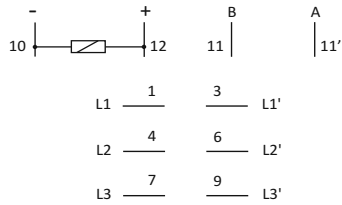
| Communication registers | | | | |
|---|--|---------|------|-------|
| address | description | funct. | type | atr. |
| 0 | Readout of a current base address | 03 | int | read |
| 0 | Recording of a new base address: 1÷238 | 06, 16 | int | write |
| The module can receive network addresses in the range 1÷247. The network address of the module is set in a combined way: using the MODBUS protocol user sets the base address, which is a number between 1÷238 and using a multi-position switch he sets the residual address, which is a number between 0÷9. The sum of these two values designate a network address (e.g. 1+6=7; 70+3=73; 238+9=247). | | | | |
| 1 | Readout of a current transmission rate | 03 | int | read |
| 1 | Recording of a new transmission rate | 06, 16 | int | write |
| Transmission rate [bit/s] is given in the form of an integer divided by 100, for example transmission rate of 9600 bits/s is written as 96; 115200 bits/s is written as 1152. | | | | |
| 2 | Readout of a current parity value | 03 | int | read |
| 2 | Recording of a new parity value | 06, 16 | int | write |
| Parity adopts adequate value: NONE - 0; EVEN - 1; ODD - 2. | | | | |
| 3 | Readout of a current number of stop bits | 03 | int | read |
| 3 | Recording of a new number of stop bits | 06, 16 | int | write |
| Stop bits number adopts value 1 or 2. | | | | |
| Input parameters | | | | |
| address | description | command | type | atr. |
| 1000 | channel 1 (L1) current value | 04 | int | read |
| 1001 | channel 2 (L2) current value | 04 | int | read |
| 1002 | channel 3 (L3) current value | 04 | int | read |
| Value of measured current is stored in the registry as an integer of 0.1 multiplication factor (e.g. the registry value 43 corresponds to the voltage of 4,3A). | | | | |
| In response to the "read ID" command (code 17), we get a packet of information about module: code 0xEC in the "Slave ID"; code 0xFF in the "Run Indicator Status" field; text "PU-1Mv1.2" in the "Additional Data" field. | | | | |

Network address settings

The module can receive network addresses in the range 1÷247. The network address of the module is set in a combined way: using the MODBUS protocol user sets the base address, which is a number between 1÷238 and using a multi-position switch he sets the residual address, which is a number between 0÷9. The sum of these two values designate a network address (e.g. 1+6=7; 70+3=73; 238+9=247). Multi-position code switch is located under the front casing. Removed the front casing with a 3mm flat screwdriver by gently prying the tabs on the sides of the housing. With 3mm flat screwdriver move the rotary switch on the selected digit as a partial address (range 0÷9). When the setting is done, reattach the front casing, paying particular attention to correctly fit LEDs in to mounting holes.



Description IN/OUT



- 1-3 L1 current circuit
- 4-6 L2 current circuit
- 7-9 L3 current circuit
- 10-12 module power supply
- 11-11' RS-485 serial port

Measurement channel is galvanically separated from the converter power input and the RS-485 communication port.
RS-485 is not separated from the power supply.

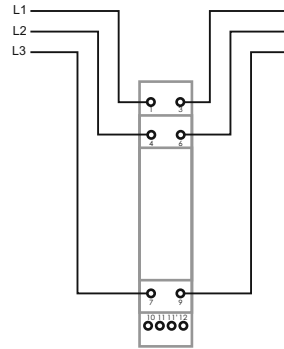
Installation

General guidelines:

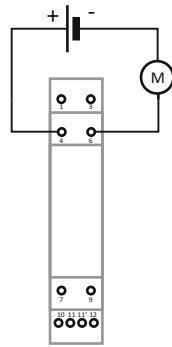
- * Use of surge protectors and interference filters is recommended (e.g. OP-230 F&F).
- * Use of shielded twisted wires is recommended for connecting the unit to another device.
- * If using shielded cables, ground the shield on one side only and as close to the device as possible.
- * The ends of the signal line must be completed with termination modules LT-04 (F&F).
- * Do not run signal cables parallel and in direct proximity to high- and medium-voltage line.
- * Do not install the unit in direct proximity to high power receivers, electromagnetic measuring devices, appliances with phase power adjustment and any other devices that can create interferences.

Installation:

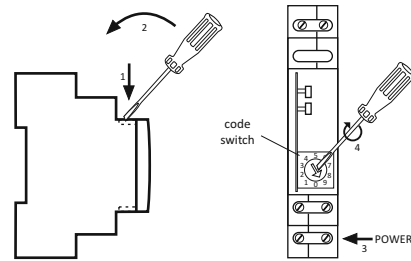
1. Set the network address and the communication parameters..
2. Disconnect the power.
3. Install the unit on the rail.
4. Connect the unit power supply to terminals 10-12 as indicated.
5. Connect signal output 11-11' (RS-485 port) to the MASTER output of another device.
6. Connect the measuring circuits connected to the corresponding inputs of the transducer (in a similar way to the given example).



Direct measurement of the three-phase network current strength



Direct measurement of the values of the DC circuits



Reset communication settings

Under cover is available code switch.

1. Take OFF the power.
2. Remove front panel.
3. Set "9" on the switch.
4. Take ON the power and within 3 sec switch to "1".

Technical data

| | |
|--|------------------------------------|
| supply voltage | 9±30V DC |
| maximum power consumption | 50mA |
| TrueRMS measurement range | |
| current | 0±14,14A AC / 0±20A DC |
| voltage | 285V AC / 400V DC |
| max. load current of measurement input | 18A AC / 24A DC |
| measurement error | ±0.5% |
| register readout precision | 0.1A |
| sampling rate | 10Hz |
| IN->OUT breakdown voltage | 2.1kV |
| port | RS-485 |
| communication protocol | Modbus RTU |
| operating mode | SLAVE |
| working temperature | -20±50°C |
| relative humidity | 85% for +30°C |
| terminal | 2,5mm ² screw terminals |
| tightening torque | 0.4Nm |
| dimensions | 1 module (18 mm) |
| protection level | IP20 |