VOLTAGE MEASUREMENT TRANSMITTER with Modbus RTU

MB-1U-1

5 908312 595328

CE

Purpose

The transmitter MB-1U-1 is designed to measure the voltage and exchange data using the RS-485 port in accordance to MODBUS RTU protocol.

Functioning

The module measures the value of input voltage (AC or DC voltage circuit). Reading the value of the input voltage and setting all parameters of communication are realised by the user via RS-485, using MODBUS RTU communication protocol.

Switching power supply voltage is indicated by a green LED U. The correct exchange of data between the module and the second device is indicated by a yellow LED Tx.

The transmitter measures the RMS voltage TrueRMS, which ensures high measurement accuracy even with distorted waveforms.

Parameters of MODBUS RTU protocol

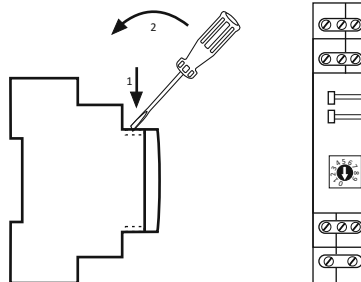| Communication parameters	
Protocol	MODBUS RTU
Work mode	SLAVE
Port settings (factory settings)	Bit numbers on sec: 1200 / 2400 / 4800 / 9600 / 19200 / 3840 / 57600 /115200 Data bits: 8 Parity: NONE/EVEN/ODD Start bits: 1 Stop bits: 1 / 2
Range of network addresses (factory settings)	1÷247 (10)
Range of base addresses	1÷238
Range of residual addresses (switch code)	0÷9
Command codes	3: Read value of outputs registry (0×03 - Read holding Register) 4:read all or some records of input values (0×04 - Read Input Register) 6: The setting of a single output (0×06 - Write Single Register) 16: The setting of multiple outputs (0×10 - Write Multiple Registers) 17: Read ID (0x11 - Report Slave ID)
The maximum frequency of queries	15Hz

Registers

Communication parameters				
adress	description	code	type	atr.
0	read actual base sdress	03	int	read
0	save a new base adress: 1÷238	06, 16	int	write

Module can accept network addresses in the range 1 ÷ 247 The network address of the module is set in a complex way: using the MODBUS protocol to set the base address, the number in the range 1 to 238, and a multi-position switch to set address residual, ie the number from 0 to 9th The sum of these two values determines the network address (eg, 1 +6 = 7, 70 +3 = 73, 238 +9 = 247).

1	read a speed of transmission	03	int	read
1	save a new speed of transmission	06, 16	int	write

The speed value [bits/sec] is given in the form of an integer divided by 100, for example, 9600 bit/sec write in figures 96; 115200 bit/sec write in figures 1152.

2	read of actual parity value	03	int	read
2	save a new parity value	06, 16	int	write

Parity adopt appropriate meanings: NONE - 0; EVEN - 1, ODD - 2

|				
3	read of actual number of stop bits	03	int	read
3	save the number of stop bits	06, 16	int	write

Number of stop bits accepts the importance of 1 or 2

Registry parameters				
adress	description	code	type	atr.
1000	readout of the measured voltage	04	int	read

The values of the input voltage is stored in the register as an integer times the one (for example, the value of the register 230 corresponds to the voltage of 230V).

In response to the command "readout ID" (code 17), we obtain a packet of information about the module: in the "Slave ID" code 0xEC; in the "Run Status Indicator" code 0xFF; in the "Additional Data" text "PU-1Mv1.2".

Setting the network address

Module can accept network addresses in the range 1 ÷ 247. The network address of the module is set in a complex way: using the MODBUS protocol to set the base address, the number in the range 1 to 238, and a multi-position switch to set address residual, i.e. the number from 0 to 9th The sum of these two values determines the network address (e.g. 1 +6 = 7, 70 +3 = 73, 238 +9 = 247). Multi-position code switch is located under the front elevation. Cladding removed using flat-head screwdriver 3mm elevation gently undermining hooks on the sides of the enclosure. 3mm flat screwdriver to switch the rotary switch to the desired number, as a sub-address (range 0 to 9). Set a new module address is the sum of the values and partial base address, after setting the front elevation set up with special attention to the proper fitting of LEDs in the holes.

Input/output description

4	measure inputs L/+
6	neutral cable N / -
11-11'	serial port RS-485
10-12	power supply
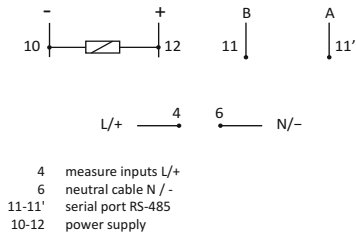
Attention!

Voltage measuring channel is galvanically isolated from input power converter and a communication port RS-485.
RS-485 port is not separated from the supply voltage.

Assembly

General assumptions:
* Recommended the use of filters and surge suppression (e.g. OP-230 F&F).
* Recommended use of shielded twisted pair signal cables for connecting the module to another device.
* Communication lines must be completed by termination module LT-04 (F&F).
* When using shielded cables grounded screens performed only on one side and as close to the device.
* Do not lay signal cables in parallel in close proximity to the line of high and medium voltage.
* Do not install the module in close proximity to high power electrical loads, electromagnetic measurement devices, devices with phase power regulation, and other devices that may introduce noise.
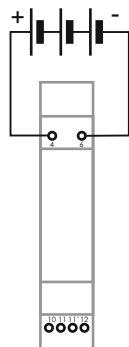
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Installation

1. Set the address and communication parameters of module.
2. Take OFF the power.
3. Put the module on the rail.
4. Power supply connect to joints 10-12 accordance to marks.
5. Signal output 11-11' connect with output of MASTER device.
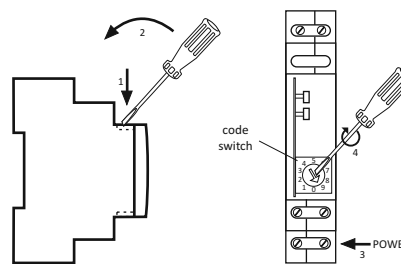6. Measured voltage circuit connect to corect input of relay (analogous to the examples).
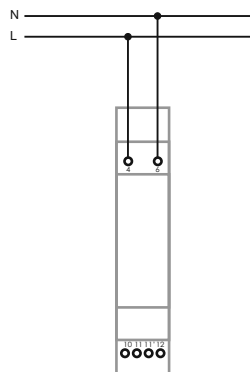
Direct measurement
of voltage

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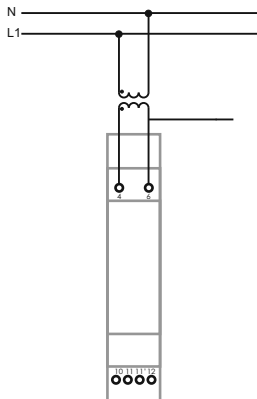
Indirect measurement of the voltage network using voltage transformers

Direct measurement of the DC ciruit current

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".

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Technical data

supply	9÷30V DC
max. current load	50mA
measure TrueRMS range	
AC	0÷285V
DC	0÷400V
measure mistake	0.5%
reading registry precision	1V
breakdown voltage IN->OUT	3kV
mistake precision	±0.5%
sampled frequency	10Hz
port	RS-485
communication protocol	Modbus RTU
working temperature	-20÷50°C
relative humidity	85% for 30°C
connection	$2.5mm^2$ screw terminals
torque	0.4Nm
dimensions	1 module (18mm)
protection level	IP20

D170213

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