

**MEASUREMENT TEMPERATURE  
 TRANSDUCER MB-PT-100**  
 with MODBUS RTU output

**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/reklamacje](http://www.fif.com.pl/reklamacje)



Do not dispose of this device to a garbage bin with other unsorted waste! In accordance with the Waste Electrical and Electronic Equipment Act any household electro-waste can be turned in free of charge and in any quantity to a collection point established for this purpose, as well as to the store in the event of purchasing new equipment (as per the old for new rule, regardless of brand). Electro-waste thrown in the garbage bin or abandoned in the bosom of nature pose a threat to the environment and human health.

**PURPOSE**

MB-PT-100 transducer is designed to measure the temperature via PT-100 external temperature sensor and to transmit data via RS-485 port using MODBUS RTU protocol.

**FEATURES**

- \* readout of the current temperature
- \* readout of the recorded maximum and minimum temperature
- \* setting the averaging measurement time
- \* setting the value of standard adjustment

**FUNCTIONING**

The unit continuously measures the temperature using an external sensor. Readout of recorded temperatures, setting of all measurement parameters, communication and data transmission are all carried out through RS-485 port using the MODBUS RTU communication protocol. Power up is indicated by a green LED U. Valid data exchange between the unit and the second device is indicated by a yellow LED Tx. The unit cooperates with the three-wire PT-100 temperature sensor. Dedicated temperature probe manufactured by F&F: RT-56 probe. The probe is sold separately.

Communication parameters of MODBUS RTU protocol	
Protocol	MODBUS RTU
Operation mode	SLAVE
Port settings (factory settings)	bit/s: 1200 / 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200 Data bits: 8 Parity: NONE / EVEN / ODD Start bits: 1 Stop bits: 1 / 1.5 / 2
Range of network addresses (factory setting)	1:245 (1)
Command codes	3: Readout of registers group (0x03 - Read Holding Register)  6: Single register value setting (0x06 - Write Single Register)  17: Readout ID (0x11 - Report Slave ID)
Maximum frequency of queries	15Hz

Measurement parameters - factory settings	
Averaging measurement time	5 s (register value: 20)
Value of standard adjustment	0°C (register value: 0)

Communication registers				
address	description	func.	type	atr
16	Readout of current one and recording of new base address: 1:245	03 06	int	read write
17	Readout of current one and recording of new transmission rate: 0:1200 / 1:2400 / 2:4800 / 3:9600 / 4:19200 / 5:38400 / 6:57600 / 7:115200	03 06	int	read write
18	Readout of current one and recording of new parity value: 0:NONE / 1:EVEN / 2:ODD	03 06	int	read write
19	Readout of current one and recording of new stop bits quantity: 0:1bit / 1:1,5bit / 2:2bits	03 06	int	read write
20	Restore factory settings: entering value 1 in the register will restore default controller setup	06	int	write

As a response to the command "read ID" (code 17), "F&F MB-PT-100" text is displayed.

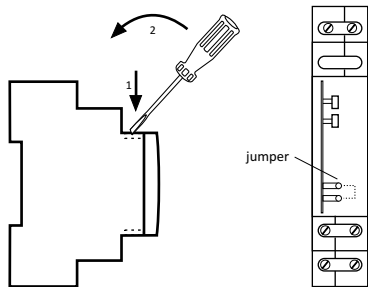
**WARNING!**

Any change in communication parameters (transmission rate, quantity of stop bits, parity) will be applied only after power restart.

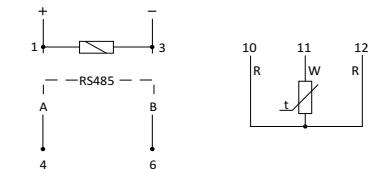
Measurement registers				
address	description	command	type	atr
0	Current temperature [°C] (x0,1)	03	int	read
1	Minimum registered temperature [°C] (x0,1) Entering value 1 will delete the value of registered temperature	03 06	int	read write
2	Maximum registered temperature [°C] (x0,1) Entering value 1 will delete the value of registered temperature	03 06	int	read write
8	Averaging measurement time (time period from which the average temperature is calculated). Setting range: 1÷480. Step: 1=0.25s. Maximum: 480	03 06	int	read write
9	Standard adjustment. Value is stored as an integer with +/- mark fold 0.1°C (e.g. a value of 15 corresponds to a temperature of 1.5°C)	03 06	int	read write

### Reset of communication settings

The configuration jumper is located under the front casing of the unit. Activating the controller with closed jumper will restore factory settings of the communication parameters. To do this, remove the front casing of the unit and put the jumper cap on both pins. When the reset is done, remove the jumper.



### Description of in/out



1-3 converter power supply  
4-6 RS-485 serial port  
10-11-12 PT-100 probe input

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### INSTALLATION

#### General guidelines:

- \* Use of surge protectors and interference filters is recommended (e.g. OP-230).
- \* 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.
- \* 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.

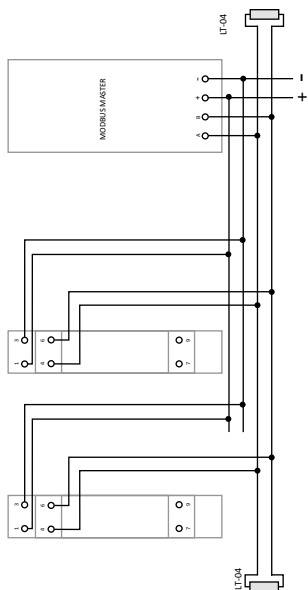
#### Installation

1. Set the selected MODBUS communication parameters prior to unit installation.
2. Disconnect the power to the distribution box.
3. Install the unit on the rail.
4. Connect the unit power supply to terminals 1-3 as indicated.
5. Connect signal output 4-6 (RS-485 port) to the MASTER output of another device.
6. Connect the temperature probe in accordance with the markings: red wires to terminals 10 and 12; white wire to terminal 11.

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### RS-485 network

RS-485 port is not galvanically isolated from the unit supply voltage. For RS-485 line use a shielded twisted wire. Cross section of each wire core can't be smaller than 0.2 mm<sup>2</sup>. The maximum length of the line can't exceed 1000 m. Each end of the line should be fitted with LT-04 termination modules (F&F).



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### TECHNICAL DATA

supply voltage	9±30V DC
range of measurement	-100÷400°C
maximum measurement error	±1°C
IN/Out breakdown voltage	2.1kV
temperature sensor type	PT100
sampling frequency	10Hz
port	RS-485
communication protocol	Modbus RTU
operation mode	SLAVE
communication parameters	
rate - to set	1200÷115200 bit/s
data bits	8
stop bits	1 / 1.5 / 2
parity bits	EVEN / ODD / NONE
address	1-247
power consumption	0.3W
operating temperature	-20÷50°C
terminal	screw terminals 2,5mm <sup>2</sup>
dimensions	1 module (18 mm)
mounting	on TH-35 rail
ingress protection	IP20

D141023/D141030

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