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MB-AHT-1

Measuring transducer
of humidity and temperature
with Modbus RTU output



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

The MB-AHT-1 transducer is used for continuous measurement of temperature in the range $-40\div 70^{\circ}\text{C}$ (with resolution $0,1^{\circ}\text{C}$) and humidity in the range $0\div 100\%$ RH (with resolution 0.1%). Data exchange is carried out via the RS-485 port in accordance with the Modbus RTU protocol.

Features

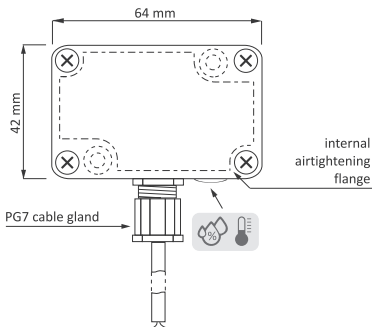
- » Humidity measurement;
- » Temperature measurement;
- » Readout of the current temperature;
- » Sensor operating status.

Functioning

The module continuously measures via the built-in sensor. Readout of recorded values, setting of all measurement, communication and data exchange parameters are all carried out via the RS-485 port using the Modbus RTU communication protocol.

Transducer's description

Transducer in a special, small-sized plastic box, connected through a PG7 gland using a round wire (max. $\varnothing 7$) of any length. Box with a special sealing collar, fastened to the ground with two screws, covered with a lid with a silicone gasket for 4 screws.



Separation

No galvanic isolation between the power supply and RS-485.

Mounting



It is recommended to use shielded twisted-pair cables to connect the module to another device.



When using shielded cables, ground the shields only on one side and as close to the device as possible.



Do not route signal cables in parallel in close proximity to high and medium voltage lines.



Do not install the module in the immediate vicinity of high-power electric receivers, electromagnetic measuring instruments, phase power control devices and other devices that may cause interference.

1. Set the selected Modbus communication parameters before installation.
2. Disconnect the power.
3. Unscrew the cover fixing screws.
4. Fix the module to the ground in the place of the measurement with the measuring sensor facing down.
5. Pull the cable through the gland and tighten it firmly so that the internal gasket fit close to the wire.
6. Connect the power cables to the +/– terminals.
7. Connect the A-B (RS-485 port) signal output to the output of the Master-type device.



The maximum length of the cable (UTP) is 300 m.
The maximum cable diameter is $\varnothing 7$.

8. Screw the cover to the housing.

Parameters of Modbus RTU protocol

Communication parameters

Protocol	Modbus RTU
Operating mode	Slave
Port settings (<u>factory settings</u>)	Number of bits per second: 1200, 2400, 4800, <u>9600</u> , 19200, 38400, 57600, 115200 Data bits: <u>8</u> Parity: <u>NONE</u> , EVEN, ODD Start bits: <u>1</u> Stop bits: <u>1/1,5/2</u>
Network address range (<u>factory settings</u>)	1÷245 (<u>1</u>)
Command codes	3: Read the values of a group of registers (0×03 – Read Holding Register) 6: Set the value of a single register (0×06) – Write Single Register
Max. frequency of queries	15 Hz

Data type

int16	16-bit signed integer
uint16	16-bit unsigned integer
uint32	32-bit unsigned integer

Measurement parameters

adr	description	type	scale	atr
0	Temperature [°C]	int16	×0,1°C	R
1	Humidity [%]	int16	×0,1%	R
2	Sensor status 0 – sensor error; 1 – sensor works properly	int16	0–1	R
3	Operating hour meter: The operating time from the time the transducer is powered on. Data is not retained when the power is turned off.	uint16	×1 h	R
4	Minimum temperature*	int16	×0,1°C	R
5	Maximum temperature*	int16	×0,1°C	R
6	Minimum humidity*	int16	×0,1%	R
7	Maximum humidity*	int16	×0,1%	R

* Minimum and maximum values recorded from the moment the transducer is powered on. Data is not retained when the power is turned off.

Configuration parameters

adr	description	type	scale	atr
128	<p>Correction of humidity reading: Shifting the humidity reading by a set value. Adjustment range: -50.0÷50.0%.</p> <p>Note! The result after correction will be reduced to the range of 0÷100%.</p>	int16	×0,1%	R/W
129	<p>Temperature correction: Offsetting the temperature reading by a set value. Setting range: -10.0÷10.0°</p>	int16	×0,1°C	R/W
256	Modbus – transducer address	uint16	1÷245	R/W
257	<p>Modbus – baud rate: 0 – 1200 bps; 1 – 2400 bps; 2 – 4800 bps; 3 – 9600 bps; 4 – 192000 bps; 5 – 38400 bps; 6 – 57600 bps; 7 – 115200 bps</p>	uint16	0÷7	R/W
258	<p>Modbus – parity check: 0:<u>NONE</u>/1:EVEN/2:ODD</p>	uint16	0÷2	R/W
259	<p>Modbus – number of stop bits: 0 – 1 stop bit; 1 – 2 stop bits</p>	uint16	0-1	R/W
260	<p>Restoring the factory settings: Set value: 1.</p>	uint16	1	W

Configuration parameters (cont.)

adr	description	type	scale	atr
261	Transducer's restart	uint16	1÷245	W
Note!				
Changes in communication parameters (baud rate, number of stop bits, parity) are only taken into account only after the power is restarted.				
1026 ÷ 1027	Serial number	uint32	–	R
1028	Production date: 5 bits/day; 4 bits/month; 7 bits/year (without 2000)	uint16	–	R
1029	Software version	uint16	–	R

Technical data

power supply	9÷30 V DC
maximum current consumption	40 mA
measurement range	
humidity	0÷100%RH
temperature	-40÷70°C
maximum temperature measurement error	
humidity	±4,5% (0÷80RH) ±6.0% (80÷100RH)
temperature	±1°C
sampling frequency	10 Hz
port	RS-485
communication protocol	Modbus RTU
operating mode	Slave
communication parameters	
baud rate (adjustable)	1200÷115200 bits/s
data bits	8
stop bits	1/2
parity bits	EVEN/ODD/NONE
address	1÷245
power consumption	0.3 W
working temperature	-40÷70°C
terminal	2.5 mm ² screw terminals
tightening torque	0.4 Nm
dimensions	42×64×30 mm
mounting	surface
protection level	IP65

Warranty

F&F products are covered by a 24-month warranty from the date of purchase. The warranty is only valid with proof of purchase. Contact your dealer or contact us directly.

CE declaration

F&F Filipowski L.P. declares that the device is in conformity with the essential requirements of The Low Voltage Directive (LVD) 2014/35/EU and the Electromagnetic Compatibility (EMC) Directive 2014/30/UE.

The CE Declaration of Conformity, along with the references to the standards in relation to which conformity is declared, can be found at www.fif.com.pl on the product page: www.fif.com.pl from the product subpage.

