

MB-THL-Sxx

Active temperature and humidity sensors with LED display, MODBUS

Description

MB-THL sensors are active sensors with microprocessor to measure temperature and relative humidity provided for installation with coordinated design with the main flush-mounted civil series (BTicino, Vimar, Gewiss, ABB etc.) featuring high readability LED display to view and set parameters. Using two touch buttons through the Modbus RTU (RS485) it is possible to set the temperature set point and the system operating mode (ON, OFF, Auto). The sensors have the following characteristics:

- the resolution of the temperature measurement is 0.1°C, the typical accuracy is +/- 0.4°C;
- the resolution of the humidity measurement is 0.1% RH, the typical accuracy is +/- 3%RH;
- the communication parameters are 19200, N, 8, 1;
- the configurable slave address goes from 1 to 255.

Inside the 503 box they occupy 2 positions.

Main features

Installation	box (503)	Storage and usage humidity	10...90% HR
Box modules	2	Power supply	12-24 V ac/dc
Dimensions (WxHxD)	depends on series	Maximum consumption	20 mA
Storage temperature	-40...+85°C	Protection class IP	IP00
Temperature of use	-20...+55°C	Safety class	A

Terms of Use

For safety reasons, the sensor must be installed and used in accordance with the manufacturer's instructions. The sensor must be adequately protected from water and dust. Have all installation and maintenance work carried out by qualified personnel.

Safety and maintenance information

If the sensor is damaged when the box is opened or if liquid substances have penetrated inside, have it checked by an authorized service centre. Report any faults and/or anomalies immediately. Before carrying out installation, maintenance and repair work on the system, remember to switch off the power supply. Responsibility for installation, maintenance and repair work is in charge on the person or organisation carrying out the work. The manufacturer of the system in which the sensor is installed is responsible for arranging the system parts adequately to avoid any possibility of the operator coming into contact with live utilities. It is the task of the manufacturer of the system on which the sensor is installed: to evaluate the risks and potential dangerous situations, preparing any devices for the safety of the operator. All modifications and/or tampering of a hardware and/or software nature carried out on the probe shall void any responsibility of the manufacturer regarding the conformity "CE".

We decline all responsibility in the event that:

- the above-mentioned rules are not complied with;
- anomalies or damage to persons and / or things due to improper use of the product occur;
- anomalies or damage to persons and / or things occur due to improper use of the information contained in the manual;
- anomalies or damage to persons and / or things occur due to non-compliance with the rules and instructions indicated in this documentation.

Disposal regulations



Disposal of electrical and electronic products at the end of the cycle of use

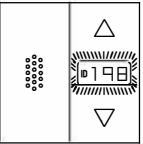
The symbol of the crossed-out bin above indicates that the product at the end of its useful life must be collected separately. Do not dispose the device in household waste bins. Check local regulations for further information on product disposal.

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Modbus slave address setting

Set the slave Modbus address pressing the buttons in the below order:

- 3 times the $\triangle$ symbol
- 2 times the ∇ symbol
- 1 times the $\triangle$ symbol
- 1 times the ∇ symbol
- 1 times the $\triangle$ symbol



The blinking words "ID XXX" will appear, that shows the current slave Modbus address of the sensor. Push the ∇ or the $\triangle$ symbol to change the slave Modbus address associated to the sensor; when the operation is complete do not touch the sensor for few seconds: the new value will be saved and the sensor will restart by itself to set the new address.

Read temperature and relative humidity values and change the temperature set point

Normally sensors are in stand by mode: brightness is low and the display shows the current ambient temperature.

If you touch the sensor on the $\triangle$ symbol or on the ∇ symbol the display becomes brighter while showing the current ambient temperature.

If you touch again the $\triangle$ symbol or the ∇ symbol the sensor will show the current relative humidity, if you touch a second time you will see again the current ambient temperature; if RH is shown the % symbol and the H letter will appear.

To change the current ambient temperature set point, press for 2 seconds the symbol $\triangle$; the current set point will be shown: the number blinks and the letters ST will appear on the right of the value. Press the symbol $\triangle$ to increase the temperature set point, or the symbol ∇ to decrease it; when the operation is complete do not touch the sensors for few seconds: the new value will be saved and the display will show again the current ambient temperature.

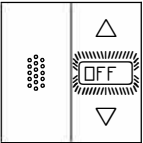
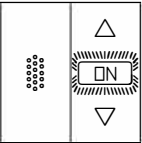
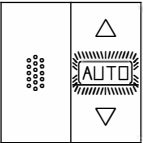
It is not possible to change the humidity set point from the display.

How activate or deactivate a zone manually

Press for 2 seconds the symbol ∇ ; the display will show the current status of the zone that can be:

- AUTO: zone is in auto mode
- OFF: zone is OFF
- ON: zone is ON

Touching the symbols $\triangle$ or ∇ , it is possible to change the mode to AUTO, OFF or ON. When the operation is complete do not touch the sensor for few seconds: the new mode will be saved and the display will go back to shown the current ambient temperature.



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Modbus Register Map

To read the registers use 0x03 function (Read Holding Register).
To write the registers use 0x06 function (Write Single Register).

The below table shows the available Modbus registers.

MODBUS REGISTERS					
Register Number	Description	Read / Write	Notes	Default values	
				HEX	DEC
0	Current Temperature	R	Integer Number in tenths of °C		
1	Current relative humidity	R	Integer Number in tenths of %		
2	Current Temperature Setpoint	R/W	Integer Number in tenths of °C *		
3	Current work mode	R/W	0=AUTO;1=OFF;2=ON *		
4	Temperature shown	R/W	Shadow Mode active		
5	Humidity shown	R/W	Shadow Mode active		
6	Active circuit indicator (point)	R/W	0 = OFF; 1 = ON		
7	Use limits for winter mode	R/W	0 = summer limits; 1 = winter limits		
8	Firmware version	R			
9	Modbus Address	R			
10	Configuration + Brightness	R/W	see notes	0x62B2	25266
11	Temp. Limits minimum Summer	R/W	Integer Number in tenths of °C	0x0064	100
12	Temp. Limits maximum Summer	R/W	Integer Number in tenths of °C	0x012C	300
13	Temp. Limits minimum Winter	R/W	Integer Number in tenths of °C	0x0064	100
14	Temp. Limits maximum Winter	R/W	Integer Number in tenths of °C	0x012C	300
15	Offset temperature	R/W	Integer Number in tenths of °C (with sign in 2's complement)	0x0000	0
16	Offset humidity	R/W	Integer Number in tenths of °C (with sign in 2's complement)	0x0000	0

* if = 32768 function disabled.

Values are returned as integer word, in 2's complement, in tenths of a degree.

Example

If there is a temperature reading (register 0) = 300 that means an ambient temperature = 30,0°C.
If there is a humidity reading (register 1) = 554 that means a relative humidity = 55,4 %.
If there is a temperature reading (register 0) = 65336 that means an ambiente temperature = -20°C (negative value in 2's complement).

Register Numebr 10: Configuration and Brightness Word

MBS

PXYN NWZN CCCC DDDD

LSB

where:

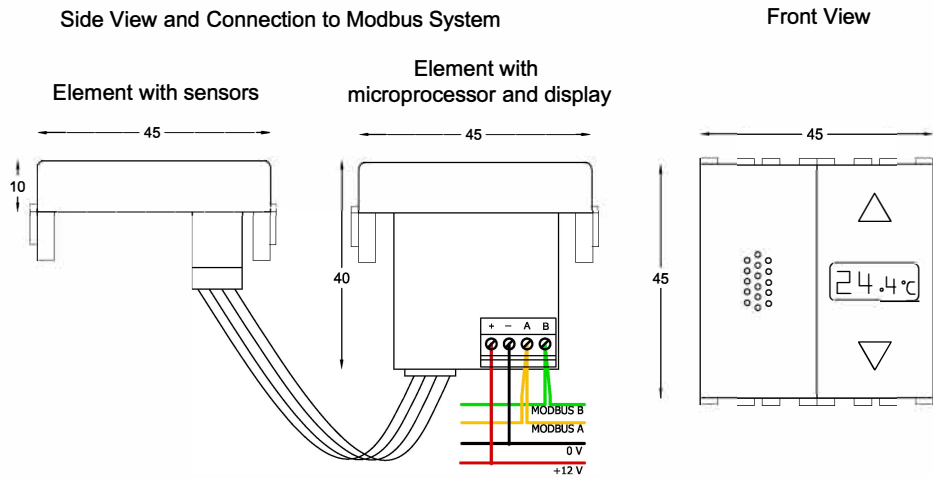
- CCCC = brightness in ON mode (do not set a value higher than 0xB)
- DDDD = brightness in OFF mode (set only the value 0x2 - low brightness in stand by - or 0x0 - display OFF in standby mode)
- X = enable change set point page
- Y = enable change mode page (ON/OFF/AUTO)
- W = enable shadow mode (shown the data received from the master controller)
- Z = enable to see the RH % on the LED display
- P = 0 (default); if = 1 the value in register 2 and 3 will be saved even if the sensor will be power OFF and ON

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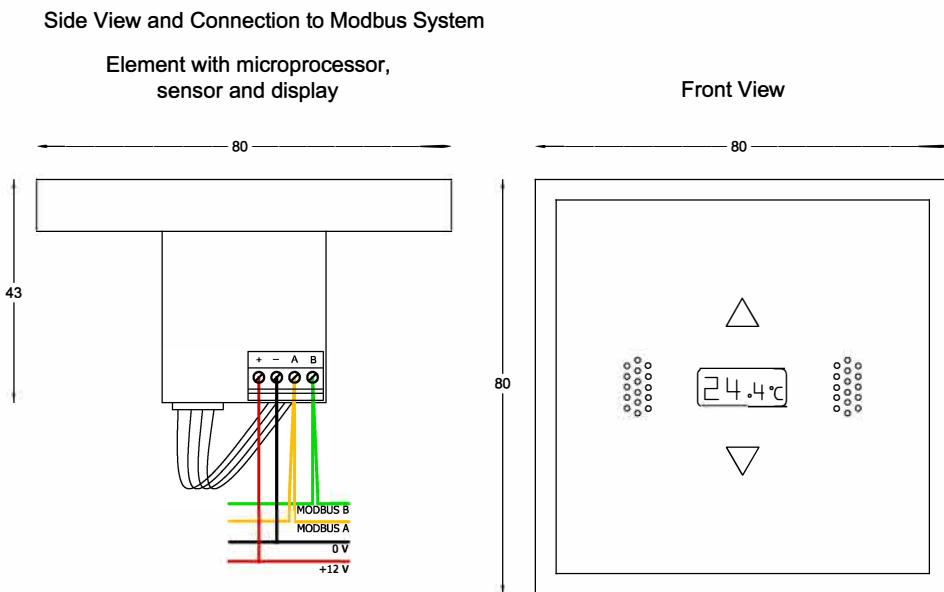
MB-THL-Sxx

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MB-THL-Sxx (generic series) - Dimensions (mm) and Electrical connection



MB-THL-S101 / MB-THL-S102 (JUNG LS series) - Dimensions (mm) and Electrical connection



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MB-THL-S77 / MB-THL-S78 / MB-THL-S79 (serie BTicino Living Now)

Dimensions (mm) and Electrical connection

