



control solutions

TERACOM



TSH300 Modbus RTU humidity and temperature sensor

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USER MANUAL

www.teracomsystems.com

1. Short description

TSH300 is humidity and temperature sensor with an RS-485 interface, supporting a Modbus RTU protocol. The device doesn't need an external power supply, it is powered through the interface.

The humidity and temperature sensor integrates basic elements plus signals processing and provides a fully calibrated digital output. A unique capacitive element is used for measuring relative humidity while the temperature is measured by a band gap sensor. Both sensors are seamlessly coupled to a 12-bit analog to digital converter. This results in superior signal quality.

The sensor is delivered with one-meter standard patch cable with RJ45 connectors. A 19" rack mount kit can be ordered separately.

2. Features

- RS-485 interface carrying up to 32 nodes;
- LED indicator for status of communication;
- Changeable bitrate and another communication parameters;
- Firmware update via the interface.

3. Applications

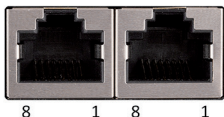
- Server room and data centers humidity and temperature logging.
- Environmental quality monitoring and assessment.
- Humidity and temperature monitoring in building management systems.
- Humidity and temperature logging for mobile operator facilities, vineyards, greenhouses, etc.

4. Specifications

The device has following specifications:

- Physical characteristics
Dimensions: 85 x 35.1 x 23.5 mm
Weight: 40 g
- Environmental limits
Operating Temperature: -20 to 85°C
Ambient Relative Humidity: 0 to 95% (non-condensing)
Ingress protection: IP20
- Power requirements
Input Voltage: 4 to 5.5 VDC (from the bus)
Input Current: 5 mA
- Humidity measurements
Operating Range: 0 to 95 %RH
Accuracy (min): ±3.0 %RH
Accuracy (max): ±5.0 %RH
Resolution: 0.1 %RH
- Temperature measurements
Operating Range: -20 to 85 °C
Accuracy (min): ±0.4 °C (in -10 to +85°C range)
Accuracy (max): ±1.0 °C (in -20 to +85°C range)
Resolution: 0.1 °C
- Warranty
Warranty period: 3 years

5. Pinout



Pin Description

- 1 not connected (most right)
- 2 not connected
- 3 not connected
- 4 Line B-
- 5 Line A+
- 6 not connected
- 7 +VDD
- 8 GND

Corresponding UTP wires color

- Orange/White Tracer
- Orange
- Green/White Tracer
- Blue
- Blue/White Tracer
- Green
- Brown/White Tracer
- Brown

6. Installation

A daisy-chained (linear) topology for multiple sensors should be used. UTP/FTP cables with RJ-45 connectors are used for interconnection. The popular ANSI/TIA/EIA T568B wiring is used. Standard patch LAN cables are recommended.



Attention:

The last sensor in the chain should have a terminator installed on the free RJ45 socket.

7. Installation tips

The location and the mounting position of sensors has a direct effect on the accuracy of monitoring the room humidity and temperature. The tips below will ensure good measuring results:

- Sensor shall be installed about 1.2-1.4 m above the floor;
- Sensor should not be installed next to windows to avoid solar radiation;
- Sensors shall be installed in a place with sufficient air circulation;
- Sensors shall be wall mounted with vent holes up/down to ensure air circulation.

8. Status indicator

The status of the device is shown by single LED, located on the front panel:

- If the LED blinks on period of 1 second, sensor works properly;
- If the LED blinks on period of 3 seconds, there isn't communication with the controller;
- If LED doesn't blink, there isn't power supply.

9. Factory default settings

Disconnect the sensor from the bus (switch off the power supply).

Press and hold “config” button. Don’t release the button, connecting the sensor to the bus (switch on the power supply).

The “status” LED will be ON for 3 seconds and after this will flash for 7 seconds. After the 10-th second the LED will be ON.

Release the button. The sensor will restart with factory default settings.

10. Firmware update

The firmware of the sensor can be updated with TCW210-TH or MBRTU-Config software. For more details ask your dealer.

11. Modbus address table

Register name	R/W	FC	PDU Address (Decimal)	Logical address (Decimal)	Offset (Decimal)	Data size	Default	Valid values
RS-485 address	R/W	03/06	10	40011	40001	16-bit Integer	1	1-247
Baud rate *	R/W	03/06	11	40012	40001	16-bit Integer	19200	2400, 4800, 9600, 19200, 38400, 57600
Parity, data, stop bits *	R/W	03/06	12	40013	40001	16-bit Integer	1	1=E81, 2=O81, 3=N81
Bytes order	R/W	03/06	13	40014	40001	16-bit Integer	1	1= MSW, LSW 2=LSW, MSW
Temperature (Measured)	R	03	100	40101	40001	32-bit Float		
Humidity (Measured)	R	03	102	40103	40001	32-bit Float		
Temperature Dimension	R	03	104	40105	40001	4 bytes UTF-8		
Humidity Dimension	R	03	106	40107	40001	4 bytes UTF-8		
ID 64-49 bits	R	03	108	40109	40001	16-bit Integer		
ID 48-33 bits	R	03	109	40110	40001	16-bit Integer		
ID 32-17 bits	R	03	110	40111	40001	16-bit Integer		
ID 16-1 bits	R	03	111	40112	40001	16-bit Integer		
Sub-family number	R	03	112	40113	40001	16-bit Integer		
FW version	R	03	113	40114	40001	16-bit Integer		
Vendor URL	R	03	300	40301	40001	64 bytes UTF-8		teracomsystems.com
Test value (floating point, MSW first)	R	03	332	40333	40001	32-bit Float		-9.9(0xC11E6666)

LSW - Least significant word (bits 15 ... 0);

MSW - Most significant word (bits 31 ... 16)

PDU address - Actual address bytes used in a Modbus Protocol Data unit

* These settings will take effect after restart of the sensor by power on reset.

12. Recycling

Recycle all applicable material.



Do not dispose of with regular household refuse.

