TERACOM TST300v3 Modbus RTU Temperature Sensor User Manual

TST300V3/V4
Modbus RTU temperature sensor
Version 1.12 / June 2023
USER MANUAL

Contents

Short description

TST300v3/v4 (successors of TST300) is a high accuracy temperature sensor with an RS-485 interface. The device doesn't need external power supply, it is powered through the interface.
The temperature sensor integrates a band-gap temperature sensor element plus signals processing and provides a fully calibrated digital output. The temperature sensors are factorycalibrated.
The calibration data is stored in the non-volatile memory. This ensures fully interchangeable of the sensors without any extra efforts.
The sensor is delivered with one meter standard patch cable with RJ45 connectors. A 19" rack mount kit can be ordered separately.

Features

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

Applications

- Server room and data centers temperature monitoring and logging.
- High precision temperature monitoring and logging for food and drug storages.
- Environmental quality monitoring and assessment.
- Temperature monitoring in building management systems.

Specifications

The device has following specifications:

- Physical characteristics

  Dimensions: 85 x 35.1 x 23.5mm

  Weight: 40g

- Environmental limits

  Operating temperature range: -20 to 60°C

  Operating relative humidity range: 5 to 85% (non-condensing)

  Storage temperature range: -20 to 60°C

  Storage relative humidity range: 5 to 85% (non-condensing)

  Ingress protection: IP20
- Power requirements

  Input Voltage: 4.5 to 26VDC

  Input Current: 7mA@5VDC
- Temperature measurements

  Accuracy (min): ±0.13°C (in +20 to +60°C range)

  Accuracy (max): ±0.25°C (in -20 to +60°C range)

  Resolution: 0.1°C
- Interface

  Number of bus transceivers: up to 32

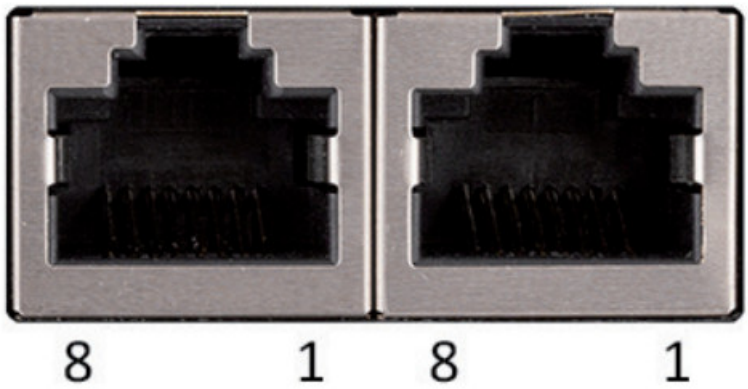
  Response time ≤ 50ms

  Master response time-out ≥ Response time + Answer time.

  The answer time depends on the number of bits and the baud rate.
- Warranty

  Warranty period: 3 years

Pinout



Pin Description	Corresponding UTP wires color
1 not connected (most right)	Orange/White Tracer
2 not connected	Orange
3 not connected	Green/White Tracer
4 RS485-	Blue
5 RS485+	Blue/White Tracer
6 not connected	Green
7 +VDD	Brown/White Tracer
8 GND	Brown

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 120 ohm terminator installed on the free RJ-45 socket.
The terminator is delivered with the module.

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.

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.

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-the second the LED will be ON.
Release the button. The sensor will restart with factory default settings.

Firmware update

The firmware of the sensor can be updated with Teracom controller which supports MODBUS RTU or MBRTU-Update software. For more details ask your dealer.

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 uns. integer	1	1-247
Baud rate *	R/W	03/06	11	40012	40001	16-bit uns. integer	19200	2400, 4800, 9600, 19200, 38400, 57600
Parity, data, stop bits *	R/W	03/06	12	40013	40001	16-bit uns. integer	1	1=E81, 2=081, 3=N81
Data order	R/W	03/06	13	40014	40001	16-bit uns. integer	1	1=MSWF (MSW, LSW) 2=LSWF (LSW, MSW)
Device code TST300v3	R	3	14	40015	40001	16-bit uns. integer		OxOOCB
Device code TST300v4	R	3	14	40015	40001	16-bit uns. integer		Ox0100
FW version	R	3	15	40016	40001	16-bit uns. integer		
Vendor URL	R	3	18	40019	40001	64 bytes UTF-8		teracomsystems.com
Float test value (MSWF)	R	3	82	40083	40001	32-bit float		-9.9(0xC11E6666)
Float test value (LSWF)	R	3	84	40085	40001	32-bit float		-9.9(0xC11E6666)
Signed integer test value	R	3	86	40087	40001	16-bit sig. integer		-999(0xFC19)
Signed integer test value (MSWF)	R	3	87	40088	40001	32-bit sig. integer		-99999(OxFFFE7961)
Signed integer test value (LSWF)	R	3	89	40090	40001	32-bit sig. integer		-99999(OxFFFE7961)
Unsigned integer test value	R	3	91	40092	40001	16-bit uns. integer		999(0x03E7)
Unsigned integer test value (MSWF)	R	3	92	40093	40001	32-bit uns. integer		99999(0x0001869F)
Unsigned integer test value (LSWF)	R	3	94	40095	40001	32-bit uns. integer		99999(0x0001869F)
Temperature °C (MSWF/LSWF)	R	3	100	40101	40001	32-bit Float		
Temperature °F (MSWF/LSWF)	R	_ 03	_ 200	40201	40001	32-bit Float		

MSWF – Most significant word first – (bits 31 … 16), (bits 15 … 0); LSWF – Least significant word first – (bits 15 … 0), (bits 31 … 16);
PDU address – Actual address bytes used in a Modbus Protocol Data unit
A “NaN” value is returned for unavailable floating-point values (e.g. in case of measurement error)
* The settings will take effect after restart of the sensor by power on reset.

Recycling

Recycle all applicable material.

Do not dispose of with regular household refuse.

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www.teracomsystems.com

Documents / Resources

	TERACOM TST300v3 Modbus RTU Temperature Sensor [pdf] User Manual TST300v3 Modbus RTU Temperature Sensor, TST300v3, Modbus RTU Temperature Sensor, RTU Temperature Sensor, Temperature Sensor, Sensor

References

- Remote monitoring and control solution for your automation challenges
- Remote monitoring and control solution for your automation challenges