control solutions

**TERACOM**

# USER MANUAL

## 1. Short description

TST300ᵥ₃ (successor 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 factory-calibrated. 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.

## 2. 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.

## 3. 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.

## 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 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 26 VDC
  Input Current: 7 mA@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
- Warranty
  Warranty period:   3 years

## 5. Pinout
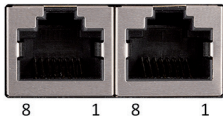


| Pin Description | Corresponding UTP wires color |
|---|---|
| 1 not connected (most right) | Orange/White Tracer |
| 2 not connected | Orange |
| 3 not connected | Green/White Tracer |
| 4 Line B- | Blue |
| 5 Line A+ | Blue/White Tracer |
| 6 not connected | Green |
| 7 +VDD | Brown/White Tracer |
| 8 GND | 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 Teracom controller which supports MODBUS RTU 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 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=O81, 3=N81 |
| Data order | R/W | 03/06 | 13 | 40014 | 40001 | 16-bit uns. integer | 1 | 1=MSWF (MSW, LSW) 2=LSWF (LSW, MSW) |
| Sub-family number | R | 03 | 14 | 40015 | 40001 | 16-bit uns. integer | 0xCB | |
| FW version | R | 03 | 15 | 40016 | 40001 | 16-bit uns. integer | | |
| Vendor URL | R | 03 | 18 | 40019 | 40001 | 64 bytes UTF-8 | teracomsystems.com | |
| Float test value (MSWF) | R | 03 | 82 | 40083 | 40001 | 32-bit float | -9.9(0xC11E6666) | |
| Float test value (LSWF) | R | 03 | 84 | 40085 | 40001 | 32-bit float | -9.9(0xC11E6666) | |
| Signed integer test value | R | 03 | 86 | 40087 | 40001 | 16-bit sig. integer | -999(0xFC19) | |
| Signed integer test value (MSWF) | R | 03 | 87 | 40088 | 40001 | 32-bit sig. integer | -99999(0xFFFE7961) | |
| Signed integer test value (LSWF) | R | 03 | 89 | 40090 | 40001 | 32-bit sig. integer | -99999(0xFFFE7961) | |
| Unsigned integer test value | R | 03 | 91 | 40092 | 40001 | 16-bit uns. integer | 999(0x03E7) | |
| Unsigned integer test value (MSWF) | R | 03 | 92 | 40093 | 40001 | 32-bit uns. integer | 99999(0x0001869F) | |
| Unsigned integer test value (LSWF) | R | 03 | 94 | 40095 | 40001 | 32-bit uns. integer | 99999(0x0001869F) | |
| Temperature °C (MSWF/LSWF) | R | 03 | 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.

## 12. Recycling

Recycle all applicable material.

Do not dispose of with regular household refuse.