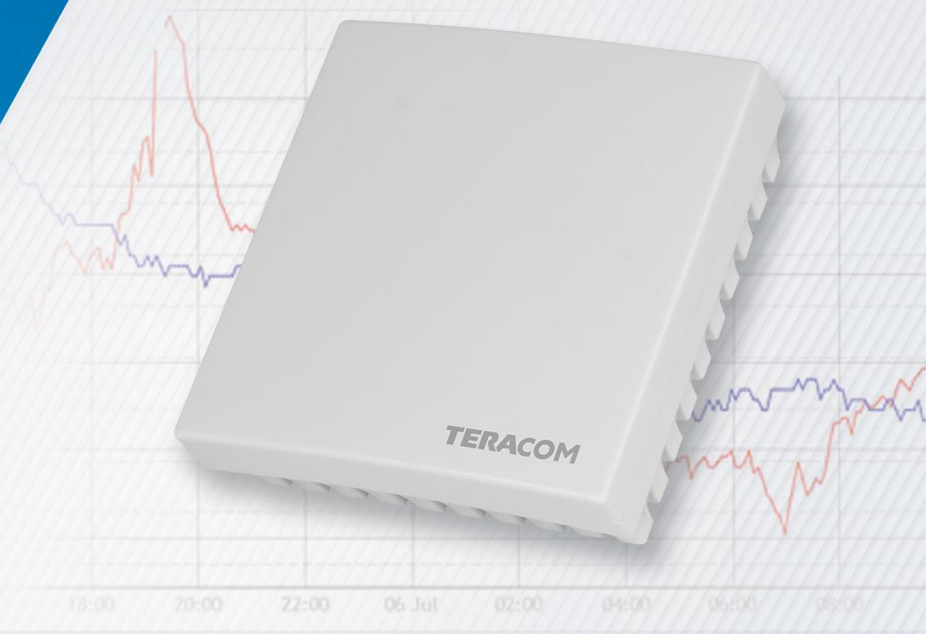
control solutions
TERACOM



TSM400-1-TH

1-Wire temperature and humidity sensor

Version 1.2 / March 2023

USER MANUAL

www.teracomsystems.com

1. Short description

TSM400-1-TH is a temperature and humidity sensor that supports the 1-Wire protocol. 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 TSM400-4-TH sensor is housed in a slim plastic enclosure. The bottom part of the enclosure is suitable for installation on standard flush-mounted/cavity wall boxes ø68mm, with installation openings on 61 mm.

2. Features

- LED indicator for status of communication
- Excellent long-term stability
- Firmware update with Teracom controller via the 1-Wire interface

3. Applications

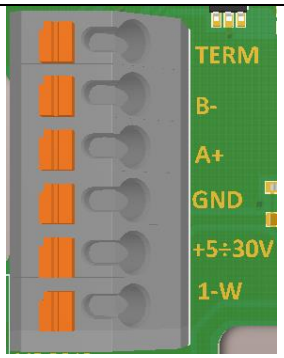
- Environmental quality monitoring and assessment for offices.
- Humidity and temperature monitoring in building management systems.
- Smart ventilation systems.

4. Specifications

- Physical characteristics
  Dimensions: 81 x 81 x 30 mm
  Weight: 66 g
- Environmental limits
  Operating temperature range: -20 to 60°C
  Operating relative humidity range: 10 to 90% (non-condensing) *
  Long term drift typical: ±0.25 %RH/year, ±0.05 °C /year **
  Storage temperature range: -20 to 60°C
  Storage relative humidity range: 10 to 90% (non-condensing)
  Ingress protection: IP20
- Power requirements
  Operating voltage range (including -15/+20% according to IEC 62368-1): 4.5 to 26 VDC
  Current consumption: 10 mA@5VDC
- Humidity measurements
  Accuracy (min): ±3.0 %RH (in 20 to 80 %RH range)
  Accuracy (max): ±5.0 %RH (in 10 to 90 %RH range) *
  Resolution: 0.1 %RH
- Temperature measurements
  Accuracy (min): ±0.4 °C (in -10 to +60°C range)
  Accuracy (max): ±0.6 °C (in -20 to +60°C range)
  Resolution: 0.1 °C
- Warranty
  Warranty period: 3 years

  * Recommended operating range is 20% to 80% RH (non-condensing) over –10 °C to 60 °C
  Prolonged operation beyond these ranges may result in a shift of sensor reading, with slow recovery time.
  ** Higher drift values might occur due to contaminant environments with vaporized solvents, out-gassing tapes, adhesives, packaging materials, etc.

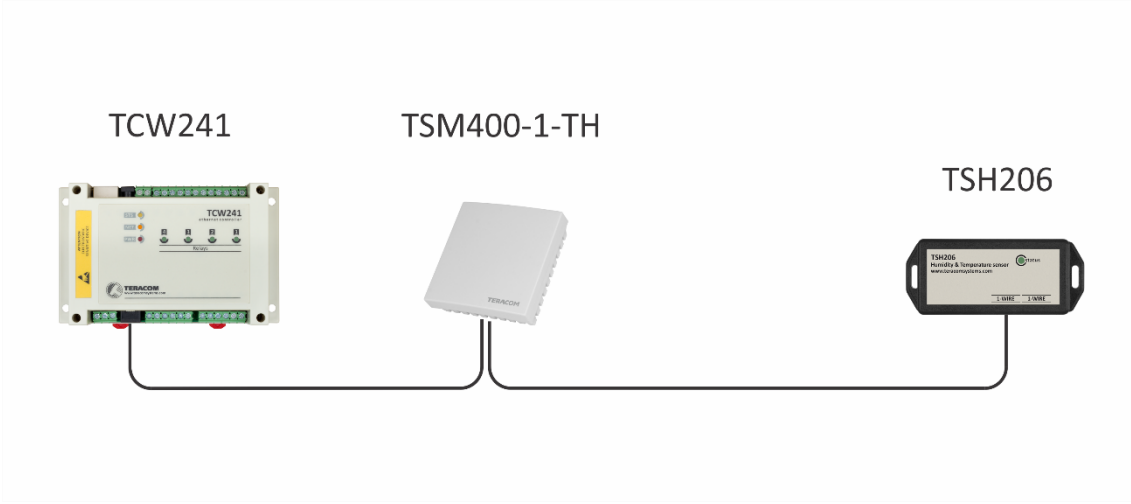
5. Pinout



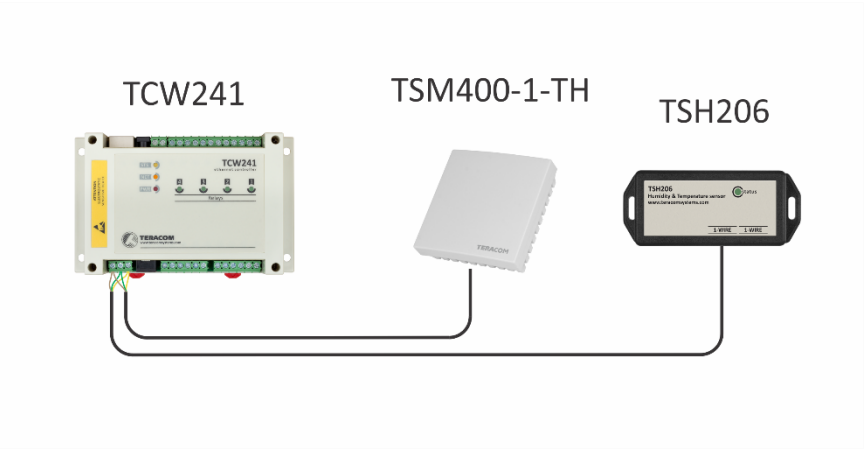
Pin	Description	UTP wires color
1-W	1-Wire data	Green
+5÷30V	Positive power supply	Orange
GND	Ground (negative) supply	Green/White tracer Orange/White Tracer
A+	Not used	
B-	Not used	
TERM	Not used	

6. Installation

It is strongly recommended to use UTP/FTP cables and daisy-chained (linear) topology for multiple sensors and keep the total cable length up to 30 meters.



"Star" topology can be used only as a last resort for up to 4 sensors and a total cable length of up to 10 meters.



7. Status indicator

The status of the device is shown by a single LED, located inside the box:

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

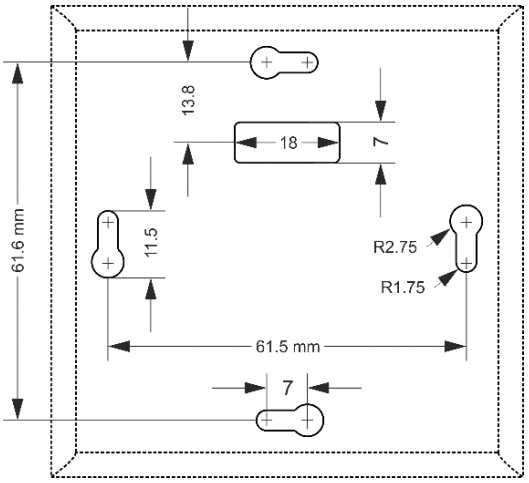
8. Installation tips

The location and the mounting position of sensors have a direct effect on the accuracy of the measurements. The tips below will ensure good measuring results:

- The sensor shall be installed about 1.2-1.4 m above the floor;
- To avoid solar radiation, the sensor should not be installed next to windows or directly in the sunlight;
- The sensors shall be installed in a place with sufficient air circulation.

1-Wire is a registered trademark of Maxim Integrated Products, Inc. It is strongly recommended to read Maxim's 1-Wire tips at https://teracomsystems.com/wp-content/uploads/AN148.pdf .

TSM400-1-TH sensor is intended for installation on a cavity wall box with 68mm diameter and 61 mm screw spacing.



9. Firmware update

The firmware of the sensor can be updated with any Teracom controller which supports a 1-Wire interface. For more details ask your dealer.

10. Recycling

Recycle all applicable material.

Do not dispose of regular household refuse.