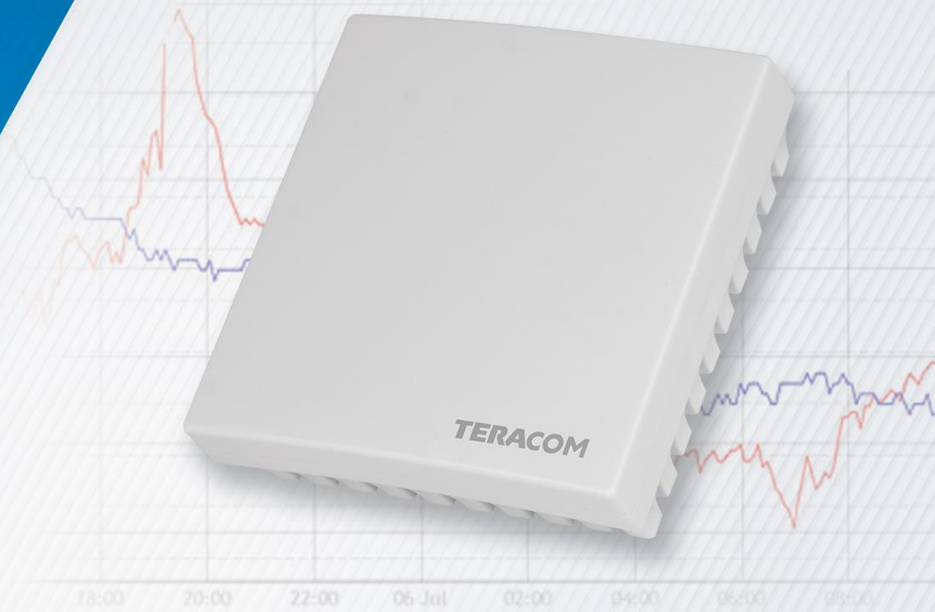




control solutions

**TERACOM**



**TSM400-1-CP**

**1-Wire carbon dioxide sensor**

Version 1.0 / June 2022

**USER MANUAL**

[www.teracomsystems.com](http://www.teracomsystems.com)

## 1. Short description

TSM400-1-CP is a multi-parameter sensor that supports the 1-Wire protocol. The sensor measures the concentration of carbon dioxide and atmospheric pressure. Both basic sensor elements, for carbon dioxide and pressure, used in the device are digital. This ensures high measurement accuracy and long-term stability.

The basic sensing element for atmospheric pressure is factory calibrated and it does not require any lifetime recalibration. Automatic calibration is available for carbon dioxide measurements.

TSH400-1-CP 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 61mm.

## 2. Features

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

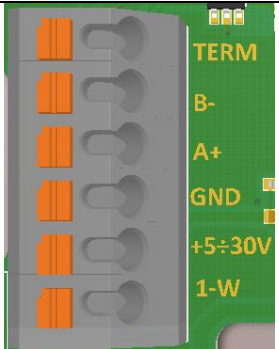
## 3. Applications

- Environmental quality monitoring and assessment for offices
- CO<sub>2</sub> pollution monitoring
- 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: 5 to 95% (non-condensing)  
Storage temperature range: -20 to 60°C  
Storage relative humidity range: 5 to 95% (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: 25 mA@5VDC (Peak: 150 mA@5VDC)
- CO<sub>2</sub> measurements  
Range: 400 to 5000 ppm  
Accuracy: ± (40 ppm + 5 %)  
Resolution: 1 ppm  
Calibration: Automatic, if the sensor is exposed to fresh air for more than 30 minutes.
- Pressure measurements  
Range: 10 to 1200 hPa  
Accuracy (min): ±1.5 (25°C, 750 hPa)  
Accuracy (max): ±2.5 (-20°C to + 85°C, 300 to 1100 hPa)  
Resolution: 1 hPa
- Warranty  
Warranty period: 3 years

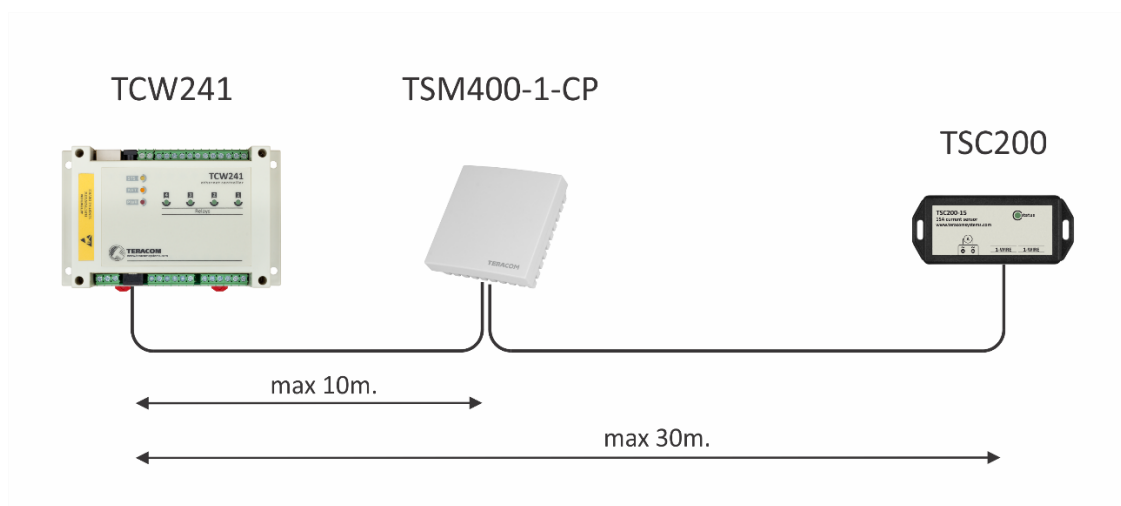
## 5. Pinout

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

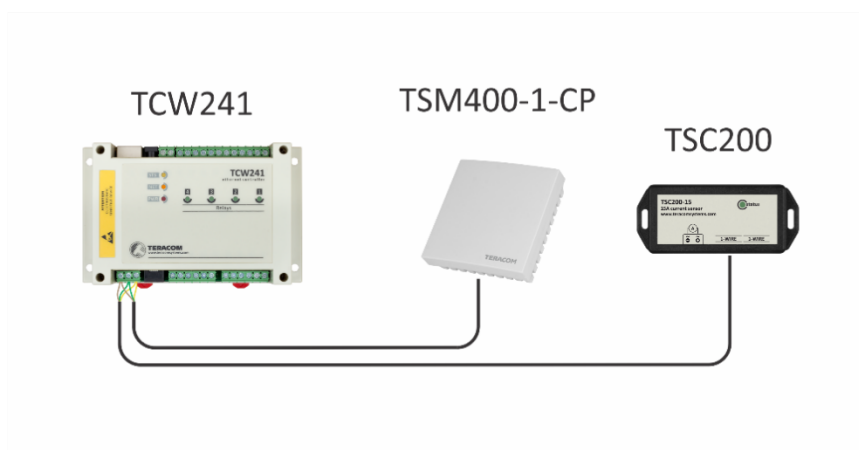
## 6. Installation

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.

**Attention!** Due to the high peak current, only one TSM400-1-CP sensor can be connected to a controller. The length of the cable between the controller and the sensor should not exceed 10 meters. If you want to connect more than one TSM400-1-CP sensor, please contact your supplier for technical guidance.



“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.

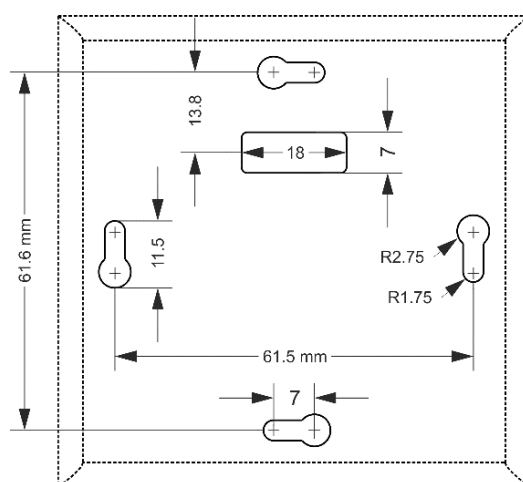
## 8. Installation tips

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 <http://www.maxim-ic.com/appnotes/index.mvp/id/148>.

TSM400-1-CP 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. 1-Wire scratchpad

|        | SCRATCHPAD   | SCRATCHPAD EXAMPLE DATA |
|--------|--------------|-------------------------|
| BYTE 0 | CO2 LSB      | 0XB0                    |
| BYTE 1 | CO2 MSB      | 0X04                    |
| BYTE 2 | Pressure LSB | 0XE3                    |
| BYTE 3 | Pressure MSB | 0X03                    |
| BYTE 4 | User byte 1  | 0XFF                    |
| BYTE 5 | User byte 2  | 0XFF                    |
| BYTE 6 | RESERVED     | 0XFF                    |
| BYTE 7 | RESERVED     | 0XFF                    |
| BYTE 8 | CRC          | 0X29                    |

CO2

Hex value - 0x04B0

Decimal value – 1200

Real value -> 1200 ppm

Pressure

Hex value - 0x03E3

Decimal value - 995

Real value -> 995 hPa

The sub-family code is 0xC9.

## 11. Recycling

Recycle all applicable material.

Do not dispose of regular household refuse.

