Wireless CO$_2$ + TRH Sensor

Installation Guide
Introduction

The wireless CO₂ + TRH (Carbon Dioxide + Temperature and Relative Humidity) sensor is a wall mounted device with ambient (indoor) comfort monitoring and HVAC control applications.

Please note the sensor is available in two variations:
1. CO₂ + TRH sensor (SED-CO2-G-5045)
2. TRH only sensor (SED-TRH-G-5045)

All information related herein applies to both models, except for CO₂ functionalities which are only available on the CO₂ + TRH sensor.

The sensor can measure ambient temperature, relative humidity and depending on the model - CO₂ concentration. The measured data is communicated wirelessly using ZigBee Green Power protocol to a Room/Zone controller.

Description

The sensor integrates an ultra-low power CO₂ and a digital temperature (T) and relative humidity (RH) sensor.

The Human Machine Interface (HMI) of the sensor is based on a bi-color Light-Emitting Diode (LED) and a pushbutton, both covered by a plastic housing. A small tool or stylus is needed to push the button located through a small hole. The LED flashes through the top plastic cover and is not visible when not active. All communication with the device is done wirelessly via a bidirectional ZigBee Green Power protocol after a successful pairing/commissioning procedure.

The sensor is powered by an embedded AA size lithium-thionyl chloride spiral battery (not rechargeable, not removable). The battery capacity allows up to 10 years of operating time at nominal conditions. The device must be replaced and recycled when the battery is discharged.

Box Contents

The wireless CO₂ + TRH sensor box contains the following:

• Wireless CO₂ + TRH sensor or TRH sensor
• Wall-mounting bracket
• Two screws for wall-mounting bracket
• Installation guide

System Requirements

If used in conjunction with a Schneider Electric Room Controller, the wireless CO₂ + TRH sensor requires a SE8000 Series Room Controller running firmware version 1.7 or higher.

The CO₂ + TRH sensor is not compatible with SE7000 Series Room Controllers.
Installation

The wireless CO₂ + TRH sensor can be secured directly on a wall or flat surface using double-sided adhesive tape (Figure 2), or by securing the plastic bracket to the wall (Figure 1) and mounting the sensor (Figure 3). Using the screws is the recommended method.

Attaching A Sensor Using The Wall Bracket

1. Using two screws provided, secure wall bracket to wall (Figure 1).

To perform an accurate ambient comfort measurement, the sensor should not be installed in areas exposed to direct sunlight or near doors, windows or areas exposed to air flow.

2. Once bracket is secured, slide sensor on bracket using downward motion.
3. Ensure click sound is heard to verify sensor is secured to bracket and ensure side tab of bracket is aligned with opening on side of sensor (Figure 3).

It is strongly recommended to attach the sensor to the wall by using the two screws. The adhesive in double-sided tape may not be as long-lasting or as strong to support the sensor throughout its lifetime.
De-mounting the sensor from the wall bracket:

To remove the sensor from the wall bracket, press on the side tab as circled in Figure 3 and slide the sensor up and then out.

Interface

A wireless CO₂ + TRH sensor is deployed by setting the interface with a push button and a multi-color LED. Both are hidden under the sensor housing and intended for use by a trained installer only.
Refer to the information below for detailed sensor operating instructions.

**Push button**

The push button can be pressed through a hole from the bottom side of the sensor, with a slim tool (Figure 4). Each recorded button press is signaled by 2 yellow LED flashes.

- **Short push**
  One short push starts the commissioning procedure if the sensor is in the decommissioned (energy saving / hibernation) mode. If the sensor is already commissioned, it will enter “demo mode” for a 5min timeout interval.

- **Long push**
  One long push puts the sensor into decommissioned / hibernate mode. The long push is confirmed by one red LED flash roughly 1 second after 2 yellow LED push signaling flashes. After a red LED signal, the button should be released in order to prevent another unintended short push detection.

**Multi-colour LED**

The multicolor LED is hidden under the top plastic cover, positioned on left (Figure 4). In normal state the LED is off in order to conserve battery life. It is only used to signal the following special events:

- 2 YELLOW flashes confirm each button push taken into account by the sensor.
- 1 RED flash acknowledges a long push. The decommissioning procedure and a sensor reset will be executed, then the sensor will enter hibernation mode.
- 3 RED flashes signal a commissioning procedure failure. The sensor stays in decommissioned / hibernation mode.
- 3 GREEN flashes signal a commissioning procedure success. The sensor will enter demo mode for 5 min. This demo mode will automatically timeout after 5 minutes. The sensor then stays in commissioned mode, periodically transmitting the measured values to the receiver.
- 1 GREEN flash acknowledges a valid GP command received by the sensor in demo mode. This feature can be used as a feedback to an installer to confirm that the sensor is still in range during the commissioning (it works only in demo mode). In this case the receiver has to be programmed to send an acknowledgment command to the sensor after the sensor data report frames.

The multiple LED flashes are executed only in 1/2 second intervals.

**CO₂ Sensor Autocalibration**

**Principle of operation**

The CO₂ module inside the wireless CO₂ + TRH sensor, is fully calibrated prior to shipping from the factory. Over time, the measurement offset needs to be calibrated to maintain the long term stability of the sensor. In most applications, this can happen automatically using the built in auto-calibration function. This technique can be used in situations in which sensors will be exposed to typical background levels (400-450ppm) at least once during the auto-calibration period. For example, many buildings will drop quickly to background CO₂ levels when unoccupied overnight or at weekends. The auto-calibration function uses the information gathered at these periods to recalibrate.

The auto-calibration function uses the lowest point of CO₂ concentration to recalibrate the offset. During every measurement cycle, the CO₂ sensor stores the latest values, and also the lowest value recorded since the last calibration point.

The first 50 measurements after calibration are ignored when calculating the lowest value.

**Autocalibration default setting**

The CO₂ sensor is shipped with the auto-calibration feature enabled. There isn’t any CO₂ measurement in the Factory Mode before the Commissioning. After the Commissioning all previous CO₂ measurement data stored in the sensor is erased.

By default the first autocalibration will happen 1 day after the commissioning, and the following auto-calibrations in 8-day intervals.
Compliance Statements

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

• this device may not cause harmful interference
• this device must accept any interference received, including interference that may cause undesired operation

Changes or modifications not approved by the manufacturer could void the user’s authority to operate the equipment. This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm during normal operation.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

• this device may not cause interference
• this device must accept any interference, including interference that may cause undesired operation of the device.

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Le présent appareil est conforme aux CNR d’Industrie Canada applicables aux appareils radio exempts de licence. L’exploitation est autorisée aux deux conditions suivantes:

• l’appareil ne doit pas produire de brouillage
• l’utilisateur de l’appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’en compromettre le fonctionnement.
Technical Support

For any issues with SmartStruxure Solution or SmartStruxure Lite, contact Schneider Electric Technical Support according to your region.

North America (NAM) Product Support

• Building Management Systems (BMS): www.nampss.com

Global Product Support

• Building Management Systems (BMS): productsupport.BMS@schneider-electric.com

Schneider Electric is the global specialist in energy management and automation. With revenues of ~€25 billion in FY2016, our 160,000+ employees serve customers in over 100 countries, helping them to manage their energy and process in ways that are safe, reliable, efficient and sustainable. From the simplest of switches to complex operational systems, our technology, software and services improve the way our customers manage and automate their operations. Our connected technologies reshape industries, transform cities and enrich lives.

At Schneider Electric, we call this Life Is On.