

**Honeywell**

# Indoor Air Quality Sensor

TR50



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**User Guide**

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## Revisions

Document Version	Firmware Version	Published	Changes	Comment
12-22	0.0.29.0	XX-12-22	Whole document	New document

## Reference documents

Indoor Air Quality Sensor TR50 Datasheet	31-00565M
Indoor Air Quality Sensor TR50 Mounting Instructions	31-00566M

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# INTRODUCTION TO TR50

## 1.1 Introduction

The IAQ Sensor TR50 is an advanced, configurable device for commercial buildings. It monitors 5 parameters

- Temperature (T)
- Relative Humidity (RH)
- Carbon Dioxide (CO<sub>2</sub>)
- Particular Matter (PM1.0, PM2.5 and PM10)
- Total Volatile Organic Compound (TVOC)

This IAQ Sensor TR50 device communicates using the Modbus, BACnet, or Sylk-Bus™ protocol and easily integrates with the building management system.

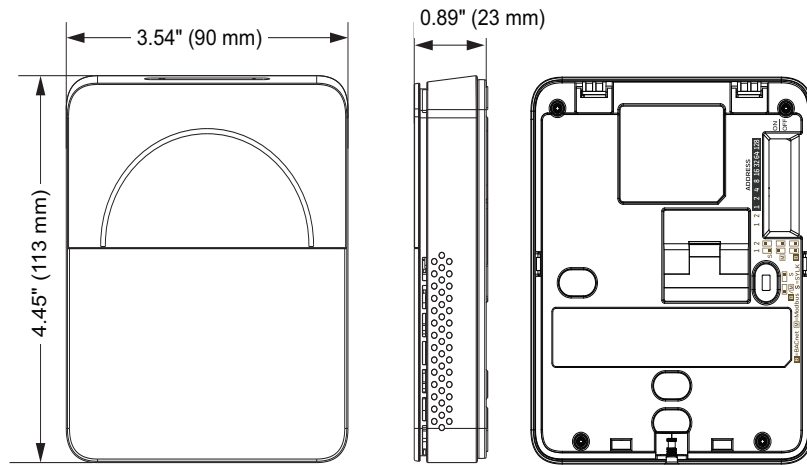
The algorithm built into the device can calculate comprehensive air quality level and display AQI number in LCD and corresponding color with LED ring. The device is packaged with numerous presets suitable for most commercial building requirements, enabling a quick and easy initial setup.

The IAQ Sensor TR50 device has multiple variants in light and dark themes. It has two display modes

- With Display
- Without Display.



## 1.2 Dimensions



All the dimensions shown are in inches (mm).

## 1.3 Intended audience and assumed knowledge

This User Guide provides information about the Getting Started, Configuration details, and Operations of the IAQ Sensor TR50 to the system integrator, technicians, and end-users. All the electrical engineers and technicians working with the product must have basic training on HVAC Sensors, Smart sensors, and Room Controllers and its application.

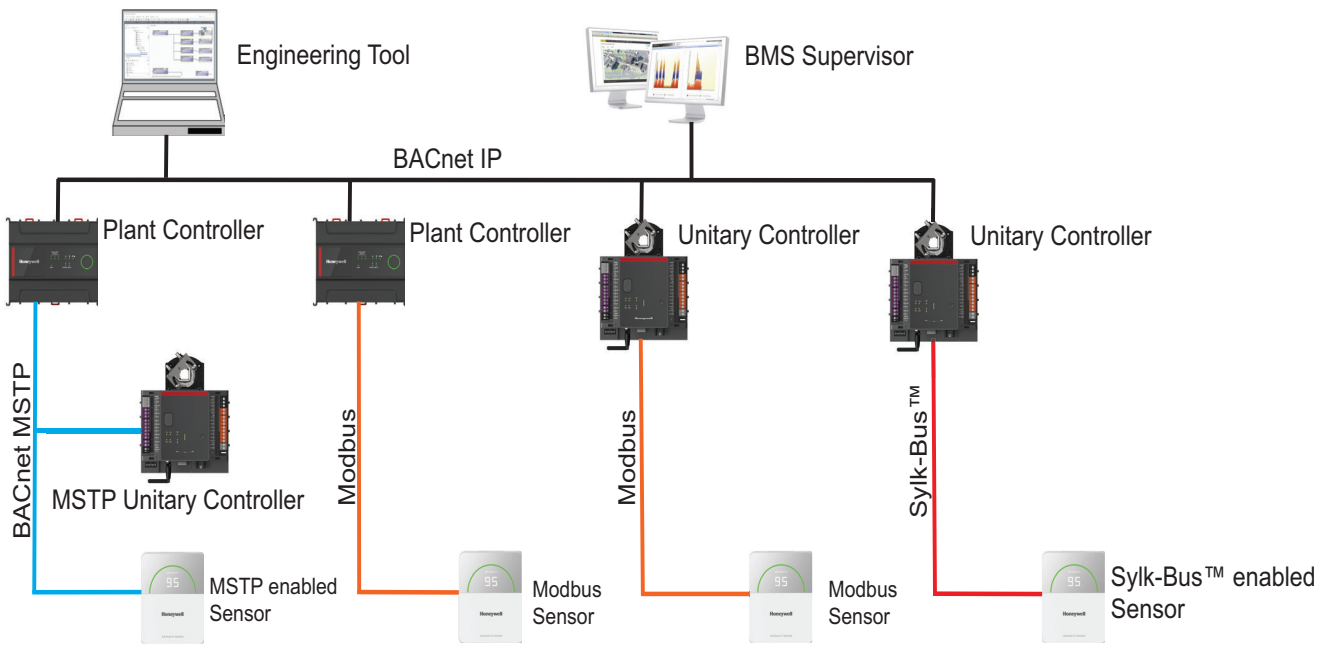
## 1.4 Specification

Parameter	Description
Detection Parameters	<ul style="list-style-type: none"> <li>- Temperature (T)</li> <li>- Relative Humidity (RH)</li> <li>- Carbon Dioxide (CO<sub>2</sub>)</li> <li>- Particular Matter (PM1.0, PM2.5 and PM10)</li> <li>- Total Volatile Organic Compound (TVOC)</li> </ul>
Power Supply	<b>Direct</b> : 24 V AC/DC ± 20 % <b>Sylk- Bus™</b> : Honeywell Sylk-Bus™ Technology
Operating Temperature	0 to 50 °C (32 to 122 °F)
Operating Humidity	0-95 % RH, non-condensing
Storage Temperature	-40 to 65.5 °C (-40 to 150 °F)
Communication	BACnet MSTP, Modbus over RS-485, or Sylk-Bus™
Net weight	189 grams (0.42 lbs.)

Parameter	Description
Power Consumption	<b>TR50-5D</b> : 24 VAC 3.8 VA, 24 VDC 1.2 W <b>TR50-5N</b> : 24 VAC 3.8 VA, 24 VDC 1.2 W <b>TR50-3D</b> : 24 VAC 3.2 VA, 24 VDC 1.0 W, Sylk-Bus™ 1.0 W <b>TR50-3N</b> : 24 VAC 3.2 VA, 24 VDC 1.0 W, Sylk-Bus™ 1.0 W
Dimensions	3.54 inches (90 mm) x 4.45 inches (113 mm) x 0.89 inches (23 mm)

## 1.5 System Architecture

There are many flexible ways IAQ Sensor TR50 can be integrated into a BMS, as shown below:



## 1.6 Ordering Information

PART NUMBER	SENSORS	COMMUNICATION PROTOCOL	DISPLAY	POWER
TR50-5D	Temperature, Humidity, CO2, PM2.5 and TVOC	Modbus + BACnet + Sylk™	Yes	24 V AC/DC
TR50-5N	Temperature, Humidity, CO2, PM2.5 and TVOC	Modbus + BACnet + Sylk™	No	24 V AC/DC
TR50-3D	Temperature, Humidity and CO2	Modbus + BACnet + Sylk™	Yes	24 V AC/DC or Sylk™
TR50-3N	Temperature, Humidity and CO2	Modbus + BACnet + Sylk™	No	24 V AC/DC or Sylk™
TR50-5D-B	Temperature, Humidity, CO2, PM2.5 and TVOC	Modbus + BACnet + Sylk™+ Bluetooth	Yes	24 V AC/DC
TR50-5N-B	Temperature, Humidity, CO2, PM2.5 and TVOC	Modbus + BACnet + Sylk™+ Bluetooth	No	24 V AC/DC
TR50-3D-B	Temperature, Humidity and CO2	Modbus + BACnet + Sylk™+ Bluetooth	Yes	24 V AC/DC or Sylk™
TR50-3N-B	Temperature, Humidity and CO2	Modbus + BACnet + Sylk™+ Bluetooth	No	24 V AC/DC or Sylk™
TR50-5D-BW	Temperature, Humidity, CO2, PM2.5 and TVOC	Modbus + BACnet + Sylk™+ Bluetooth + Sub-G	Yes	24 V AC/DC
TR50-5N-BW	Temperature, Humidity, CO2, PM2.5 and TVOC	Modbus + BACnet + Sylk™+ Bluetooth + Sub-G	No	24 V AC/DC
TR50-3D-BW	Temperature, Humidity and CO2	Modbus + BACnet + Sylk™+ Bluetooth + Sub-G	Yes	24 V AC/DC or Sylk™
TR50-3N-BW	Temperature, Humidity and CO2	Modbus + BACnet + Sylk™+ Bluetooth + Sub-G	No	24 V AC/DC or Sylk™



## 2.1 Important Safety Information and Installation Precautions

Read the below instructions carefully for safety and installation.

### **Local codes and practices**

Always install equipment in accordance with the National Electric Code and a in manner acceptable to the local authority having jurisdiction.

### **Electrostatic sensitivity**

This product and its components may be susceptible to Electrostatic Discharge (ESD). Use appropriate ESD grounding techniques while handling the product. When possible, always run the product by its non-electrical components.

### **High voltage safety test**

Experienced electricians, at first contact, always assume that hazardous voltages may exist in any wiring system. A safety check using a known, reliable voltage measurement or detection device should be made immediately before starting work and when work resumes.

### **Lightning and high-voltage danger**

Most electrical injuries involving low-voltage wiring result from sudden, unexpected high voltages on usually low-voltage wiring. Low-voltage wiring can carry hazardous high voltages under unsafe conditions. Never install or connect wiring or equipment during electrical storms. Improperly protected wiring can have a fatal lightning surge for many miles. All outdoor wiring must be equipped with adequately grounded and listed signal circuit protectors, which must comply with local, applicable codes. Never install wiring or equipment while standing in water.

## Wiring and equipment separations

Install all the wiring and controllers to minimize the possibility of accidental contact with other potentially hazardous and disruptive power and lighting wiring. Never place 24 VAC or communications wiring near other bare power wires, lightning rods, antennas, transformers, or steam or hot water pipes. Never place the wire in any conduit, box, channel, duct, or other enclosure containing power or lighting circuits. Always provide adequate separation of communications and another electrical wiring according to code. Keep wiring and controllers at least six feet from large inductive loads (power distribution panels, lighting ballasts, motors, etc.). Failure to follow these guidelines can introduce electrical interference and cause the system to operate erratically.

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## 2.1.1 Before Installation

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and the product to ensure the product is suitable for your application.
3. IAQ Sensor TR50 must be installed and mounted only by authorized and trained personnel.
4. When performing any work (installation, mounting, start-up), all manufacturer instructions, particularly the Mounting Instructions (31-00566M-01), are to be observed.
5. It is recommended to keep the device at room temperature for at least 24 hours before applying power. This allows any condensation resulting from low shipping/storage temperatures to evaporate.
6. After installation is complete, check out product operation as provided in these instructions.

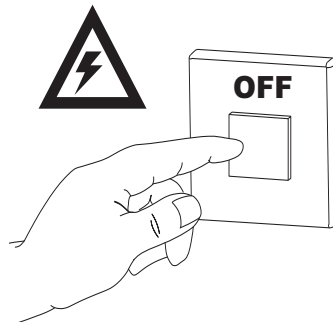
**Note:** All wiring must agree with applicable codes, ordinances, and regulations as specified in installation wiring diagrams.

## 2.1.2 Restricting Access to Network

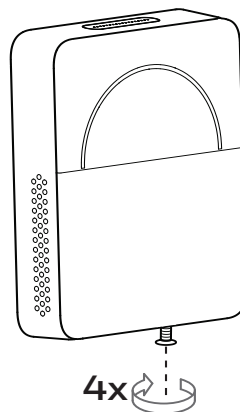
Prevent unauthorised access to the network (e.g., BACnet MSTP, MODBUS, or Sylkbus™) that the Smart Sensor uses. With any system, preventing physical access to the network and equipment reduces the risk of unauthorised interference. When using open protocols such as MODBUS or BACnet MSTP, care should be taken to ensure that the physical network is protected from unauthorised access.

## 2.2 Steps to Install TR50 Sensor

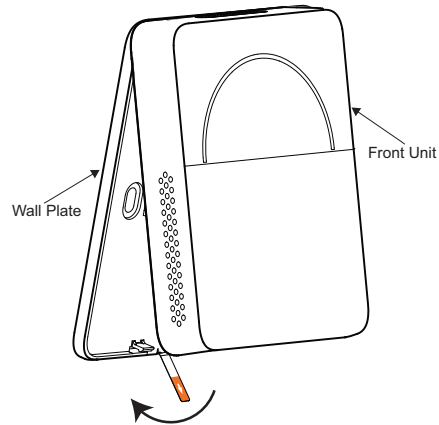
1. Switch OFF the power supply before initiating the IAQ TR50 Sensor installation.



2. Loosen the bottom screw by turning it anticlockwise with the help of a screwdriver.

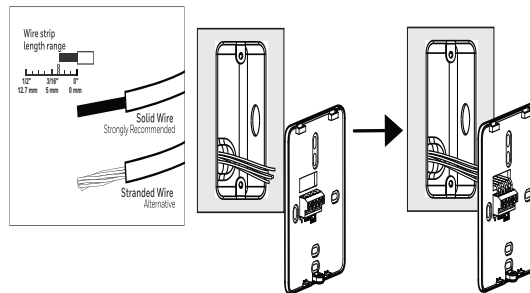


3. Separate the front unit and wall plate by pulling out the tape from the bottom to do the wiring.

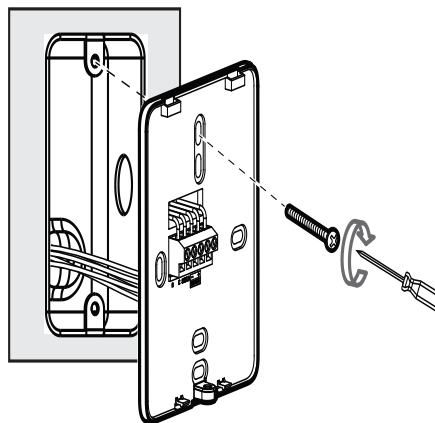


4. Pull the cables through the junction box and do wiring.

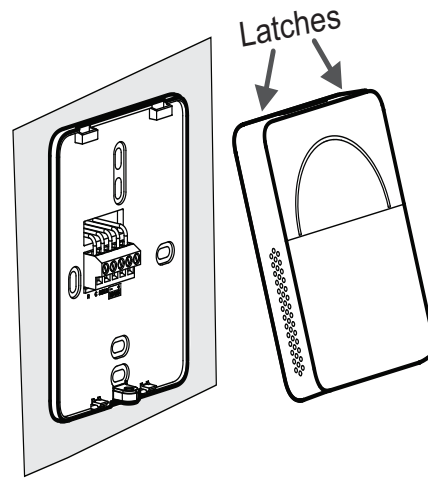
### Single wire



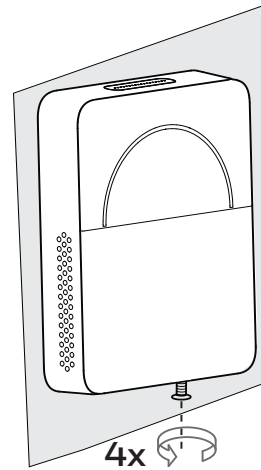
5. Fix the wall plate with the help of two screws to the Junction box.



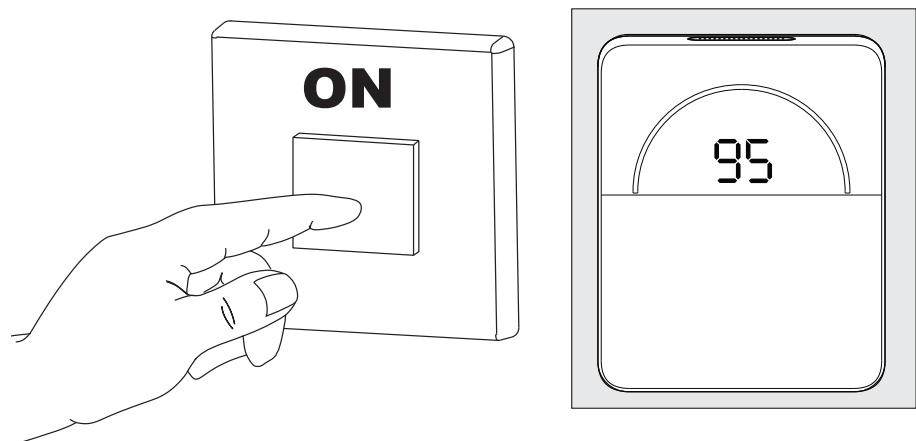
6. Attach the front unit to the wall plate, making sure the latches on each side are well matched.



7. Tighten the bottom screw to fix the front unit and wall plate.

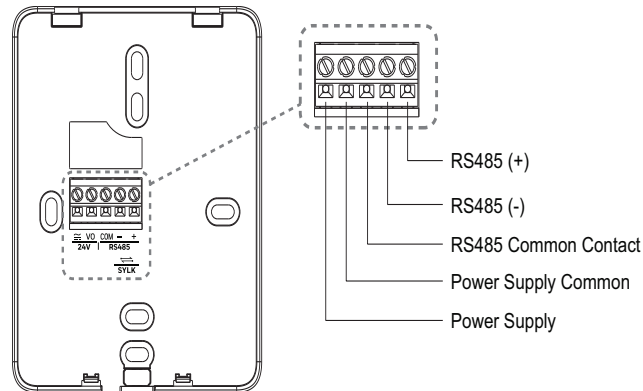


8. Switch ON the power supply to start IAQ TR50 Sensor device.



## 2.3 Wiring Connections

Terminal identification for the wiring is shown below.



## 2.4 Wiring Terminals

Legends/Label	Description
	Power supply (24 V AC/DC)
VO	Power supply common
COM	COM contact for RS485 interface
-	(-) for RS485 interface
+	(+) for RS485 interface
	Slyk™ slave, Power input (only for 3D, 3N series)

## 2.5 Power Up the Sensor Device

Once the IAQ Sensor TR50 device is installed and powered, the device gets started. It will show firmware version number “x.x.x.x” as per the latest updated firmware and the parameter values are displayed on the LCD.

## GETTING STARTED

### 3.1 Display Overview

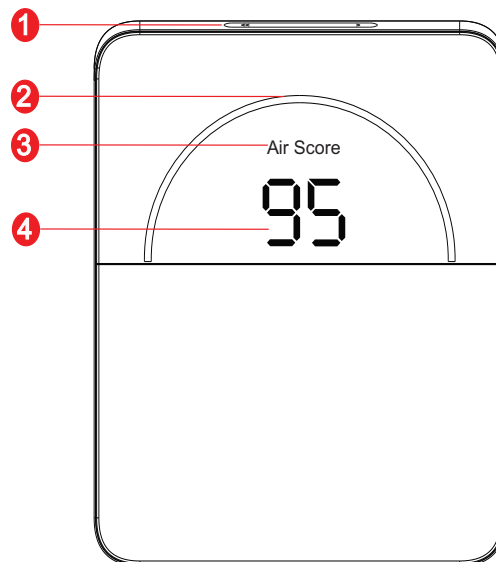
The IAQ Sensor TR50 device has two display modes:

- Normal Mode
- Dark Mode

### 3.2 Home Screen - User Interface

The IAQ Sensor TR50 user interface contains

1. Touch Button
2. LED Status Color Ring
3. Parameter Description
4. Mono display



### 3.2.1 Touch Button

A Touch Button is available on the top of the IAQ Sensor TR50 device to change the parameters. Swipe the touch button left to right to change the parameters.



### 3.2.2 LED Ring Behavior / Indication

The LED light behavior can be configured into two modes:

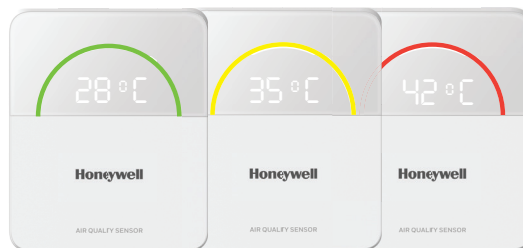
- Color Mode
- Neutral Mode

These two modes indicates LED behavior, air quality, sensor reading, or sensor health.

#### **Color Mode: With Display/ Without Display**

The LED behavior of color mode Temperature readings are shown below:

WITH DISPLAY



WITHOUT DISPLAY

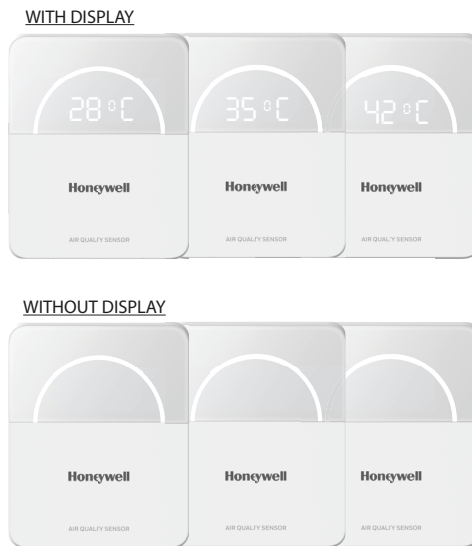




LED Behavior	Air Quality Level	Sensor Reading Level	Sensor Health
Green	Good	Good	-
Yellow	Medium	Medium	-
Red	Poor	Poor (For CO <sub>2</sub> , PM2.5 and TVOC)	Sensor Failure

**Neutral Mode: With Display/ Without Display**

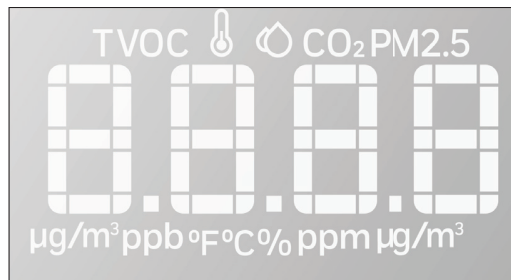
The LED behavior of Neutral mode Temperature readings are shown below:





LED Behavior	Air Quality Level	Sensor Reading Level	Sensor Health
White on	Good	Good	-
White Breath	Medium	Medium	-
White Blink	Poor	Poor (For CO <sub>2</sub> , PM2.5 and TVOC)	Sensor Failure

### 3.2.3 Parameter Description

The IAQ Sensor TR50 device will show 5 different parameter readings on the LCD display.



The following table provide an overview of all the available segments of the IAQ Sensor TR50 device with its parameter names and units.

Segments	Parameter Name	Units
	Temperature	°C (°F)
	Humidity	%
CO <sub>2</sub>	Carbon Dioxide	PPM
PM2.5	Particular Matter	µg/m <sup>3</sup>
TVOC	Total Volatile Organic Compound	PPB

### 3.2.4 Mono Display

The Mono segment display on the IAQ Sensor TR50 is used to show the system parameter values.

## 3.3 Display Parameter

The Display Parameter of IAQ Sensor TR50 have 2 different modes

- Auto Mode
- Manual Mode

### 3.3.1 Auto Mode

After the installation and configuration, the display will show the parameter values per cycle time. The default time for the cycle to change the parameter is 5 seconds. If the SKU don't have PM2.5 and TVOC in the device, or installer configure to hide the parameters, the display will jump to next parameters.

The display brightness is set to default 80 %.

### 3.3.2 Manual Mode

Under the manual mode the installer will configure the required parameters. The cycle time to display the parameters can be set manually from the range of 3-10 seconds or swipe the touch button to change the parameters.

The display brightness can be changed manually from a range of 20-100 %.

## CONFIGURATION

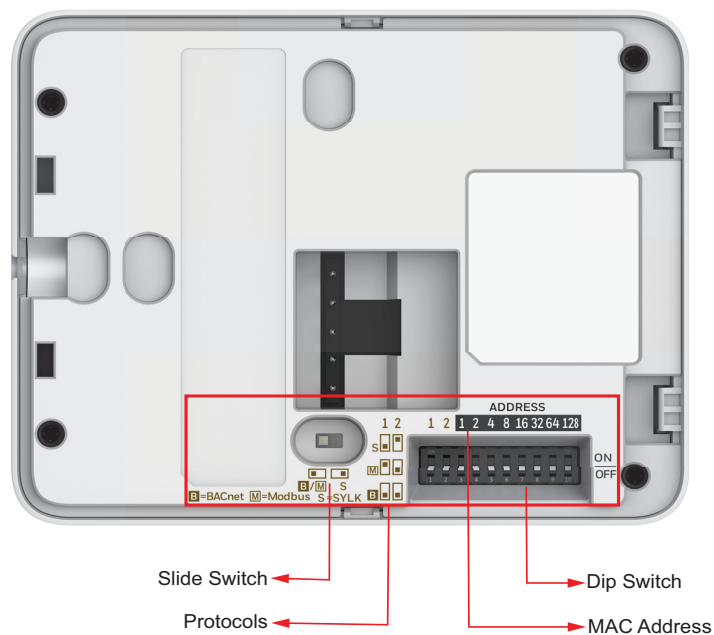
## 4.1 Topologies used to connect IAQ Sensor TR50

To configure the IAQ Sensor TR50, the device must be connected to plant or unitary controller. Before configuring the device, complete the dip switch configuration and connect the device to plant controller or unitary controller through RS-485 cables and connect your supervisor's workstation (Laptop or PC) to the same network. For more details refer [System Architecture](#) on page 3 and Niagara Engineering Guide, Smart Sensor configuration section.

## 4.2 Dip Switch Configuration

The Dip switch is used to change the communication protocols as per the selected networks.

The below figure describes the different switch how to communicate the networks:



### 4.1.1 BACnet Mode

**Slide Switch:** The slide switch is set to LEFT to work in BACnet network mode.

**DIP Switch:** The BACnet protocol switch is set to OFF for both 1 and 2 address.

The Auto MAC address for the BACnet mode is all ON/OFF.

### 4.1.2 Modbus Mode

**Slide Switch:** The slide switch is set to LEFT to work in Modbus network mode.

**DIP Switch:** The Modbus protocol switch is set to ON/OFF for 1/2 address.

The Modbus mode does not have auto MAC address.

### 4.1.3 Slyk-Bus™ Mode

The Slyk-Bus™ communication feature is not available in the current beta release. The details will be added before the final product launch.

## 4.4 RS-485 Configuration

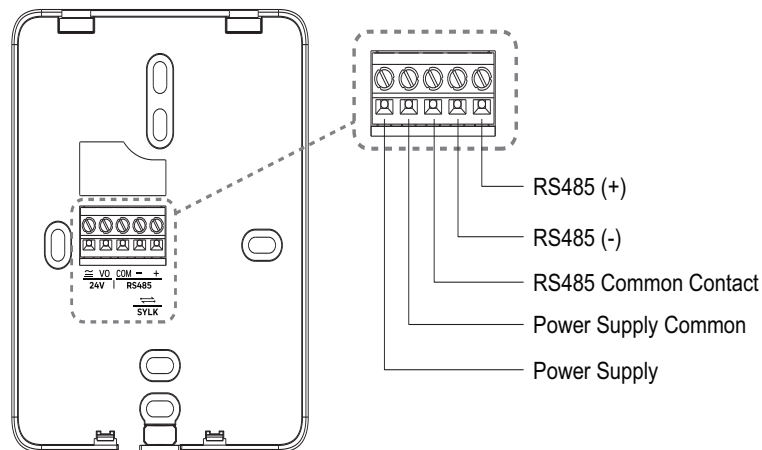
### 4.3.1 Pre-Requisites:

- Power Source (24 V AC/DC) to connect TR50 device and Plant controller/ Unitary controller
- RS-485 cables
- Plant controller/ Unitary controller

Before configuring the device make sure the power supply is Switch OFF.

## 4.3.2 Wiring

Below are the wiring details of RS-485 via communication BACnet, Modbus and Sylk-Bus™ through plant or unitary controller.



For more details about wiring RS-485 refer the installation steps on [page 7](#).

## 4.4 BACnet Configuration

### 4.4.1 Pre-Requisties

Adjust the switches on the back of the device to enable the device to operate in BACnet mode. Refer [Dip Switch Configuration](#) for more details.

### 4.4.2 Automatic MAC Address

The IAQ Sensor TR50 device support automatic MAC address when DIP switch address is put to all OFF or all ON.

By default, all the DIP switch address are OFF, so the MAC address will be assigned automatically.

Below are the default MAC address details. Engineers can assign MAC address manually via DIP address switch.

- **Default MAX Master:** 127
- **Default Min MAC:** 1
- **Default Max MAC:** 127

### 4.4.3 BACnet Device Instance ID

By default, the IAQ TR50 sensor device will use MAC address as BACnet device instance to benefit initial device discovery process for TR50 commissioning.

After TR50 device is discovered, commissioning engineer take the responsibility to assign a unique BACnet device instance across inter-network. For more details about device discovery and device ID refer Niagara Engineering Guide Smart Sensor section.

### 4.4.4 Auto Baud Rate

The IAQ Sensor TR50 device will be running in adaptive baud rate mode.

The adaptive baud rate will work in the first 4 minutes after the device is power ON. Choose a valid baud rate (9600, 38400, 19200, 57600, 76800, 115200). If the valid baud rate can not be found in this period, device will look in flash for the baud rate found last time, if failed again, use default 38400.

### 4.4.5 BACnet Points

Use the BACnet MSTP network to discover and add the IAQ Sensor TR50 device.

Refer Niagara Engineering Guide Smart Sensor device discovery section for more details.

After the device is discovered, different BACnet points will be created as per SKUs. These points are used to configure below sections as desired.

- Changing Parameter values
- Out of Range reading
- Alarm set values
- LCD Brightness

#### 4.4.5.1 Device Points (TR50-5D)

Analog Input Objects	Analog Value Objects	Binary Value Objects	Multi State Value Objects
SS_AI_SensorReading_Temp	CfgAlarmTempLowLimit	CfgIsAlarmLocalDetection	SS_MV_OutOfRange_Temp
SS_AI_SensorReading_Humi	CfgAlarmTempHighLimit	-	SS_MV_OutOfRange_Humi
SS_AI_SensorReading_CO2	CfgAlarmTempDeadband	-	SS_MV_OutOfRange_CO2
SS_AI_SensorReading_PM1.0	CfgAlarmTempTimeDelay	-	SS_MV_OutOfRange_PM2.5
SS_AI_SensorReading_PM2.5	CfgAlarmHumiLowLimit	-	SS_MV_OutOfRange_TVOC
SS_AI_SensorReading_PM10	CfgAlarmHumiHighLimit	-	CfgIsAlarmTempLimitEnable
SS_AI_SensorReading_TVOC	CfgAlarmHumiDeadband	-	CfgIsAlarmHumiLimitEnable
-	CfgAlarmHumiTimeDelay	-	CfgIsAlarmCO2LimitEnable
-	CfgAlarmCO2HighLimit	-	CfgIsAlarmPM2.5LimitEnable
-	CfgAlarmCO2HighhighLimit	-	CfgIsAlarmTVOCLimitEnable
-	CfgAlarmCO2Deadband	-	CfgIsAlarmIndicateEnable

Analog Input Objects	Analog Value Objects	Binary Value Objects	Multi State Value Objects
-	CfgAlarmCO <sub>2</sub> TimeDelay	-	CfgLcdParameterSwitch
-	CfgAlarmPM2.5HighLimit	-	CfgLcdColorOption
-	CfgAlarmPM2.5HighHighLimit	-	-
-	CfgAlarmPM2.5Deadband	-	-
-	CfgAlarmPM2.5TimeDelay	-	-
-	CfgAlarmTVOCHighLimit	-	-
-	CfgAlarmTVOCHighhighLimit	-	-
-	CfgAlarmTVOCDeadband	-	-
-	CfgAlarmTVOCTimeDelay	-	-
-	CfgLedBrightness	-	-
-	CfgLcdBrightness	-	-
-	CfgLcdBrightness	-	-
-	CfgLcdTimeoutTime	-	-
-	CfgLcdDimTime	-	-
-	CfgLcdParaDisplayed	-	-

#### 4.4.5.2 Device Points (TR50-5N)

Analog Input Objects	Analog Value Objects	Binary Value Objects	Multi State Value Objects
SS_AI_SensorReading_Temp	CfgAlarmTempLowLimit	CfgIsAlarmLocalDetection	SS_MV_OutOfRange_Temp
SS_AI_SensorReading_Humi	CfgAlarmTempHighLimit	-	SS_MV_OutOfRange_Humi
SS_AI_SensorReading_CO <sub>2</sub>	CfgAlarmTempDeadband	-	SS_MV_OutOfRange_CO <sub>2</sub>
SS_AI_SensorReading_PM1.0	CfgAlarmTempTimeDelay	-	SS_MV_OutOfRange_Humi
SS_AI_SensorReading_PM2.5	CfgAlarmHumiLowLimit	-	SS_MV_OutOfRange_PM2.5
SS_AI_SensorReading_PM10	CfgAlarmHumiHighLimit	-	SS_MV_OutOfRange_TVOC
SS_AI_SensorReading_TVOC	CfgAlarmHumiDeadband	-	CfgIsAlarmTempLimitEnable
-	CfgAlarmHumiTimeDelay	-	CfgIsAlarmHumiLimitEnable
-	CfgAlarmCO <sub>2</sub> HighLimit	-	CfgIsAlarmCO <sub>2</sub> LimitEnable
-	CfgAlarmCO <sub>2</sub> HighhighLimit	-	CfgIsAlarmPM2.5LimitEnable
-	CfgAlarmCO <sub>2</sub> Deadband	-	CfgIsAlarmTVOCLimitEnable
-	CfgAlarmCO <sub>2</sub> TimeDelay	-	CfgIsAlarmIndicateEnable
-	CfgAlarmPM2.5HighLimit	-	CfgLcdColorOption
-	CfgAlarmPM2.5HighHighLimit	-	-
-	CfgAlarmPM2.5Deadband	-	-
-	CfgAlarmPM2.5TimeDelay	-	-
-	CfgAlarmTVOCHighLimit	-	-
-	CfgAlarmTVOCHighhighLimit	-	-
-	CfgAlarmTVOCDeadband	-	-
-	CfgAlarmTVOCTimeDelay	-	-
-	CfgLedBrightness	-	-

**Note:** In TR50-5N device mode the LCD brightness, LCD timeout, parameter display points are not available.

#### 4.4.5.3 Device Points (TR50-3D)

Analog Input Objects	Analog Value Objects	Binary Value Objects	Multi State Value Objects
SS_AI_SensorReading_Temp	CfgAlarmTempLowLimit	CfgIsAlarmLocalDetection	SS_MV_OutOfRange_Temp
SS_AI_SensorReading_Humi	CfgAlarmTempHighLimit	-	SS_MV_OutOfRange_Humi
SS_AI_SensorReading_CO <sub>2</sub>	CfgAlarmTempDeadband	-	SS_MV_OutOfRange_CO <sub>2</sub>
-	CfgAlarmTempTimeDelay	-	SS_MV_OutOfRange_Humi
-	CfgAlarmHumiLowLimit	-	CfgIsAlarmTempLimitEnable
-	CfgAlarmHumiHighLimit	-	CfgIsAlarmHumiLimitEnable
-	CfgAlarmHumiDeadband	-	CfgIsAlarmCO <sub>2</sub> LimitEnable
-	CfgAlarmHumiTimeDelay	-	CfgIsAlarmIndicateEnable
-	CfgAlarmCO <sub>2</sub> HighLimit	-	CfgLcdParameterSwitch
-	CfgAlarmCO <sub>2</sub> HighhighLimit	-	CfgLedColorOption
-	CfgAlarmCO <sub>2</sub> Deadband	-	
-	CfgAlarmCO <sub>2</sub> TimeDelay	-	
-	CfgLedBrightness	-	
-	CfgLcdBrightness	-	
-	CfgLcdBrightness	-	-
-	CfgLcdTimeoutTime	-	-
-	CfgLcdDimTime	-	-
-	CfgLcdParaDisplayed	-	-

**Note:** In TR50-3D device mode PM2.5, TVOC parameters are not available.

#### 4.4.5.4 Device Points (TR50-3N)

Analog Input Objects	Analog Value Objects	Binary Value Objects	Multi State Value Objects
SS_AI_SensorReading_Temp	CfgAlarmTempLowLimit	CfgIsAlarmLocalDetection	SS_MV_OutOfRange_Temp
SS_AI_SensorReading_Humi	CfgAlarmTempHighLimit	-	SS_MV_OutOfRange_Humi
SS_AI_SensorReading_CO <sub>2</sub>	CfgAlarmTempDeadband	-	SS_MV_OutOfRange_CO <sub>2</sub>
-	CfgAlarmTempTimeDelay	-	CfgIsAlarmTempLimitEnable
-	CfgAlarmHumiLowLimit	-	CfgIsAlarmHumiLimitEnable
-	CfgAlarmHumiHighLimit	-	CfgIsAlarmCO <sub>2</sub> LimitEnable
-	CfgAlarmHumiDeadband	-	CfgIsAlarmIndicateEnable
-	CfgAlarmHumiTimeDelay	-	CfgLedColorOption
-	CfgAlarmCO <sub>2</sub> HighLimit	-	-
-	CfgAlarmCO <sub>2</sub> HighhighLimit	-	-
-	CfgAlarmCO <sub>2</sub> Deadband	-	-
-	CfgAlarmCO <sub>2</sub> TimeDelay	-	-
-	CfgLedBrightness	-	-

**Note:** In TR50-3D device mode PM2.5, TVOC parameters the LCD brightness, LCD timeout, parameter display points are not available.



## 4.5 Modbus Configuration

### 4.5.1 Baud Rate

The IAQ Sensor TR50 device will automatically detect baudrate when it is connected Modbus channel. Refer Niagara Engineering Guide Smart Sensor section

Baud rate range is 200, 2400, 4800,9600, 14400, 19200, 38400, 57600 and 115200 bps.

### 4.5.2 Modbus Serial Port Settings

- **Data Bits:** 8
- **Stop Bits:** 1
- **Parity:** None/Even/odd (**Default:** Even)

### 4.5.3 Modbus Register Table

Category	Reg Type	Setup/runtime	Addr	Dir	NoN-Volatile	Name	SKU	Type/Unit	Bits Num	Range	Scale	Default
Device	Holding	Setup	2000	R/W	Nv	cfgBaudrate	3N/3D/5N/5D	enum/int16	16	0: 1200 baud 1: 2400 baud 2: 4800 baud 3: 9600 baud 4: 14400 baud 5: 19200 baud 6: 38400 baud 7: 57600 baud 8: 115200 baud	-	5
Device	Holding	Setup	2001	R/W	Nv	cfgParity	3N/3D/5N/5D	enum/int16	16	0: none 1: odd 2: even	-	2
Device	Holding	Setup	2002	R/W	Nv	cfgStopBits	3N/3D/5N/5D	int16	16	1-2	1	1
Device	Holding	Setup	2010	R/W	Nv	cfgTemperature-Offset	3N/3D/5N/5D	signed/int16	16	-	1	0
Device	Holding	Setup	2011	R/W	Nv	cfgHumidityOffset	3N/3D/5N/5D	signed/int16	16	-	1	0
Device	Holding	Setup	2012	R/W	Nv	cfgCO2Offset	3N/3D/5N/5D	signed/int16	16	-	1	0
Device	Holding	Setup	2013	R/W	Nv	cfgPM2.5Offset	5N/5D	signed/int16	16	-	1	0
Device	Holding	Setup	2014	R/W	Nv	cfgTVOCOffset	5N/5D	signed/int16	16	-	1	0
Device	Holding	Setup	2030	R/W	Nv	cfgTemperatureLowLimit	3N/3D/5N/5D	signed/int16	16	0 < TemperatureLowLimit < TemperatureHighLimit	1	68 °F
Device	Holding	Setup	2031	R/W	Nv	cfgHumidityLowLimit	3N/3D/5N/5D	int16	16	0 < HumidityLowLimit < HumidityHighLimit	1	40
Device	Holding	Setup	2032	R/W	Nv	cfgCO2HighLimit	3N/3D/5N/5D	int16	16	400 < CO2HighLimit < CO2HighHighLimit	1	600
Device	Holding	Setup	2033	R/W	Nv	cfgPM2.5HighLimit	5N/5D	int16	16	0 < PM2.5HighLimit < PM2.5HighHighLimit	1	15
Device	Holding	Setup	2034	R/W	Nv	cfgTVOCHighLimit	5N/5D	int16	16	8 < TVOCHighLimit < TVOCHighHighLimit	1	200 ppb
Device	Holding	Setup	2050	R/W	Nv	cfgTemperatureHighLimit	3N/3D/5N/5D	signed/int16	16	TemperatureLowLimit < TemperatureHighLimit < 110?	1	77 °F
Device	Holding	Setup	2051	R/W	Nv	cfgHumidityHighLimit	3N/3D/5N/5D	int16	16	HumidityLowLimit < HumidityHighLimit	1	60
Device	Holding	Setup	2052	R/W	Nv	cfgCO2HighHighLimit	3N/3D/5N/5D	int16	16	CO2HighLimit < CO2HighHighLimit	1	1000
Device	Holding	Setup	2053	R/W	Nv	cfgPM2.5HighHighLimit	5N/5D	int16	16	PM2.5HighLimit < PM2.5HighHighLimit	1	35
Device	Holding	Setup	2054	R/W	Nv	cfgTVOCHighHighLimit	5N/5D	int16	16	TVOCHighLimit < TVOCHighHighLimit	1	250 ppb
Device	Holding	Setup	2070	R/W	Nv	cfgTemperature deadband	3N/3D/5N/5D	int16	16	0 <= deadband	1	2
Device	Holding	Setup	2071	R/W	Nv	cfgHumidity deadband	3N/3D/5N/5D	int16	16	0 <= deadband	1	1
Device	Holding	Setup	2072	R/W	Nv	cfgCO2 deadband	3N/3D/5N/5D	int16	16	0 <= deadband	1	5
Device	Holding	Setup	2073	R/W	Nv	cfgPM25 deadband	5N/5D	int16	16	0 <= deadband	1	3
Device	Holding	Setup	2074	R/W	Nv	cfgTVOC deadband	5N/5D	int16	16	0 <= deadband	1	10 ppb
Device	Holding	Setup	2090	R/W	Nv	cfgTemperature time delay	3N/3D/5N/5D	int16	16	-	1	10
Device	Holding	Setup	2091	R/W	Nv	cfgHumidity time-delay	3N/3D/5N/5D	int16	16	-	1	10
Device	Holding	Setup	2092	R/W	Nv	cfgCO2time delay	3N/3D/5N/5D	int16	16	-	1	10
Device	Holding	Setup	2093	R/W	Nv	cfgPM2time delay	5N/5D	int16	16	-	1	10
Device	Holding	Setup	2094	R/W	Nv	cfgTVOtime delay	5N/5D	int16	16	-	1	10

Category	Reg Type	Setup/runtime	Addr	Dir	NoN-Volatile	Name	SKU	Type/Unit	Bits Num	Range	Scale	Default
Device	Holding	Setup	2110	R/W	Nv	Cfg_OORSensor-FailAlarmIndicatorEn	3N/3D/5N/5D	enum/int16	16	1:Disable 2:cfgOutOfRangeAlarmIndicatorEnable 3:cfgSensorFailureAlarmIndicatorEnable 4:cfgOutOfRangeAlarmIndicatorEnable && cfgSensorFailureAlarmIndicatorEnable	1	4
Device	Holding	Setup	2130	R/W	Nv	cfgSensorReadingDisplayEnable	3D/5D	int16	16	cfgIsDisplayed_AQI-bit0 cfgIsDisplayed_Temp-bit1 cfgIsDisplayed_Humi-bit2 cfgIsDisplayed_CO2-bit3 cfgIsDisplayed_PM2.5-bit4 cfgIsDisplayed_TVOC-bit5	1	63
Device	Holding	Setup	2150	R/W	Nv	cfgTempAlarmLimitEnable	3N/3D/5N/5D	enum/int16	16	1:Temp Low Limit And High Limit Disable 2:Temp Low Limit Enable 3:Temp High Limit Enable 4:Temp Low Limit And High Limit Enable	1	4
Device	Holding	Setup	2151	R/W	Nv	cfgHumiAlarmLimitEnable	3N/3D/5N/5D	enum/int16	16	1:Humidity Low Limit And High Limit Disable 2:Humidity Low Limit Enable 3:Humidity High Limit Enable 4:Humidity Low Limit And High Limit Enable	1	4
Device	Holding	Setup	2152	R/W	Nv	cfgCO2AlarmLimitEnable	3N/3D/5N/5D	enum/int16	16	1:PM2.5 High Limit And High High Limit Disable 2:PM2.5 High Limit Enable 3:PM2.5 High High Limit Enable 4:PM2.5 High Limit And High High Limit Enable	1	4
Device	Holding	Setup	2153	R/W	Nv	cfgPM25AlarmLimitEnable	5N/5D	enum/int16	16	1:TVOC High Limit And High High Limit Disable 2:TVOC High Limit Enable 3:TVOC High High Limit Enable 4:TVOC High Limit And High High Limit Enable	1	4
Device	Holding	Setup	2154	R/W	Nv	cfgTVOVAlarmLimitEnable	5N/5D	enum/int16	16	1:TVOC High Limit And High High Limit Disable 2:TVOC High Limit Enable 3:TVOC High High Limit Enable 4:TVOC High Limit And High High Limit Enable	1	4
Device	Holding	Setup	3000	R/W	Nv	cfgLED Ring Color Option	3N/3D/5N/5D	int16	16	1-2	1	1
Device	Holding	Setup	3001	R/W	Nv	cfgLED Ring brightness	3N/3D/5N/5D	int16	16	20-100	1	80
Device	Holding	Setup	3020	R/W	Nv	cfgLCD_AUTO_CYCLE_TIME	3D/5D	int16	16	3-10	1	5
Device	Holding	Setup	3021	R/W	Nv	cfgLCD backlight brightness	3D/5D	int16	16	20-100	1	80

Category	Reg Type	Setup/runtime	Addr	Dir	NoN-Volatile	Name	SKU	Type/Unit	Bits Num	Range	Scale	Default
Device	Holding	Setup	3022	R/W	Nv	cfgLCDParameterSwitchAutoEnable	3D/5D	enum/int16	16	1: Auto (default) 2: Manual + no static page 3: Manual + AQI ( as the static page) 4: Manual + Temperature ( as the static page) 5: Manual + Humidity ( as the static page) 6: Manual + CO2 ( as the static page) 7: Manual + PM2.5 ( as the static page) 8: Manual + TVOC ( as the static page)	-	1
Device	Holding	Setup	3030	R/W	Nv	cfgLCD DIM Time	3D/5D	int16	16	-	1	10
Device	Holding	Setup	3031	R/W	Nv	cfgLCD OFF time	3D/5D	int16	16	-	1	30
Device	Coil	Setup	4000	R/W	Nv	cfgTemperatureUnit	3N/3D/5N/5D	bit/boolean	1	-Fahrenheit: 0 -Celsius: 1	-	Fahrenheit
Device	Coil	Setup	4004	R/W	Nv	cfgTVOCUnit	5N/5D	bit/boolean	1	-ppb: 0 -ug/m3: 1	-	ppb
Device	Coil	Setup	5000	R/W	Nv	cfgModbusAutoBaudrateEnable	3N/3D/5N/5D	bool	1	TRUE or FALSE	-	True
Device	Coil	Setup	5040	R/W	Nv	cfgLocalDetectionEnable	3N/3D/5N/5D	bool	1	TRUE or FALSE	-	True

## 4.6 Sylk-Bus™ Configuration

The Sylk-Bus™ communication feature is not available in the current beta release. The details will be added before the final product launch.

## 5.1 About Status LED Ring

The LED status ring colors are configured for data points to indicate the conditions of the parameters that may require control. IAQ Sensor TR50 device helps to view and manage the parameter readings through LED ring. This LED ring is available in both with and without modes. Refer [LED Ring Behavior / Indication](#) section on page 11 for more details.

## 5.2 Factory Reset

1. Hold the top touch button for 10 seconds by your fingers.
2. LED ring will blink quickly with the cycle of Green-Red-Green-Red-Green...
3. Remove your finger from button area.
4. LED ring will stay with status showing “WHITE ON”.
5. Click on the middle button on top within 5 seconds.
6. LED ring will show “WHITE ON” and LCD display shows “0000” (Only in display mode i.e., TR50-5D and TR50-3D devices)
7. Wait device run “Reset to Factory Default” and then reboot.
8. Wait a moment, IAQ Sensor device will Light LED and parameter values are displayed on the LCD.
9. Complete “Reset”.

# CORRECTION AND CALIBRATION

## 6.1 Regular Correction

To ensure the accuracy of the measured value, the IAQ Sensor TR50 should be corrected every year. The correction should be carried out when a large deviation in the measured value occurs, even if it has been used for less than one year. This chapter describes the correction environment and requirements needed on the user's site; Honeywell can perform the correction via a calibration software tool at the factory if the following environmental conditions are required for field correction.

## 6.2 Correction Environment

- Temperature: 0 to 50 °C (32 to 122 °F)
- Humidity: 0-100 % RH, non-condensing
- The IAQ Sensor TR50 needs to be placed in the indoor natural environment within the above temperature and humidity range.
- There should be windows and no human interference with good air circulation.
- The room area for correction should not be less than 30 m<sup>2</sup> (325 ft<sup>2</sup>).

## 6.3 Calibration Standards Needed for Factory Correction

### 6.3.1 Temperature and Humidity

#### **Temperature and Humidity Calibration Standard:**

After the temperature and humidity calibration standard and IAQ Sensor TR50 that needs to be corrected are powered on continuously and synchronously for more than 60 minutes, start to record the temperature and humidity value for 10 minutes, use the synchronous average value within 10 minutes overcorrection.

## 6.3.2 CO<sub>2</sub>

### **CO<sub>2</sub> Calibration Standard:**

The CO<sub>2</sub> sensor has an auto-calibration feature inbuilt. The outdoor CO<sub>2</sub> reference value is about 380 ppm - 420 ppm. After the CO<sub>2</sub> calibration standard and IAQ Sensor TR50 that needs to be corrected are powered continuously and synchronously, the CO<sub>2</sub> value shall be continuously recorded for 30 minutes, using the synchronous average value over 30 minutes for correction.

## 6.3.3 TVOC

### **TVOC Calibration Standard:**

TVOC sensor has auto calibration feature inbuilt. Since, each TVOC uses different sensors and sensitive substances, it is recommended to use the new IAQ Sensor TR50 machine as the TVOC calibration standard.

After the TVOC and IAQ Sensor TR50 that needs to be corrected are powered on continuously and synchronously, record the TVOC value continuously for 30 minutes and use the synchronous average value over 30 minutes for correction, TVOC value will be stable only after correction and at least 24 hours power-on.

## 6.3.4 PM1.0, PM2.5, and PM10

### **PM1.0, PM2.5, and PM10 Calibration Standard:**

After the new IAQ Sensor and old IAQ Sensor that needs to be corrected are powered on continuously and synchronously for more than 10 minutes, record the PM1.0, PM2.5 and PM10 value for 30 minutes, and synchronous average value over 30 minutes can be applied for correction.

# MAINTENANCE AND TROUBLESHOOTING

## 7.1 Maintenance

Regular maintenance is required in everyday use environments to ensure accurate IAQ Sensor data. Depending on the environment, maintenance is done every 3 to 6 months. Public places with a high concentration of dust, dry seasons, pollen seasons, and poor environmental cleanliness can shorten maintenance.

General maintenance includes: Cleaning the IAQ Sensor using a vacuum cleaner to remove dust inside.

## 7.2 Troubleshooting

If a fault occurs in a typical use environment, see the below troubleshooting table. Contact the dealer or manufacturer if the defect cannot be fixed.

Fault Condition	Troubleshooting
PM1.0, PM2.5, and PM10 data are abnormal; the deviation is too large, and the value is too high or too low.	Check whether debris or dust is in the sensor housing or the air inlet and outlet.
The CO <sub>2</sub> data is abnormal; the value is too high or too low.	<p>The CO<sub>2</sub> sensor has a self-calibration function inside. Usually, the self-calibration will return CO<sub>2</sub> values to normal.</p> <p><b>Self-calibration conditions:</b> The CO<sub>2</sub> concentration is around 400 ppm for at least 4 hours every 24 periods. The self-calibration environment should last for one week.</p>



Fault Condition	Troubleshooting
TVOC's deviation is too large (high or low).	TVOC in the environment needs to be stabilized for at least 48 hours after the sensor is powered ON. TVOC data deviation may be large within a short time after power is ON. TVOC baseline deviation may result in large data deviation. The equipment can be placed outside the window or outdoors for at least 24 hours when the outdoor air is good and clear, allowing TVOC to retrace its baseline.
Temperature and humidity deviation is too large, the value is too high or low.	Check whether the environmental factors surrounding the IAQ Sensor have any influence, such as direct sunlight, close to the heating or air conditioning air outlets, etc.
Temperature and humidity deviation is too large; value does not change for a long time.	The sensor can be powered off and back on to see if the reading returns to normal. Contact the dealer or manufacturer if the sensor value cannot be recovered.
Communication interruption RS-485 (MODBUS RTU)	Check if the power supply is normal and the RS-485 terminal is loose. Check whether the RS-485 communication line is accidentally cut. Check for an inductive load with electromagnetic interference near the equipment or RS-485 communication line, such as a water pump.

## 7.3 Error Code

### 7.3.1 Error Code With Display

In case of any sensor failure alarm for **TR50-5D** and **TR50-3D**, the display will show the sensor name and Err, until the user change it manually. For example, in case of PM2.5 sensor failure, the display will show the error code as Err<sup>PM2.5</sup>. If more than one sensor fails, the display will switch among those failure sensors.

The below figure indicates the Error Code for Color mode and Neutral Mode.

- **Color Mode:** Indicates Red LED ring with Error Code.
- **Neutral Mode:** Indicates White LED ring (Blink) with Error Code.



### 7.3.2 Error Code Without Display

In case of any sensor failure alarm for **TR50-5N** and **TR50-3N**, LED ring will blink as per color and neutral modes.


The below figure indicates the Error Code for Color mode and Neutral Mode.

- **Color Mode:** Indicates Red LED ring.
- **Neutral Mode:** Indicates White LED ring (Blink).



# CERTIFICATION AND REGULATION

## 8.1 Waste Electrical and Electronic Equipment (WEEE)

<b>WEEE: Waste Electrical and Electronic Equipment Directive</b>	
	<ul style="list-style-type: none"> <li>• At the end of the product life, dispose of the packaging and product in an appropriate recycling center.</li> <li>• Do not dispose of the device with the usual domestic refuse.</li> <li>• Do not burn the device.</li> </ul>

## 8.2 FCC Part 15 compliant

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

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

## 8.3 Regulation (EU) No 1907/2006

According to Article 33 of Reach Regulation, the substances listed below may be contained in these products above the threshold level of 0.1% by weight of the listed article.

Product/Part Code	Substance Name	CAS Number
TR50 Terminal block and PM2.5 sensor	Lead	7439-92-1
	Lead oxide	1317-36-8

## 8.4 Power Supply Guidelines and Requirements

The IAQ Sensor TR50 uses 24 VAC/VDC power from a UL Listed Class- 2, 24 VAC/VDC transformer (not provided in the kit). It uses a halfwave rectifier to convert the AC power supply to onboard power. This enables multiple devices with halfwave power supplies to be powered from a single, grounded transformer.

**Honeywell Building Technologies**

715 Peachtree Street NE

Atlanta, GA 30308

[customer.honeywell.com](http://customer.honeywell.com)

[buildingcontrols.honeywell.com](http://buildingcontrols.honeywell.com)

# INDOOR AIR QUALITY SENSOR TR50

The Honeywell TR50 Series IAQ Sensor is an advanced, configurable device for commercial buildings. It monitors

- Temperature (T)
- Relative Humidity (RH)
- Carbon Dioxide (CO<sub>2</sub>)
- Particulate Matter (PM1.0, PM2.5, PM10)
- Total Volatile Organic Compound (TVOC)

Flexible building automation system integration via Modbus, BACnet, or Sylk bus protocols. Customizable display and sensor thresholds with stable long-term accuracy for minimal maintenance or recalibration.



## FEATURES AND BENEFITS

### MULTI-SENSOR

Proper air cleaning and exchange can help reduce disease transmission by removing or dissipating pathogens, odors, and chemicals.

- Parameters are Temperature, Humidity, CO<sub>2</sub>, Particulate Matter (PM1.0, PM2.5, PM10), and TVOC
- Wall-mounted sensors

### TEMPERATURE AND HUMIDITY

#### Temperature:

Temperature between 20 - 25 °C (68 - 77 °F) can improve health and productivity.

#### Humidity:

Relative humidity of 40-60 % can decrease exposure to infectious particles and reduce virus transmission.

### CARBON DIOXIDE AND PARTICULAR MATTER

#### Carbon Dioxide:

CO<sub>2</sub> sensing is a proven way to gauge occupant density and automate Demand-Controlled Ventilation (DCV), optimizing air quality, and energy use.

#### Particulate Matter:

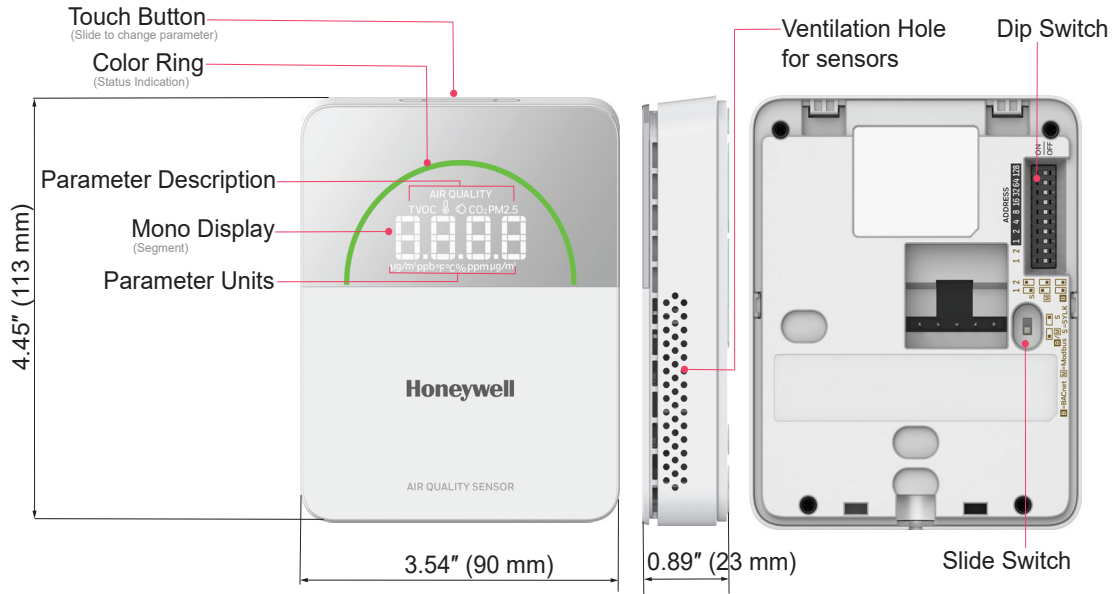
Track the range of detective level Particulate Matter that can cause asthma or other respiratory diseases.

### TOTAL VOLATILE ORGANIC COMPOUNDS (TVOC)

Detect poor air quality due to various VOCs such as odors, bio effluents, and outdoor pollutants.

VOC concentrations can be 10 times higher indoors.

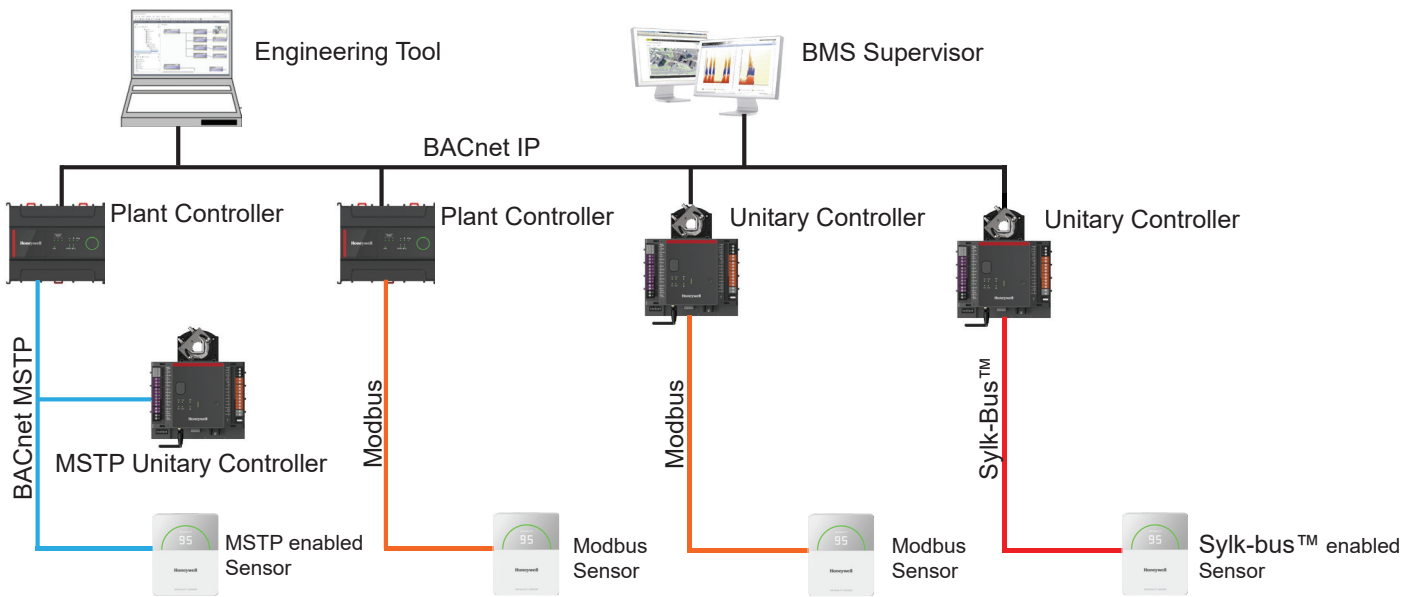
# OVERVIEW AND DIMENSIONS



All the dimensions are in inches (mm).

# SYSTEM ARCHITECTURE

There are many flexible ways a TR50 can be integrated into a BMS as shown below.



# ORDERING INFORMATION

PART NUMBER	SENSORS	COMMUNICATION PROTOCOL	DISPLAY	POWER
TR50-5D	Temperature, Humidity, CO2, PM2.5 and TVOC	Modbus + BACnet + Sylk™	Yes	24 V AC/DC
TR50-5N	Temperature, Humidity, CO2, PM2.5 and TVOC	Modbus + BACnet + Sylk™	No	24 V AC/DC
TR50-3D	Temperature, Humidity and CO2	Modbus + BACnet + Sylk™	Yes	24 V AC/DC or Sylk™
TR50-3N	Temperature, Humidity and CO2	Modbus + BACnet + Sylk™	No	24 V AC/DC or Sylk™
TR50-5D-B	Temperature, Humidity, CO2, PM2.5 and TVOC	Modbus + BACnet + Sylk™ + Bluetooth	Yes	24 V AC/DC
TR50-5N-B	Temperature, Humidity, CO2, PM2.5 and TVOC	Modbus + BACnet + Sylk™ + Bluetooth	No	24 V AC/DC
TR50-3D-B	Temperature, Humidity and CO2	Modbus + BACnet + Sylk™ + Bluetooth	Yes	24 V AC/DC or Sylk™
TR50-3N-B	Temperature, Humidity and CO2	Modbus + BACnet + Sylk™ + Bluetooth	No	24 V AC/DC or Sylk™
TR50-5D-BW	Temperature, Humidity, CO2, PM2.5 and TVOC	Modbus + BACnet + Sylk™ + Bluetooth + Sub-G	Yes	24 V AC/DC
TR50-5N-BW	Temperature, Humidity, CO2, PM2.5 and TVOC	Modbus + BACnet + Sylk™ + Bluetooth + Sub-G	No	24 V AC/DC
TR50-3D-BW	Temperature, Humidity and CO2	Modbus + BACnet + Sylk™ + Bluetooth + Sub-G	Yes	24 V AC/DC or Sylk™
TR50-3N-BW	Temperature, Humidity and CO2	Modbus + BACnet + Sylk™ + Bluetooth + Sub-G	No	24 V AC/DC or Sylk™

# PRODUCT SPECIFICATION

## GENERAL

PARAMETER	DESCRIPTION
Detection Parameters	- Temperature (T) - Relative Humidity (RH) - Carbon Dioxide (CO <sub>2</sub> ) - Particular Matter (PM1.0, PM2.5 and PM10) - Total Volatile Organic Compound (TVOC)
Display	Mono segment display
Power Supply	<b>Direct</b> : 24 V AC/DC ± 20 % <b>Sylk™</b> : Honeywell Sylk™ Bus Technology
Power Consumption	<b>TR50-5D</b> : 24 VAC 3.8 VA, 24 VDC 1.2 W <b>TR50-5N</b> : 24 VAC 3.8 VA, 24 VDC 1.2 W <b>TR50-3D</b> : 24 VAC 3.2 VA, 24 VDC 1.0 W, Sylk™ 1.0 W <b>TR50-3N</b> : 24 VAC 3.2 VA, 24 VDC 1.0 W, Sylk™ 1.0 W
Operating Temperature	0 - 50 °C (32 - 122 °F)
Operating Humidity	0-95 % RH, non-condensing
Storage Temperature	-40 - 65.5 °C (-40 - 150 °F)
Communication	BACnet MSTP, Modbus over RS485, or Sylk™
Net weight	189 grams (0.42 lbs.)
Enclosure	Polycarbonate
IP protection level	IP20
Junction Box compatibility	US single vertical, BS single, ME single, EUR single
Surface mount	The device can be mounted on drywall/ stone/etc. in retrofit cases.
Touch Button	Use to switch screens on the device from one parameter to another.

## USER INTERFACE

PARAMETER	SPECIFICATION			
	The LED light behavior can be configured into two modes. It shows LED behavior, air quality, sensor reading level or sensor health.			
Color Mode	LED Behavior	Air Quality Level	Sensor Reading Level	Sensor Health
	Green	Good	Good	
	Yellow	Medium	Medium	
	Red	Poor	Poor (For CO <sub>2</sub> , PM2.5 and TVOC)	Sensor Failure
Neutral Mode	White On	Good	Good	
	White Breath	Medium	Medium	
	White Blink	Poor	Poor (For CO <sub>2</sub> , PM2.5 and TVOC)	Sensor Failure

## SENSING

PARAMETER	DETAIL	SPECIFICATION	
Temperature	Measuring range	0 - 50 °C (32 - 122 °F)	
	Sensor output resolution	0.1 °C (0.1 °F)	
	Accuracy (According to Alcohol Volatilization)	± 1 °C (± 1.8 °F)	
Humidity	Measuring range	0 - 100 % RH	
	Sensor output resolution	0.1 % RH	
	Accuracy	±5 % RH @ 10 - 90 % RH in Room Temperature	
CO <sub>2</sub>	Measuring range	0-9999 ppm	
	Sensor output resolution	1 ppm	
	Accuracy	± 75 ppm @ 400-1000 ppm. ± 40 ppm ± 5 % reading @ 1001-2000 ppm	
PM1.0 PM2.5 PM10	Measuring Range	0 - 5000 µg/m <sup>3</sup>	
	Sensor output resolution	1 µg/m <sup>3</sup>	
	Accuracy (According to GRIMM Technology)	PM1.0	± 10 µg @ 0-100 µg/m <sup>3</sup> ± 10 % reading @ 101-500 µg/m <sup>3</sup>
		PM2.5	± 10 µg @ 0-100 µg/m <sup>3</sup> ± 10 % reading @ 101-500 µg/m <sup>3</sup>
		PM10	± 25 µg @ 0-100 µg/m <sup>3</sup> ± 25 % reading @ 101-500 µg/m <sup>3</sup>
	TVOC	Measuring range	0-9999 ppb
Sensor output resolution		0.1 ppb	
Accuracy (According to Alcohol Volatilization)		± 25 % reading	

## DISPLAY OPTIONS\*

PARAMETER	SPECIFICATION
Air Quality	Indoor Air Quality value
Sensor Reading	Temperature, Humidity, CO <sub>2</sub> value
	PM2.5, TVOC value (Only available in TR50-5D)
Error Code	In case of sensor failure, the display will show the sensor name and Err. For example, in the case of PM2.5 sensor failure, the display will show the error code as <b>Err</b> <sup>PM2.5</sup> . If more than one sensor fails, the display will switch among those failure sensors.

\*Only available in TR50-5D and TR50-3D models.

SCALABILITY
The IAQ Sensors are open protocol and can connect to any controller using BACnet and Modbus. The Sylk™ bus connectivity is compatible with Honeywell Optimizer Suite controllers and limited compatibility with the Honeywell Spyder model.



# PRODUCT SPECIFICATION

## COMPLIANCES

CERTIFICATES	STANDARDS
RoHS	IEC63000
CE	EN 60730-1 EN 60730-2-9
FCC	CFR 47 Part 15 Subpart B
UL	UL 60730-1 UL 60730-2-9
ISED	ICES -003 issue 7

## CALIBRATION

The devices come pre-calibrated out of the box and do not need to be recalibrated before installation. Our high-precision sensors ensure that the devices do not need to be recalibrated regularly over their lifetime either.

If the device readings start to drift or you see anomalous data, you can recalibrate the sensor by providing an offset with a new sensor reading (more details in the User Guide).

## GENERAL SAFETY INSTRUCTIONS

- Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
  1. This device may not cause harmful interference, and
  2. This device must accept any interference received, including interference that may cause undesired operation.
- This equipment complies with FCC/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 and your body.
- This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
  1. This device may not cause interference.
  2. This device must accept any interference, including interference that may cause undesired operation of the device.
- l'appareil contient des émetteurs/récepteurs exempts de licence qui sont conformes aux CNR exempts de licence d'Innovation, Sciences et Développement économique Canada. L'exploitation est soumise aux deux conditions suivantes:
  1. l'appareil ne doit pas produire de brouillage,
  2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.
- This equipment complies with FCC/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 and your body.
- ce matériel est conforme aux limites de dose d'exposition aux rayonnements, FCC / CNR-102 énoncée dans un autre environnement.cette eqipment devrait être installé et exploité avec distance minimale de 20 entre le radiateur et votre corps.
- CAN ICES-3(B)/NMB-3(B).

### UK Importer Address

Honeywell Building Technologies  
Building 5 Carlton Park  
King Edward Avenue  
Narborough, Leicester LE19 3EQ.

### Honeywell Building Technology

715 Peachtree Street NE,  
Atlanta, GA 30308  
[building.honeywell.com](http://building.honeywell.com)

### Honeywell Products & Solutions Sàrl

ZA La Pièce 16,  
1180 Rolle, Switzerland.  
[building.honeywell.com](http://building.honeywell.com)

### EU Importer Address

Honeywell GmbH  
Strahlenberger Str. 110-112  
63067 Offenbach am Main  
Germany

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# INDOOR AIR QUALITY SENSOR TR50

Mounting Instruction / Montageanleitung / Instructions de montage  
/ Instrucciones de montaje / Mounting Instruction

**Honeywell**



## Introduction / Einleitung / Introducción / Introduction

The smart sensor device is designed to be mounted on a wall, indoors. Mount in a clean, dry location away from windows, air ducts, and other places where environmental factors may affect readings. If you mount the sensor on the interior of an outside wall, thoroughly insulate it, so outside air behind the sensor does not affect the sensor reading.

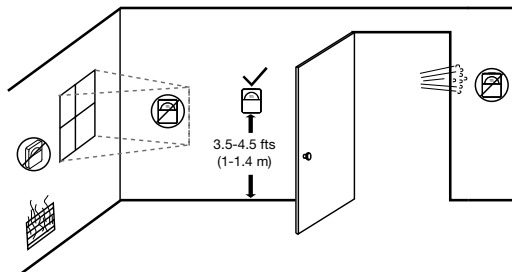
Der Monitor ist für die Wand- oder Deckenmontage in Innenräumen konzipiert. Montieren Sie das Gerät an einem sauberen, trockenen Ort, nicht in der Nähe von Fenstern, Luftschächten oder anderen Orten, an denen Umwelteinflüsse die Messwerte beeinflussen können. Wenn Sie das Gerät an der Innenseite einer Außenwand montieren, isolieren Sie es gründlich, damit die Außenluft hinter dem Sensor nicht den Messwert des Sensors beeinflusst.

Le moniteur est conçu pour être monté sur un mur ou un plafond à l'intérieur. Installez-le dans un endroit propre et sec, loin des fenêtres, des conduits d'air et d'autres endroits où des facteurs environnementaux pourraient affecter les lectures. Si vous montez l'appareil à l'intérieur d'un mur extérieur, isolez-le soigneusement pour que l'air extérieur derrière le capteur n'affecte pas la lecture du capteur.

El monitor se ha diseñado para montaje en la pared o en el techo en interiores. Móntelo en una ubicación limpia y seca lejos de las ventanas, conductos de aire y otros lugares donde los factores ambientales puedan afectar las lecturas. Si monta la unidad en el interior de una pared exterior, aisla completamente para que el aire exterior detrás del sensor no afecte a la lectura del sensor.

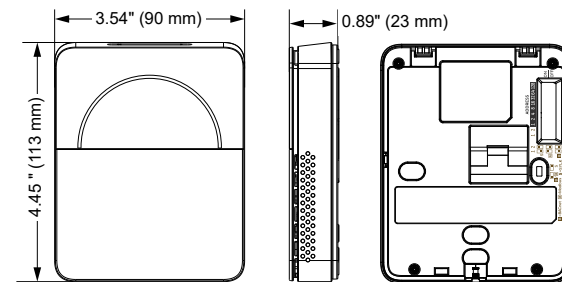
Il dispositivo smart sensor è progettato per essere montato a parete, in ambienti interni. Montarlo in un luogo pulito e asciutto, lontano da finestre, condotti d'aria e altri luoghi in cui i fattori ambientali possono influenzare le letture. Se si monta il sensore all'interno di una parete esterna, isolarlo accuratamente in modo che l'aria esterna dietro il sensore non influisca sulla lettura del sensore.

## Location / Standort / Emplacement / Ubicación / Posizione

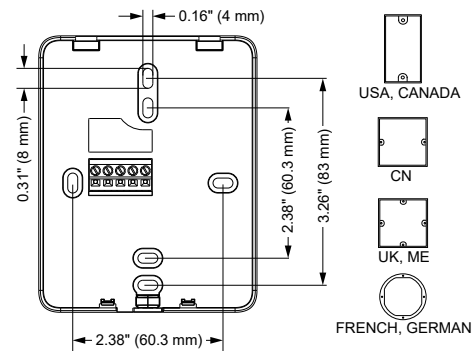


All the dimensions shown are in feet (meters). / Alle Abmessungen sind in mm (Zoll) angegeben. / Toutes les dimensions sont en mm (pouces). / Todas las dimensiones se indican en mm (pulgadas). / Tutte le dimensioni indicate sono in metri.

## Dimension / Abmessungen / Dimensiones

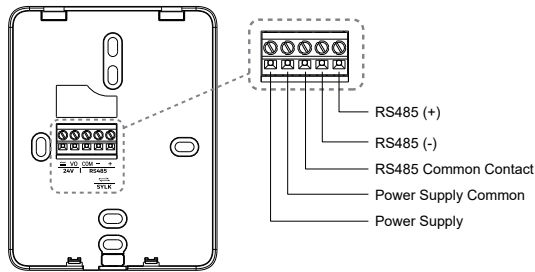


## Junction Box / Verbindungskasten / Boîte De Raccordement / Caja De Conexiones / Scatola Di Giunzione



All the dimensions shown are in inches (mm). / Alle Abmessungen sind in Zoll (mm) angegeben. / Toutes les dimensions sont en pouces (mm). / Todas las dimensiones se indican en pulgadas (mm). / Tutte le dimensioni indicate sono in pollici (mm).

## Terminal Identification / Terminal-Identifikation / Identification De La Borne / Identificación De Bornes / Identificazione Dei Terminali



## Installation Instructions / Montageanleitung / Manuel D'instruction / Instrucciones De Instalación / Istruzioni Di Installazione

1. Switch OFF the power supply before initiating the TR50 sensor installation.

1. Schalten Sie die Stromversorgung aus, bevor Sie mit der Installation des TR50-Sensors beginnen.

1. Couper l'alimentation électrique avant de commencer l'installation du capteur TR50.

1. Desconecte la alimentación eléctrica antes de iniciar la instalación del sensor TR50.

1. Spegner l'alimentazione prima di iniziare l'installazione del sensore TR50.

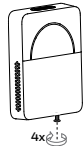
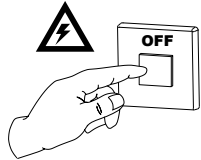
2. Loosen the bottom screw by turning it anticlockwise with the help of a screwdriver.

2. Lösen Sie die untere Schraube, indem Sie sie mit Hilfe eines Schraubendrehers gegen den Uhrzeigersinn drehen.

2. Desserrez la vis inférieure en la tournant dans le sens inverse des aiguilles d'une montre à l'aide d'un tournevis.

2. Afloje el tornillo inferior girándolo en sentido contrario a las agujas del reloj con la ayuda de un destornillador.

2. Allentare la vite inferiore ruotandola in senso antiorario con l'aiuto di un cacciavite.



## Installation Instructions / Montageanleitung / Manuel D'instruction / Instrucciones De Instalación / Istruzioni Di Installazione

3. Separate the front unit and wall plate by pulling out the tape from the bottom to do the wiring.

3. Trennen Sie die vordere Einheit und die Wandplatte, indem Sie das Klebeband an der Unterseite abziehen, um die Verkabelung vorzunehmen.

3. Séparez l'unité frontale et la plaque murale en retirant le ruban adhésif du bas pour effectuer le câblage.

3. Separe la unidad frontal y la placa de pared tirando de la cinta adhesiva de la parte inferior para realizar el cableado.

3. Separare l'unità anteriore e la piastra a parete tirando il nastro dal fondo per effettuare il cablaggio.



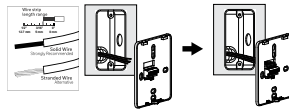
4. Pull the cables through the junction box and do wiring.

4. Ziehen Sie die Kabel durch die Anschlussdose und führen Sie die Verkabelung durch.

4. Tirez les câbles à travers la boîte de jonction et effectuez le câblage.

4. Pase los cables por la caja de empalmes y realice el cableado.

4. Far passare i cavi attraverso la scatola di giunzione ed eseguire il cablaggio.



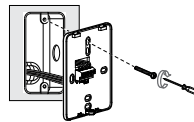
5. Fix the wall plate with the help of two screws to the Junction box.

5. Befestigen Sie die Wandplatte mit Hilfe von zwei Schrauben an der Anschlussdose.

5. Fixez la plaque murale à la boîte de jonction à l'aide de deux vis.

5. Fije la placa de pared con la ayuda de dos tornillos a la caja de empalmes.

5. Fissare la piastra a parete con l'aiuto di due viti alla scatola di giunzione.



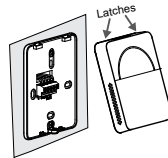
6. Attach the front unit to the wall plate, making sure the latches on each side are well matched.

6. Bringen Sie die vordere Einheit an der Wandplatte an und achten Sie darauf, dass die Verriegelungen auf beiden Seiten gut aufeinander abgestimmt sind.

6. Fixez l'unité frontale à la plaque murale, en vous assurant que les loquets de chaque côté sont bien assortis.

6. Fije la unidad frontal a la placa de pared, asegurándose de que los pestillos de cada lado estén bien encajados.

6. Fissare l'unità anteriore alla piastra a parete, assicurandosi che le chiusure su ciascun lato siano ben allineate.



## Installation Instructions / Montageanleitung / Manuel D'instruction / Instrucciones De Instalación / Istruzioni Di Installazione

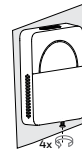
7. Tighten the bottom screw to fix the front unit and wall plate.

7. Ziehen Sie die untere Schraube an, um die Fronteinheit und die Wandplatte zu befestigen.

7. Serrez la vis inférieure pour fixer l'unité frontale et la plaque murale.

7. Apriete el tornillo inferior para fijar la unidad frontal y la placa de pared.

7. Serrare la vite inferiore per fissare l'unità anteriore e la piastra a parete.



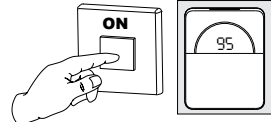
8. Switch ON the power supply to start the TR50 Smart Sensor.

8. Schalten Sie die Stromzufuhr ein, um den TR50 Smart Sensor zu starten.

8. Allumez l'alimentation électrique pour démarrer le capteur intelligent TR50.

8. Encienda la fuente de alimentación para poner en marcha el sensor inteligente TR50.

8. Accendere l'alimentazione per avviare il sensore intelligente TR50.



### Regulation (EU) No / VERORDNUNG (EU) NR. / RÉGLEMENTATION (UE) n° / REGLAMENTO (UE) N.° 1907/2006

According to Article 33 of the Reach Regulation, substances listed below may be contained in these products above the threshold level of 0.1% by weight of listed article.

Gemäß Artikel 33 der Reach-Verordnung dürfen die unten aufgeführten Stoffe in diesen Produkten oberhalb des Schwellenwerts von 0,1 Gewichtsprozent des aufgeführten Erzeugnisses enthalten sein.

Selon l'article 33 du Règlement REACH, les substances répertoriées ci-dessous peuvent être présentes dans ces produits en quantité supérieure au seuil de 0,1 % du poids de l'article mentionné.

Según el artículo 33 del Reglamento REACH, las sustancias enumeradas a continuación pueden encontrarse en estos productos en una cantidad superior al nivel umbral de 0,1 % en peso del artículo mencionado.

Product / Produkt / Produit / Nombre de producto	Substance Name / Substanzname / nom de la substance / Nombre de sustancia	# CAS
TR50 Terminal block and PM2.5 sensor / TR50 Terminal block and PM2.5 sensor /	Lead / Blei / Plomb / Plomo	7439-92-1
TR50 Terminal block and PM2.5 sensor / TR50 Terminal block and PM2.5 sensor	Lead oxide / Bleioxid / Monoxyde de plomb / Óxido de plomo	1317-36-8

Honeywell Building Technology  
715 Peachtree Street NE  
Atlanta, GA 30308  
customer.honeywell.com  
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