



External Module



A3 CO2 Junction Box



Outdoor CO2 Housing

CO₂ Sensor

General Description

Monitoring and controlling CO₂ levels is an important factor in building system optimization for both energy efficiency, building performance and occupant health and comfort.

The COZIR CO₂ sensor module can be operated with SMT's wireless and wired data logger systems. Results can be graphed and analyzed alongside other critical building performance metrics such as temperature, RH, moisture content, air flow, differential pressure and heat flux.

Typical Applications

- HVAC and HRV system validation and optimization.
- Indoor/Outdoor environmental CO₂ validation monitoring.

Features

- Low power CO₂ module uses infrared LED technology to facilitate low energy wireless monitoring.
- Compatible with SMT A2, A3 and WiDAQ voltage data loggers.
- Integrated with junction box A3 for interior monitoring.
- Leaded units available for placement in tight locations such as duct work.
- 2000ppm and 5000ppm models available.
- In-field calibration port available.
- Built in auto-calibration available (powered applications only)



General

CO ₂ Detection Method	Non-Dispersive Infrared Optical Sensor
Sample Method	Diffusion

Environmental

Operating Temperature	0°C to 50°C
Storage Temperature	-30°C to 70°C
Humidity	0% to 95% RH Non Condensing
Enclosure Rating	External CO ₂ Module: IP54 (dust and water spray) A3 CO ₂ Junction Box: Indoor use only Outdoor CO ₂ Housing: IP66
Pressure Range	950 to 1050 bar

Performance

Measurement Range	0-2000 ppm, 0-5000 ppm, 0-1%
Accuracy	+/- 50 ppm +/- 3% of reading
Non Linearity	< 1% of full scale
Calibration	Manual or Automatic (powered)

Specifications are subject to change without notice

External CO₂ Module

External CO₂ Modules are typically used in locations where more than one unit is required to connect to a data logger and in areas where the data logger is located in a different place than the CO₂ sensor.



A temperature sensor is located inside the housing. The housing is NEMA rated however the CO₂ opening is not, therefore, mount the CO₂ entry point downward in applications where water may come in contact with the unit. For outdoor applications, the outdoor housing is recommended.



External CO₂ sensor monitoring grass



Monitoring CO₂ around ductwork

A3 CO₂ Junction Box



The CO₂ sensor is integrated with a junction box mount, 8 channel A3 4 Resistance, 4 Voltage unit. This is the most used configuration as CO₂ is often required to be monitored in a central area where the A3 is typically located and in conjunction with other inputs such as temperature, RH and moisture content.

Indoor CO₂ sensors are usually 0-5000 ppm rated.

A3 Outdoor Enclosure

It is often necessary to evaluate the internal CO₂ level with respect to the outside CO₂ level. Usually a CO₂ sensor is mounted on the roof or in an area away from CO₂ sources. As a result an enclosure capable of withstanding the elements (rain and UV) is recommended.

Outdoor CO₂ sensors are usually 0-2000 ppm rated with an extended temperature specification.



Connecting the CO₂ Sensor

The A3 CO₂ Junction Box, A3 Vented NEMA unit and Outdoor units have the CO₂ sensor already connected, results are displayed on Input 24. No further connectivity is required.

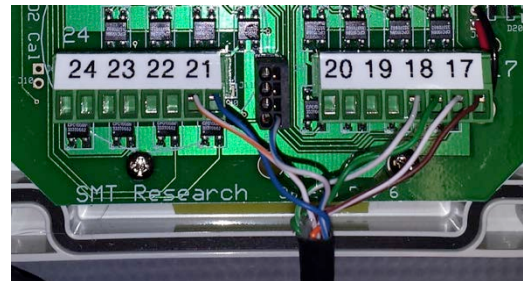
To connect a CO₂ sensor to an A2 the CO₂ sensor must be ordered with an audio jack. To connect, plug the audio jack into port 3/4.

The external sensor is connected to the voltage ports of the A3 external as follows:

Connect the CO₂ temperature sensor into the resistance block. Brown pair.

Connect the CO₂ Sensor to the voltage block:

- Blue 5V
- Orange CO₂
- White/Blue Ground



Any pin on the ground bar can be used. To connect to the ground bar simply push the white/blue wire into the circular slot. To release a wire from the ground bar push a small slot screwdriver into the slot adjacent to the wire you wish to release, gently pull on the wire and it will be released.

Note the green/white pair above is not used in the CO₂ sensor.

Calibrating the Sensor

The CO₂ sensor may drift over time, in particular, calibration could drift if the units were subjected to excessive vibration often experienced during transit. It is recommended to perform a yearly calibration on the sensor.

Auto-Calibration

The COZIR CO₂ sensor is programmed to auto calibrate once every week by setting the lowest reading recorded to 450 ppm. This is assuming that there is a period in the building that will equalize with the outdoor CO₂ level.

Manual Calibration

To calibrate the sensor the calibrate pin must be grounded.

External CO₂ Module (Leaded)

- Locate the solid orange wires extended from the CO₂ module.
- If it's not already stripped, strip the wire back about ¼ inch.
- Insert this wire into the black ground bar on the A3 data logger.
- Place the CO₂ sensor outdoors away from windows, doors, humans or other CO₂ sources.
- Allow the A3 to record at last 2 readings at 5 minute sampling outdoors. This will set the unit to 450ppm for fresh air. These readings will be recorded on BiG
- Using a small screwdriver press the insert in the black ground bar and pull the orange wire out.

External CO₂ Module (Audio Jack used with A2)

- Open the CO₂ module enclosure.
- Locate the jumper and move it to the calibration position.
- Place the A2 outdoors away from windows, doors, humans or other CO₂ sources.
- Allow the A2 to record at last 2 readings at 5 minute sampling outdoors. This will set the unit to 450ppm for fresh air. These readings will be recorded on BiG.
- Return the jumper to its original position.

A3 CO₂ Junction Box

- Locate the calibration jumper as shown in Figure 1.
- Place the A3 outdoors away from windows, doors, humans or other CO₂ sources.
- Allow the unit to record at last 2 readings at 5 minute sampling outdoors. This will set the unit to 450ppm for fresh air. These readings will be recorded on BiG.
- Move the jumper back to the original position.

Outdoor CO₂ Housing and Vented NEMA Box

- Locate the calibration jumper as shown in Figure 1.
- Move the jumper to the top two pins as shown.
- Place the A3 outdoors away from windows, doors, humans or other CO₂ sources.
- Allow the unit to record at last 2 readings at 5 minute sampling outdoors. This will set the unit to 450ppm for fresh air. These readings will be recorded on BiG.
- Move the jumper back to the original position.



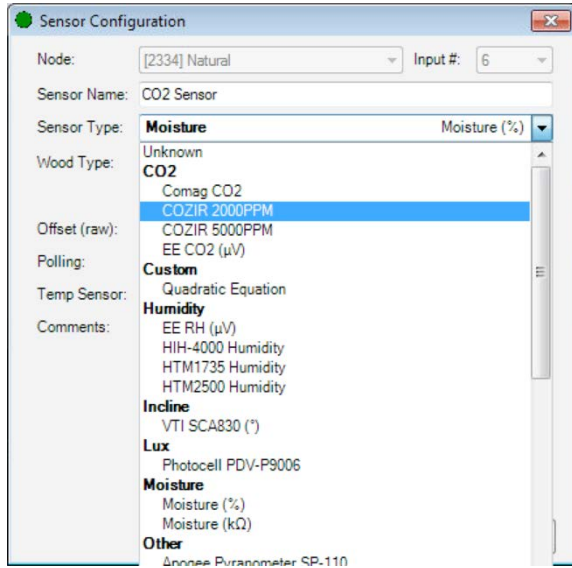
Figure 1. CO₂ Calibration Jumper

Note: This procedure may differ on older versions.

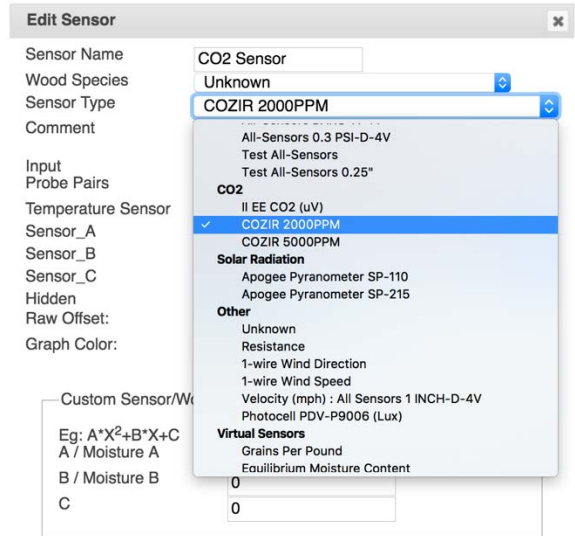
Configuration

Building Intelligence Gateway

- Right click on the sensor to configure
- Select Configure
- Under CO2 select the appropriate sensor type
- Settings will be synchronized with Analytics

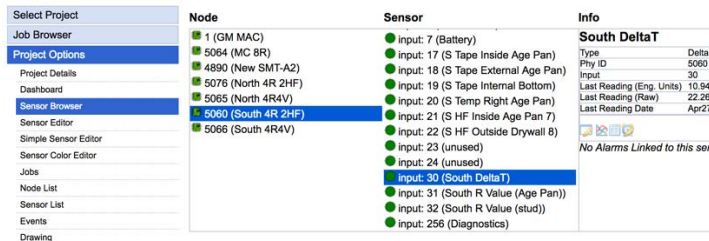


- Select the appropriate sensor the configure.

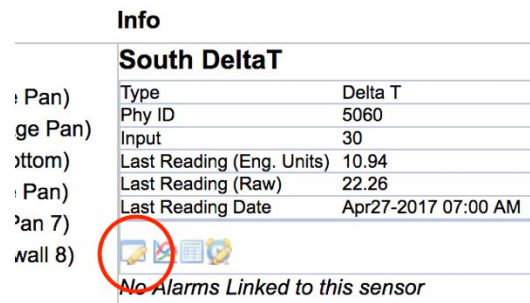


Analytics

- Using the Sensor Browser select the node and sensor to configure.



- Select the configuration icon



Ordering Information	
A3 CO2 Junction box	A3-J22-H22-4R3V-CO2 (5000 ppm sensor)
A3 CO2 Vented NEMA box	A3-I22-H00-4R3V-CO2 (5000 ppm sensor)
External CO2 (audio jack)	CO2-01-100
External CO2 (30' cable)	CO2-02-030
Outdoor CO2	A3-H00-1R2V-EXT-CO2 (2000 ppm sensor extended temp range)