

cns-enocean Batteryless CO2 Sensor User Guide

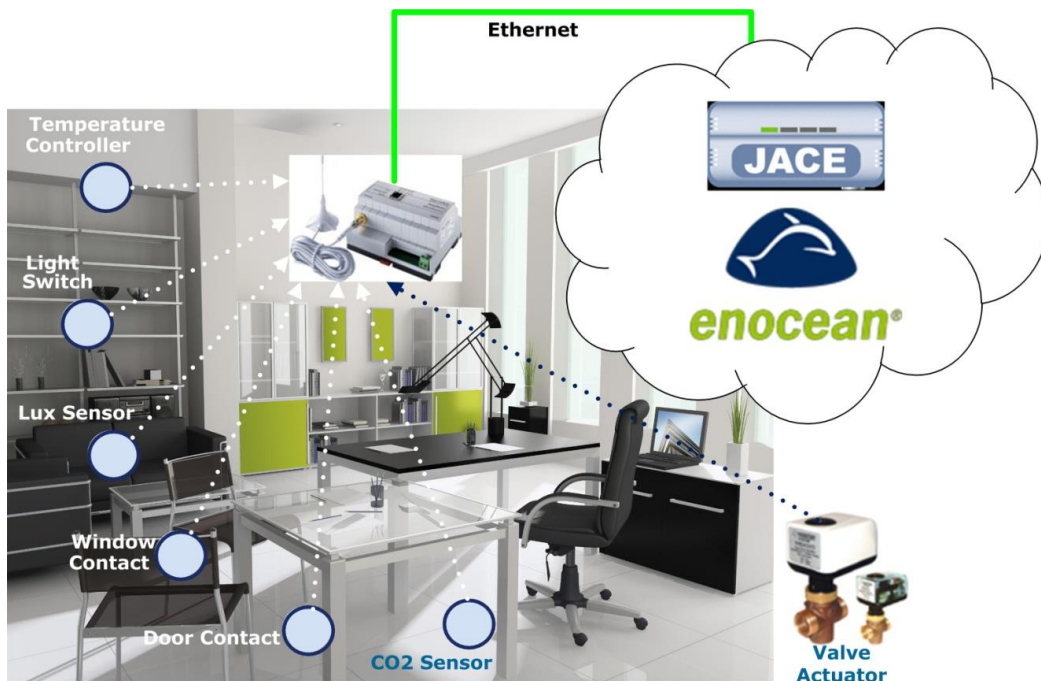
Control Network Solutions, (CNS) creates market disruptive SMART web based solutions for building and lighting controls.

"Energy harvesting wireless solutions based upon open interoperable device international standards properly applied to smart building controls, offer highly energy efficient, low operating cost and sustainable solutions"

Introduction



cns-enocean™ for Niagara, is a web based solution, globally available today, that enables the simple commissioning and operation of networks of EnOcean® wireless energy harvesting devices through Ethernet connected wireless interfaces, via any suitable Niagara or Web Supervisor™ platform.



This enables Niagara Community and System Integrator Partners to leverage their existing Niagara tools, skills and knowledge to offer advanced wireless energy harvesting switching and sensing solutions to their customers: For further information visit www.cns-enocean.com.

cns-enocean **Batteryless CO2 Sensor User Guide**

EnOcean Batteryless CO2 Sensor

This world first CO2 sensor is the totally maintenance free, requires no batteries and is powered by harvesting energy from ambient indoor light making it straightforward and low cost to install. The sensor supports the open EnOcean standard (ISO/IEC 14543-3-10) facilitating seamless connection with Niagara building management systems using the Niagara EnOcean Ethernet driver from CNS, [click here](#) for details.



EnOcean Batteryless CO2 Sensor Features

- ◆ Low cost, totally wire free installation, energy harvesting solar powered
- ◆ Can operate for up to 14 hours in total darkness
- ◆ Learn button for integration with EnOcean networks
- ◆ Fully EnOcean compliant, (EnOcean® Equipment Profiles): A5-09-04
- ◆ Uses proven CO2 sensing technology
- ◆ Peel and stick sensor deployment
- ◆ Temperature Range option from 0°C to 40°C
- ◆ Maintenance free operation for up to 10 years

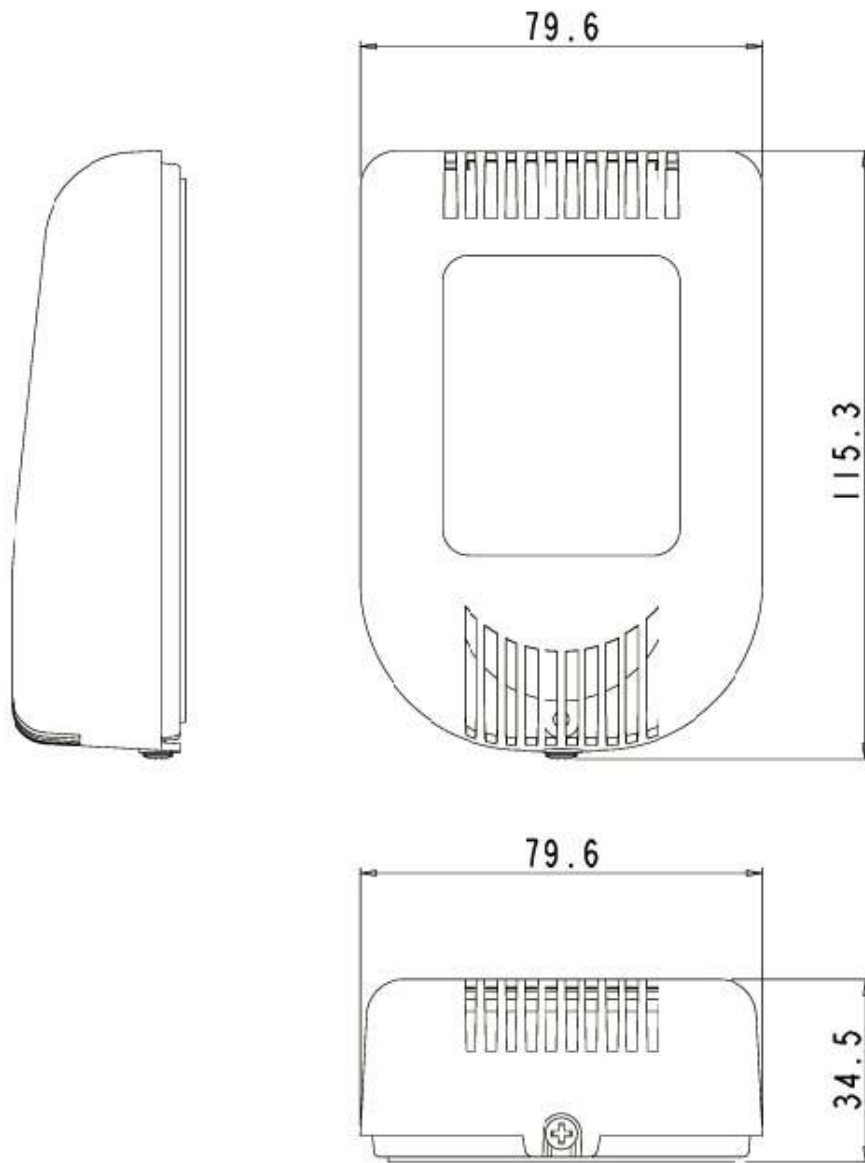
This CO2 sensor is totally wire free and operates in total darkness for up to 14 hours.

The CO2 sensor sample rate is automatically varied between 9 and 2 sample per hour) according to the available light level or fixed at 6, 4 or 2 times per hour.

It automatically self-calibrates and requires no maintenance.

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EnOcean Batteryless CO2 Sensor Dimensions, mm



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Product Installation

It is recommended the CO2 sensor is installed in an environment where:

1. The local CO2 level is representative of the complete area being measured i.e. do not place the unit close to a frequently opened window or A/C unit.
2. A source of either natural or artificial light is available during the hours when the building is occupied (due to the unit being solar powered).

Installation of back-plate:

The CO2 sensor is designed to be wall mounted. For ease of installation it is supplied with a back-plate that can be mounted on the wall prior to installation of the CO2 sensor itself.

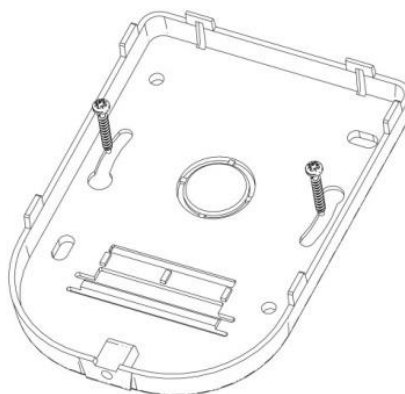
The back-plate can be wall mounted either using the screws and rawl-plugs provided, or alternatively it can be mounted over an existing 'pattress' box using the appropriate machine screws. (Not provided).

Installation of unit on back-plate:

BEFORE FINALLY FIXING THE SENSOR ON THE BACKPLATE, ENSURE THE UNIT HAS BEEN SET UP AND COMMISSIONED AS PER THE PRODUCT OPERATION SECTION.

The CO2 Sensor will latch onto the previously mounted back-plate via the latches on the top of the unit.

Once latched, the securing screw at the bottom of the back-plate can be tightened.



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Product Operation

The CO2 Sensor needs to be commissioned before use. There are 4 stages to the commissioning process.

1. Selection of Sampling Rate

As the unit is designed to harvest energy from ambient light, it may be favourable (where applicable) to reduce the unit's sampling frequency in prolonged low level light conditions. This can be set by configuring DIP switch 1 as below.

Light Status	Energy Supply	Sampling Rate	DIP Switch 1
Ambient light good	(Powered from solar cell)	3 mins	On
Ambient light poor	(Powered from battery)	3 mins	On
Ambient light good	(Powered from solar cell)	3 mins	Off
Ambient light poor	(Powered from battery)	Dynamic (9 minutes)	Off

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2. Calibration

The CO2 sensor has been factory calibrated prior to supply. Like all CO2 sensors, it does need to update its calibration status periodically. In normal environments, background CO2 levels are typically 450ppm.

Auto Calibration ON/OFF

Auto calibration ON calibrates the reported background level of CO2 against the lowest measured values of CO2 taken over an 8 day period. Auto calibration is the preferred operating mode of the CO2 sensor, however to maintain accuracy, there must be periods of low room occupancy (only background CO2 present) during the 8 day period.

Manual Calibration

When auto calibration is not used, it may be beneficial to recalibrate the unit's background CO2 level of 450ppm.

To recalibrate the default level of 450ppm, set DIP Switch 3 to ON and depress the learn key for 5 seconds. The unit's LED will flash once per second for 300 seconds. During this time, take the unit into an unoccupied environment. After the 300 seconds, the unit will take 120 CO2 measurements in a 60 second period (the LED will flash quickly during this period). Once the LED has stopped flashing, the unit is recalibrated. Return DIP switch 3 to the OFF position. Moving DIP switch 3 back to OFF during the procedure will abort the calibration.

Operating Mode (Calibration)	DIP Switch 2	Dip Switch 3	Learn Button
Sensor auto calibrates every 8 days	ON	OFF	N/A
Sensor uses factory calibration level (450ppm)	OFF	OFF	N/A
Sensor uses recalibrated background level on completion	OFF	ON	Pressed

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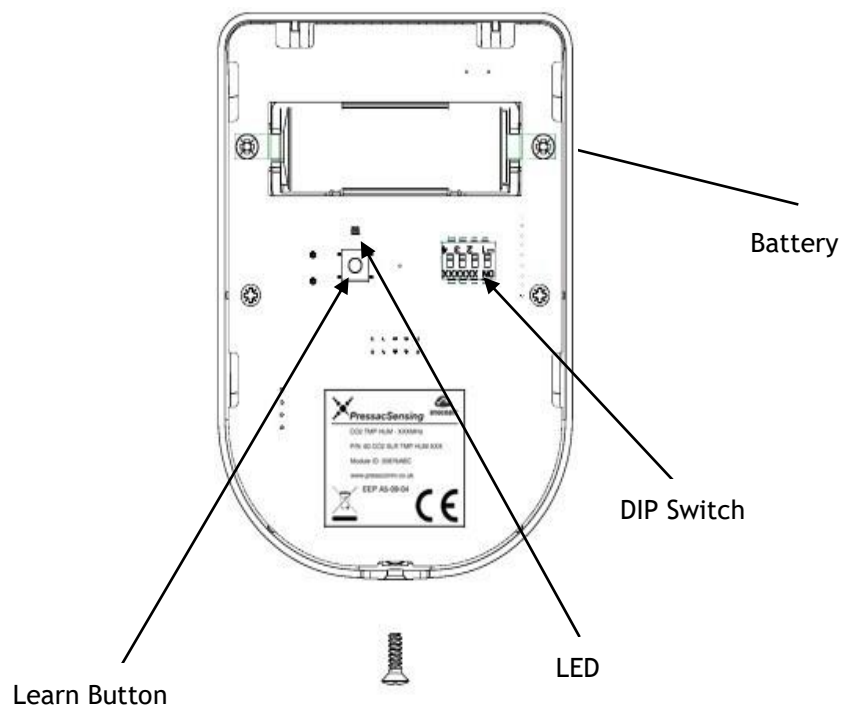
3. Connection of battery

The unit is pre-installed with a non-rechargeable 3.6v Lithium "A" type battery. To enable commissioning and provide battery back-up operation in continuously low level light conditions, the battery must be connected by switching DIP Switch 4 on.

Battery	Unit Status	Dip Switch 4
Not connected	Solar powered only	OFF
Connected	Solar + battery powered	ON

4. Commissioning

Please refer to **cns-enocean** Connectivity Kit User Manual.



EnOcean Wireless Information

EnOcean Wireless Systems Range Planning application note, [click here](#).

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CNS can also supply additional **cns-enocean** compatible EnOcean wireless energy harvesting products [click here](#) for more details.

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