

ERS Eco CO₂ Wireless LoRaWAN® sensor





Description

ELSYS ERS Eco CO2 is a LoRaWAN indoor climate sensor that measures temperature, humidity, and CO₂ level. This sensor is an environmentally friendly option, with an organic solar cell as the only power source and an enclosure made from biodegradable material. Removing batteries from a wireless IoT device significantly reduces the environmental impact and maintenance costs. ERS Eco has a Scandinavian design, which fits nicely in any application.

The sensor can last up to thirty days in the dark depending on the sample interval, transmit interval, data rate, and environmental factors. It can be used with a self-adapting feature, which results in lower current consumption and better performance.

- Temperature, humidity, and CO₂ sensor
- Powered by organic indoor solar cell
- Made from biodegradable material
- Wireless and battery-free
- Scandinavian design
- Lasts up to thirty days in the dark
- Self-adapting feature
- Easy configuration

Device Description

Mechanical specifications

Weight 55 g

Dimensions 66 x 66 x 17 mm

Enclosure Biodegradable material. Biodolomer®

IP20 IP rating

Screw/Adhesive tape Mounting

Operating conditions

Temperature 0 - 50 °C Humidity 0 - 85 % RH Usage environment Indoor

Device Power Supply

Battery type Lithium-ion capacitor (LIC) Up to 30 days in the dark¹ Expected battery life

Device Logging Function

Sampling Interval 10 min (Default)² Data upload Interval 10 min (Default)²

Radio / Wireless

Wireless technology LoRaWAN® 1.0 and 1.1

Wireless security LoRaWAN® End-to-End encryption (AES-CTR),

> Data Integrity Protection (AES-CMAC) Class A/C (configurable) End-device

LoRaWAN device type

OTAA, ABP, ADR, Adaptive Channel Setup Supported LoRaWAN® features Supported LoRaWAN® regions EU863 - 870, RU864, IN865

Link budget 137 dB (SF7) to 151 dB (SF12)

RF transmit power 14 dBm

¹ Depending on the sample interval, transmit interval, data rate, and environmental factors.

² Configurable via NFC and Downlink

ERS Eco CO₂ Wireless LoRaWAN® sensor



Sensors

Temperature

Resolution 0.1 °C

Accuracy ± 0.2 °C (see figure 1)

Humidity

Resolution 1 % RH

Accuracy at 25 °C ± 2 % RH (see figure 2)

See figure 3 Accuracy of humidity over

temperature

CO_2

Operating principle Non-dispersive infrared (NDIR)

Measurement range 400-5000 ppm; extended range up to 10000

ppm

Accuracy ± (30 ppm + 3% of reading)

Extended range ±10% of reading

Accuracy is achieved at 15-35°C, 0-80% RH after at least three automatic baseline corrections have been performed

(24 days, three 8-day periods).

Calibration Automatic baseline calibration routine that will

set 400 ppm to the lowest measured value in

the last 8-day period.

The sensor can also be manually calibrated.

The self-adapting feature

The feature is optional but recommended. With the feature activated, the sensor will adapt the transmission rate if the measured data is unchanged. This will result in lower current consumption, lower network load, and less redundant data sent.

The biodegradable material

Biodolmers' biodegradable material is carefully chosen for the making of the enclosure. The material consists of bio-based biodegradable ester mixed with fiber, calcium carbonate, and vegetable oils.

The solar cell

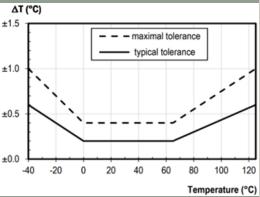
The indoor solar cell is Epishine's Organic Indoor Light Energy Harvesting Module. The cell is adapted for an indoor environment and is sensitive to high light intensities. Direct sunlight for a prolonged time may degrade performance and lifetime. Occasional short exposure (~2h/day) to strong light intensities, such as sunlight through a window, should not affect the cell.

How to recycle

Remove the back panel and then separate the circuit board from the enclosure. Sort the enclosure into your food waste and the circuit board with the solar cell in electronic waste.

Avoid

- Using the sensor outside.
- Placing the sensor where it constantly is exposed to direct sunlight and close to air vents.
- Removing the back panel.





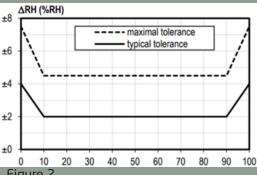


Figure 2

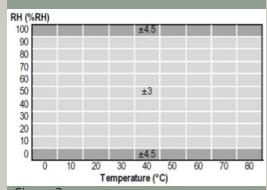


Figure 3