ERS Eco CO2

LoRaWAN Wireless Sensor

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. Eco CO2 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.

Product features

- 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 specifications

Mechanical specifications	
Weight	55 g
Dimensions	66 x 66 x 17 mm
Enclosure	Biodegradable material, Biodolomer®
IP rating	IP20
Mounting	Screw/Adhesive tape

Operating conditions	
Temperature	0 to 50 °C
Humidity	0 to 85 % RH
Usage Enviroment	Indoor

ElektronikSystem i Umeå AB

Tvistevägen 48
907 36 Umeå
Sweden

+469010050
info@elsys.se

www.elsys.se
elsysumea

Specifications in this document are subject to change without notice. ©ElektronikSystem i Umeå AB 2025

Device Power Supply	
Battery Type	Lithium-ion capacitor (LIC)
Expected Battery Life	Up to 50 days in the dark. Depending on the sample interval, transmit interval, data rate, and environmental factors.

Device Logging Function	
Sampling Interval	10 min (Default), Configurable via NFC and Downlink
Data Upload Interval	10 min (Default), Configurable via NFC and Downlink

Radio / Wireless	
Wireless Technology	LoRaWAN® 1.0.4
Wireless Security	LoRaWAN® End-to-End encryption (AES-CTR), Data Integrity Protection (AES-CMAC)
LoRaWAN device type	Class A (configurable) End-device
Supported LoRaWAN® features	OTAA, ABP, ADR, Adaptive Channel Setup
Supported LoRaWAN® regions	EU863 – 870, IN865
Link budget	137 dB (SF7) to 151 dB (SF12)
RF transmit power	14 dBm

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)
Accuracy of humidity over temperature	See figure 3

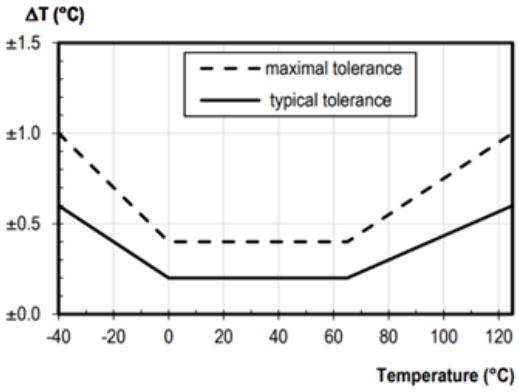

Figure 1

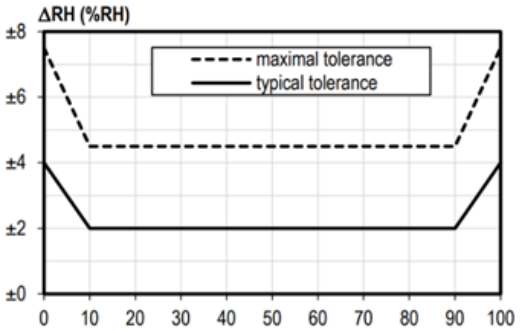

Figure 2

C02

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.*

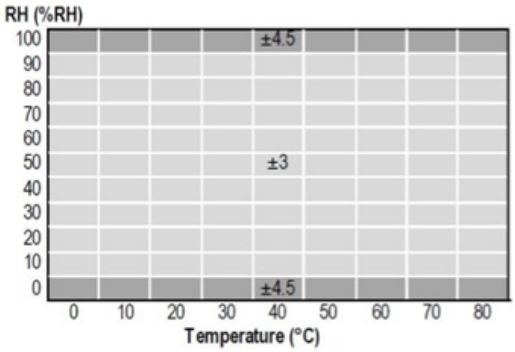

Figure 3

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.
- Removing the back panel.

ElektronikSystem i Umeå AB

Tvistevägen 48
907 36 Umeå
Sweden

+469010050
info@elsys.se

www.elsys.se
elsysumea

Specifications in this document are subject to change without notice. ©ElektronikSystem i Umeå AB 2025