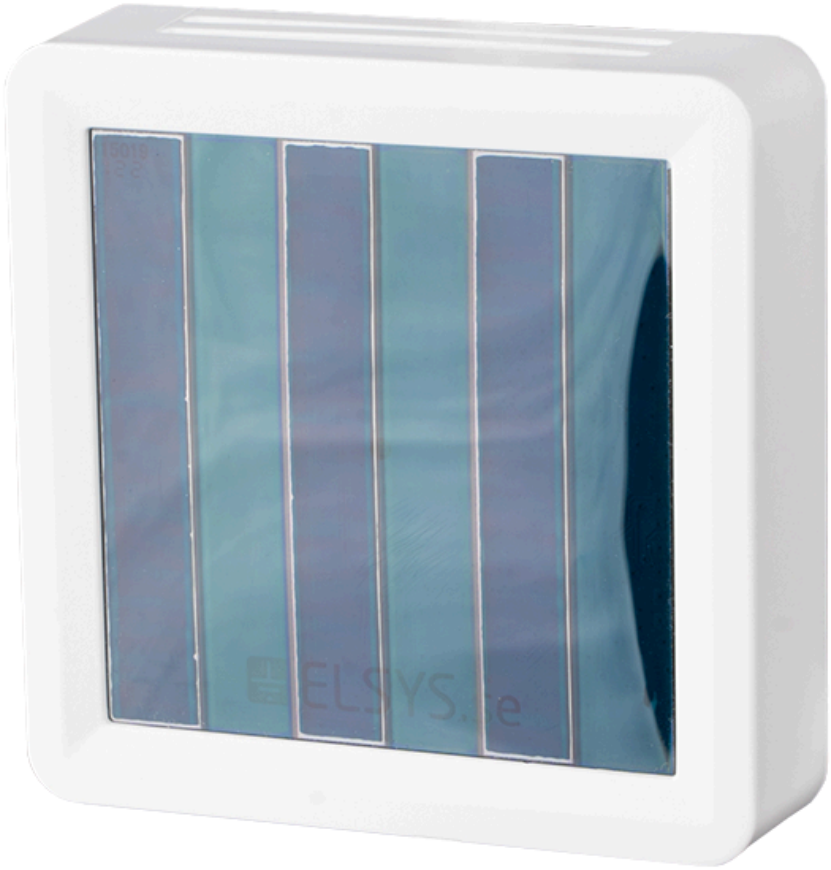
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Eco CO_2

Wireless LoRaWAN® sensor







Description

ELSYS Eco CO_2 is a LoRaWAN indoor climate sensor that measures temperature, humidity, and CO_2 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 CO_2 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 CO_2 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®
IP rating	IP20
Mounting	Screw/Adhesive tape

Operating conditions

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

Device Power Supply

Battery type	Lithium-ion capacitor (LIC)
Expected battery life	Up to 30 days in the dark[1]

Device Logging Function

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

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

[1] Depending on the sample interval, transmit interval, data rate, and environmental factors.
[2] Configurable via NFC and Downlink

+46901100500
elsys.se/shop
info@elsys.se
elsysumea

Elektroniksystem i Umeå AB
Tvistevägen 48
90736 Umeå, Sweden

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ERS Eco CO_2 Wireless LoRaWAN® sensor

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Sensors

Temperature

Resolution	0.1 °C
Accuracy	± 0.2 °C (see figure 1)

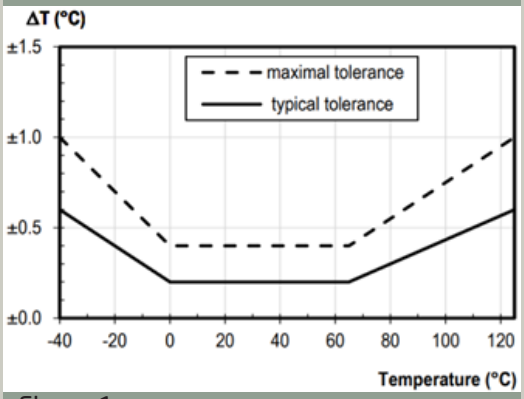


Figure 1

Humidity

Resolution	1 % RH
Accuracy at 25 °C	± 2 % RH (see figure 2)
Accuracy of humidity over temperature	See figure 3

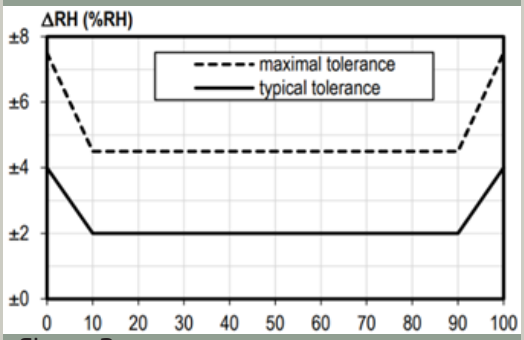


Figure 2

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.*

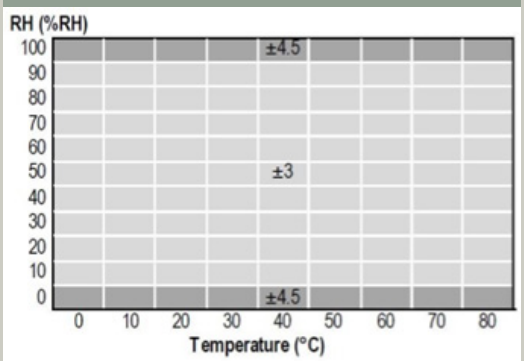


Figure 3

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 and close to air vents.
- Removing the back panel.

Elektroniksystem i Umeå AB
Tvistevägen 48
90736 Umeå, Sweden

+4690100500
elsys.se/shop
info@elsys.se
elsysumea

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