Датчик ECD
Беспроводной датчик двуокиси углерода (CO2), температуры и влажности
Wireless carbon dioxide, temperature and humidity sensor

Dolphin based.

Autonomous digital sensors array in one device

Description.

This sensor gives information concerning carbon dioxide (CO2) concentration levels, essential element in air quality monitoring and control in occupied buildings. Changes in concentration of this gas are difficult for humans to recognize. The gas is safe in low concentrations (typically <1000ppm), however prolonged exposure at moderate levels can lead to a range of health related problems such as sick building syndrome causing fatigue like symptoms, effects are most notable in children –kindergartens, schools- due to their higher metabolic activity.

Current and incoming legislation requires CO2 gas monitoring within building environments for optimal control of air quality. Moreover, such CO2 gas monitoring is employed within demand control ventilation systems used for building heating ventilation and air conditioning.
Additionally sensor can measure actual temperature and humidity. So the whole wireless telegram contains triple data about carbon dioxide, temperature and humidity with 8-bit coding accuracy.

Application Areas

- Indoor Air Quality Measurement in Offices, Schools, hotels and residential areas
- DCV- Demand Controlled Ventilation for energy savings
- HVAC applications for building management
- Home air quality control

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Technical data:

ECD.xxx - xxx

024 -Power supply: 24 VDC (7-28VDC);
220 -Power supply: 220 VAC(113-311VAC);

Options:
001 – CO2 sensor EnOcean EEP profile A5-09-04
002 – CO2, temperature and humidity EnOcean EEP profile A5-09-04

CO2 specification	
Type of Measurement	NDIR -non dispersive infrared technology-
Sensor Type	dual wavelenght
Measurement Range	400 – 2,550 ppm CO2 by volume
Resolution	< 20 ppm CO2
Accuracy	± 5% of reading
Pressure Dependence	0.13 % of reading per mm Hg
Response Time	< 3 minutes for a 90% step change
Warm up Time	< 30 seconds operational < 15 minutes full accuracy

Outputs	
wireless version	EnOcean EEP profile A5-09-04
	Databyte 2 (scale 0...255) 0 bit - 400 ppm 255 bit- 2550 ppm
Radio Regulations	R&TTE EN 300 220 (TCM 310)

Temperature and humidity specification	
Measurement Range Temp	0-51 C
Resolution Temp	0.2 C
Measurement Range Humid	0-100% relative
Resolution Humid	0,5 %

Outputs	
wireless version	EnOcean EEP profile A5-09-04
	Databyte 1 (scale 0...255) 1 bit – 0,2 C 255 bit- 2550 ppm
	Databyte 3 (scale 0...255) 1 bit – 0,5 %

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Electrical Specifications	
Power supply	230Vac (113-311V absolute maximum ratings) 24Vdc (7-28Vdc)
Power consumption	14-45 mA
Operating Temperature	0 ~ +40º C
Storage Temperature	-20 ~ + 50 ºC
Operating Humidity	0 ~ 95% non-condensing
Electrical connection	screw terminals max. 1.5 mm2
EMC	EN 60730-1:2002

General Specifications	
Regulatory Compliance	CE Mark: EMC 2004/108/EC, RoHS 2011/65/EU, WEE CFR47, Part15 Class A
Product safety	2001/95/EG
Material of housing	ABS
Protection Class	IP20
Color housing	White
Dimensions	80x80x25 mm 3.15x3.15x0.98 "
Weight	0.93 kg

LED CO2 Thresholds:

PPM1	●	Level1: green x < 500 ppm
PPM2	✸	Level 2: green flashing when 500 ≤ ppm < 700 ppm
PPM3	●	Level 3: yellow when 700 ≤ ppm < 1200 ppm
PPM4	✸	Level 4: yellow flashing when 1200 ≤ ppm < 1800
PPM5	●	Level 5: red when 1800 ≤ ppm < 2500
PPM6	✸	Level 6: red flashing when ppm ≥ 2500 ppm

Hysteresis for the threshold/level values:

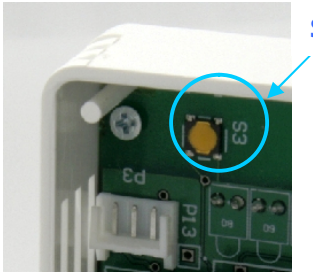
Levels 1,2,3: ± 30 ppm
Levels 4,5,6: ± 80 ppm

Time-Interval
Measuring period: every 1 minute

Transmission Measured Value:

⇒ if not concentration changes: 4 min by default
⇒ if there is ± 40 ppm variation always sending

Learning process:



When the sensor is connected to the power the device sends a learning telegram with profile indication. On this moment you can link it with the appropriate EnOcean receiver. If you observe the sensor by front, learn telegram is sent when the 3 LED lights is flashing .

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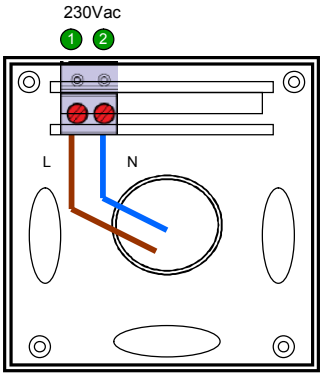
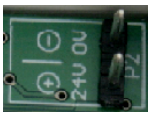
After a few seconds 5-10 sec. when all LEDs are lit, the sensor starts the measurements and just 1 LED is going ON according with the status of the Air Quality.

If you desire to start the learning process again to link with another receiver you have to power on again the sensor or you could press the S3-LRN button on the PCB *(see figure)*. Every time that the sensor starts up due to power on, it launches a learning telegram after a few seconds –aprox. 5s -

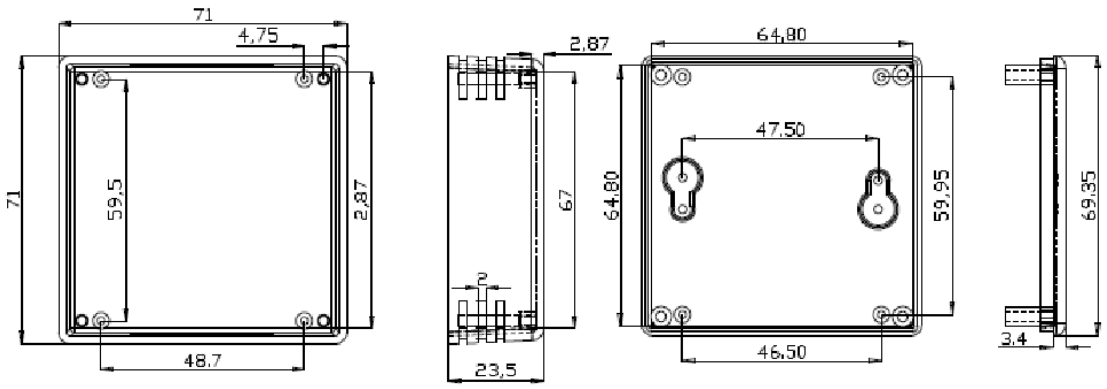
Installation



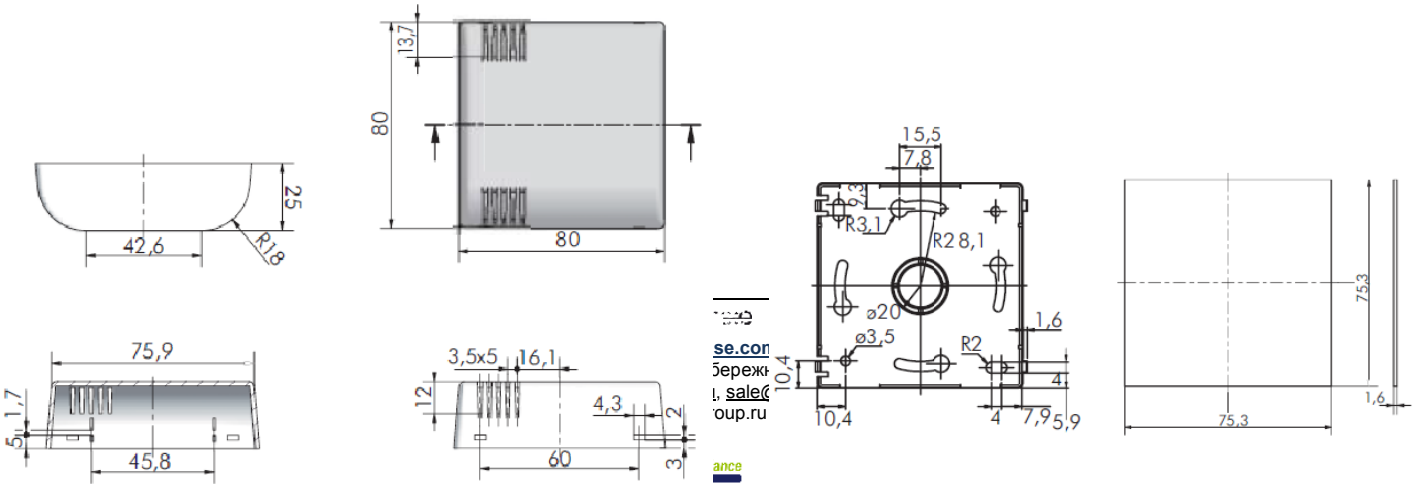


Housing Dimensions (mm)

24 VDC version



220 VAC



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Warnings & Troubleshooting Considerations:

Polarity connection of the power +/- must be observed!

Don't touch and don't cover the CO2 module!

When start up if all LEDs are permanently ON means: ● ● ●
Wrong CO2 measurements, module fault, CO2 module ERROR COMMUNICATION!

Appendix

Indoor Air Quality

The DIN EN 13779 defines several classes for the indoor air quality, which are shown in the table below.

	CO2 content over the content in outdoor air in ppm		
Category	Typical range	Standard value	Description
IDA1	<400 ppm	350 ppm	High Indoor Air Qualitiy
IDA2	400 ... 600 ppm	500 ppm	Mean Indoor Air Qualitiy
IDA3	600 ... 1.000 ppm	800 ppm	Moderate Indoor Air Qualitiy
IDA4	>1.000 ppm	1.200 ppm	Low Indoor Air Qualitiy

EnOcean EEP profile A5-09-04

RORG	A5	4BS Telegram
FUNC	09	Gas Sensor
TYPE	04	CO2 Sensor

Offset	Size	Bitrange	Data	ShortCut	Description	Valid Range	Scale	Unit
0	8	DB3.7...DB3.0	Humidity	HUM	Rel. Humidity (linear), 0.5 % = 1 bit	0...200	0...100	%
8	8	DB2.7...DB2.0	Concentration	Conc	Concentration (linear), 10 ppm = 1 bit	0...255	0...2550	ppm
16	8	DB1.7...DB1.0	Temperature	TMP	Temperature (linear), 0.2 °C = 1 bit	0...255	0...+51.0	°C
24	4	DB0.7...DB0.4	Not Used (= 0)					
28	1	DB0.3	LRN Bit	LRNB	LRN Bit	Enum: 0: Teach-in telegram 1: Data telegram		
29	1	DB0.2	H-Sensor	HSN	..	Enum: 0: Humidity Sensor not available 1: Humidity Sensor available		
30	1	DB0.1	T-Sensor	TSN	..	Enum: 0: Temperature Sensor not available 1: Temperature Sensor available		
31	1	DB0.0	Not Used (= 0)					