

NLII-CO2+RH+T-5-RS485 | Room CO₂/RH/T sensor with RS485

Room sensor NLII-CO2 is used to continuously monitor air quality inside buildings and then control ventilation (HVAC) systems according to current levels of internal air quality. The sensor measures concentration of carbon dioxide (CO₂), relative humidity (RH) and temperature (T). It can be effectively used in offices, classrooms, shopping centers, homes, restaurants, fitness centers, commercial buildings, etc.

- > measures CO₂, RH and temperature
- > RS485 bus communication with Modbus RTU protocol
- > maintenance during operation is not required



Sensor type / Order code	CO ₂ measurement	RH measurement	T measurement	CO ₂ ppm range
NLII-CO2-5-RS485	✓	-	-	400-5000
NLII-CO2+RH+T-RS485	✓	✓	✓	400-2000
NLII-CO2+RH+T-5-RS485	✓	✓	✓	400-5000

Description

The measuring of CO₂ is based on the principle of infrared radiation attenuation dependence on the CO₂ concentration in the air (NDIR). Built-in auto-calibration function ensures very good long term stability.

Measurement of the relative humidity is based on the principle of capacitive polymer sensor.

Sensor can efficiently manage ventilation and heat recovery units, based on current air quality. The current air quality can easily be determined by looking at the three LED indicators. The **eco** level means good indoor air quality necessary to achieve a sense of well-being and at the same time optimal energy costs for heating, ventilation or air conditioning.

All outputs of measurement are available through RS485 bus. For information on the communication protocol, use the document [NLII-Modbus-komunikace](#).

Explanation of abbreviations and technical terms can be found on our website in the [Glossary](#) section.

Technical data

Parameter	Value	Unit
Supply voltage range	12 – 35	V DC
	12 – 24	V AC
Average consumption	0,5	W
CO ₂ measuring range	400 – 2000 (5000)	ppm
CO ₂ accuracy	± 35 ppm ± 5 % of reading	
CO ₂ startup	max 1	min
CO ₂ step response	(90 %) 80	s
RH measuring range	0 – 100 %	RH
RH accuracy 20 – 80 %	± 3 %	RH
RH accuracy 0 – 100 %	± 6 %	RH
Working humidity non condensing	0 – 95 %	RH
Working temperature	0 to +50	°C
Storage temperature	-20 to +60	°C
Expected lifetime	min. 10	years
Ingress protection	IP20	
Dimensions	90x80x31	mm
RS485 bus		
A-B voltage difference	max 5	V
A-B common input voltage	-7 to 12	V
A-B common output voltage	max 3	V

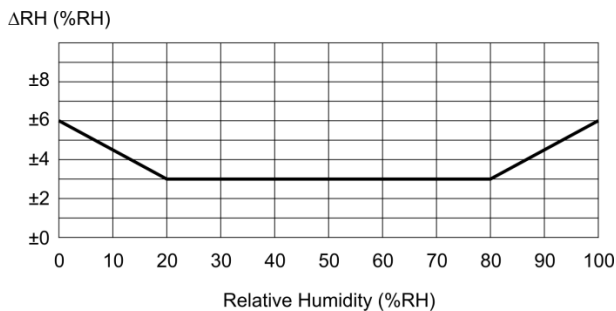


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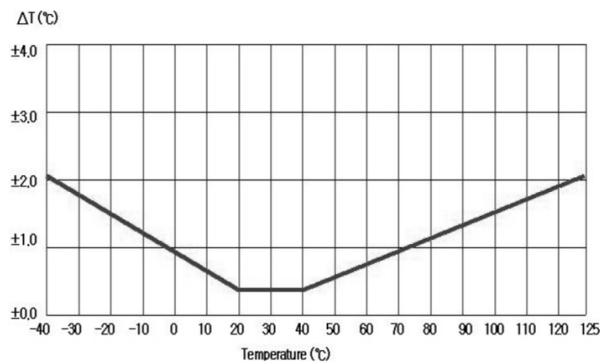
CO₂ sensor autocalibration function

Autocalibration compensates for long-term aging of the key components of the sensor. This function is available only when sensor power supply is continuous and uninterrupted. Calibration during operation is not necessary.

Typical RH measurement accuracy at 25 °C



Typical T measurement accuracy



CAUTION:

Warm-up: operational after 1 minute since power on.
The declared accuracy is reached after 4 days of continuous power supply.
It is necessary to avoid severe mechanical shock of the sensor.

LED indication description

White LED lights:

- Less than 600 ppm CO₂ or less than 40 % RH.
(according to the quantity selected for indication)
- – maintaining low concentrations of CO₂ is not cost-effective - slightly increased concentration does not cause any health complications
- – low concentrations of RH. Too dry air feels cooler as compared to equally hot but more humid air – risk of drying of the mucous membranes - respiratory problems

Green LED lights:

- More than or equal to 600 ppm CO₂ or 40 % RH, less than or equal to 1200 ppm CO₂ or 60 % RH.
(according to the quantity selected for indication)
- – optimal balance of air quality and energy efficiency of ventilation and air conditioning
- – optimal relative humidity for humans

Yellow LED lights:

- More than 1200 ppm CO₂ or more than 60 % RH.
(according to the quantity selected for indication)
- – higher concentration of CO₂ - further increase of CO₂ concentrations above this level can cause fatigue, restlessness, headache
- – too high humidity - the risk of mold growth and associated health complications

Sensor start after power on

All three LEDs flash simultaneously until the first readings are available, but no longer than 10 seconds.

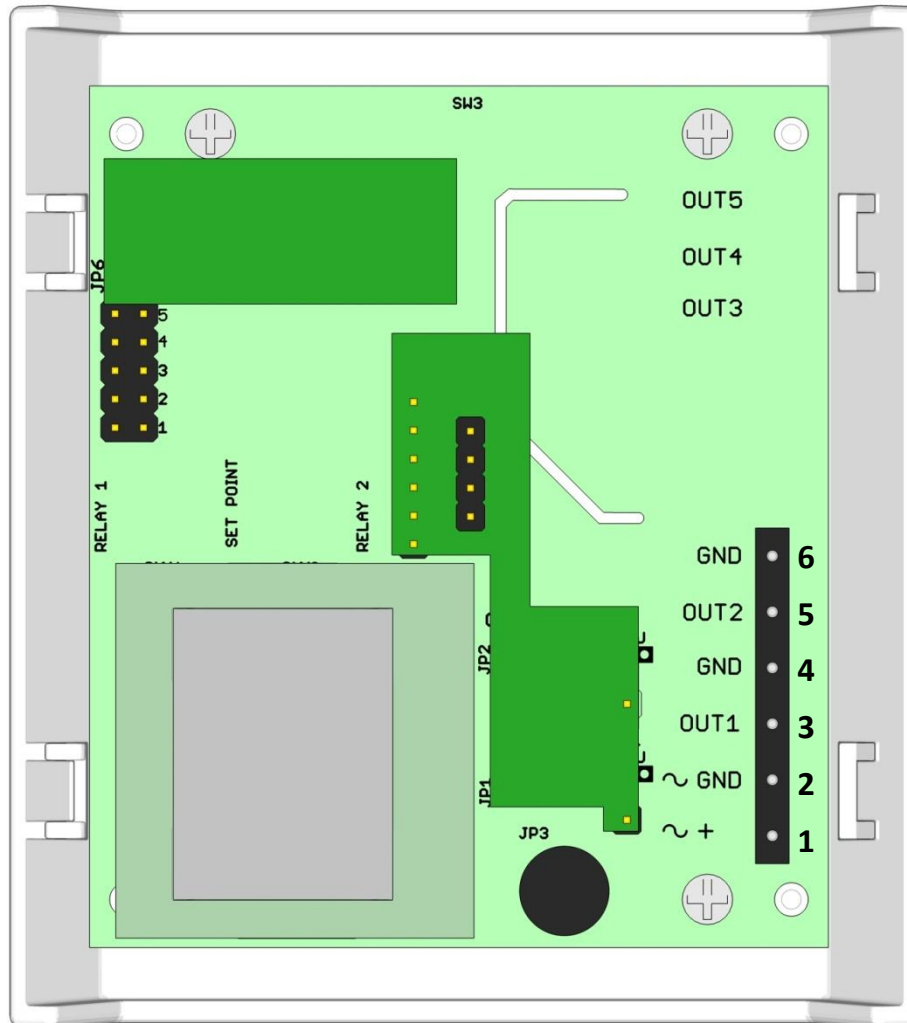
Sensor failure indication

All three LEDs are shining permanently.



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Electronic board controls and terminals



Terminals

- 1. ~ + supply AC or DC (+) plus pole
- 2. ~ GND supply AC or DC (-) minus pole, GND
- 3. OUT1 RS485 bus – signal line B
- 4. GND GND
- 5. OUT2 RS485 bus – signal line A
- 6. GND GND

Jumpers

JP6 – LED indication settings



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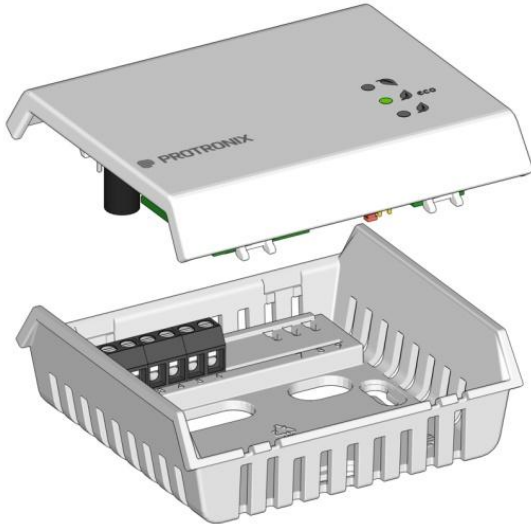
Jumpers on the electronics board

Mark	Description	Settings	Meaning
JP6 - 1	LED indication (factory setting - CO ₂) - LED indication according to ambient light - when ambient light is dimmed (at night), LED indicators turn off automatically.	■ ■ 5 ■ ■ 4 ■ ■ 3 ■ ■ 2 ■ ■ 1	permanent LED indication enabled
		■ ■ 5 ■ ■ 4 ■ ■ 3 ■ ■ 2 ■ ■ 1	
JP6 - 3	Selecting the sensor for LED indication - CO₂ or RH.	■ ■ 5 ■ ■ 4 ■ ■ 3 ■ ■ 2 ■ ■ 1	LED indication by CO ₂
		■ ■ 5 ■ ■ 4 ■ ■ 3 ■ ■ 2 ■ ■ 1	LED indication by RH
JP6 - 4 JP6 - 5	These positions are not intended for user setting.	■ ■ 5 ■ ■ 4 ■ ■ 3 ■ ■ 2 ■ ■ 1	



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Sensor assembly



Box color

Front: white - RAL9016

Base: gray - RAL7035

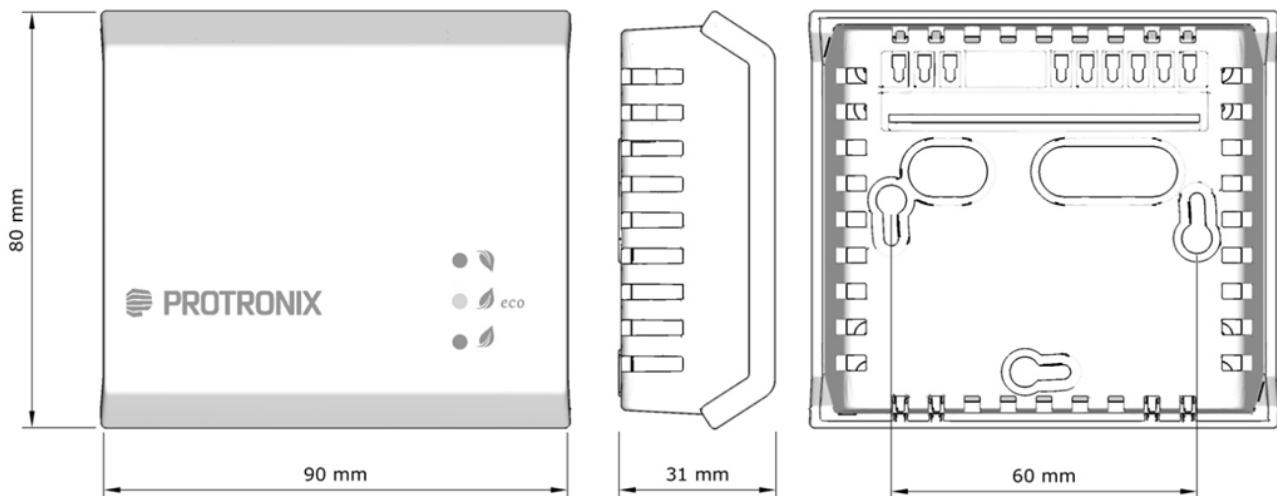
Way to use

The product is intended for indoor use only. You can read the [recommendations for sensor placement](#) on our web pages.

End of product life

Discard the product in according to the electronic waste law and the EU directives.

Dimensions



The producer reserves the right of technical changes in order to product improvements its properties and functions without previous notice.

