PROTRONIX NLII-CO2+RH+T-5-RS485 Room Sensor with RS485 User Manual

PROTRONIX

SENSE & EASY

User manual

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 the 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

Contents

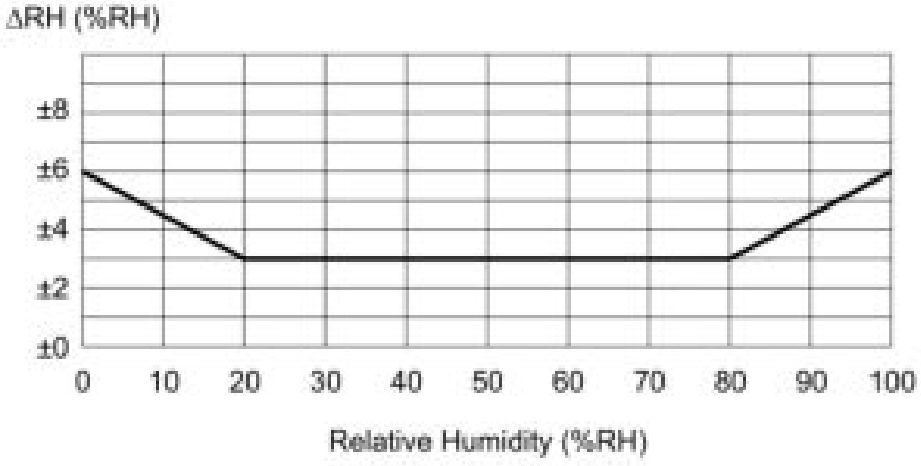
Description

The measuring of CO2 is based on the principle of infrared radiation attenuation dependence on the CO2 concentration in the air (NDIR). Built-in autocalibration function ensures very good long-term stability.
Measurement of the relative humidity is based on the principle of capacitive polymer sensor. Sensors 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 the 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.

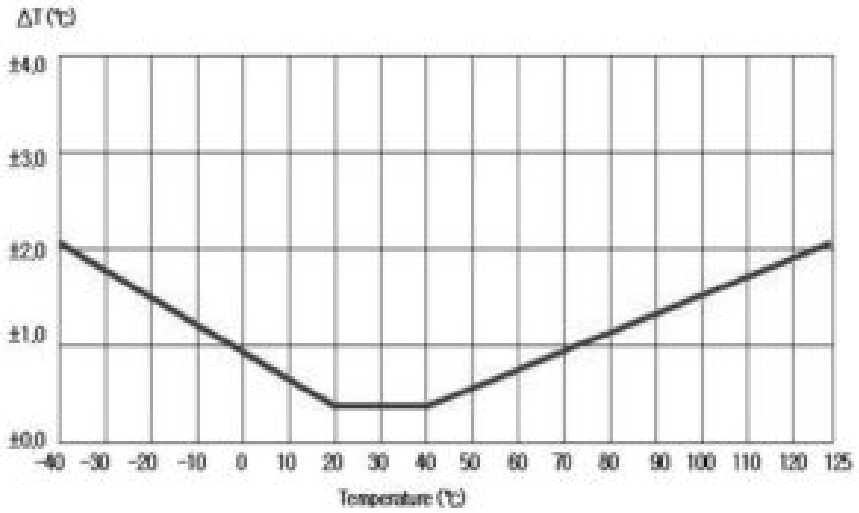
Parameter	Value	Unit
Supply voltage range	12 – 35 12 – 24	V DC V AC
Average consumption	0,5	W
CO_2 measuring range	400 – 2000 (5000)	ppm
CO_2 accuracy	± 35 ppm ±5 % of reading	
CO_2 startup	max 1	min
CO_2 step response	(90 %) 80	s
RH measuring range	0 – 100 %	RH
RH accuracy 20 – 80 %	± 3 %	RH
RH accuracy 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

CO2 sensor autocalibration function
Autocalibration compensates for the long-term aging of the key components of the sensor. This function is available only when the 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 the 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 – the risk of drying of the mucous membranes – respiratory problems

Green LED lights:

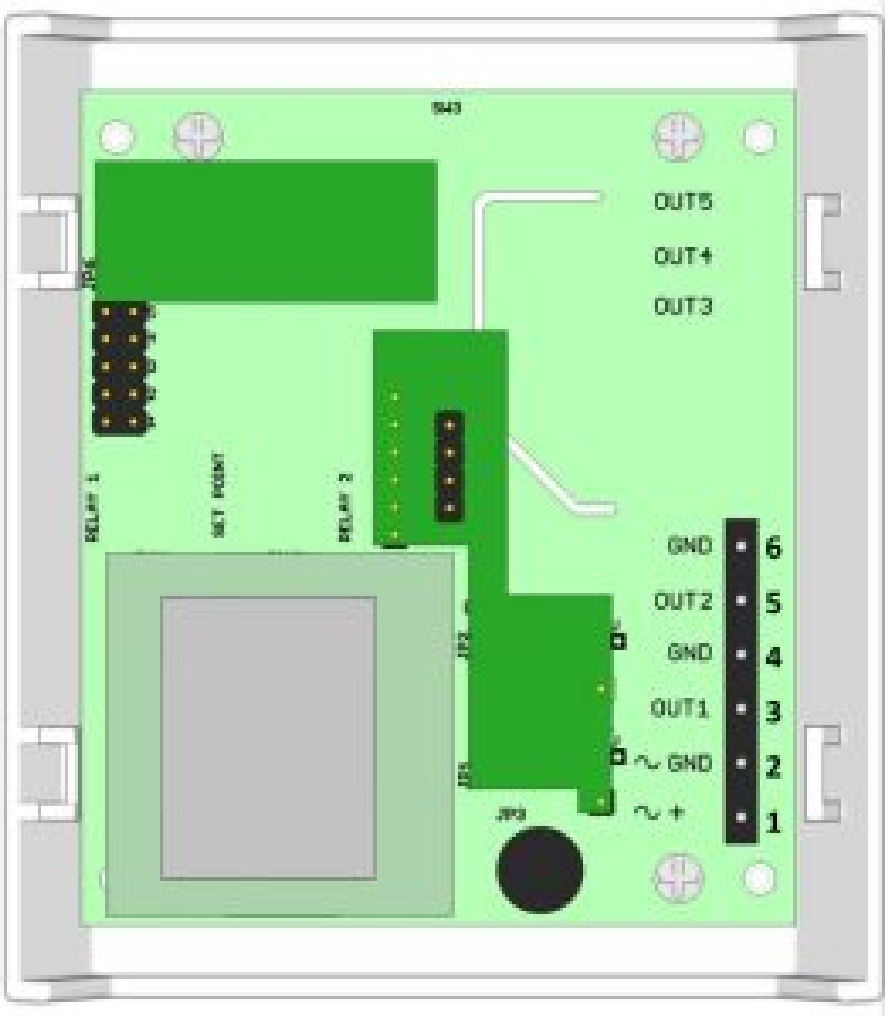
More than or equal to 600 ppm CO2 or 40 % RH, less than or equal to 1200 ppm CO2 or 60 % RH. (according to the quantity selected for indication)
– the optimal balance of air quality and energy the efficiency of ventilation and air conditioning
– optimal relative humidity for humans

Yellow LED lights:


More than 1200 ppm CO2 or more than 60 % RH. (according to the quantity selected for indication)
– higher concentration of CO2 – a 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

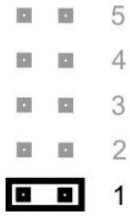
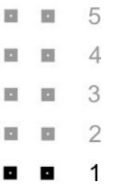
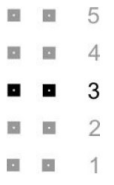
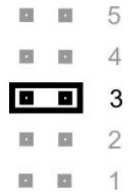
Sensor start after power on
All three LEDs flash simultaneously until the first readings are available, but no longer than 10 seconds.
Sensor failure indication
All three LEDs are shining permanently.

Electronic board controls and terminals

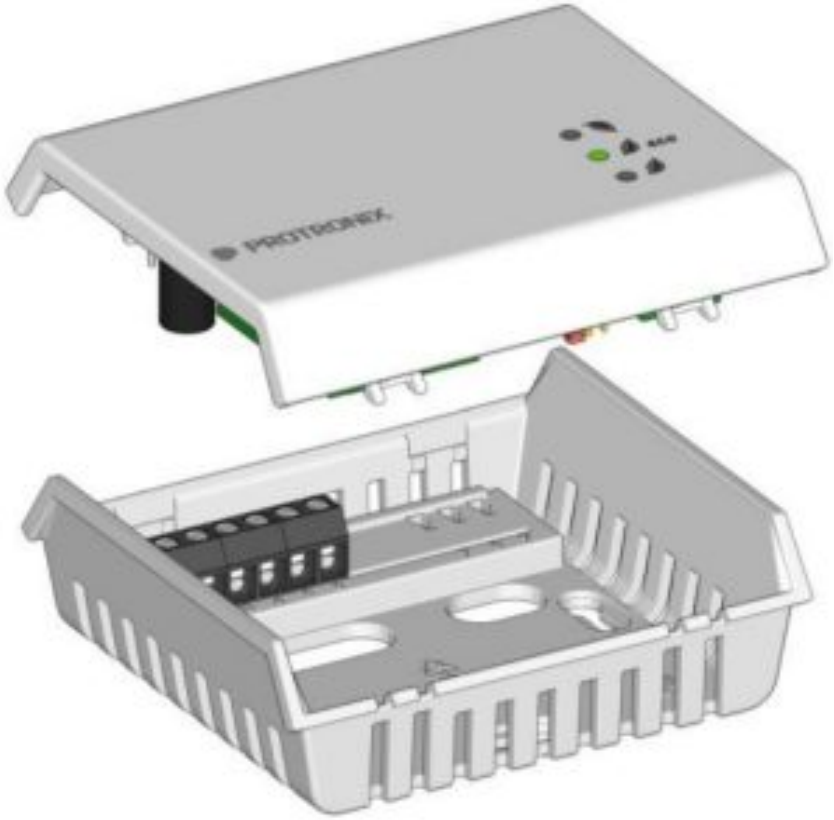


Terminals **1.** ~ **+** supply AC or DC (+) plus pole **2.** ~ **GND** supply AC or DC (-) minus pole, GND **3. OUT1** RS485 bus – signal line B **4. GND** GND **5. OUT2** RS485 bus – signal line A **6. GND** GND	**Jumpers** JP6 – LED indication settings

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 to turn off automatically.		permanent LED indication enabled
			LED indication according to ambient light
JP6 – 3	**Selecting the sensor for an LED indication – CO_2 or RH.**		LED indication by CO_2
			LED indication by RH
JP6 – 4 **JP6 – 5**	**These positions are not intended for user settings.**		

Sensor assembly

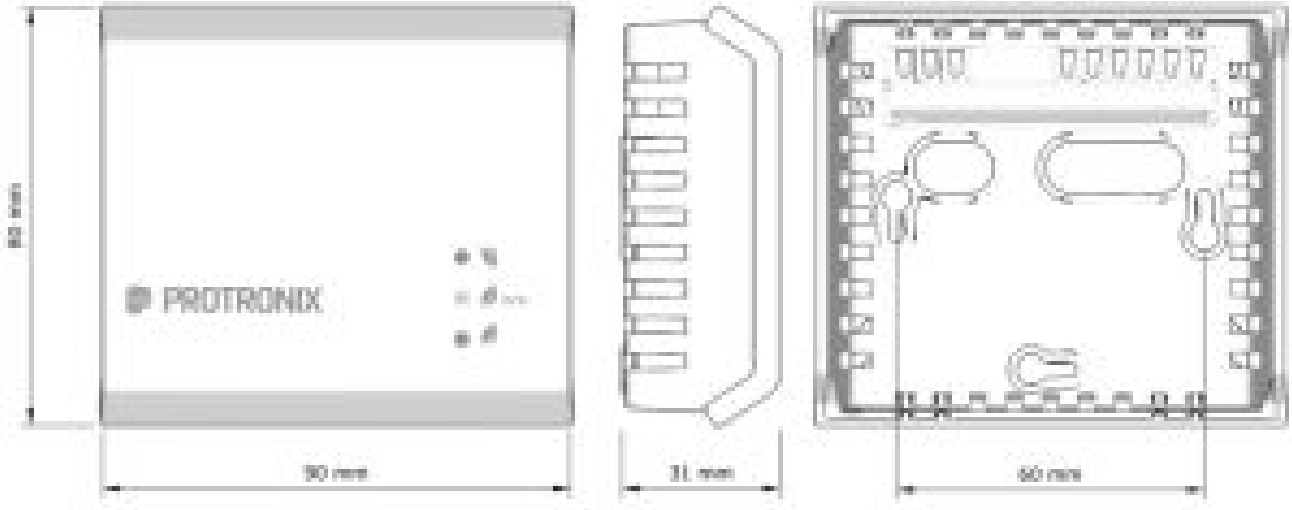


Box color
Front: white – RAL9016
Base: gray – RAL7035

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 according to the electronic waste law and the EU directives.

Dimensions



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

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www.protronix.cz/en/
www.careforair.eu/en/

Documents / Resources

	PROTRONIX NLII-CO2+RH+T-5-RS485 Room Sensor with RS485 [pdf] User Manual NLII-CO2 RH T-5-RS485, Room Sensor with RS485