PROTRONIX NLII-CO2-R-5-A Room Sensor CO2 with Sound Alarm User Manual

PROTRONIX

SENSE & EASY

User manual

NLII-CO2-R-5-A | Room sensor CO2 with sound alarm

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) in the air. It is suitable for schools, offices, classrooms, shopping centers, homes, restaurants, fitness centers, commercial buildings, etc.

〉 measures CO2
〉 analog voltage/current output
〉 2x output relay – 2x NO/C

〉 sound signalization – alarm
〉 two modes of relay switching
〉 maintenance during operation not required
〉 long life and stability

Type of sensor / Order code	CO_2 output	Relay
NLII-CO2-R-5-A	0-10 V/0-20 mA/4-20 mA[1)]	1x NO/C
NLII-CO2-2R-5-A	0-10 V/0-20 mA/4-20 mA[1)]	2x NO/C

1) It is possible to select the desired type of analog output by a jumper on the electronics board. The minimum achievable output value corresponds to the minimum value of the measuring range.

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 auto-calibration function ensures very good long-term stability.
The sensor has built-in one analog output for the actual concentration of CO2. The relay trigger level can be set by the SETPOINT rotary switch.
Relay switching is indicated simultaneously with a short (1,5s) audible signal and yellow LED light.
The way of relay switching can be set by a jumper – 5s pulses when the CO2 concentration exceeds and falls below the set CO2 level for e.g. opening and closing a skylight, or standard switching, where relays are closed until the measured CO2 concentration drops under the set CO2 level.
So the sensor efficiently manages ventilation and heat recovery units, based on current room 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.
Explanation of abbreviations and technical terms can be found on our website in the **Glossary** section.

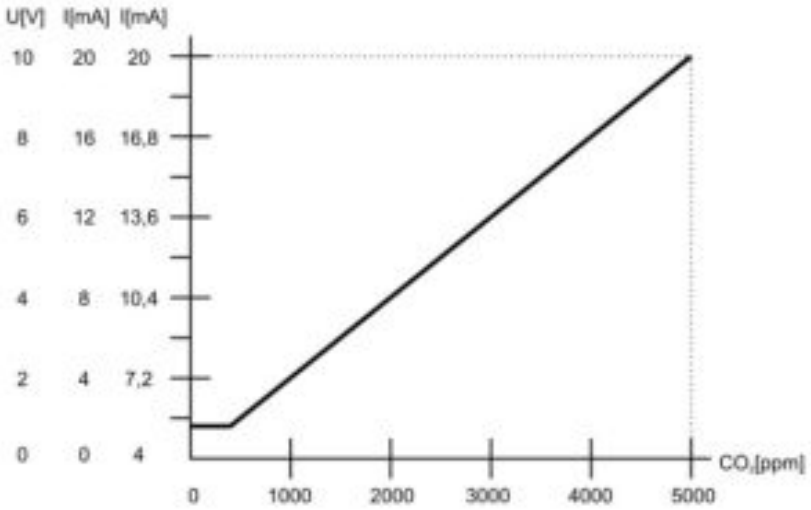
Technical data

Parameter	Value	Unit
Supply voltage range	12 – 35 12 – 24	V DC V AC
Average consumption	0,5	W
CO_2 measuring range	400 – 5000	ppm
CO_2 accuracy	± 35 ppm ±5 % of reading	
CO_2 relay – hysteresis	100	ppm
CO_2 rate rise	max 1	min
CO_2 step response	(90 %) 80	s
Max. switching voltage	250/30	V AC / V DC
Max. switching current	5/5	A AC / A DC
Working humidity no condensing	5 – 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

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.

Selected analog output values versus CO2 concentration



LED indication description

White LED lights:

 Less than 600 ppm CO2.
– maintaining low concentrations of CO2 is not cost-effective – slightly increased concentration does not cause any health complications

Green LED lights:

 More than or equal to 600 ppm CO2, less than or equal to 1200 ppm CO2.
– the optimal balance of air quality and energy efficiency of ventilation and air conditioning

Yellow LED lights + sound alarm:

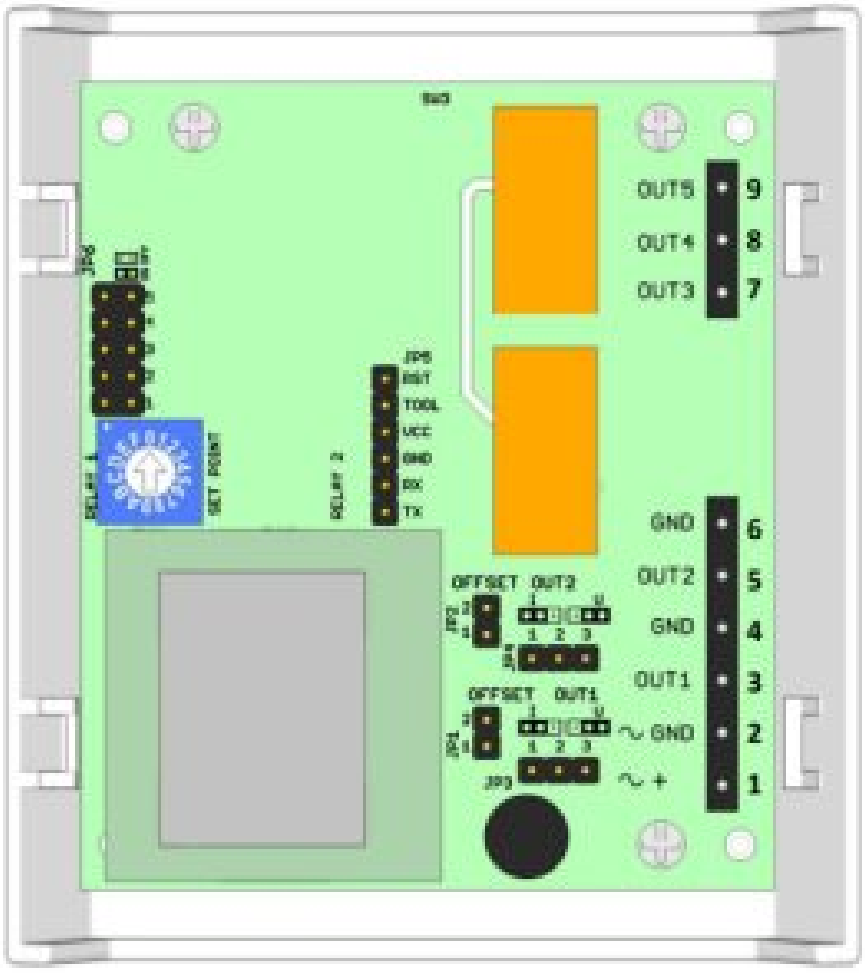
 When the measured CO2 concentration exceeds the level set by the SETPOINT rotary switch.
– yellow LED lights always when the measured CO2 concentration exceeds the level set by SETPOINT rotary switch (min 1000ppm), simultaneously the sound alarm is triggered and the relay contacts close. The sensor remains in this state for 2 minutes – see relay switching graph below.
– CO2 concentration higher than 1200 ppm can cause fatigue, restlessness, headache and feel uncomfortable, hotness, etc.

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.

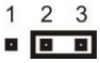
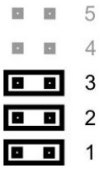
CAUTION:
Warm-up: operational after 1 minute since power on. The declared accuracy is reached after 4 days of continuous power supply.
It is necessary to avoid the severe mechanical shock of the sensor.

Electronic board controls and terminals



Terminals **1.** ~ **+** power AC or DC (+) plus pole **2.** ~ **GND** power AC or DC (-) minus pole, GND **3. OUT1** CO2 sensor analog output, 0-10 V or 0-20 m A or 4-20 mA **4. GND** CO2 sensor output GND **5. OUT2** unused **6. GND** unused 7**. OUT3** NO relay 2 output, normally open (RH) **8. OUT4** C output relay, common contact **9. OUT5** NO relay 1 output, normally open (CO2)	**SETPOINT rotary switch for setting the relays swit ching level** RELAY 1 – switching level for CO2 setting **Jumpers** **JP1** – unused **JP2** – Current output offset CO2 **JP3** – Voltage/current output CO2 **JP4** – unused **JP6** – LED indication and switching mode settings

Jumpers on the electronics board

Mark	Description	Settings	Meaning
JP2	**Current output offset CO_2** – shift quiescent current from 0 mA to 4 mA		current output CO_2 0-20 mA
			current output CO_2 4-20 mA
JP3	**Voltage/current output CO_2** – select the type of analog output – if the selected voltage output is CO_2, JP2 must not be shorted		voltage output CO_2
			current output CO_2
JP6 – 1 **JP6 – 2** **JP6 – 3**	**Switching mode, signalization, and a larm** – LED indication according to ambient li ght – when ambient light is dimmed (at night), LED indicators to turn off automa tically.		relays contacts closed until concentration drop s sound alarm disabled LED indication according to ambient light
			relays switching in 5s pulses sound alarmed enabled permanent LED indication enabled
JP6 – 4 **JP6 – 5**	**These positions are not intended for user settings.**		

Setting the relay switching mode using jumper JP6-3 and SETPOINT rotary switch

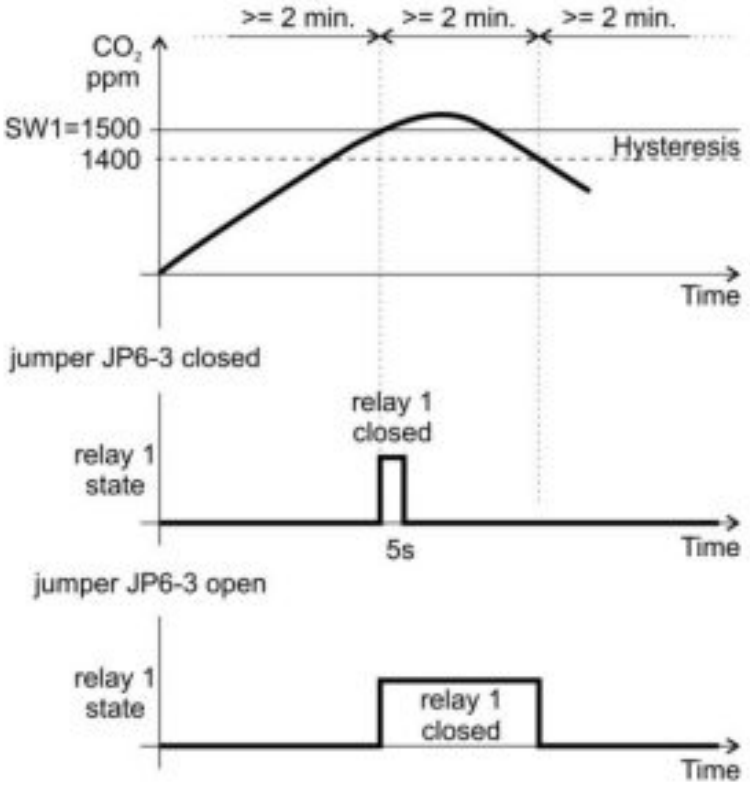
If the jumper JP6-3 is closed, relay 1 contacts close for 5s always, when the measured concentration of CO2 rises above the level set by the SETPOINT rotary switch.

When the measured concentration of CO2 drops below the level set by the SETPOINT switch minus the hysteresis value of 100 ppm, relay 2 contacts close for 5s.

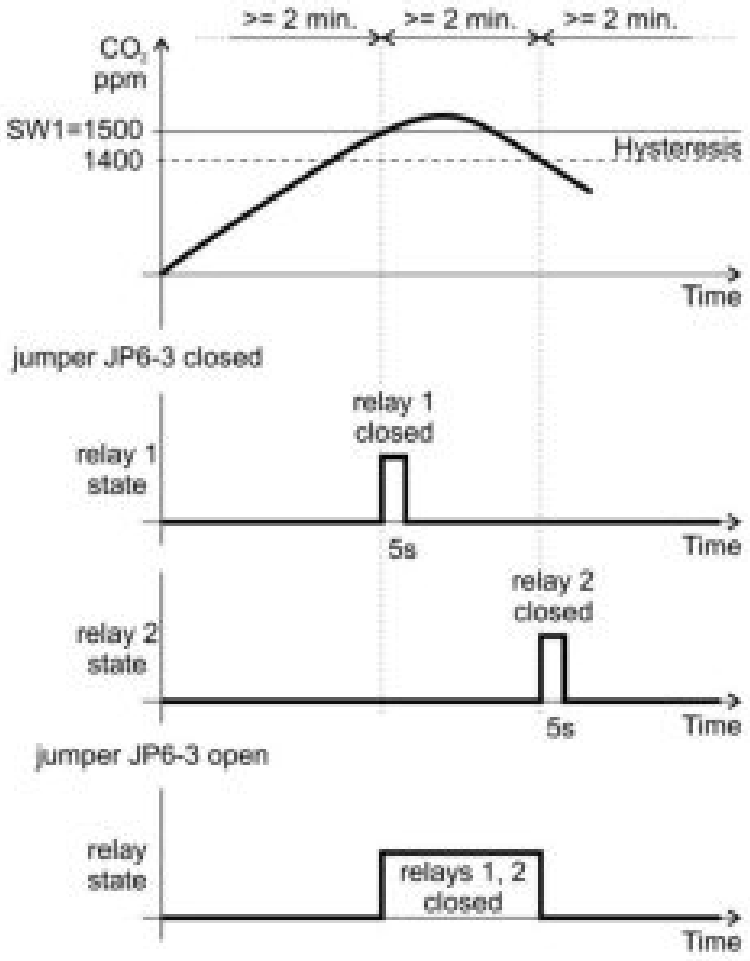
If the jumper JP6-3 is open, both relays contact close, when the measured concentration of CO2 rises above the level set by the SETPOINT rotary switch and stay close until the measured concentration drops below the level set by SETPOINT switch minus the hysteresis value of 100 ppm.

The minimum delay between changes of relays state is 2 minutes.

Relay switching graph with 1 relay (NLII-CO2-R-5-A)



Relay switching graph with 2 relays (NLII-CO2-2R-5-A)

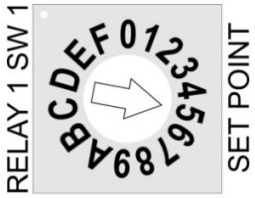


Setting the switching levels

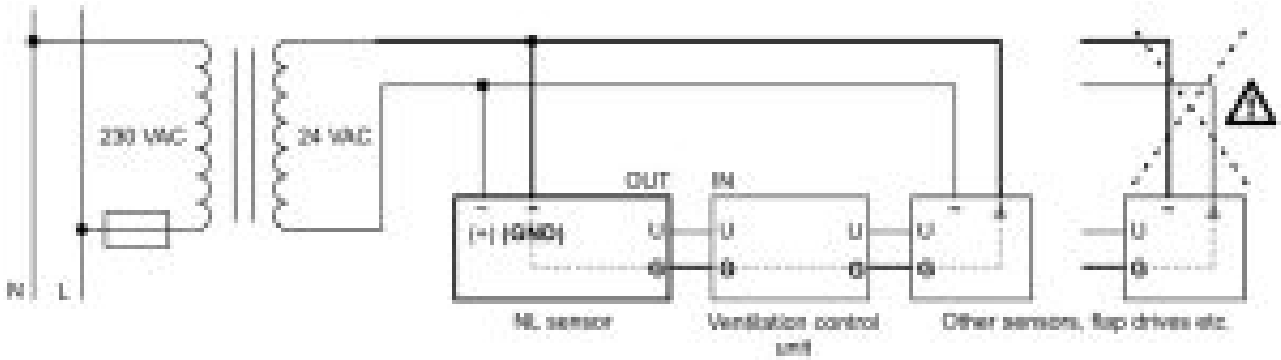
The required concentration of CO2

SETPOINT	CO_2 [ppm]
0	1000
1	1100
2	1200
3	1300
4	1400
5	1500
6	1600
7	1700
8	1800
9	1900
A	2000
B	2100
C	2200
D	2300
E	2400
F	2500

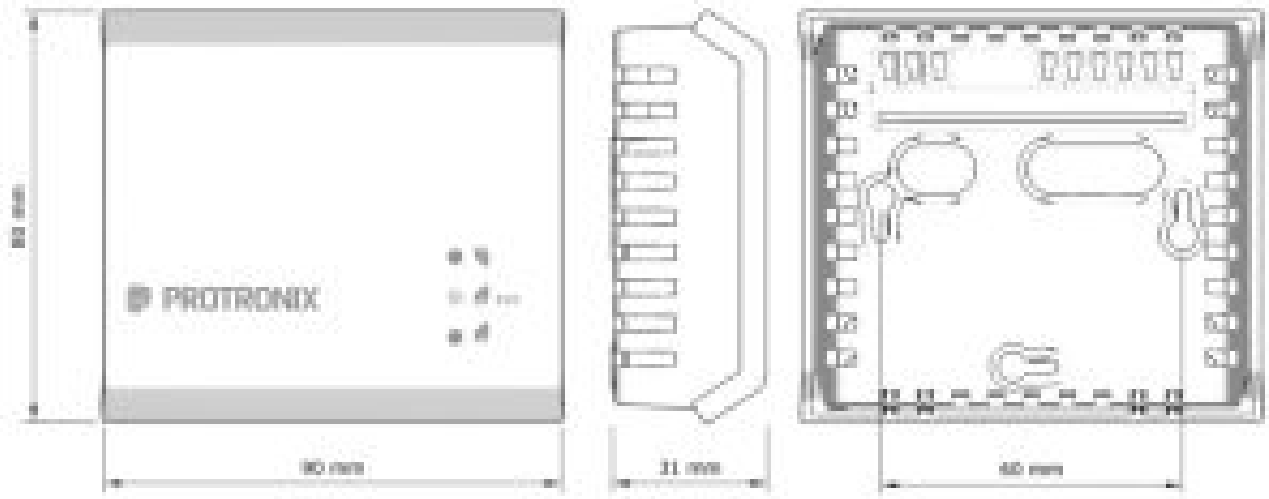
Example for setting the concentration of 1500 ppm



If you connect other devices to the same AC power source as the NL sensor, it is necessary to meet the GND wiring of all analog inputs and outputs, as well as power wires.



Dimensions



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.

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-R-5-A Room Sensor CO2 with Sound Alarm** [pdf] User Manual NLII-CO2-R-5-A, Room Sensor CO2 with Sound Alarm