

NLII-CO2+TVOC-R-5-RS485 | Combined CO₂/TVOC sensor with RS485

Combined room sensor NLII-CO2+TVOC-R-5-RS485 is used to continuously monitor indoor air quality and for effective control of ventilation (HVAC) systems according to current air quality. The sensor monitors the concentration of carbon dioxide (CO₂) and the concentration of total Volatile Organic Compounds in air (TVOC=Total VOC). It can be effectively used in offices, schoolrooms, shopping malls, households, restaurants, fitness centres, commercial buildings, etc.

- > monitors CO₂ a TVOC
- > TVOC output in conformance with [EPA](#) and [UBA](#) standards
- > three selectable TVOC ranges and an extra [eCO₂](#) output compatible with CO₂ standard
- > 2x output relay – 2x C/NO contacts, relays switch according to selected output range
- > three-level LED indication
- > no disturbance at night – automatic turn off of LED indication
- > RS485 bus communication with Modbus RTU protocol
- > maintenance free during operation
- > wide range of supply voltage

Description

The measuring of CO₂ is based on the optical 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.

Built-in advanced VOC sensor is sensitive to volatile organic compounds typically contained in the exhausted air - gaseous metabolic products of human bodies and other gaseous pollutants such as formaldehyde, disinfectant vapours, cooking vapours, fumes from paints, varnishes, adhesives, detergents, cigarette smoke etc. that the CO₂ sensor does not detect.

Besides the CO₂ sensor output, there is the TVOC sensor output, which can be set to one of three TVOC measuring range or you can select the [eCO₂](#) (estimated CO₂) measuring mode.



In this mode the sensor uses special algorithm to estimate CO₂ concentration based on the assumption that the TVOC produced by human metabolism is proportional to the exhaled CO₂. The analogue voltage output of the sensor is adjusted as equivalent to a standard CO₂ sensor in range of 400–2000 ppm of estimated CO₂. The relay then switches according to the selected measuring range.

The sensor contains 2 relays, it can be set to two switching modes: standard (each relay switches according to its assigned quantity), a cascade mode (both relays switch according to one selected quantity and each one can be set to different switching level). Cascade switching, for example, can be used to two-step switching of ventilation units output power. Relay trigger levels can be set independently by two rotary elements.

Ventilation and heat recovery units can be controlled as effectively as possible with the sensor output signal. Built-in LED indicators show in three steps actual indoor air quality. 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 are available through RS485 bus. For information on the communication protocol, use the document [NLII-Modbus-Communication](#).

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



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Parameter	Value	Unit
Supply voltage range	12 – 35	V DC
	12 – 24	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 startup	max 1	min
CO ₂ step response	(90 %) 80	s
TVOC measuring ranges	0 – 1000	µg/m ³
	0 – 3000	
	0 – 10000	
eCO ₂ measuring range ^{1) 2)}	400 – 2000	ppm
TVOC relay hysteresis	5% from selected range	
Max. switching voltage	250/30	V AC / V DC
Max. switching current	5/5	A AC / A DC
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
¹⁾ Output type and range can be set with jumpers. Factory setting range is TVOC 0 - 3000 µg/m ³ . ²⁾ Calculated estimated CO ₂ concentration (estimated CO ₂ - eCO ₂).		

