PROTRONIX NLII-DUST Particulate Matter Room Sensor User Manual

PROTRONIX
SENSE & EASY

User manual

NLII-DUST
Particulate matter room sensor
The sensor is used to monitor air quality inside buildings and to control ventilation (HVAC) and air iltration systems according to current levels of air pollution. The sensor measures the concentration of particulate matter (PMx), such as dust and various chemical substances in the air. The sensor is suited for indoor air quality monitoring, where is the need to monitor PM concentrations such as offices, school classrooms, homes, shopping centers, light industry etc.

- detects and measures dust particles in air
- 0 – 10 VDC analog output for PM2,5
- 0 – 10 VDC analog output for PM10
- the sensor is suited for indoor air quality monitoring according to WELL Building
- Standard defined by IWBI (International
- WELL Building Institute)
- does not require maintenance during operation
- long life > 8 years

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Description

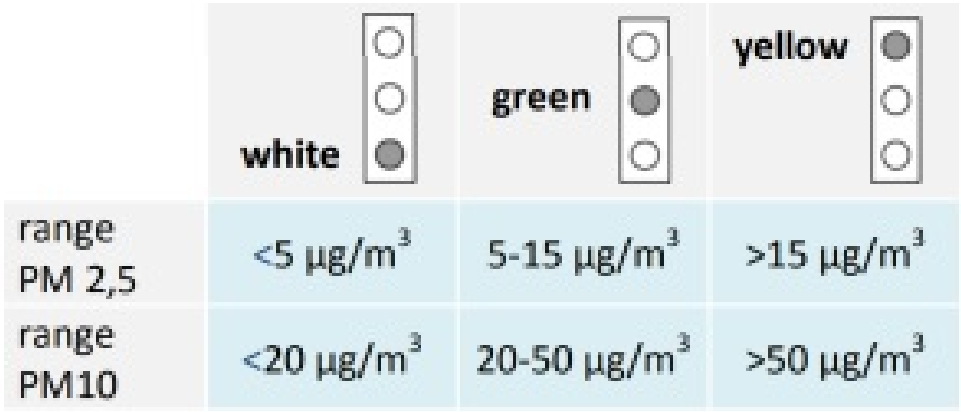
Measurement is based on the principle of laser beam dispersion on particles. The human organism can dispose of particles bigger than 10 µm, but smaller particles will easy get deep in to the respiratory tract and can come through up to alveoli and then to the bloodstream. Increased PM concentration can cause respiratory irritation and lead to more frequent infections. Prolonged exposure to elevated concentrations increases also the risk of other health problems.
The sensor has built-in two separate analog outputs according to the size of particles, PM2,5 and PM10, which are the standard indicators of particle matter air pollution. The current air quality can easily be determined by looking at the three LED indicators.
International WELL Building Institute provides the following particulate matter limits for indoor air: < 15 µg/m 3 for PM2,5 3 and < 50 µg/m for PM10.
Explanation of abbreviations and technical terms can be found on our website in the Glossary section.

Table of parameters

Parameter	Value Unit
Supply voltage range	12 – 35 V DC
Power consumption	12 – 24 V AC
Measuring range PM10, PM2,5	max 0,8 W
PM2,5 analog output	0 – 100 µg/m
PM10 analog output	1) 0-10 V / 0-20 mA
Resolution	3 1 µg/m
Accuracy 0 – 100 µg/m	3 ± 10 µg/m
Measurement interval	1 s
Start-up time	˂ 8 s
Working humidity condensing	0 – 95 % RH
Working temperature	0 to +50 °C
Storage temperature	20 to +60 °C
Expected lifetime	min. 8 years
Ingress protection	IP20
Dimensions	90x80x31 mm
It is possible to select the desired type of analog output by a jumper.	

Particle sizes ranges	
PM2,5	0,3 – 2,5 µm
PM10	0,3 – 10,0 µm

LED indication description



By a jumper setting it is possible to select the output, according to what the LED will indicate — see Jumpers setting.

White light:

Low level of PMx concentration. Excellent air quality but maintaining low concentrations of PMx is not cost-effective.

Greenlight:

Optimal balance of air quality and energy efficiency of ventilation, heating or air conditioning.

Yellow light:

The increased amount of PM, which can cause respiratory irritation and can lead to more frequent infections. Prolonged exposure to elevated concentrations increases the risk of other health problems.

Auto-cleaning

The sensor has a self-cleaning function, which is performed automatically once a week using a built-in fan. The process lasts 10 s and during it the measured data are not available.

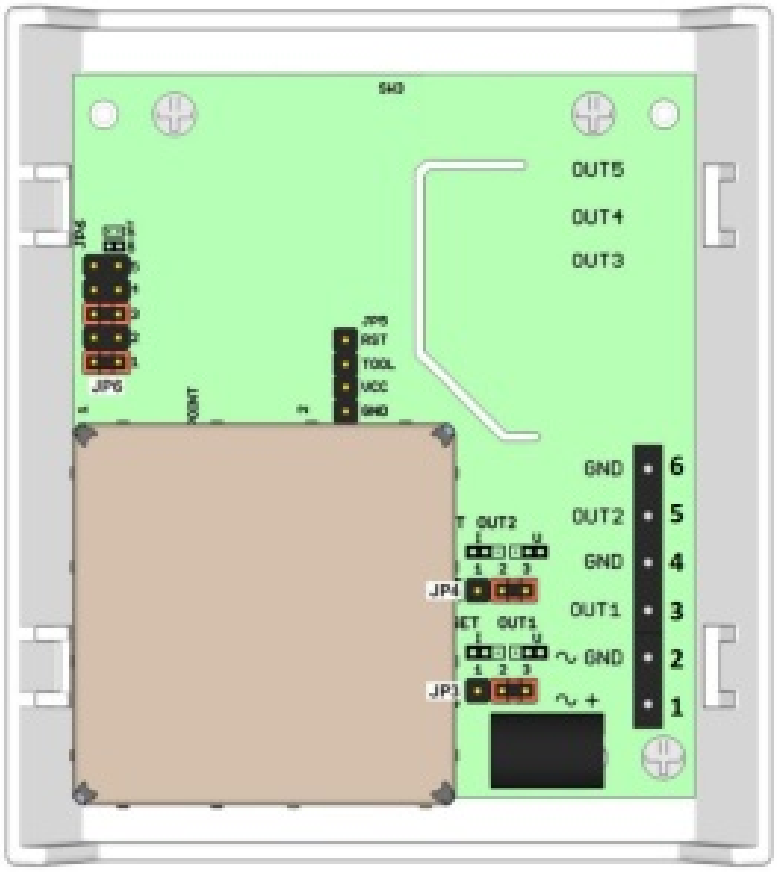
Sensor failure indication

All three LEDs light up at the same time permanently.

CAUTION:

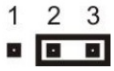
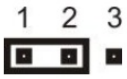
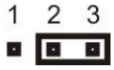
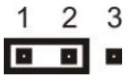
It is necessary to avoid the severe mechanical shock of the sensor.

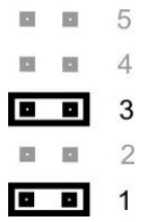
Electronic boards controls and terminals



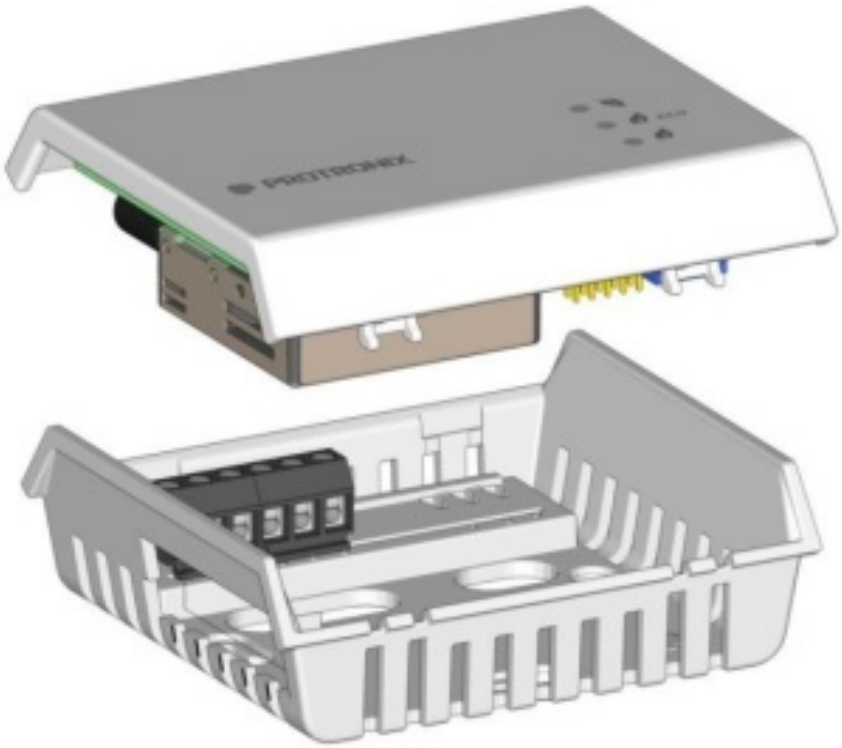
Terminals 1. ~ + power supply DC (+) plus pole 2. ~ GND power supply DC (-) minus pole, GND 3. OUT1 analog output PM10 0-10 V or 0-20 mA 4. GND ground for output PM10 5. OUT2 analog output PM2,5 0-10 V or 0-20 mA 6. GND ground for output PM2,5	**Jumpers**JP3 – voltage/current output OUT1 – PM 10 JP4 – voltage/current output OUT2 – PM2,5 JP6 – LED indication

Jumpers setting

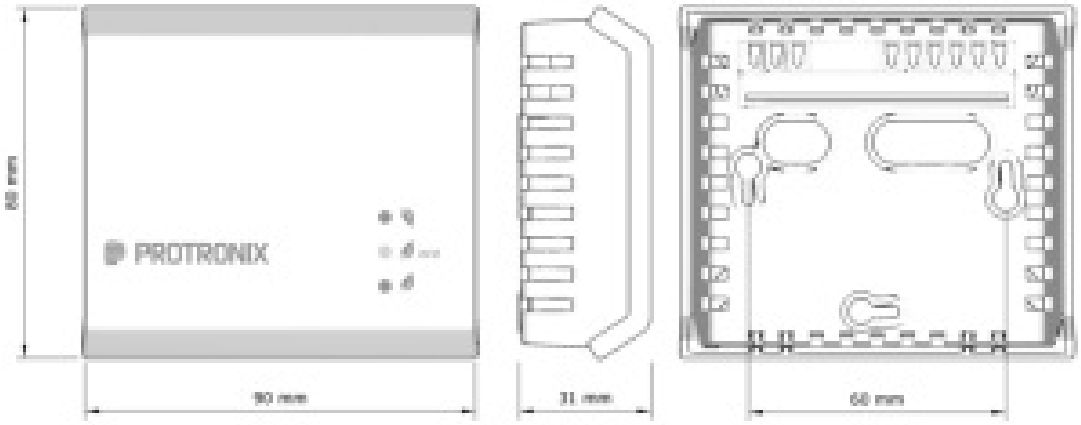
Mark	Description	Setting	Meaning
JP3	**Voltage/current output PM10** – selection of analog output type		voltage output PM10
			current output PM10
JP4	**Voltage/current output PM2,5** – selection of analog output type		voltage output PM2,5
			current output PM2,5
JP6 – 1 **JP6 – 3**	**Enabling LED indication** **LED indication according to PM2,5 / PM10**		LED indication disabled
			LED indication according to PM10 LED indication enabled

			LED indication according to PM2,5 LED indication enabled

Sensor assembly



Dimensions



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 product improvements its properties and functions without previous notice.

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Chrudim 537 01, Czech Republic
www.protronix.cz/en/
www.careforair.eu/en/
um-nlii-dust-en-v3-201026.docx

Documents / Resources

	PROTRONIX NLII-DUST Particulate Matter Room Sensor [pdf] User Manual NLII-DUST, Particulate Matter Room Sensor