

## NLII-DUST-IQRF | Particulate matter room sensor with IQRF

Sensor is used to monitor air quality inside buildings and to control ventilation (HVAC) and air filtration systems according to current levels of air pollution. The sensor measures the concentration of particulate matter (PM<sub>x</sub>), 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, etc.

- › detects and measures dust particles PM<sub>1</sub>, PM<sub>2,5</sub>, PM<sub>4</sub> a PM<sub>10</sub> in air
- › 0 – 10 VDC analog output for PM<sub>2,5</sub>
- › 0 – 10 VDC analog output for PM<sub>10</sub>
- › communication over IQRF network
- › 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

### Description

Measurement is based on the principle of laser beam dispersion on particles. 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 with range 0-100 µg/m<sup>3</sup> according to size of particles PM<sub>2,5</sub> and PM<sub>10</sub>, which are the standard indicators of particle matter air pollution. Output of all detected particle sizes measurement, including PM<sub>1</sub> and PM<sub>4</sub>, is available through communication interface. 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<sup>3</sup> for PM<sub>2,5</sub> and < 50 µg/m<sup>3</sup> for PM<sub>10</sub>.

For detailed information about IQRF, use the document [NLII-IQRF-Communication](#). 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.



Table of parameters

Parameter	Value	Unit
Supply voltage range	12 – 35	V DC
	12 – 24	V AC
Power consumption	max 0,8	W
Measuring range PM <sub>1</sub> , PM <sub>2,5</sub> , PM <sub>4</sub> , PM <sub>10</sub>	0 - 1000	µg/m <sup>3</sup>
Analog outputs range	0 - 100	µg/m <sup>3</sup>
PM <sub>2,5</sub> analog output	0-10 V / 0-20 mA <sup>1)</sup>	
PM <sub>10</sub> analog output	0-10 V / 0-20 mA <sup>1)</sup>	
Resolution	1	µg/m <sup>3</sup>
Accuracy 0 – 100 µg/m <sup>3</sup>	± 10	µg/m <sup>3</sup>
Accuracy 100 – 1000 µg/m <sup>3</sup>	± 10	%
Measurement interval	1	s
Start-up time	< 8	s
Working humidity non 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
<sup>1)</sup> It is possible to select the desired type of analog output by a jumper.		




### Particle sizes ranges

PM <sub>1</sub>	0,3 – 1,0	µm
PM <sub>2,5</sub>	0,3 – 2,5	µm
PM <sub>4</sub>	0,3 – 4,0	µm
PM <sub>10</sub>	0,3 – 10,0	µm



## NLII-DUST-IQRF | Particulate matter room sensor with IQRF

### LED indication description

	white 	green 	yellow 
range PM 2,5	<5 µg/m <sup>3</sup>	5-15 µg/m <sup>3</sup>	>15 µg/m <sup>3</sup>
range PM10	<20 µg/m <sup>3</sup>	20-50 µg/m <sup>3</sup>	>50 µg/m <sup>3</sup>

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.

#### Green light:

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

#### Yellow light:

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 LED's lights up at the same time permanently.

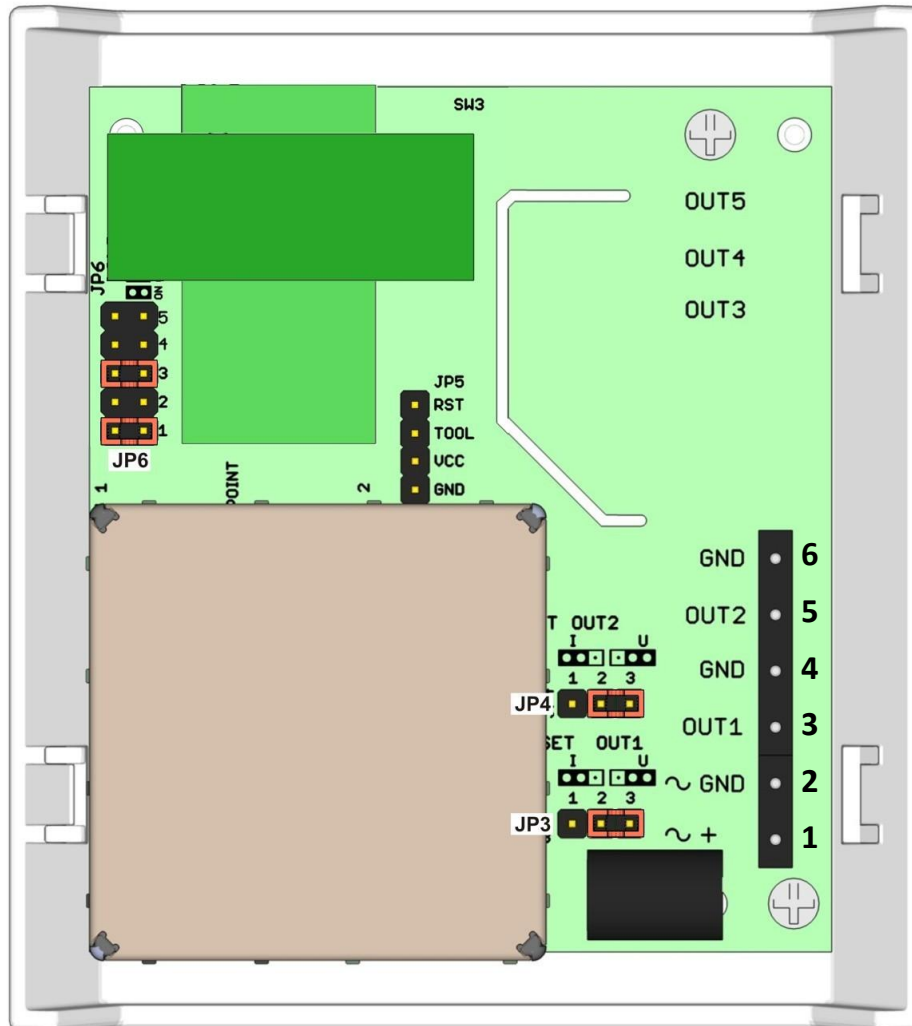
#### CAUTION:

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



## NLII-DUST-IQRF | Particulate matter room sensor with IQRF

### 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               |


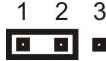

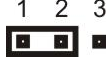
















#### Jumpers

- JP3 – voltage/current output OUT1 - PM10  
 JP4 – voltage/current output OUT2 - PM2,5  
 JP6 – LED indication



## NLII-DUST-IQRF | Particulate matter room sensor with IQRF

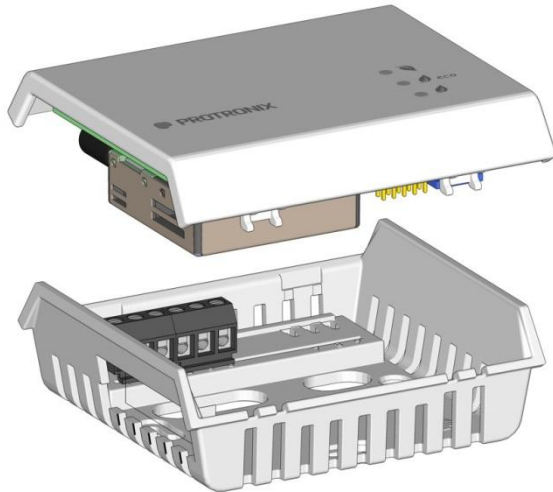
### Jumpers setting

Mark	Description	Setting	Meaning
JP3	Voltage/current output PM10 - selection of analog output type	1 2 3 	voltage output PM10
		1 2 3 	current output PM10
JP4	Voltage/current output PM2,5 - selection of analog output type	1 2 3 	voltage output PM2,5
		1 2 3 	current output PM2,5
JP6 - 1 JP6 - 3	Enabling LED indication LED indication according to PM2,5 / PM10	 5  4  3  2  1 LED indication disabled	
		 5  4  3  2  1 LED indication according to PM10	LED indication according to PM10
		 5  4  3  2  1 LED indication according to PM2,5	LED indication according to PM2,5
		 1 LED indication enabled	LED indication enabled



## NLII-DUST-IQRF | Particulate matter room sensor with IQRF

### Sensor assembly



### Box color

Front: White - RAL9016

Base: gray - RAL7035

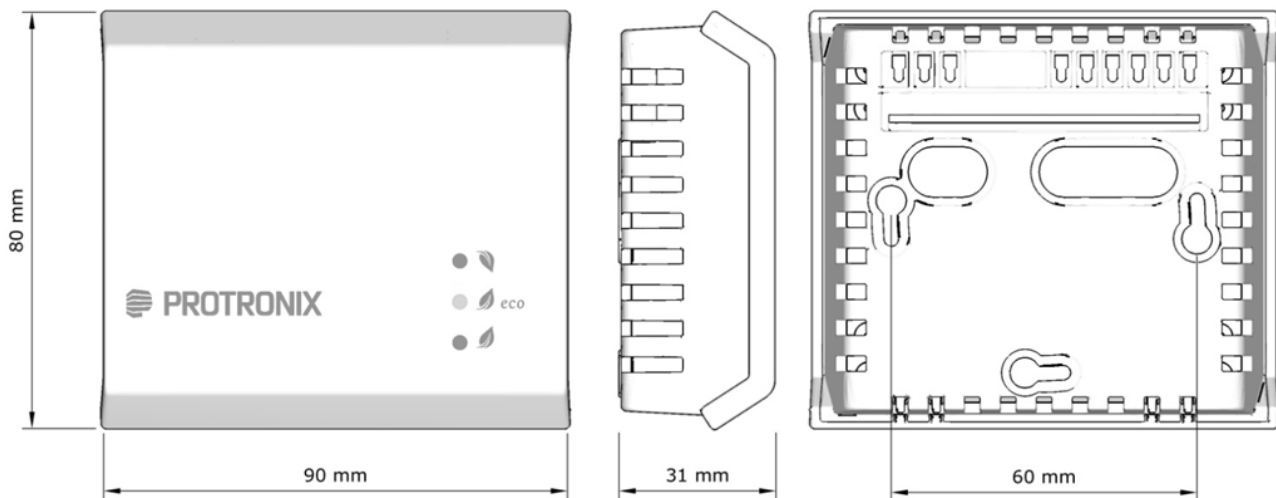
### Way to use

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.*

