NS114 PM2.5

Analog Particulate Matter Sensor

- PM2.5 laser particle counter
- 0-10V Analog or Digital Output
- Adjustable Sensitivity
- 12-24V 100mA DC Supply
- 3 Wire Screw Terminal

Overview

The NS114 PM2.5 sensor is a simple low voltage analog airborne particle laser counter. It can easily integrate into an existing building control system. Connect the sensor output signal to an analog input of a controller, gateway, or data acquisition unit. The air particle count signal can be used to warn occupants and maintenance staff or adjust ventilation and filtration.

Operation

The sensor can detect particle pollution with a size of 2.5um or smaller. The device is suitable for ceiling or wall mount applications. Place the sensor in a location where pollution is critical close to sensitive equipment or at-risk persons.

The sensitivity can be adjusted with a simple jumper position. This selection changes the gain of an analog amplifier. Choose a gain suitable for typical range of pollution. A high gain will detect a lower more critical range. Whereas a lower gain will observe a broad range in highly polluted airspace.

The output mode can be changed from a continuously varying analog signal to a digital signal. The digital signal is produced by a comparator with a threshold at half scale (i.e. 5V) or quarter scale (i.e. 2.5V). Use the analog mode to continuously monitor pollution level. Or use the digital mode to trigger actuators at a specific pollution threshold.

Changing the sensitivity and choosing the digital output scale can adjust the pollution threshold. Setting sensitivity high and digital scale low will reduce the pollution threshold to a minimum and detect good to moderate pollution levels. Whereas, setting sensitivity low and digital scale high will increase the threshold to a maximum and detect only hazardous pollution.

Particle Pollution Level

Fine particles are detected by the PM2.5 sensor. These particles cause air pollution hazards. Breathing unhealthy air can increase health risks. It is recommended to continuously monitor the particle pollution level. If the pollution exceeds healthy or safe levels notify occupants and advise maintenance or building controls to adjust ventilation and filtration. If possible, identify the source of the particle pollution and eliminate it.
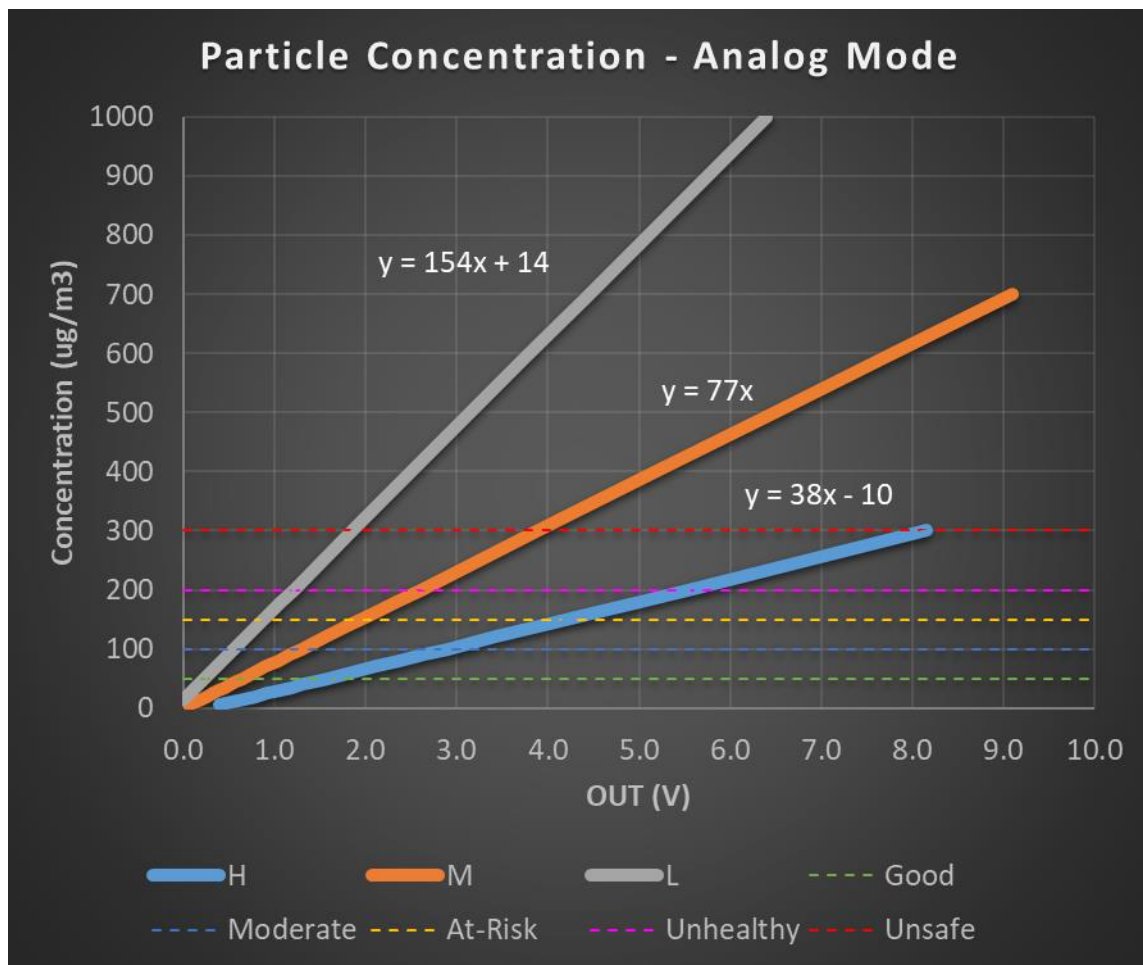
*1 Particle Concentration in Analog Mode for H, M, and L Sensitivities*
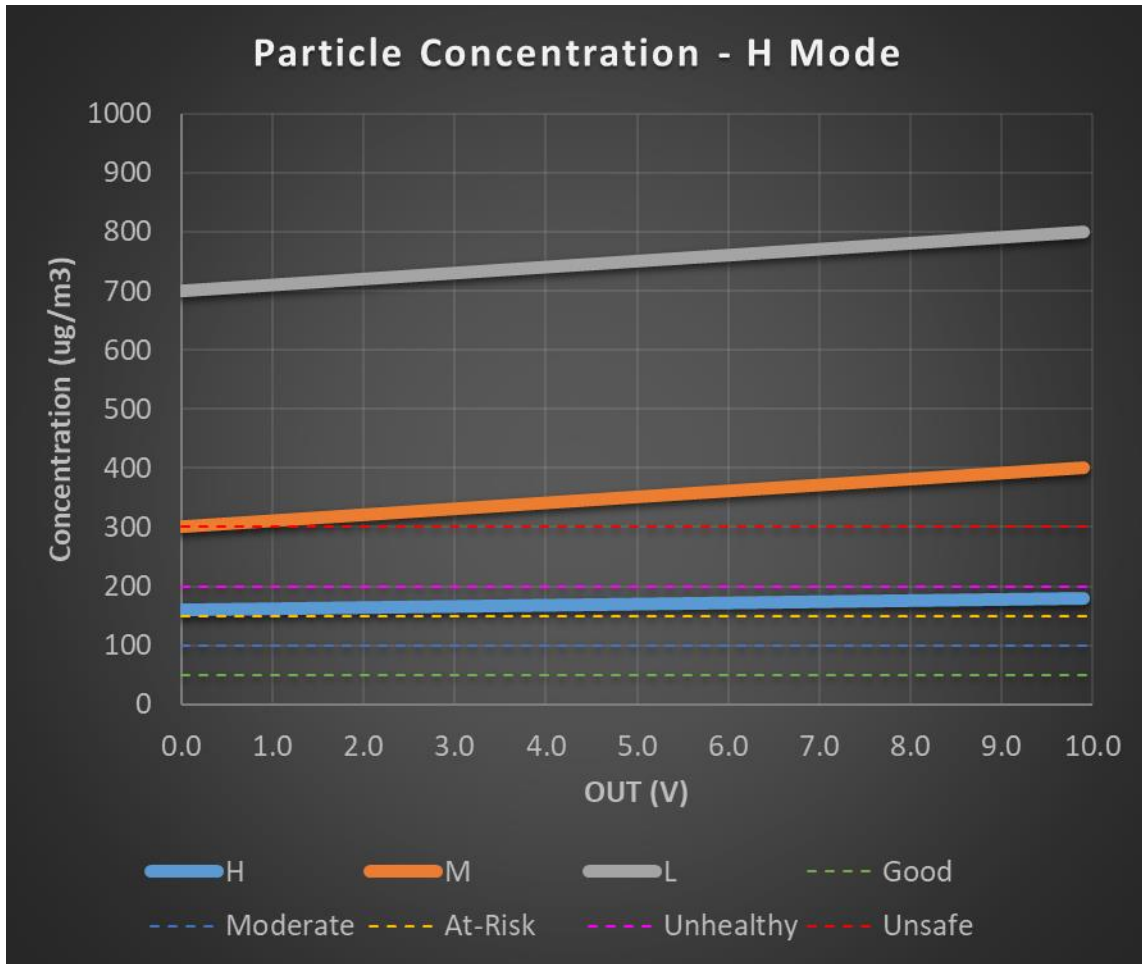
2 Particle Concentration in H Mode for H, M, and L Sensitivities
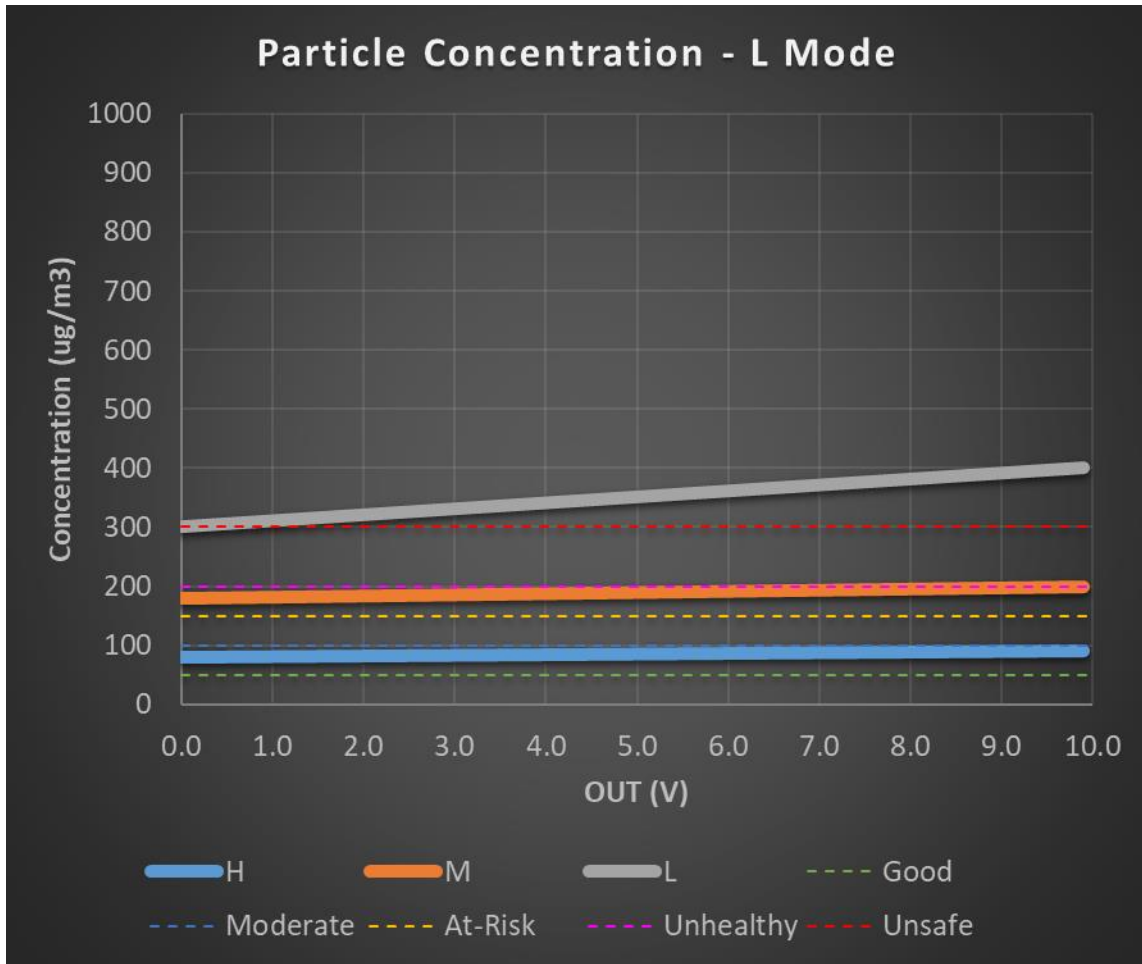
3 Particle Concentration in L Mode for H, M, and L Sensitivities

Product Features and Installation

The product is a small plastic enclosure that can be wall or ceiling mounted. The back mounting plate is removable. Separate the front housing from the back mounting plate. Then use screws or adhesive to secure the plate to the ceiling or wall surface. Reattach the front housing to the back mounting plate. The two pieces snap together without extra screws.
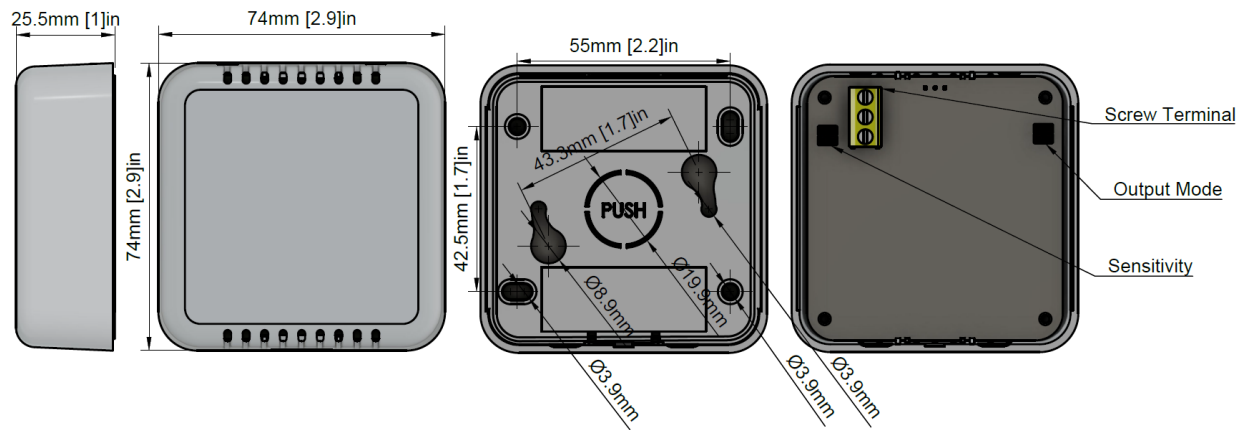


4 Product Dimensions and Features

Sensitivity and Output Mode

The sensitivity and output modes can be changed by moving a jumper between header pins. There are 3 options for sensitivity.

H	High sensitivity
M	Medium
L	Low

And there are 3 options for output mode. In analog mode the output varies continuously in proportion to the particle count. For digital modes the signal is active high which would be 10V when particle count is high and 0V when low.

Analog	continuously varying output signal between 0 and 10V
H	Digital high threshold, trigger at half scale (i.e. 5V)
L	Digital low threshold, trigger at quarter scale (i.e. 2.5V)
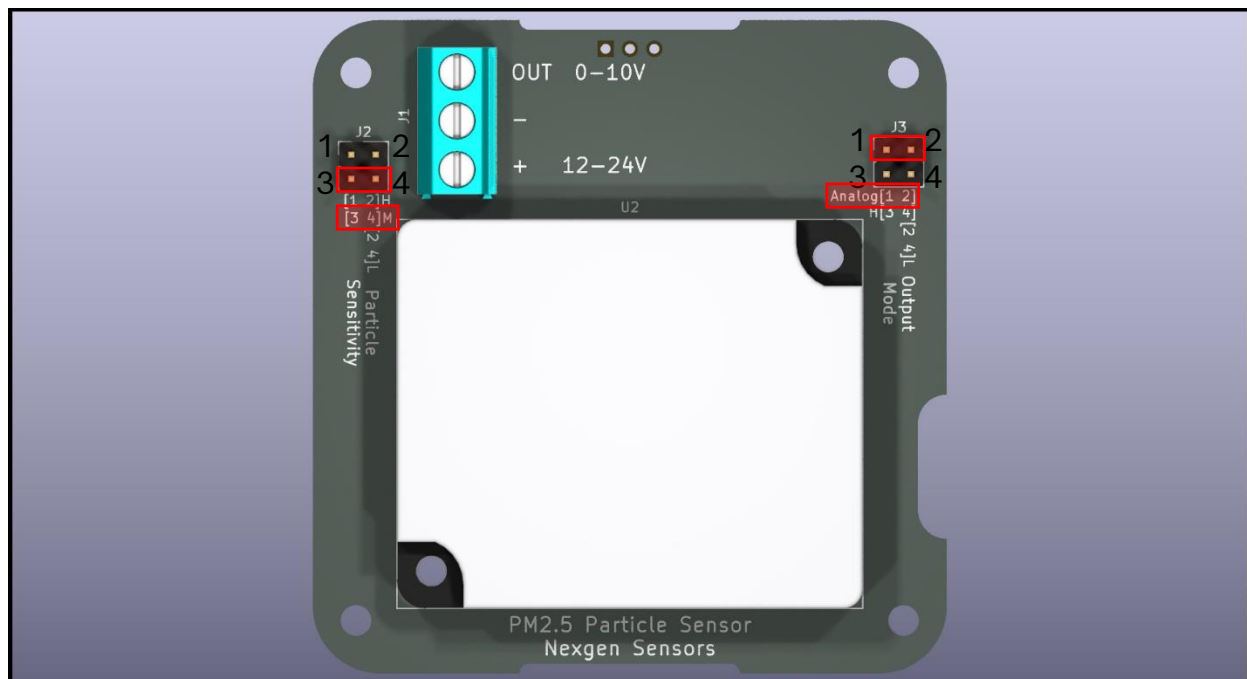
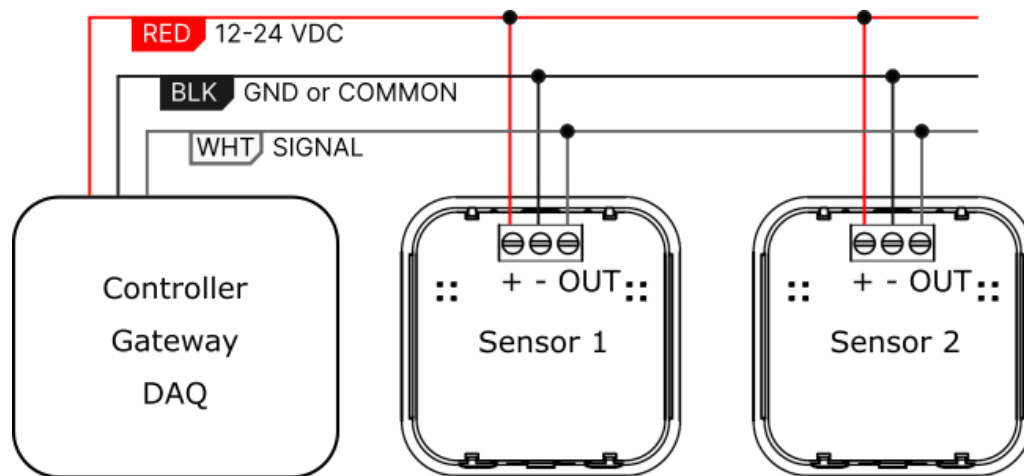*5 Sensitivity and Output Mode Adjustment*

Usage and Wiring

Connect the sensor to an existing controller, gateway, or data acquisition unit (DAQ). Provide a DC supply of 12-24V with at least 100mA. Use appropriate wires or cabling. Conductors can be solid or stranded 14-26 AWG. Secure the conductors to the 3 pins of the screw terminals.

+ Positive Supply, connect to 12-24V

- Negative Supply and signal return, connect to ground or common

OUT Sensor Signal, connect to input of controller, gateway, or DAQ

Multiple sensors can be wired in parallel. Each output has a series blocking diode. The largest signal is detected by the controller. This is useful for extending the sensing range or observing a larger area.

6 Sensor Wiring Diagram