

NS111 Light

Analog Ambient Light Sensor

- Human Eye Spectral Response
- 360-degree Lens
- 0-10V Analog or Digital Output
- Adjustable Sensitivity
- 12-24V 50mA DC Supply
- 3 Wire Screw Terminal



Overview

The NS111 Light sensor is a simple low voltage analog ambient light detector. 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 light signal can be used to detect daylight for light harvesting and HVAC or shade automation.

Operation

The sensor can detect illumination either direct glare or indirect reflection. The field of view is 360 degrees which is suitable for ceiling or wall mount application. Place the sensor in a suitable location with line of sight to areas where illumination should be detected.

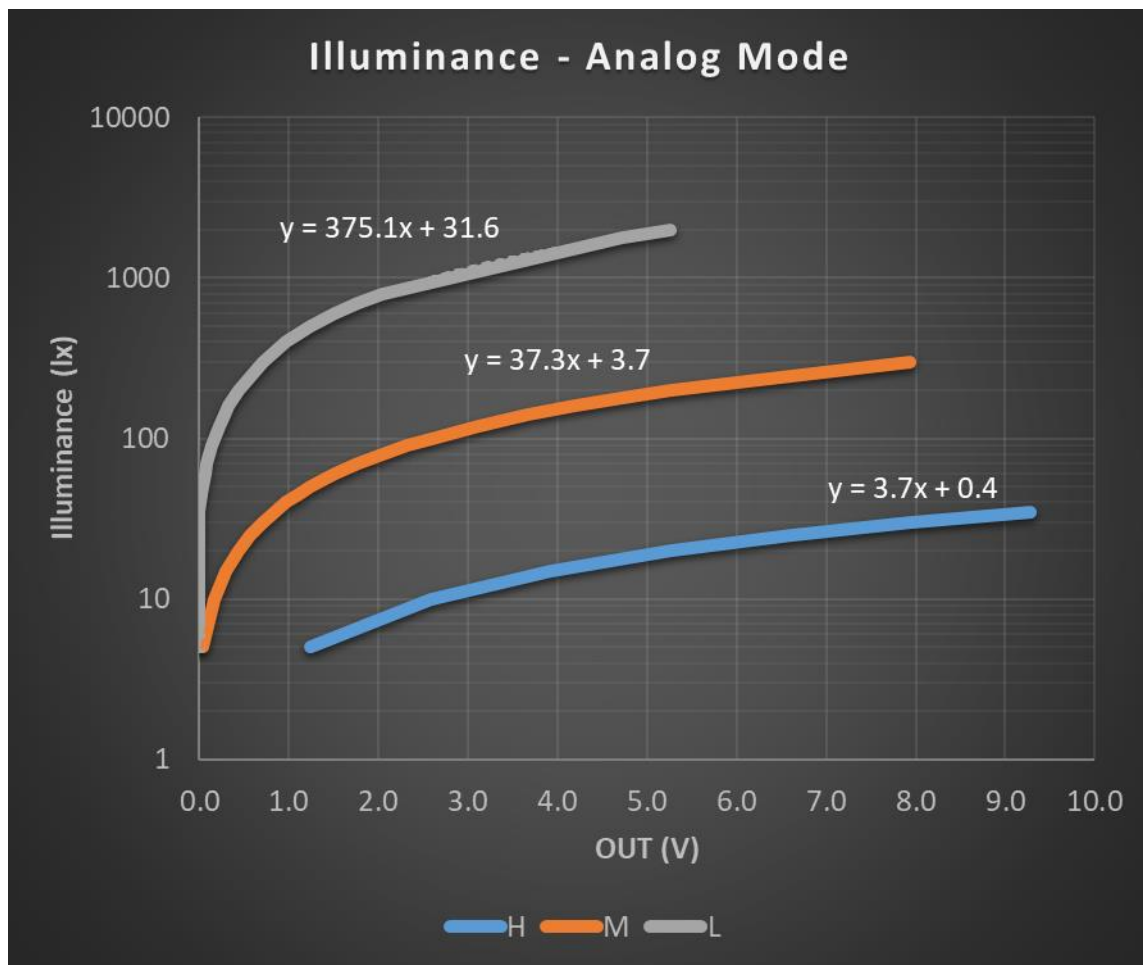
The sensitivity can be adjusted with a simple jumper position. This selection changes the gain of an analog amplifier. Choose a gain suitable for typical brightness. A high gain will detect lower brightness levels. Whereas a lower gain will minimize noise in the signal.

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 lighting levels. Or use the digital mode to trigger actuators at a specific event threshold.

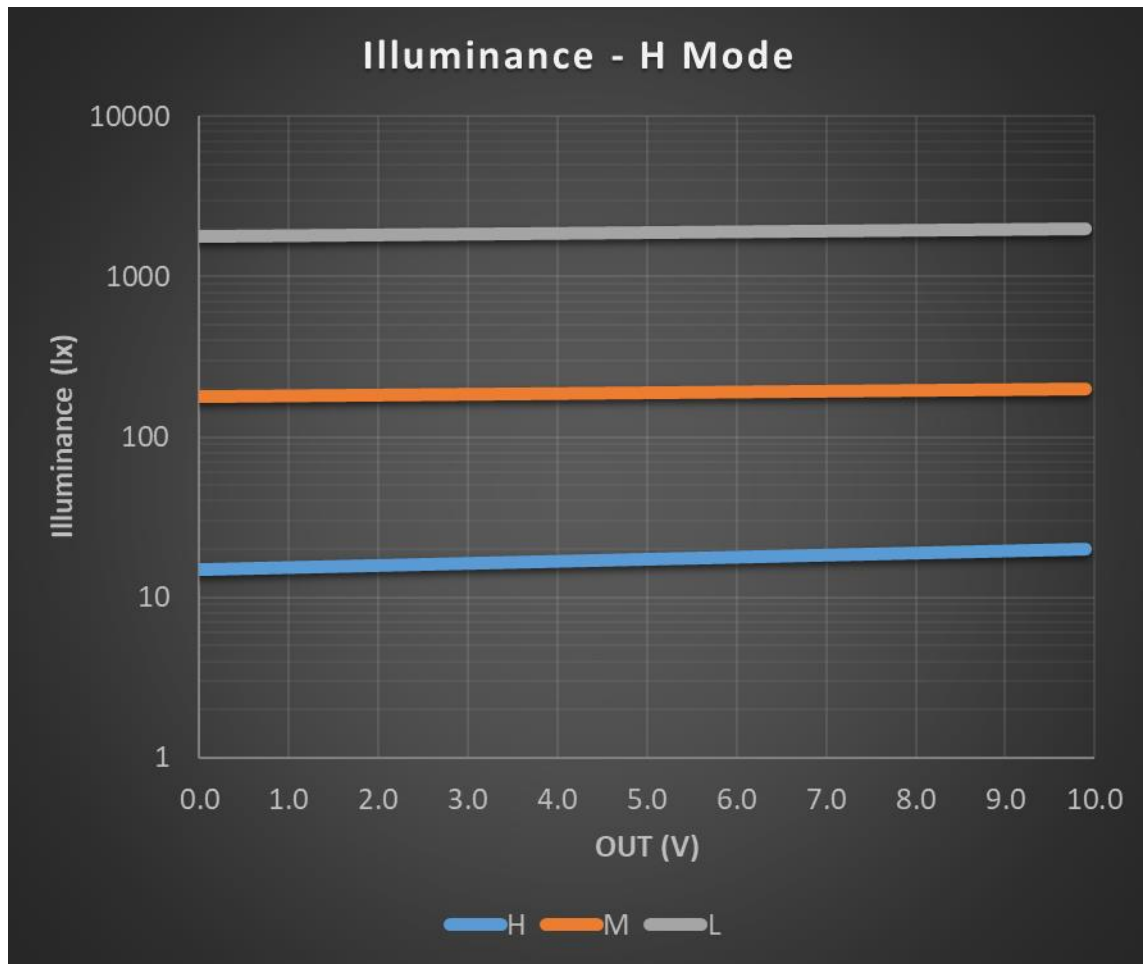
Changing the sensitivity and choosing the digital output scale can adjust the event threshold. Setting sensitivity high and digital scale low will reduce the event threshold to a minimum and detect the smallest changes in brightness. Whereas, setting sensitivity low and digital scale high will increase the threshold to a maximum and detect only the largest changes in brightness such as glare.

Detection Level

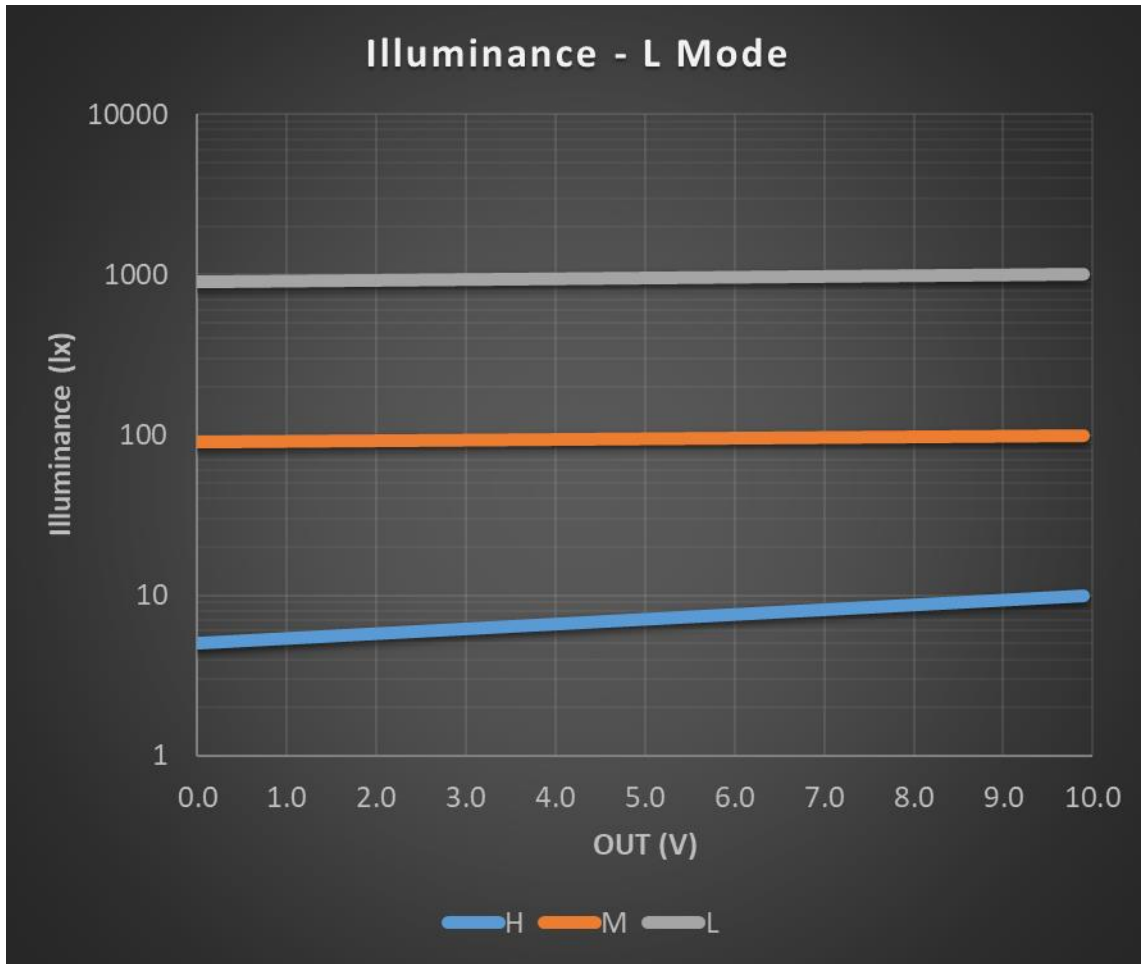
The light detection level can span many orders of magnitude. Choose an appropriate range for the typical brightness at the installation location. Indirect illumination can be a small fraction of actual illumination on work surfaces. Whereas glare can be many times larger than actual illumination. Some understanding of these differences is important to accurately detect the lighting levels in a space.



1 Illuminance Analog Mode for H, M, and L Sensitivities



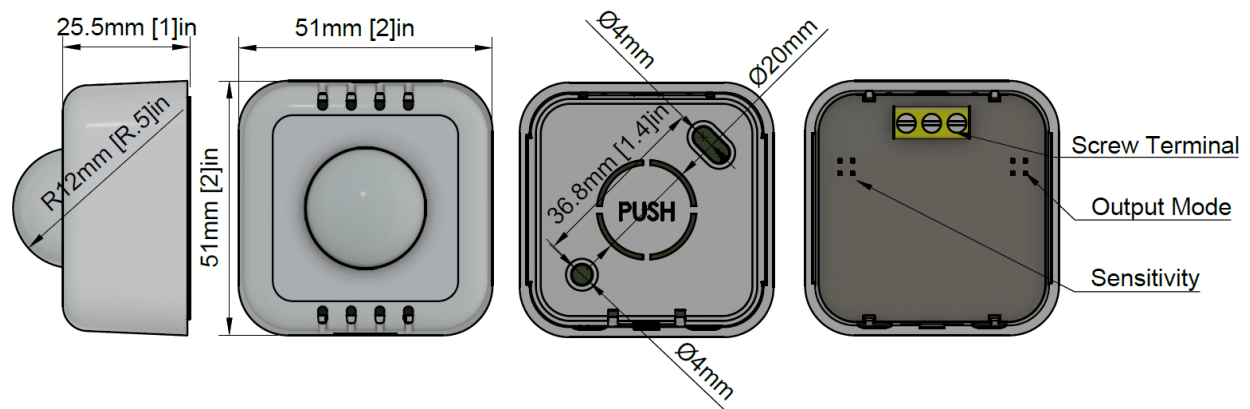
2 Illuminance H Digital Mode for H, M, and L Sensitivities



3 Illuminance L Digital 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

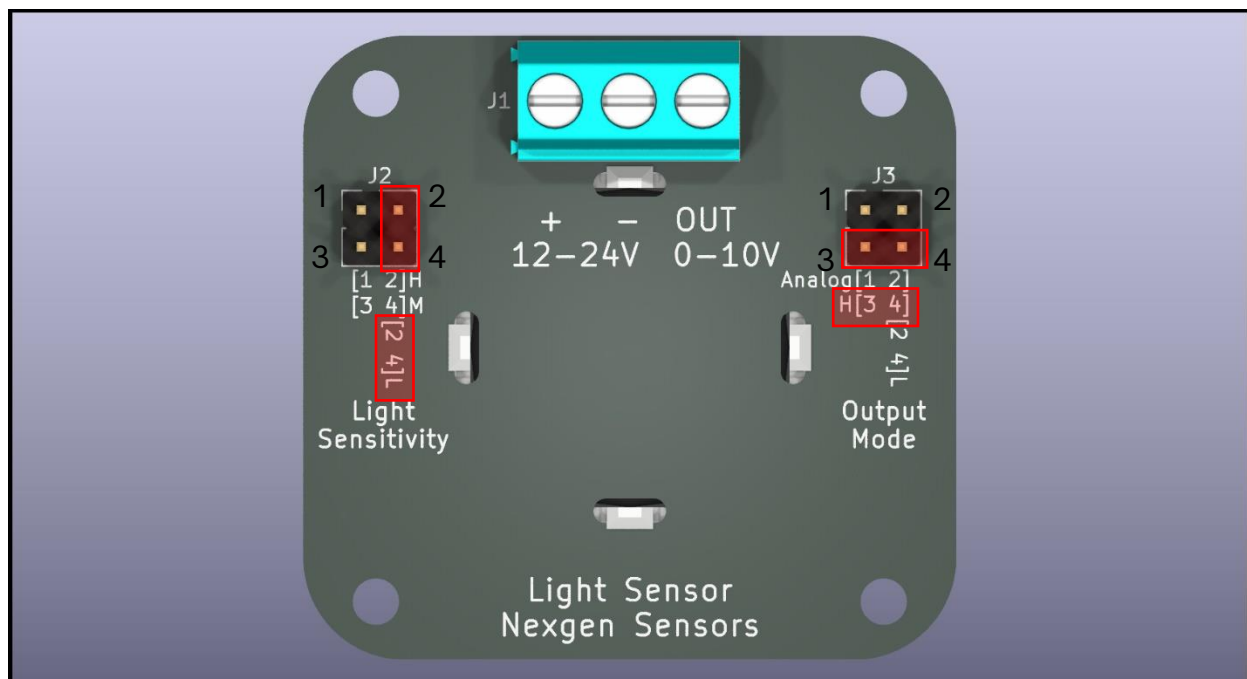
Sensitivity and Output Mode

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 motion speed. For digital modes the signal is active high which would be 10V when excessive light is detected and 0V when adequately or under illuminated.

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

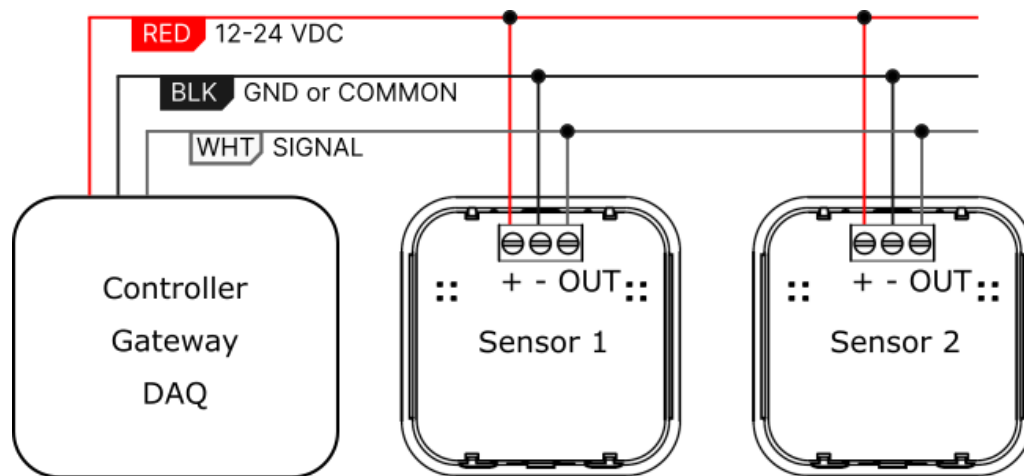
Usage and Wiring

Connect the sensor to an existing controller, gateway, or data acquisition unit (DAQ). Provide a DC supply of 12-24V with at least 50mA. 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