Sense Nano Sensor

Installation Guide

The PassiveLogic Sense Nano™ sensor is a tiny, light-powered, multi-sensor environmental monitoring device that gathers building and occupancy data—no wires needed.

The Sense Nano sensor connects wirelessly to the PassiveLogic Hive™ and Hive Mini® controllers, and to other PassiveLogic Sense devices, via our self-federating enhanced mesh network. PassiveLogic aggregates the sensor data in real time and creates autonomous comfort-based control for your building based on the underlying physics.

With a toolless 30-second install, place the Sense Nano on the wall, then use the PassiveLogic Lens™ iOS app to provision.

The Sense Nano sensor can be powered by ambient light or indirect sunlight, meaning no wires are required. Optionally, adding wired power is useful for low-light locations and expands your control design options. External power enables indoor air quality measurements, improves wireless network strength, and provides an increased sampling rate.

This small but powerful device monitors six parameters:

- Temperature
- Radiant temperature
- Humidity
- Air pressure
- Light
- Air quality (TVOC, when wired for power)

Specifications

Sensor Specifications

Weight	Less than 1 oz (24.5 g)
Diameter | Height	1.77 in (45 mm) | 0.45 in (11.33 mm)
Surface mounting	Bracket with adhesive included (screws optional)
Temperature	Accuracy: ±0.5°F at 77°F (±0.27°C at 25°C)
Radiant temperature	Accuracy: ±3.6°F at 77°F (±2°C at 25°C) when ambient temperature is no more than 9°F (5°C) different than radiant surfaces measured
Humidity	0 to 100% RH, ±3% RH (from 10 to 90% RH)
Atmospheric pressure	300 to 1100 hPa, ±0.6 hPa
Light level	0 to 10,000 lux (±10%)
Air quality, TVOC (wired only)	0 to 500 Index of Air Quality (IAQ), ±3 IAQ

Networking/Communication

Bluetooth wireless communication (always available)	Light powered: 50 ft (15 m) Wired for power: 70 ft (21.3 m)
1-Wire communication (optional)	See "Option 2: 1-Wire protocol"

Wire-Free Power

Light powered (ambient light)	Light requirement: Install location must have an independent reading of ≥615 lux for 4 hours/day
Battery autonomy (no room light)	7–8 months battery life when fully charged

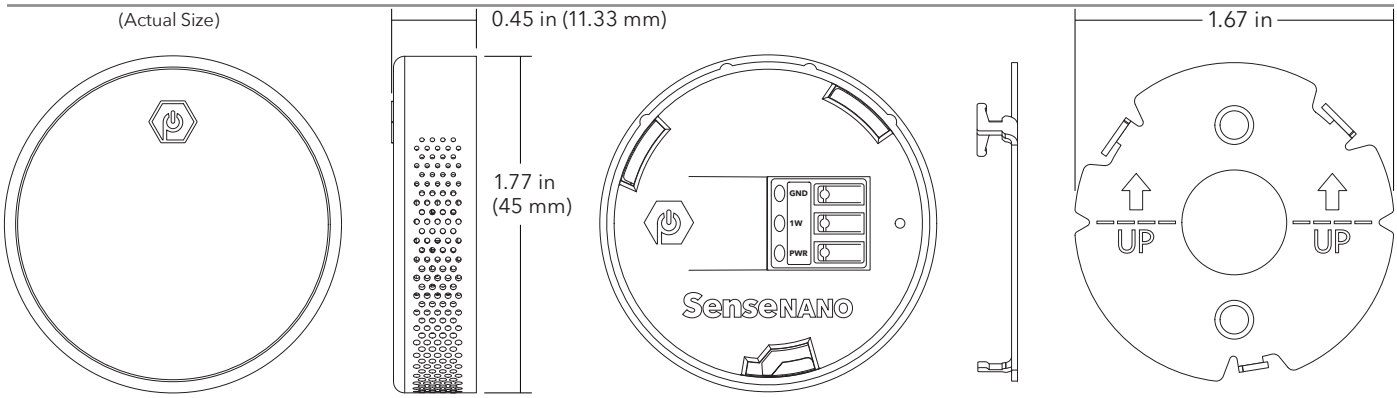
(Optional) Wired Specifications

Option 1: External power	24VAC or 12V–24VDC • Allows device to act as a signal repeater with more throughput • Enables measuring indoor air quality (IAQ)
Option 2: 1-Wire protocol	5V 1-Wire, standard speed, wired communication and parasitic power Same features as Option 1, plus the following: • 984 ft (300 m) maximum wire length • Requires a PassiveLogic 1-Wire master such as a Multi™ Cell® module
Option 3: 1-Wire protocol with additional power wire	Same as Option 2, but with dedicated power wire instead of parasitic power
Wire gauge	18–22 AWG

Environmental Operating Conditions

Operating temperature	32 to 113°F (0 to 45°C)
Compensated temperature	32 to 113°F (0 to 45°C)
Storage temperature	-4 to 113°F (-20 to 45°C)
Operating humidity	10 to 90% RH
Storage humidity	0 to 99% RH (non-condensing)

Dimensions



Installation

Sense Nano sensors are typically installed wire free because they are powered by ambient light.

Optionally, you can choose to wire for power and/or for communication.

Tools and materials

You will need the following:

- iPhone Pro/Pro Max with Lens installed
- Lux meter, bubble level, pencil, measuring tape, surface-safe cleaning supplies

Installation guidelines

Surface: Flat, clean, non-porous

Wire-free installations: Well-lit area to charge the battery, ≥615 lux for 4 hours per day

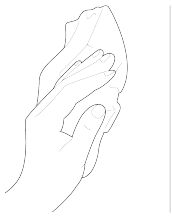
Interior spaces: Conditioned, indoor areas 32 to 113°F (0 to 45°C)

Avoid the following for best temperature and humidity readings:

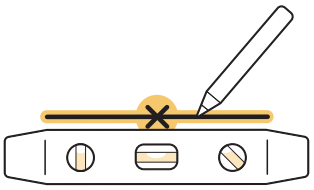
- Direct sunlight
- Heat sources and ventilation
- Exterior windows, walls, and doors
- Doors, curtains, and dividers

Installing the Sense Nano

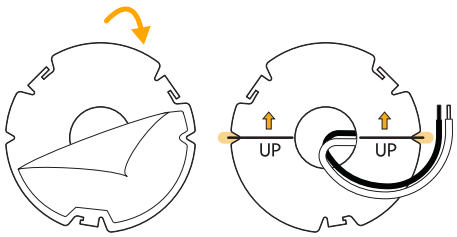
1. Select the install location. With a lux meter, make sure it will receive ≥615 lux for 4 hours per day. (For optional wired installations, make sure wires have been pulled.)
2. Clean the wall thoroughly to ensure best adhesion of the bracket to the wall.



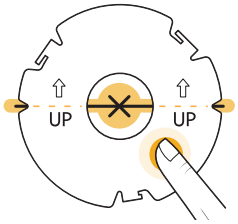
3. Measure the desired height, then draw a level line the width of the mounting bracket.



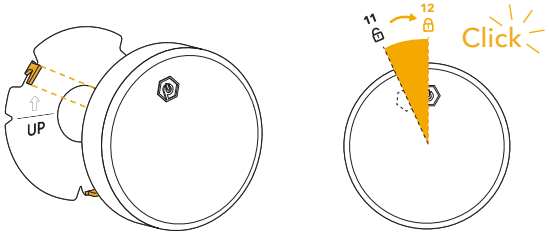
4. Remove the adhesive backer from the bracket. **Note:** Adhesive is difficult to remove once installed. (For optional **wired installations**, pull wires through the bracket before adhering to the wall.)



5. Align the bracket notches to the level line, then apply pressure to the bracket for 30 seconds.

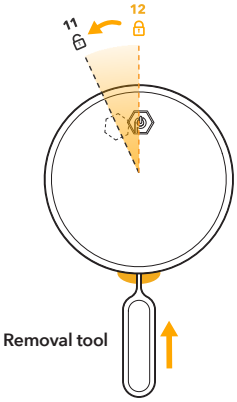


6. Align the PassiveLogic logo as shown, then twist the sensor clockwise **until it locks with a click.**



7. Provision the Sense Nano sensor using the Lens™ iOS mobile app.

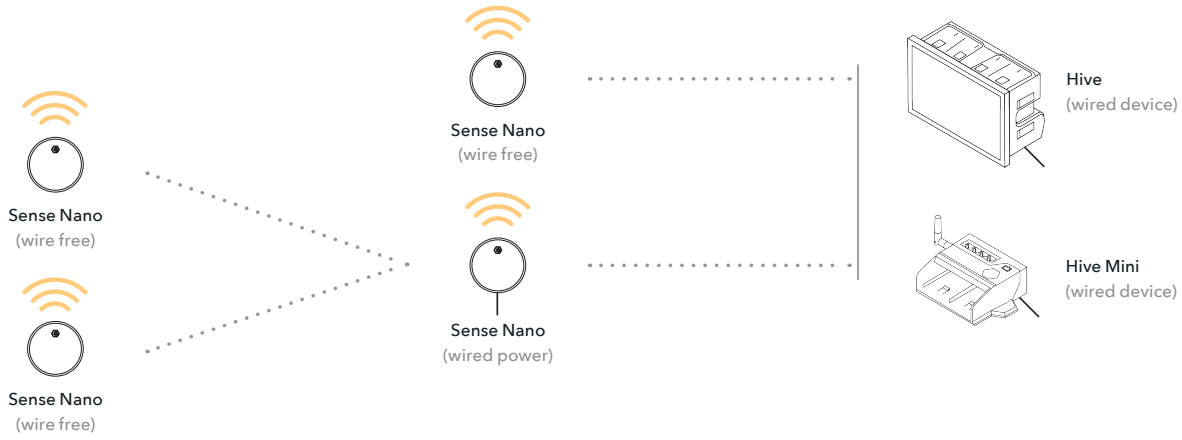
To **remove** a sensor, insert the removal tool into the larger hole at the bottom, then twist the sensor counterclockwise to release it from the bracket.



Wireless connectivity

Sense Nano sensors can communicate wirelessly with a PassiveLogic Hive controller, Hive Mini controller, and Sense sensors that are wired for power.

A fully wire-free Sense Nano device communicates wirelessly while being powered by ambient or natural light. Adding wired power to a Sense Nano sensor makes the device a repeater that transmits data from other Sense Nano sensors.



(Optional) Wiring for power or communication

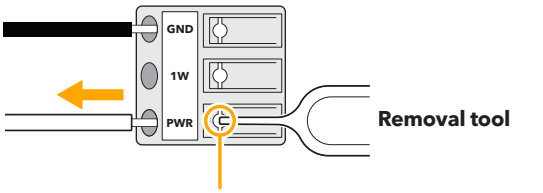
You can choose to wire a Sense Nano sensor for the following reasons:

- To enable air quality measurements
- For low-light locations with less than 615 lux for 4 hours per day
- For wireless communication at distances of 50-70 ft (15-21.3 m)
- For wired communication over 1-Wire protocol at distances up to 984 ft (300 m)
- To make a wireless-signal repeater for other Sense Nano devices

A wired sensor provides increased sampling rates, and it becomes a repeater with a stronger signal and more throughput, extending the reach of the PassiveLogic wireless sensor network.

Using the Nano wire terminals

- To **insert wires**, strip 0.25 in (7 mm), push into the terminal, and pull gently to ensure the wire is secure.
- To **remove wires**, push lightly on the release tab (pushing hard will break the tab and does not help disengage the wire). See illustration at right.

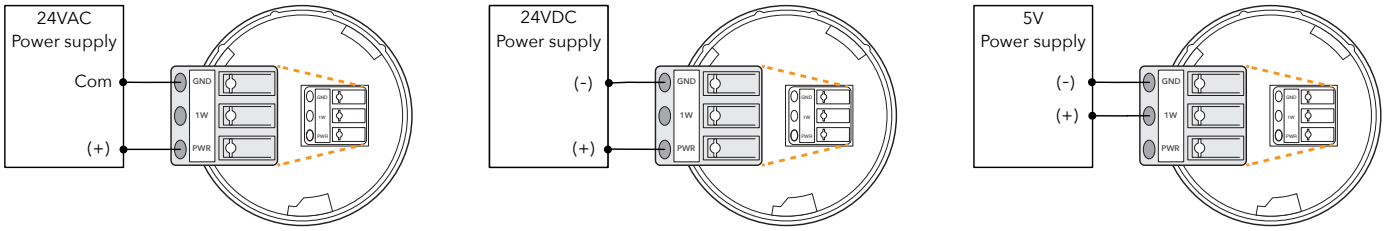


Press down gently **only** on the **release tab** indentation

Optional wiring examples

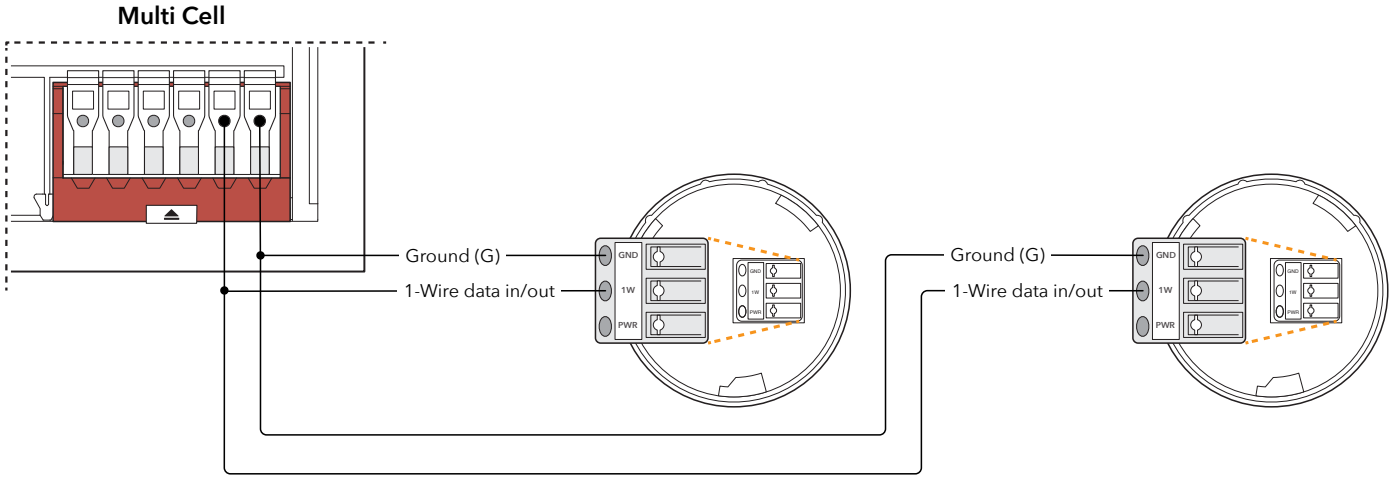
Wired power for installations with <615 lux, or to enable IAQ measurement & signal repeater

There are three ways to power the device with an external supply for lower light conditions or to enable IAQ measurements & signal repeater.



1-Wire protocol: Power and/or communication (daisy chain optional)

Powered from 1-Wire by PassiveLogic Hive or Hive Mini with Multi Cell, supports ≈10 daisy-chained Sense Nano sensors



1-Wire protocol, with additional power wire: Power and/or communication (daisy chain optional)

Powered by PassiveLogic Hive or Hive Mini controller with Multi Cell, supports ≈15 daisy-chained Sense Nano sensors