
# Indoor Air Quality Monitor

## AirGradient ONE (Model: I-9PSL)

AirGradient ONE is an indoor air quality monitor enabling you to know if the air quality is healthy or not. It measures CO2, PM2.5, TVOCs, NOx, Temperature and Humidity.
It's easy to assemble, fully open-source and customizable, so you can extend it in whatever way you like.

The AirGradient ONE is also available as an easy to assemble kit.

## Technical Data

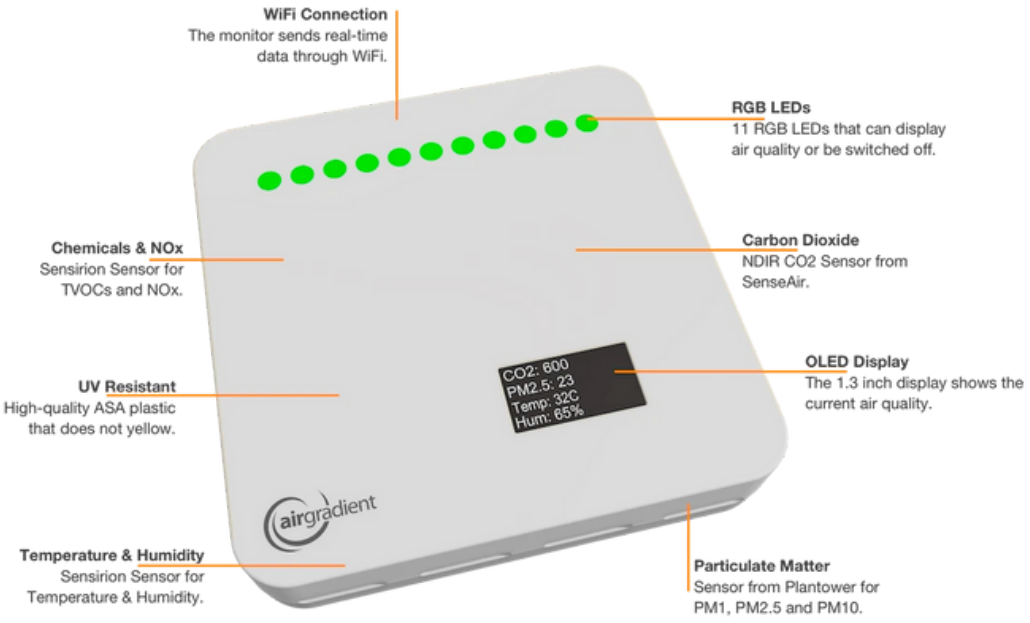
| Specification | Description |
|---|---|
| Model | I-9PSL (AirGradient ONE, 9th Generation) |
| Microcontroller | ESP32-C3-MINI (32-bit RISC-V single-core processor, up to 160MHz, 384 KB ROM, 400 KB SRAM, 8 KB SRAM in RTC, 4 MB flash in chip package) |
| WiFi | 2.4GHz IEEE 802.11 b/g/n-compliant |
| Bluetooth | Bluetooth LE: Bluetooth 5, Bluetooth mesh |
| Extensions | Broken out on PCB: I2C, 3 GPIO, 2 UART |
| Peripherals | 11 RGB-LEDs, Push Button, Reset Button, USB C Connector |
| External Hardware Watchdog | Texas Instruments TPL5010 |
| CO2 Sensor Module | SenseAir S8 (NDIR). 400 to 10000ppm. Accuracy: ±40 ppm ±3% of reading at 5 to 30°C, 20-70%RH (400 - 2000ppm range) |
| Particle Sensor Module | Plantower PMS5003 (laser scattering principle). Accuracy: ±10%@100~500µ g/m³, ±10µg/m³@0~100µ g/m³ |
| Temperature and Humidity | Sensirion SHT40. Accuracy: Temperature ±0.2°C @ -40 to + 125°C; Humidity ±2% RH @ 0 - 100% RH |
| TVOC/NOx Module | Sensirion SGP41. Accuracy: TVOC <±15 @ 0 to 500 VOC Index; NOx <±50 @ 0 - 500 NOx Index |
| Enclosure | ASA Plastic, UV Resistant and Weather Proof |
| Mounting Options | Wall or pole mounting options |
| Cable | 2m USB C Cable including data lines for flashing |
| Certifications | CE, RoHS, REACH, FCC ID: 2AC7Z-ESPC3MINI |
| License | Open Source Hardware licensed under CC-BY-SA |

**www.airgradient.com**
support@airgradient.com

Airgradient Limited, 181 M.10 Baan Nam Long Soi 2, Chiang Mai 50180, Thailand

# Key Characteristics

AirGradient uses high quality sensor modules from industry leaders SenseAir, Sensirion and Plantower.




## What does it measure?

The SenseAir S8 CO2 sensor utilizes NDIR technology for very accurate measurements. It auto calibrates with an automatic baseline calibration (ABC) every 7 days. High levels of CO2 can indicate insufficient ventilation and cause headaches, tiredness and lower cognitive performance.

For PM2.5 measurements, the AirGradient uses the Plantower PMS5003 sensor with laser scattering technology that has been extensively tested in various studies. Elevated levels of fine particles -especially below 2.5 microns - has been linked to a broad range of health issues including premature mortality, heart or lung problems, acute and chronic bronchitis, asthma attacks, and respiratory symptoms. The sensor module is factory calibrated.

TVOC and NOx is measured with the Sensirion SGP41 TVOC/NOx sensor. TVOCs are organic chemicals that can easily vaporize and enter the air we breathe. These often do have indoor causes like off gasing furniture or aggressive cleaning liquids. NOx are harmful gases that can be caused by indoor gas stoves or boilers.

Temperature and Humidity are measured with the Sensirion SHT3x/4x sensors which are one of the most accurate ones in the market. These two air quality parameters can give you good information about indoor comfort levels and also indicate e.g. the risk of mold due to high humidity levels.

AirGradient started as a volunteer project in a school in Northern Thailand monitoring dangerously high air pollution levels in classrooms during the “burning season”.

Our mission is to enable people to breathe healthy air by providing open-source, reliable and accurate air quality monitors and supporting organizations and citizens in understanding the air quality in their communities.

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