airgradient

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Indoor Air Quality Monitor

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

AirGradient ONE is an indoor air quality monitor that lets you know if the air you're breathing is healthy. 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.

Technical Data

Specification	Description	
Model	I-9PSL-DE (AirGradient ONE, 9th Generation)	
Dimensions & Weight	131.2 x131.2 x 36.2, 230g (without cable)	
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	
Display	OLED display 1.3 inch (I2C 128x64px). Also available without display.	
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	
Particle Sensor Module	Plantower PMS5003 (laser scattering principle). Accuracy Fully Assembled & Tested Model (I-9PSL-DE_asd): Accuracy PM2.5: ±4µg/m³@0~100µg/m³, ±8%@100-500µg/m³. Accuracy Kit Version (I-9PSL-DE_kit): Accuracy PM2.5: ±10µg/m³@0~100µg/m³, ±10%@100-500µg/m³. (PM1 and PM10 are also measured but PM2.5 has the highest accuracy).	
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)	SenseAir S88 (NDIR). 0 to 10000ppm. Accuracy: ±40 ppm ±3% of reading at 5 to 30°C, 0-85% RH (400 - 3000ppm range)
TVOC/NOx Module	Sensirion SGP41. Accuracy: TVOC <±15 @ 0 to 500 VOC Index (also available in ppb), NOx <±50 @ 0 - 500 NOx Index	
Temperature and Humidity	Sensirion SHT40. Accuracy: Temperature ±0.2°C @ -40 to + 125°C, Humidity ±2% RH @ 0 - 100% RH	
Enclosure	ASA Plastic, UV Resistant and Weather Proof	
Mounting Options	Wall or pole mounting options	
Cable / Power Plug	2m USB (USB C to USB A) Cable including data lines for flashing. (2A 5V USB A Power Plug not included)	
Certifications	RESET Air accredited, CE, RoHS, REACH, FCC ID: 2AC7Z-ESPC3MINI	

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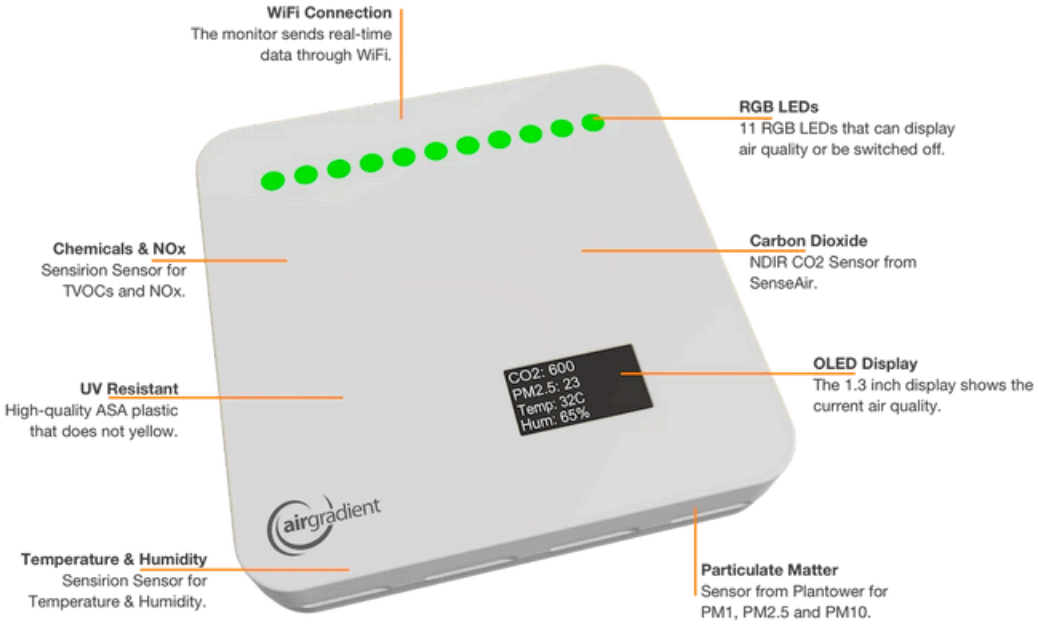
Key Characteristics

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 seven days (this period can be adjusted, or the function can be disabled entirely if desired). 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, which has been extensively tested in various studies. Elevated levels of fine particles - especially below 2.5 microns - have been linked to a wide range of health issues, including premature mortality, heart and lung problems, acute and chronic bronchitis, asthma attacks, and respiratory symptoms. The sensor module is factory calibrated.

The Sensirion SGP41 TVOC/NOx sensor measures TVOCs (volatile organic compounds) and NOx. TVOCs are organic chemicals that can easily vaporize and enter the air we breathe. They often have indoor causes, like off-gassing 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 some of the most accurate sensors on the market. These two air quality parameters can give you good information about indoor comfort levels and also indicate, for example, the risk of mould due to high humidity levels.

About AirGradient

1% FOR THE PLANET — MEMBER —

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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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