

Outdoor Air Quality Monitor

AirGradient Open Air (Model: O-1PST)

Open Air is an outdoor air quality monitor that lets you know if the air you're breathing is healthy. It measures CO₂, PM_{2.5}, TVOCs, NO_x, Temperature, and Humidity. It's easy to assemble, fully open-source, and customizable, so you can extend it in whatever way you like.

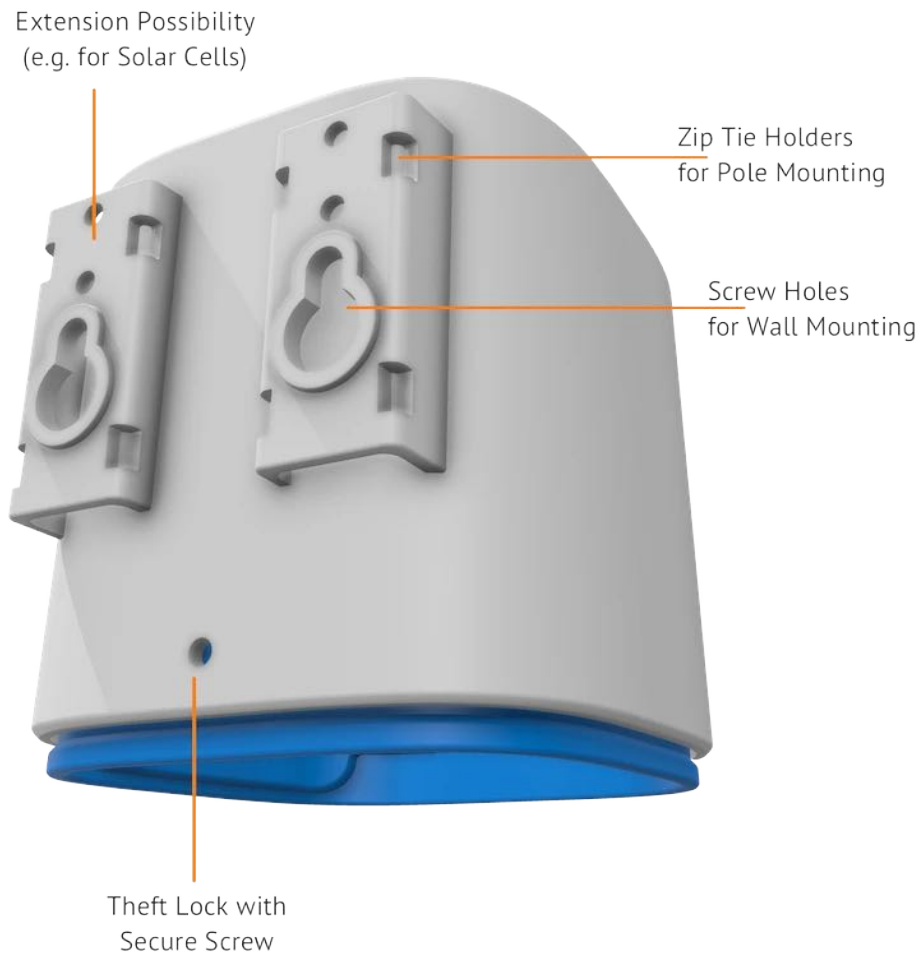


Technical Data

Specification	Description	
Model	O-1PST (AirGradient Open Air)	
Dimensions & Weight	91.5 x 86.7 x 85, 180g (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	
Bluetooth	Bluetooth LE: Bluetooth 5, Bluetooth mesh	
Extensions	Broken out on PCB: I2C, 3 GPIO, 2 UART	
Peripherals	Status LED, Push Button, USB C Connector	
External Hardware Watchdog	Texas Instruments TPL5010	
Particle Sensor Module	Plantower PMS5003T (laser scattering principle). Accuracy PM _{2.5} : $\pm 10\%$ @100-500 μ g/m ³ , $\pm 10\mu$ g/m ³ @0-100 μ g/m ³ . (PM ₁ and PM ₁₀ are also measured but PM _{2.5} has the highest accuracy.)	
CO ₂ Sensor Module	SenseAir S8 (NDIR). 400 to 10000ppm. Accuracy: ± 40 ppm $\pm 3\%$ of reading at 5 to 30°C, 20-70%RH (400 - 2000ppm range)	SenseAir S88 (NDIR). 0 to 10000ppm. Accuracy: ± 40 ppm $\pm 3\%$ of reading at 5 to 30°C, 0-85% RH (400 - 3000ppm range)
TVOC/NO _x Module	Sensirion SGP41. Accuracy: TVOC $\leq \pm 15$ @ 0 to 500 VOC Index, NO _x $\leq \pm 50$ @ 0 - 500 NO _x Index	
Temperature and Humidity	ENS210 (inside PMS5003T module). Accuracy: Temperature $\pm 0.2^\circ\text{C}$ @ 0 - 70°C, Humidity $\pm 3.5\%$ RH @ 20 - 80% RH The ENS210 does not show exact ambient temperatures and RH. This sensor takes measurements inside the PMS5003T module to increase PM accuracy, and corrections must be applied through the dashboard to show ambient readings. These may not be entirely accurate.	
Enclosure	ASA Plastic, UV Resistant and Weather Proof	
Mounting Options	Wall or pole mounting options	
Cable	4m USB (USB C to USB A) Cable including data lines for flashing. (2A 5V USB A Power Plug not included)	
Certifications	CE, RoHS, REACH, FCC ID: 2AC7Z-ESPC3MINI	
License	Open Hardware under CC-BY-SA, Source Code available	

Mounting Options

Flexible wall or pole mounting options



What does it measure?

The monitor focuses on measuring particulate matter, especially PM2.5, which can be harmful to our health. These tiny particles are released into the air from sources like vehicle emissions, industrial activity, fossil fuel burning, and wildfires. When we breathe in PM2.5, it can go deep into our lungs and cause various health problems. Long-term exposure to PM2.5

is linked to respiratory and heart diseases, including asthma, bronchitis, heart attacks, and even early death.

This version of the Open Air also contains a NDIR CO2 sensor from Sensirion and a TVOC/NOx sensor from Senseair allowing the collecting of additional air quality parameters.

About AirGradient



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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