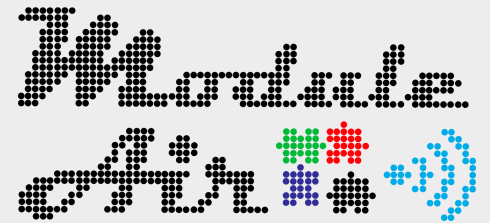
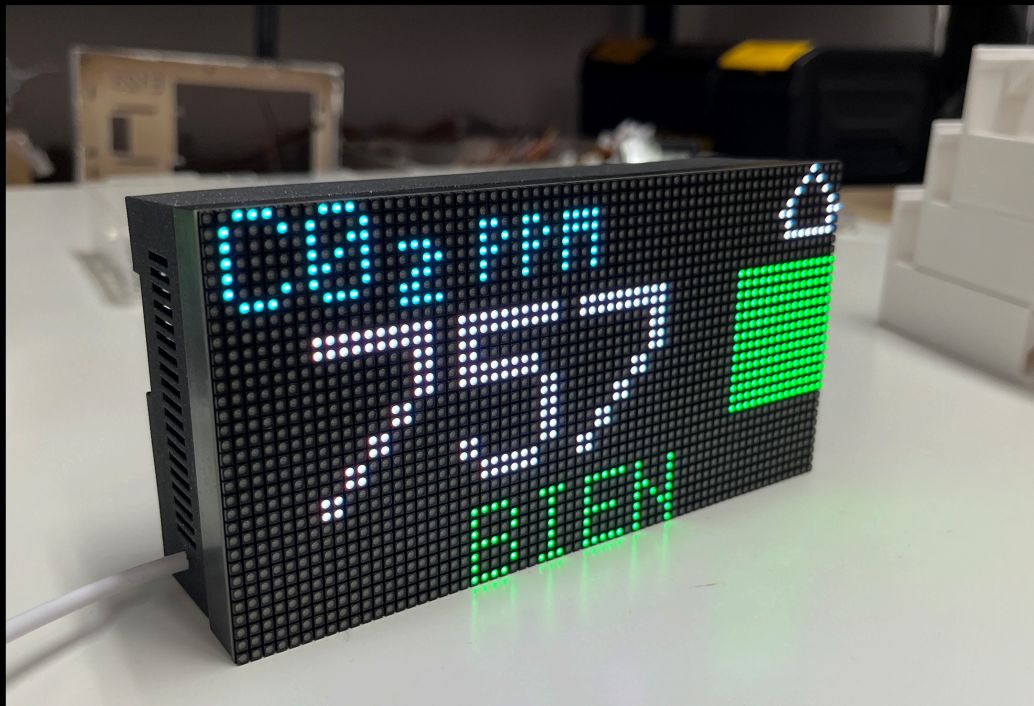


AirCarto



OPEN SOURCE SENSOR FOR MEASURING INDOOR AIR QUALITY

The ModuleAir

Open source and educational device for measuring air quality. The Module Air sensor measures fine particles (PM10, PM 2.5 and PM1) and carbon dioxide (CO₂). A large LED screen displays measurements as well as recommendations. The sensor can record data remotely via WIFI or only be used for display.

Made in France

Module Air sensors are manufactured in France, in Marseille by the company AirCarto created in 2021. The sensors are produced in small series in a low-tech spirit: technological simplicity, technical viability, repairability and sharing of know-how.

Open Source

The ModuleAir is an open source device. The source code which runs the electronic components and in particular the microcontroller (an ESP32 from Espressif) is available for free access on GitHub. The data collected by the connected Air Modules is also freely accessible and can be downloaded.

Awareness

AirCarto with its partners (AtmoSud, Fédération l'Air et Moi, AirCitoyen, FNE13) organizes sensor assembly workshops around the Module Air device to introduce people to electronics and the issues related to measuring air quality



PARTICULATE MATTER (PM)

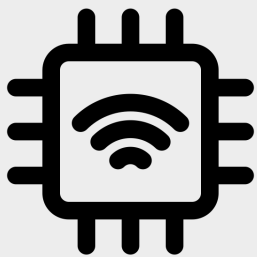
To measure PM, the ModuleAir is equipped with the **NextPM** probe from Tera Sensor. This is an optical meter (laser diffusion principle) which measures PM10, PM2.5 and PM1.

Unit of measurement: $\mu\text{g}/\text{m}^3$.
Measuring range 0 - 1000 $\mu\text{g}/\text{m}^3$.

To evaluate the CO₂ level, the sensor has an **MH-z19** probe (NDIR detector non-dispersive infrared absorption spectrometry principle).

Unit of measurement: ppm (part per million).
Measuring accuracy: +/- 50 ppm +5%.
Measuring range 0.0 - 5000 ppm.
Automatic calibration (24h).

CARBON DIOXYDE



Microcontroller: ESP-32
Connexion: WIFI 2,4 GHz
Screen: 64x32 LEDs
Size: 16x8x4.5cm
Weight: 300gr
Power: USB 5V 2A

SEUILS ET MESSAGES ASSOCIÉS*

For CO₂:
<800 ppm
entre 800 ppm et 1500 ppm
>1500 ppm

GOOD
AIR PLEASE
AIR FAST

For PM10:
<15 $\mu\text{g}/\text{m}^3$
entre 15 $\mu\text{g}/\text{m}^3$ et 30 $\mu\text{g}/\text{m}^3$
entre 30 $\mu\text{g}/\text{m}^3$ et 75 $\mu\text{g}/\text{m}^3$
>75 $\mu\text{g}/\text{m}^3$

For PM2.5 & PM1:
<10 $\mu\text{g}/\text{m}^3$
entre 10 $\mu\text{g}/\text{m}^3$ et 20 $\mu\text{g}/\text{m}^3$
entre 20 $\mu\text{g}/\text{m}^3$ et 50 $\mu\text{g}/\text{m}^3$
>50 $\mu\text{g}/\text{m}^3$

GOOD
AVERAGE
DEGRADED
POOR



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Inspirer un air meilleur

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* Valeurs de références utilisées pour les seuils de codes couleur selon l'avis du Haut Conseil de la Santé Publique
pour le CO2 (2022) : <https://www.hcsp.fr/explore.cgi/avisrapportsdomaine?clefr=1154>
pour les PM (2023) : <https://www.hcsp.fr/Explore.cgi/avisrapportsdomaine?clefr=371>