ENSENSIA

Datasheet

The Smart Way to Monitor Air

emAIRging
Engineering&Consulting

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Description

ENSENSIA is a comprehensive air quality monitoring solution designed for professional applications in both indoor and outdoor environments. It integrates advanced IoT sensors, data analytics algorithms, and a cloud-based platform to deliver precise and continuous measurements of key air quality pollutants and parameters.

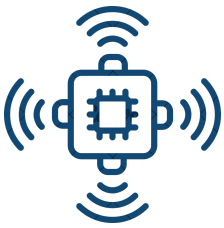
Two models are available: **ENSENSIA,** a full version equipped with 12 sensors for extensive pollution detection, and **ENSENSIA Mini**, a version optimized for indoor spaces with 5 key pollutant sensors. Both models support real-time monitoring, alerts, reporting and data visualization through the ENSENSIA Cloud Platform.

Applications

- Indoor air quality monitoring in offices, schools & healthcare facilities
- Outdoor air pollution monitoring & Smart City networks
- Industrial site and workplace exposure assessment
- Research studies & field campaigns on air quality & pollutants

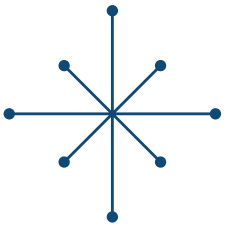
Key Features

Designed for flexibility and precision, ENSENSIA integrates cutting-edge sensors, AI-driven calibration and IoT connectivity to deliver reliable and scalable air quality monitoring in any environment.



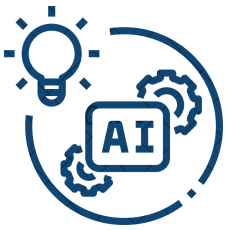
Multi-pollutant sensing

Measures key air quality pollutants and parameters, customizable per device and application.



Low cost & high scalability

Ideal for deployment across multiple space or buildings with minimal infrastructure.



Machine Learning Calibration

Continuously corrects sensor biases to improve measurement accuracy over time.

Plug-and-play IoT integration

Easily connects via Wi-Fi, 4G, or Ethernet for seamless cloud data transmission.

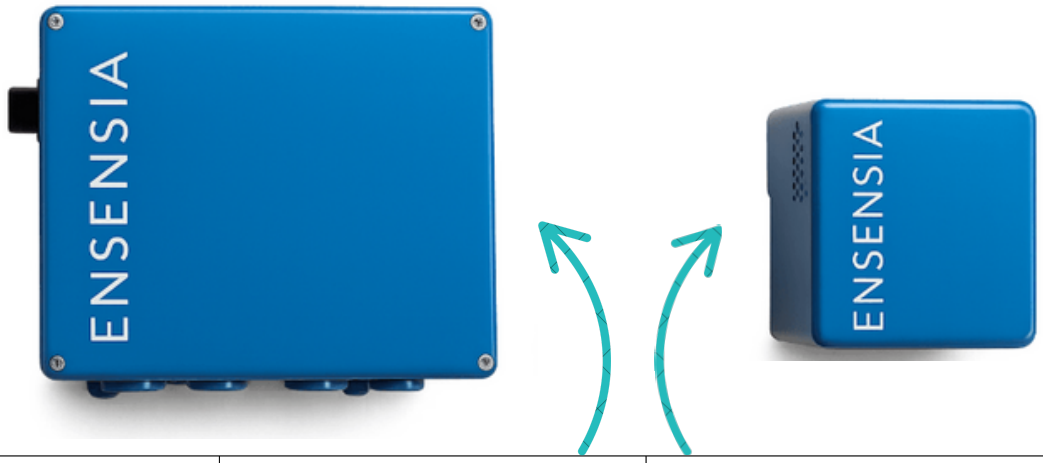
Edge-computing & Intelligence

Allows dynamic calibration, remote management and updates

Accurate data. Continuous insight. Confident decisions

Sensor Configuration Comparison

Both ENSENSIA models share the same advanced features; the main difference is the number and type of sensors included, according to their intended application.



Sensor Name	ENSENSIA	ENSENSIA Mini
CO	✓	
NO	✓	
NO_2	✓	✓
O_3	✓	✓
CO_2	✓	✓
tVOC	✓	✓
HCHO	✓	
$PM_{2.5}$	✓	✓
Temperature	✓	✓
Humidity	✓	✓

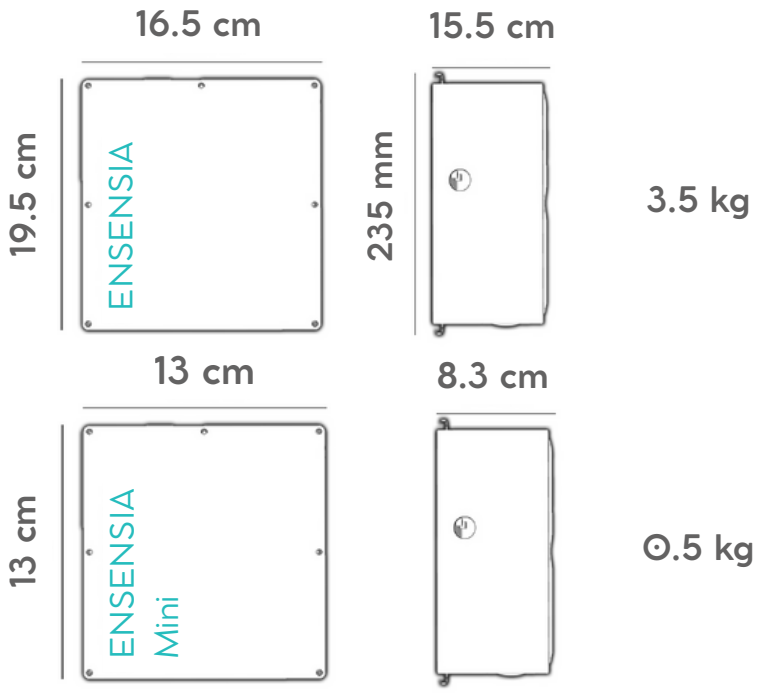
Sensor selection can be adapted for specific customer requirements. All sensors are factory-calibrated and managed through the ENSENSIA Cloud Platform.

General Information

Features

Indoor & Outdoor Use
Material: ASA EVO plastic with UV protection
Power button with LED indicator
GPS (optional)
CE mark

Dimensions & Weight



Power

Supply: 220-240V AC 50 Hz
Consumption: 4.3 W

Battery

2 x Li-Ion 5000mAh

Connectivity

2.4 GHz and 5.0 GHz IEEE 802.11ax wireless
Cellular 4G/LTE (optional)
LoRaWAN (optional)

Communication

MQTT
SSH with 2FA
Web-based platform

Sensors

CO	Sensor Technology: Electrochemical Units: ppb / Range 0 to 10.000 ppb Lifespan: >36 Months
NO	Sensor Technology: Electrochemical Units: ppb / Range 0 to 400 ppb Lifespan: >36 Months
NO_2	Sensor Technology: Electrochemical Units: ppb / Range 0 to 400 ppb Lifespan: >36 Months
O_3	Sensor Technology: Electrochemical Units: ppb / Range 0 to 200 ppb Lifespan: >36 Months
SO_2	Sensor Technology: Electrochemical Units: ppb / Range 0 to 20 ppb Lifespan: >36 Months
CO_2	Sensor Technology: NDIR Units: ppm / Range 400 to 10.000 ppb Lifespan: >15 years
tVOC	Sensor Technology: Electrochemical Units: ppb / Range 0 to 15.000 ppb Lifespan: >36 months
HCHO	Sensor Technology: Electrochemical Units: ppb / Range 0 to 5 ppm Lifespan: >36 months

Sensors

$PM_{2.5}$	Sensor Technology: Optical Units: μg m^{-3}/ Range ⊙ to 5⊙⊙ μg m^{-3} Lifespan: >5 years
Temperature	Units: °C / Range: -4⊙ to 85 °C Lifespan: >15 years
Humidity	Units: % / Range: ⊙ to 1⊙⊙% Lifespan: >15 years

Operation Guide & Precautions

Do not blow air from the bottom of the device, where the sensors are placed.

Exposure to direct air flow will affect the precision of the readings.

The device operates in environments where the temperature ranges between ⊙ and 4⊙ °C.

Warm-up period is 3 hours. The NO and tVOC sensors may require more then 8 hours to provide stable responses.

VOC species estimations are applivable for indoor purposes and work best in well-ventilated rooms.

After installing, power-on the device by pressing the power button on the left. The device responses with a reading after 7 minutes tops.

Data

All readings are stored in the SD card of the device. There is enough capacity for at least 5 years of persisent operation.

The user can download the readings through an API or a web-based platform at hhht://aqmmon.iceht.forth.gr

Calibration

The sensors are factory calibrated and their readings are corrected every 10 minutes to ensure reliability using Machine Learning methods. Regulatory instrumentations and frequent co-locations take place to persistenly update the algorithms. The user can calibrate the sensors applying a linear formula to compensate for sensor to drift and ageing.

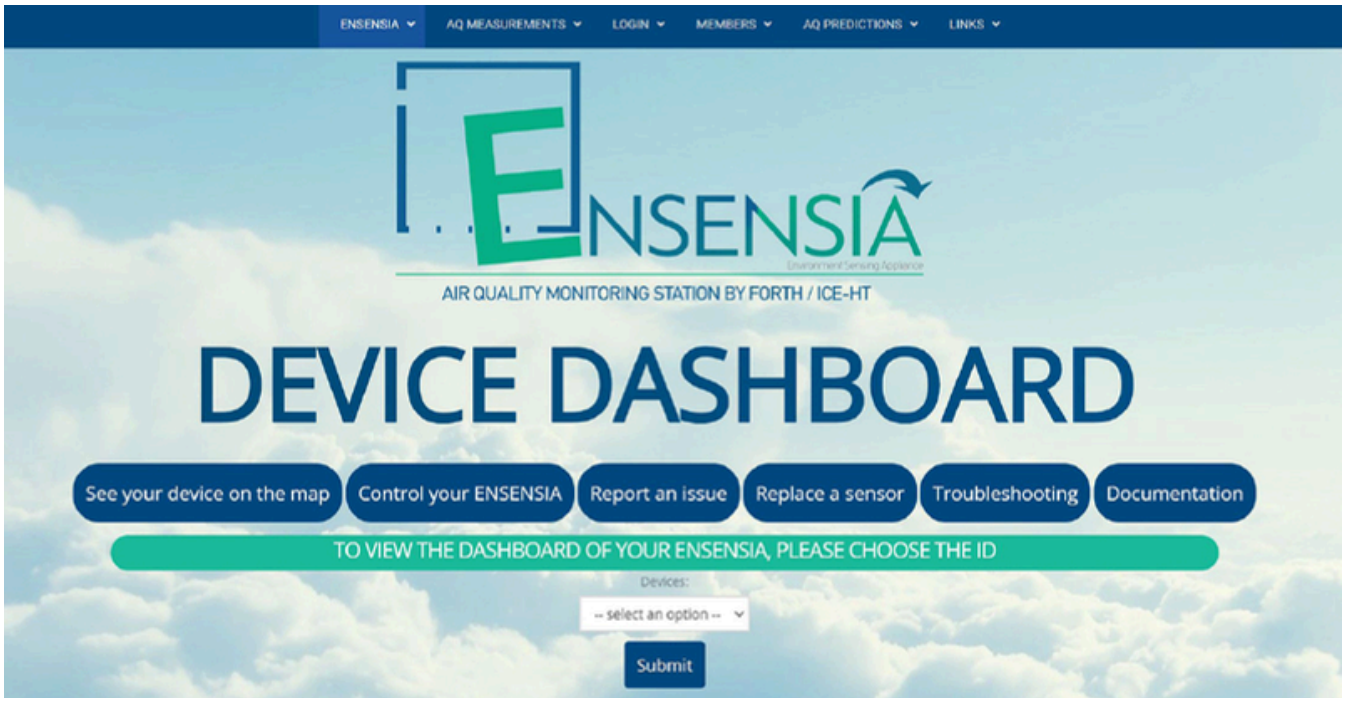
Cloud Dashboard

Visualization: Access live and historical air quality data on your dashboard.

Data download: Export environmental reports via the web interface or REST API. Custom reporting options are also available for specific use cases.

Device management: Configure alerts, adjust measurement parameters, and perform electrochemical sensor adjustments.

Machine Learning algorithms are continuously applied to the sensor data to correct biases and deviations, ensuring persistent calibration and improving measurement precision.



Investing in health pays back

Clean Air
Healthy Future

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