

Atomsenses LoRaWAN Indoor Air Quality Sensor

Product Specification

Applicability

This guide applies to the following Atomsenses products, unless otherwise specified:

Model	Description
AS,ES Series	- LoRaWAN Indoor Air Quality Sensor

Declaration of Conformity

Atomsenses sensors and other products comply with the essential requirements and relevant provisions of CE/EMC, and RoHS standards.



Product Overview

The Atomsenses Indoor Air Quality sensor represents a highly compact indoor environmental monitoring sensor engineered for the precise measurement of temperature, humidity, CO2 concentration, formaldehyde/ozone levels, TVOC, barometric pressure, PM2.5, PM10, and air pressure. The sensor data is transmitted via LoRaWAN® technology. By integrating the Atomsenses LoRaWAN® gateway with the Atomsenses IoT Cloud, users are enabled to remotely and visually manage all sensor data in a comprehensive manner.

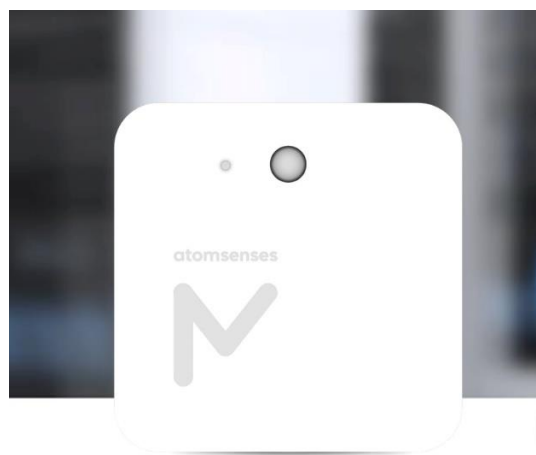
The acquired data is uploaded to the Internet of Things (IoT) platform in accordance with the pre-configured sampling frequency, thereby facilitating a comprehensive assessment of the indoor environment and comfort levels.

The AS and ES series find extensive applications in diverse settings such as offices, stores, classrooms, hospitals, and other similar indoor environments.

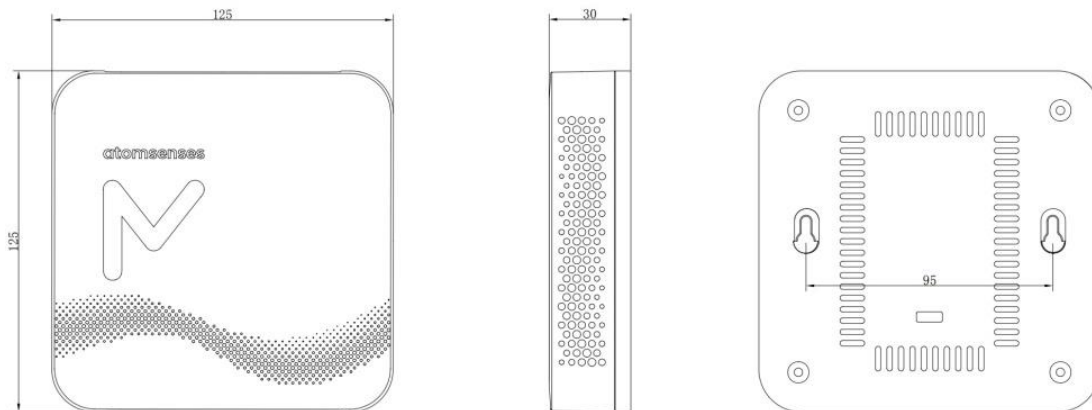
AS Series Device Appearance



ES Series Device Appearance



Dimensions (mm)



Features

- Incorporates a comprehensive suite of sensors, including but not limited to humidity, temperature, CO₂, light, barometric pressure, PM_{2.5}, and PM₁₀ sensors.
- Offers multiple display modalities and a distinct emoticon interface, facilitating effortless comprehension of comfort levels directly from the screen.
- Accommodates both battery-powered and DC power supply options for enhanced flexibility and adaptability.
- Is outfitted with a traffic light indicator and buzzer mechanism, which serve to provide real-time visual and audible cues regarding device status and threshold alarm conditions.
- Capable of locally storing up to 18,000 historical records and supporting data retransmission functionality to safeguard against potential data loss incidents.
- Demonstrates full compatibility with standard LoRaWAN[®] gateways and network servers, ensuring seamless integration within existing IoT infrastructures.
- Enables rapid and efficient management through the utilization of the Atomsenses IoT Cloud platform.

Technical specifications and standards

Wireless Transmission		
Technology	LoRaWAN®	
Frequency	CN470/RU864/IN865/EU868/US915/AU915/KR920/AS923-1&2&3&4	
Sensitivity	-137dBm @300bps	
Work Mode	OTAA/ABP Class C	
Configuration	USB Type-C port	
Physical Characteristics		
Power Supply	<ol style="list-style-type: none"> 5V/1A by Type-C Port Battery Powered (Can be switched to be powered by USB-C by a change to the PCB board : https://youtu.be/es7j3ARSLVY) <ul style="list-style-type: none"> 3x2700 mAh ER14505 Li-SOCI2 Replaceable Batteries (Small Case) 4x4000mAh ER ER18505 Li-SOCI2 Replaceable Batteries (Big Case) 	
Operating Temperature	-20°C - 60°C	
Operating Life	2-5 years	
Relative Humidity	10% - 90% (non-condensing)	
Ingress Protection	IP30	
Dimension	98*98*30 mm / 125*125*30 mm	
Installation	Wall Mounting via 3M Tape or Screws	
Approvals		
Regulatory	CE, FCC, ISED	
Environmental	RoHS, Works with WELL	
Sensors		
Temperature	Temperature Range	-20°C to + 70°C
	Accuracy	±0.5°C
	Resolution	0.1°C
	Operating Principle	Digital CMOSens® technology
Humidity	Humidity Range	0% to 100% RH
	Accuracy	10% to 90% RH (± 3%), below 10% and above 90% RH (± 5%)
	Resolution	0.5% RH
	Operating Principle	Digital CMOSens® technology
Carbon Dioxide (CO2)	Carbon Dioxide (CO2) Range	400 to 5000 ppm
	Accuracy	± (30 ppm + 3 % of reading)
	Resolution	1 ppm
	Operating Principle	Nondispersive Infrared (NDIR)

PM 1.0/PM 2.5/PM 10	PM2.5 Range	0 ~ 1000 µg/m ³
	Accuracy	± 10µg/m ³ at 1-100µg/m ³
	Resolution	1 µg/m ³
	Operating Principle	Laser Scattering
TVOC	TVOC Range	1-2000µg/m ³
	Accuracy	(± 20 µg/m ³ + 15%) at 1 to 1000µg/m ³
	Resolution	1 µg/m ³
	Operating Principle	Digital MOX
Formaldehyde (HCHO)	Formaldehyde (HCHO) Range	0 ~ 2000 PPB
	Accuracy	±20ppb at 0-100ppb
	Resolution	1PPB
	Operating Principle	Electrochemical
O3	O3 Range	0-9999PPB
	Accuracy	±10ppb at 0-100ppb
	Resolution	1 PPB
	Operating Principle	Electrochemical
NH3	NH3 Range	0~ 100PPM
	Accuracy	< ±3%
	Resolution	0.01ppm
	Operating Principle	Solid Polymer Electrochemical
H2S	H2S Range	0~ 100PPM
	Accuracy	< ±3%
	Resolution	0.01 PPM
	Operating Principle	Solid Polymer Electrochemical
Nitrogen Dioxide (NO2)	NO2 Range	0~ 10PPM
	Accuracy	±20ppb at 0-100ppb
	Resolution	0.1 ppm
	Operating Principle	Solid Polymer Electrochemical
Carbon Monoxide (CO)	CO Range	0~ 1000PPM
	Accuracy	±5 ppm or 10% of reading
	Resolution	1PPM
	Operating Principle	Electrochemical
S02	S02 Range	1~20 PPM
	Accuracy	0.60±0.20µA/ppm
	Resolution	0.1ppm
	Operating Principle	Solid Polymer Electrochemical
Oxygen	O2 Range	0 ~ 30%vol

	Accuracy	±5%FS
	Resolution	0.01%vol
	Operating Principle	Solid Polymer Electrochemical
Motion PIR		
	Operating Principle	Passive infrared (PIR)
	IR Receiving Electrode	2 x 1 mm, 2 elements
	Window Size	4 x 3 mm
	Spectral Response	5 - 14 μm
	Transmittance	≥ 75%
	Sensitivity	≥ 3300
	Status	Vacant/Occupied
Light/Illumination		
	Operating Principle	Photodiode
	Measuring Range	0-60000 Lux (Determine as 6 levels, 0-5)
Noise		
	Operating Principle	Analog MEMS microphone
	Measuring Range	48...90 dBA
	Accuracy	±3 dBA Leq

All the above specification parameters are measured under the environmental conditions: temperature 20°C, relative humidity 50%RH, 1 atmosphere, and the concentration of the gas to be measured does not exceed the sensor's measurement range at most.