MACHINE SENS IOT

AiroCheck.

Eco Monitor with Display

Measures environmental conditions, particulate matter, pollutant gases, light, sound and motion with a single sensor.

Product Overview

AiroCheck Eco Monitor is a customizable and compact wireless indoor air quality sensor designed to measure and monitor various parameters in the air to assess the quality of the air we breathe.

These sensors are valuable tools for detecting and quantifying environmental conditions, pollutants, and particulate matter, providing near real-time or periodic data on air quality conditions.

The 4.2-inch E-ink display offered in the option with screen, with its ultra-low power consumption and broad viewing angle, presents real-time performance data, making it well-suited for assessing indoor environmental conditions and comfort.

AiroCheck Eco Monitor wirelessly provides near real-time and exceptionally accurate data through low-power, long-range communication. Utilizing this data and dashboards facilitates the monitoring and reporting of air quality performance.

Versions available include:

Eco Monitor 3 in 1: Sensor for monitoring temperature, humidity and CO2 levels.

Eco Monitor 7 in 1: Sensor for monitoring temperature, humidity, CO2, TVOC, PM1, PM2.5 and PM10 levels.

Eco Monitor 8 in 1: Sensor for monitoring temperature, humidity, CO2, TVOC, PM1, PM2.5, PM10 and Ozone levels.

Eco Monitor 11 in 1: Sensor for monitoring temperature, humidity, CO2, TVOC, PM1, PM2.5, PM10, Ozone, Lux, Noise and Motion.

The sensors within **Eco Monitor** can also be customized to measure Dust, Formaldehyde (HCHO), Oxygen (O_2), Hydrogen Sulfide (H_2S), Methane (CH_4), Carbon Monoxide (CO), Nitrogen Dioxide (NO_2), Sulphur Dioxide (SO_2), Hydrogen Gas (H_2), Ammonia (NH_3) and THI for swift assessment of environmental conditions that may affect microbial activity such as bacteria and fungi.

Product Features

Customizable sensor configuration based on application requirement.

Wireless data transmission Option through LoRaWAN®, and/or WIFI wireless protocol

Secure operation with top-down encryption (Wireless models)

Easy Performance Management through MachineSens IoT Platform

Data updated every second

Integration with Building Management System through MQTT

Specifications

General	
Power Input	5V DC
Material	ABS Flame Redundant Shell
Operating temperature	-10 °C to +50 °C
Storage temperature	-20 °C to +70 °C
Relative Humidity	0% to 95%RH
Environment	Indoor
IP Class	IP30
Mounting Options	Wall Mounted
Dimensions (HxWxD)	100 x 110 x 47 mm
Display	Black & White E-Ink Screen
Sensor Calibration	Not Required (with auto calibration algorithm)
Wireless Communication	
Technology	LoRaWAN®
Frequency	EU868 (868 Mhz)
Transmit Range	500m inside Building, 2KM Open Air
Security	128 AES Encryption

Data Format	JSON
Device Class	Class C
Activation Method	OTTA (Over-The-Air-Activation)

Sensors

Parameters	Resolution	Range	Accuracy	Operating Principle
Carbon Dioxide (CO_2)	1 ppm	400 ppm ~ 5000 ppm	50ppm +3% Reading	Digital NDIR
TVOC	0.001mg/m3	0 ~ 5 mg/m3	≤±10% Reading	MEMS
PM2.5	1 µg/m3	0 ~ 1000 µg/m3	≤±10% Reading	Laser Scattering
PM10	1 µg/m3	0 ~ 1000 µg/m3	≤±10% Reading	Laser Scattering
Temperature	0.1°C	-40 ~100 °C	<±0.2°C	MEMS
Humidity	0.1%RH	0 ~ 99%	≤±2% RH	MEMS
Ozone (O_3)	0.001 ppm	0 ppm ~ 10 ppm	≤±2% Reading	Electrochemical
Lux	1 Lux	0 ~ 65535 Lux	≤±7% Reading	Photodiode
Atmospheric Pressure	0.1Kpa	30 ~ 110Kpa	≤±0.15Kpa	MEMS

Motion

Operating Principle	Passive infrared (PIR)
Status	Vacant/Occupied
Detection	80° Horizontal & 60° Vertical

Noise

Temperature Range	-40 °C to 85 °C
Open Loop Gain AVOL	125dB (RL = 100kΩ)
Rejection Ratio	112dB PSRR & 126 dB CMRR

Life Expectancy of Each sensor

T, RH, TVOC, CO_2,	10 Years
Light, Noise	3 Years
HCHO, O_3	2 Years

PM 2.5, PM 10	≥ 40,000 hours
Certifications	
Regulatory	CE
Environmental	RoHS

Architecture

The **AiroCheck Eco Monitor** air quality sensors employ cutting-edge communication technology, LoRaWAN which provides low power consumption as well as long range signal propagation to enable real-time control and monitoring.

Our smart gateway collects near real-time data from all wireless sensors within range, converts it into an easy-to-use JSON format, and publishes it via the MQTT protocol.

Data can be transmitted to any local or cloud MQTT broker through Ethernet, LTE (4G), or WIFI.

Integration to Building Management System (BMS) can be achieved using an external MQTT to BACnet converter.