
Wireless Multi-Sensor Device (DC-Powered)

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Wireless Sensor Network Based on LoRa Technology



RA08DxxS



RA08Dxx

RA08Dxx(S) Series Data Sheet

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Wireless Multi-Sensor Device (DC-Powered)

Introduction

RA08Dxx(S) series is a multi-sensor device that helps users monitor air quality. With temperature + humidity, TVOC, illuminance, air pressure, PIR, CO₂, NH₃ + H₂S, O₃, HCHO, PM2.5, CO sensors equipped in one device. In addition to RA08Dxx, we also have the RA08DxxS series. With an e-paper display, users can enjoy better and more convenient experiences through an easy and quick data check.

RA08Dxx(S) series could transmit data to the server and connect to the programmable alarm system based on the LoRa long-distance transmission technology. Looking for a device with multiple functions, accurate measurement results, and a user-friendly E-ink display? RA08Dxx(S) series can satisfy all your needs.

RA08Dxx(S) Series

Sensor Model	Temperature + Humidity	TVOC	Light	Air Pressure	PIR	CO ₂	NH ₃ + H ₂ S	O ₃	HCHO	PM2.5	CO (RS485)
RA08D01(S)	•	•	•	•	•	•					
RA08D02(S)	•	•	•	•	•	•					•
RA08D03(S)	•	•	•	•	•	•		•			
RA08D04(S)	•	•	•	•	•	•			•		
RA08D05(S)	•	•	•	•	•					•	
RA08D06(S)	•	•	•	•	•	•		•			•
RA08D07(S)	•	•	•	•	•	•			•		•
RA08D08(S)	•	•	•	•	•					•	•
RA08D09(S)	•	•	•	•	•	•	•				
RA08D10(S)	•	•	•	•	•	•	•				•

Wireless Multi-Sensor Device (DC-Powered)

Features

- Powered by DC 12V adapter
- SX1262 wireless communication module
- Compatible with LoRaWAN™ Class A device
- Frequency hopping spread spectrum
- Support third-party platforms: Actility/ThingPark, TTN, MyDevices/Cayenne

Applications

- Mansion and office building
- Hotel and apartment
- School, mall, and supermarket
- Smoking room, process plant, and museum

NH₃ and H₂S Detection:

- Smart toilet
- Odor detection
- Wastewater treatment and waste incineration
- Device integration for Smart odor eliminator

HCHO Detection:

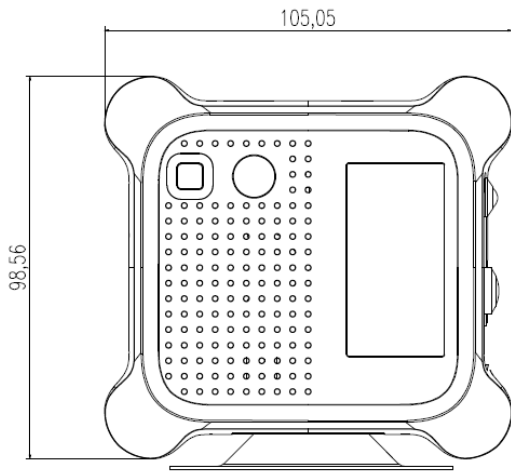
- New ventilation system and air purifier

O₃ Detection:

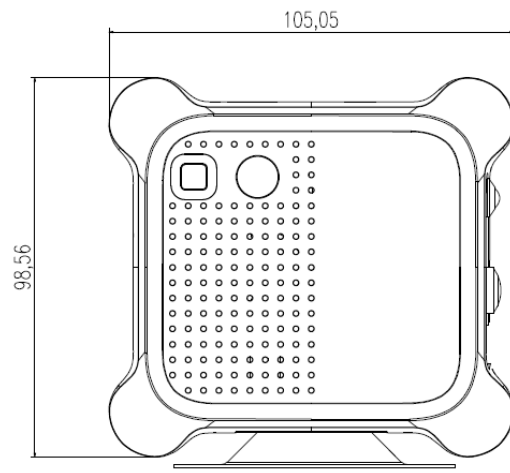
- Wastewater treatment, swimming pool, and chemistry industry

Wireless Multi-Sensor Device (DC-Powered)

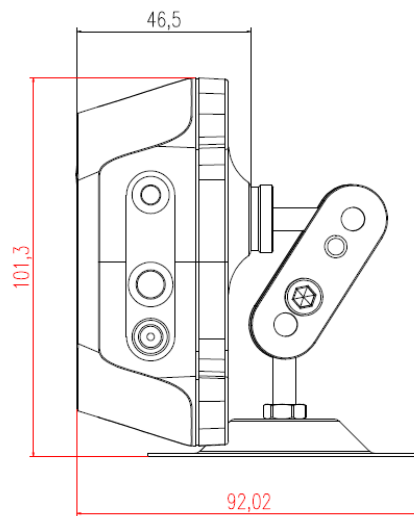
Dimensions



RA08DxxS
(with e-paper display)



RA08Dxx



Dimensions: 105.05 mm x 98.56 mm x 46.5 mm

Wireless Multi-Sensor Device (DC-Powered)

Electrical Specifications

Rated Current	Powered by DC12V adapter
Operating Current	<150mA

Note: Electrical specifications may vary due to the power supply voltage.

Temperature/Humidity Sensor

Temperature Measurement Range	0°C to +50°C
Temperature Accuracy	±0.8°C
Humidity Measurement Range	0%RH to 100%RH
Humidity Accuracy	±4%RH @25°C ±8%RH at other temperatures

TVOC Sensor

TVOC Range	0 to 1000000 ppb
Accuracy	±25%

Illuminance Sensor

Illuminance Range	0.01 Lux to 157 Klux
Accuracy	±10% (at room temperature under 6500k white LED) ±20% (under daylight)

Air Pressure Sensor

Measurement Range	300hPa to 1100hPa
Accuracy	± 1.5hPa (at 0 to +40 °C, under 950 to1050 hPa)

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PIR sensor

Standby Current	10uA
Detection Angle	80° horizontally; 90° vertically
Detection Distance	0m to 2.5m

CO₂ Sensor (optional)

Range & Accuracy	400 to 5000 ppm \pm (50ppm \pm 3% of reading) 5001 to 10000ppm \pm 10% of reading
Operating Temperature	0 to +50°C
Operating Humidity	0%RH to 85%RH (No condensation)

NH₃ and H₂S Sensor (optional)

Range	NH ₃ : 0 to 10ppm; H ₂ S : 0 to 5ppm
Resolution	NH ₃ : 0.01ppm; H ₂ S: 0.01ppm
Accuracy	\pm 5% F.S
Standby Current	0.85mA @5VDC
Operating Temperature	-20 to +50°C Note: Sensor works better in the range of 0 to +30°C. Operating below or over 0 to 30°C may have slight errors while detection.
Operating Humidity	15%RH to 85%RH (No condensation)

O₃ Sensor (optional)

Range	0 to 50ppm
Resolution	0.1ppm
Accuracy	\pm 5% F.S
Operating Temperature	0 to +40°C (for indoor uses) Note: Operating in the range of -40°C to +55°C may need temperature compensation.
Operating Humidity	15%RH to 95%RH (No condensation)

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HCHO Sensor (optional)

Range	0 to 2000ppb
Accuracy	± 10% Note: The accuracy of the sensor was tested under a pure -formaldehyde environment.
Operating Temperature	-20 to +50°C
Operating Humidity	10%RH to 90%RH (No condensation)

CO Sensor (optional, connect RA08D through RS485)

Power Supply	10 to 30VDC
Range	0 to 1000ppm
Resolution	1ppm
Accuracy	±5ppm or ±10%
Comprehensive Response Time	≤30 seconds
Operating Pressure	90 to 110kpa

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PM2.5 Sensor (optional)

PM2.5 Measurement Range	0.3 to 1.0um; 1.0 to 2.5um
Particle Counting Efficiency	50% @0.3um 98% @ ≥ 0.5um
Particle Mass Concentration Effective Range (PM2.5 standard value)	0 to 500µg/m3
Particle Mass Concentration Resolution	1µg/m ³
Particle Mass Concentration Consistency (PM2.5 standard value)	±10% @100 – 500µg/m3 ±10µg/m3@0 – 100µg/m3
Comprehensive Response Time	≤10 seconds
Lifetime and Product Consistency	The average time that PMS7003M PM2.5 particle concentration sensor with no faults is 3 years. If the concentration is greater than 300 ug/m3 for more than 50% of the year, or the concentration exceeds 500ug/m3 for more than 20% of the year, the consistency of the sensor will decrease. The data may be higher because of internal dust accumulation.

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Frequency

Frequency Range	863MHz-928MHz 470MHz-510MHz
Tx Power	US915 20dbm AS923 16dbm AU915 20dbm CN470 19.15dbm EU868 16dbm KR920 14dbm IN865 20dbm
Rx Sensitivity	-123dBm (Frequency deviation = 5kHz, Bit Rate = 1.2kb/s)
Antenna Type	Helical antenna
Communication Range	10km (line of sight) Note: The actual communication distance may vary depending on the environment.
Data Transfer Rate	0.3kbps to 50kbps (LoRawan); 0.6 to 300kbps (FSK)
Modulation Method	LoRa / FSK Note: One modulation method is required.
Available LoRaWAN Frequency Plans	EU863-870, US902-928, AU915-928, KR920-923, AS923-1, AS923-2, AS923-3, IN865-867, CN470-510 Note: optional, to be done in the factory configuration

Physical Properties

Main Body Operating Temperature	0°C to +50°C
Environment Humidity Range	<90%RH (No condensation)
Storage Temperature	-40°C to +85°C