RS-MG111-WIFI-1 Multifunctional air quality transmitter (WIFI type) User manual

Document version：V1.9

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1.Product Introduction

1.1product description

RS-MG111-WIFI-1 is an air environment multi-element transmitter independently developed by our company. It is used to detect temperature, humidity, PM2.5, PM10, atmospheric pressure, light, TVOC, CO2, formaldehyde in the air environment , O3, CO, CH4, O2, SO2, NO2, H2, H2S, NH3 and many other elements, basically covering various indicators reflecting air quality.

The transmitter adopts the original imported sensor and control chip, which has the characteristics of high precision, high resolution and good stability. Using WIFI network transmission, it can be directly connected to the on-site WIFI network, and the connection is convenient. With the free monitoring platform software RS-RJ-K provided by our company or the free IoT cloud platform (en.0531yun.com) provided by our company, it can be directly formed online Integrated air environment monitoring system. Widely used in building HVAC, building energy saving, smart home, schools, hospitals, airport stations and other places。

1.2Features

1. Integrate multiple measurement elements, up to 14 measurement elements can be integrated at the same time.

2. It can measure temperature, humidity, PM2.5, PM10, atmospheric pressure, light, TVOC, CO2, formaldehyde, O3, CO, CH4, O2, SO2, NO2, H2, H2S, NH3 and many other elements.

3. WIFI wireless transmission is adopted, and data can be easily uploaded online with the help of on-site network.

4. It can be configured and the real-time values can be read via Bluetooth on the mobile phone, which is convenient and fast.

5. It adopts a round arc shell, and can be ceiling-mounted or wall-mounted with the base we provide.

6.10~30V wide voltage power supply.

1.3Technical index

DC power supply (default)	DC 10-30V
Maximum power consumption	1.6W (24V DC power supply)
Detection parameters	Temperature, humidity, PM2.5, PM10, air pressure, light, TVOC, CO2, formaldehyde, O3, CO, CH4, O2, SO2, NO2, H2, H2S, NH3

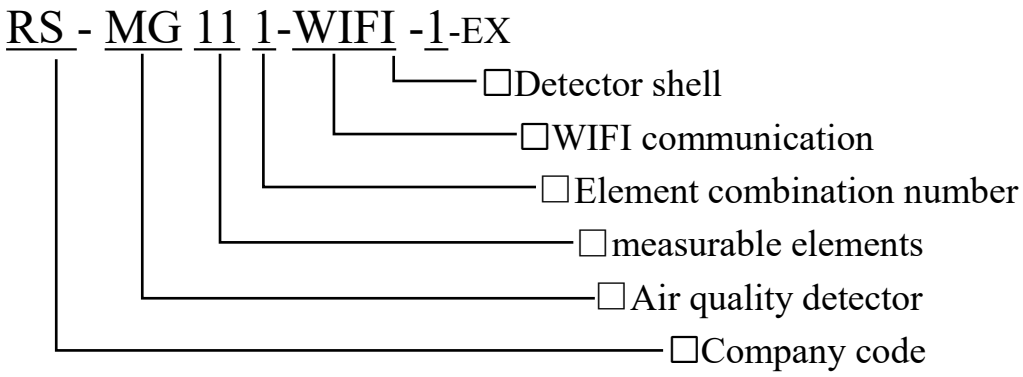
working environment:	Temperature -10℃-55℃; humidity 0~95%RH non-condensing TSP:Temperature: -10℃～55℃; Humidity: 0%~70% RH
Signal output	WIFI wireless transmission
product material	ABS
Installation method	Wall hanging, ceiling

Detection parameters	range	Resolution	precision	Preheat time
PM2.5	0~1000ug/m^3	1ug/m3	Particle counting efficiency: 50%@0.3um, 98%@>=0.5um. PM2.5 accuracy: ± 10ug/m3@0~100ug/m3	≤2min
PM10	0~1000ug/m^3			
TSP	0~20000 μ g/m3	1 μ g/m3	±25% or ±40 μ g/m3, take the larger value (@1000 μ g/m3, 25℃, 50%RH)	
temperature	-40℃～+120℃, default -40℃ ~+80℃	0.1℃	±0.5℃(25℃)	
humidity	0%RH-100%RH	0.1%RH	±3%RH（60%RH,25℃）	
Atmospheric pressure	0~120Kpa	0.1Kpa	±0.15Kpa@25℃75Kpa	
Illuminance	0~200000 Lux	1Lux	±7%(25℃)	
TVOC	0~60000ppb	1ppb	Typical accuracy ± 8%FS(@C2H6O，0.5ppm，25℃，50%RH， used for measure variation trend of TVOC, measurement value as a reference)	
CO2	0~5000ppm	1ppm	±(50ppm+ 3%F・S)	2min (available), 10min (maximum accuracy)
CH4	0~5ppm	0.01ppm	Typical accuracy: ±	≥5 minutes

			0.025ppm or ±20%FS whichever is greater	
O3	0~10ppm	0.01ppm	Typical accuracy: ±15%FS	≥5 minutes
O2	0~25%Vol	0.1%Vol	±2%FS	≥5 minutes
H_2S	0~100ppm	1ppm	±2ppm or ±10%	≥5 minutes
CH_4	0~100%LEL	1%LEL	±5%FS	≥5 minutes
CO	0~1000ppm	1ppm	±5ppm or ±10%	≥5 minutes
NO_2	0~20ppm	0.1ppm	±5%FS	≥5 minutes
SO_2	0~20ppm	0.1ppm	±5%FS	≥5 minutes
H_2	0~1000ppm	1ppm	±5%FS	≥5 minutes
NH_3	0~100ppm	1ppm	±8%	≥5minutes
noise	30~130db	0.1dB	±0.5dB (at reference pitch, 94dB@1kHz)	
Odor (electrochemical type)	0~5ppm	0.001ppm	Typical accuracy: ±5%FS (@H_2S, 500ppb)	≥5minutes
Odor (semiconductor type)	0.03~3ppm	0.001ppm	±13%FS（@C_2H_6O，5ppm,20℃,65%RH）	≥60minutes
Smog	0~10000ppm	1ppm	±5%FS(@C_3H_8,2000PPM,25℃,50%RH）	≥24 hours

All the above specification parameters are measured under environmental conditions: temperature 20℃, relative humidity 50%RH, 1 atmosphere, and the maximum concentration of the gas to be measured does not exceed the sensor range.

2. product model



Description of element types:：

11 optional detection	Numbering		Description

elements				
PM2.5	A			
PM10				
TSP	T			Total suspended particulates
TSP(high accuracy)	TH			High accuracy total suspended particulates
temperature	B			Air temperature and humidity
humidity				
Atmospheric pressure	C			0~120Kpa
Illuminance	D			0~200000Lux
TVOC	E			Total volatile organic compounds
carbon dioxide	F			CO2 Range 0-5000ppm
formaldehyde	G	5P		CH2O Range 0~5ppm
ozone	H	10P		O3Range 0~10ppm
In addition to the above detection elements, three gases can be selected from the right gas selection	I	O2	30VOL	O2Range30VOL
	J	H2S	100P	H2SRange100 ppm
	K	CH4	100LEL	CH4Range100 LEL
	L	CO	1000P	CORange1000 ppm
	M	NO2	20P	NO2Range20ppm
	N	SO2	20P	SO2Range20ppm
	O	H2	1000P	H2Range1000ppm
	P	NH3	100P	NH3Range100ppm
	Q	Noise		Range 30-130dB
	S	Odor(semiconductor type)	3P	Range 0.03~3ppm
	R	Odor (electrochemical type)	5P	Range 0~5ppm
	U	Smog	10000P	Range 0~10000ppm

Selection example: If the selected measurement elements are PM2.5, PM10, temperature,

humidity, formaldehyde, O2, CH4, CO.

The corresponding selection is RS-MG111-WIFI-1-ABGIKL

Note:Odor and CO2 elements can not be chosen at the same time.Electrochemical type,semiconductor type and high accuracy can not be chosen at the same time.If you have chosen TSP(high accuracy) element,then you can not choose the other elements.

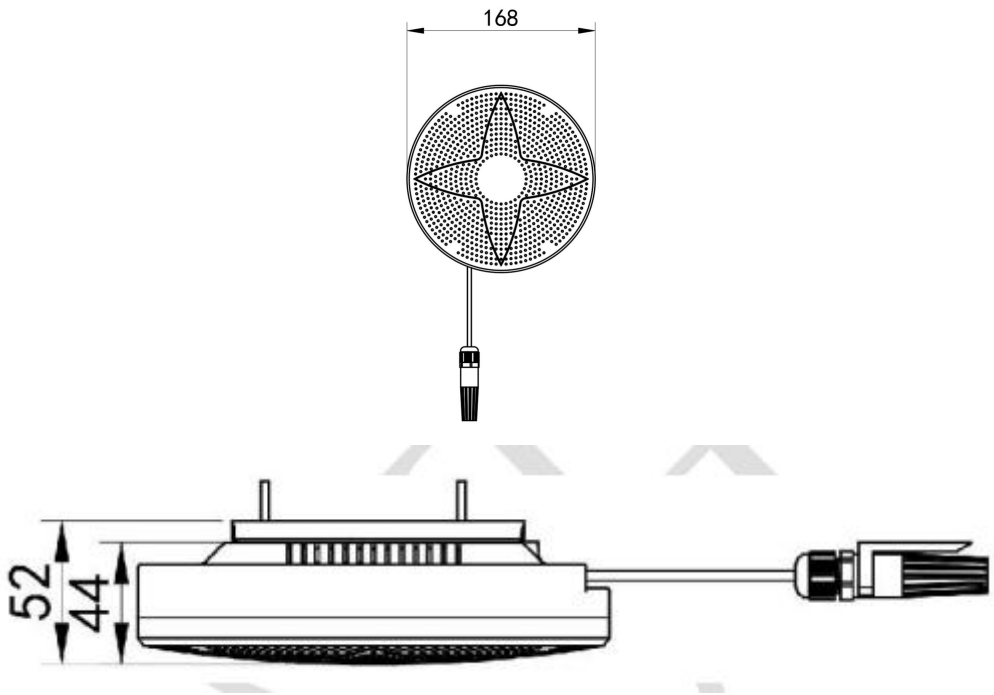
3.device installation

3.1 Inspection before equipment installation

Equipment List:

1. 1 multifunctional air quality detector
2. 1 installation card seat (optional)
3. 2 packs of mounting screws
4. Product certificate, warranty card

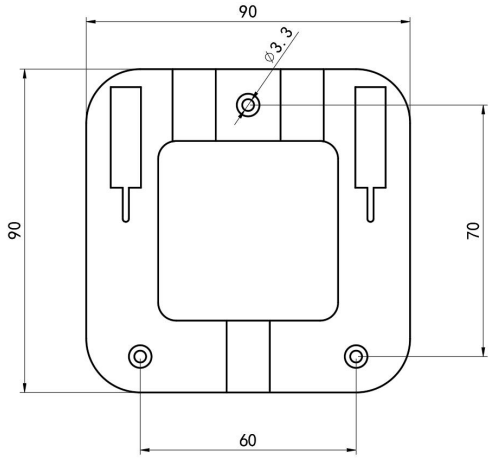
3.2Equipment size



(unit of mm)

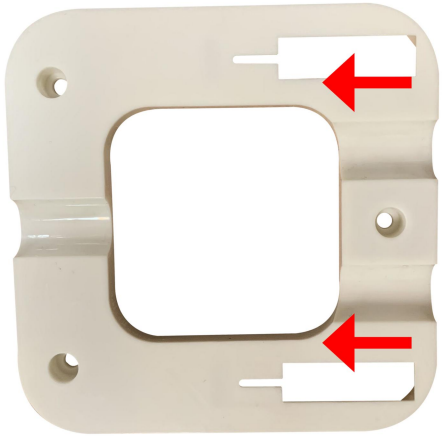
3.3 Installation Notes

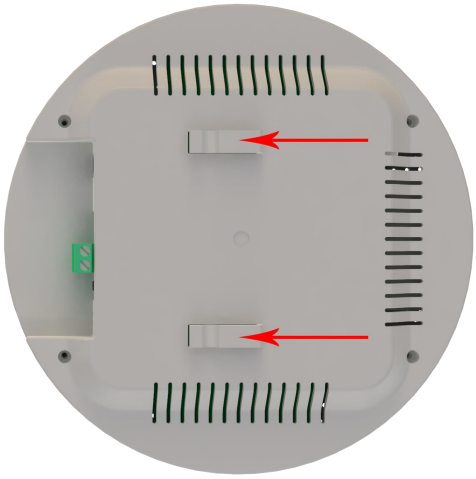
Punch holes in the wall first, and fix the mounting base to the wall or roof. The installation aperture and spacing are shown in the figure below:



Installation base size (unit: mm)

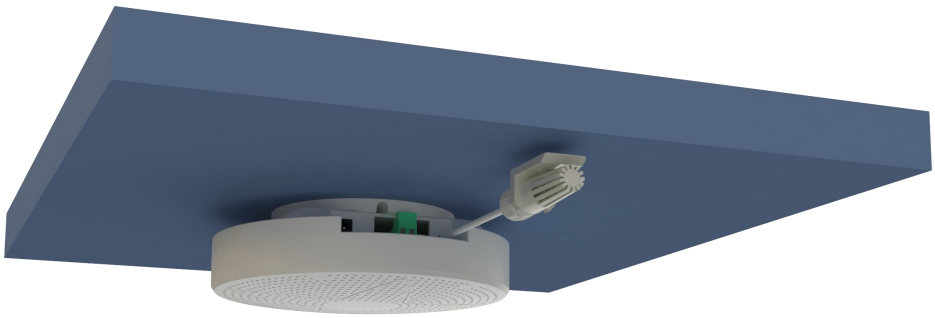
Fix the mounting bracket, and snap the device buckle into the mounting base, as shown in the figure below:



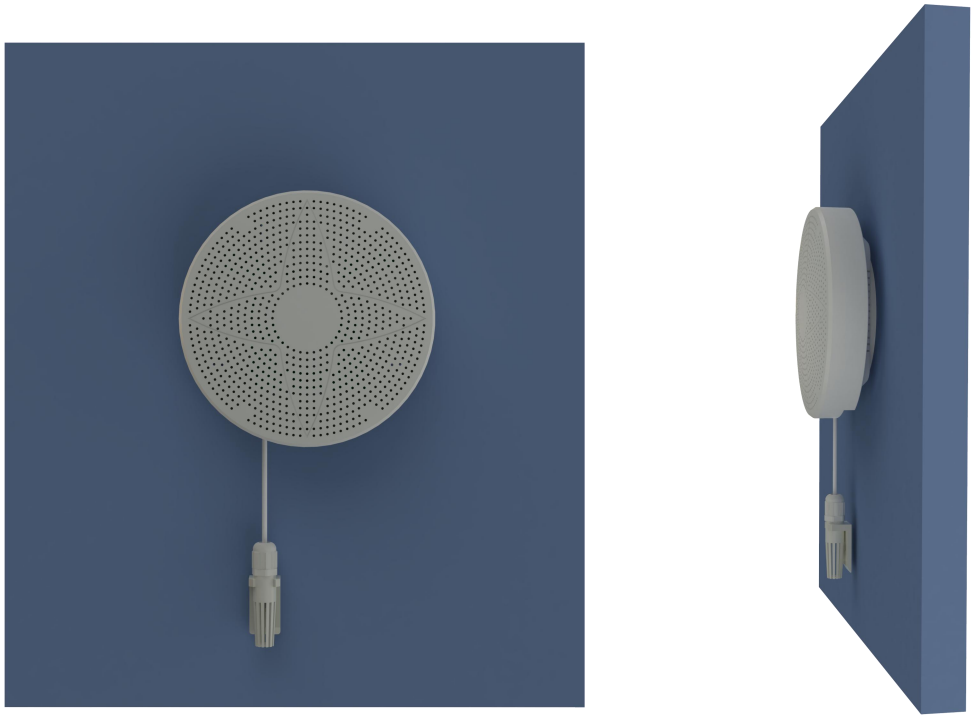


3.4Example of installation

3.3.1Ceiling installation



3.3.2Wall mount



3.4 Installation site

The equipment should be installed in a place free from shock, vibration, strong electromagnetic field interference, and easily accessible for maintenance. The clear distance between the equipment installation location and the surrounding process pipelines or equipment should not be less than 0.5 meters.

3.5 Installation notes

To ensure the correct operation of this equipment and to prevent its malfunction, please do not install it in the following locations:

■ Areas directly exposed to steam and cooking fumes;

■ Locations with high air flow such as air inlets, ventilation fans, and doorways;

■ Areas with a lot of water vapor and water droplets (relative humidity: ⩾ 95% RH or places where condensation may occur);

■ Locations beyond the equipment's operating temperature range;

■ Areas with strong electromagnetic fields.

4.Interface Description

DC10-30V power supply

5. Bluetooth Configuration

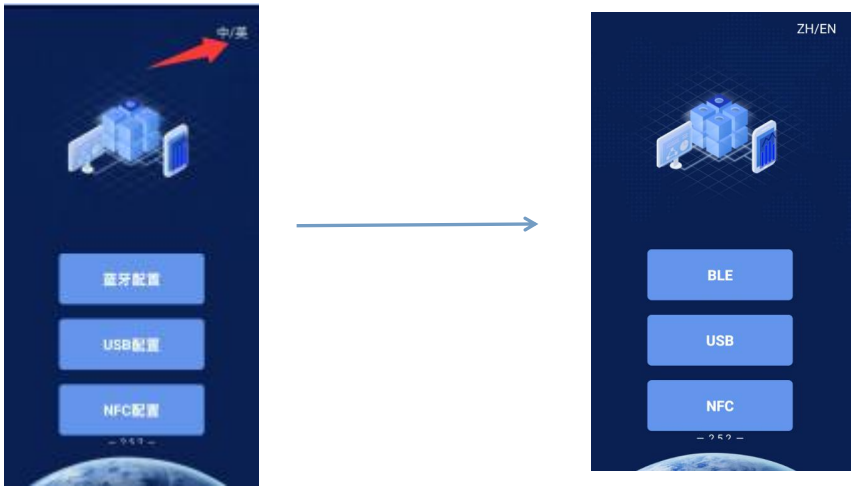
The equipment supports Bluetooth configuration and needs to be set up and used through the mobile phone APP.

(1) Download the APP

Scan the QR code, download and install the "Tap to Pair Bluetooth Configuration" APP.

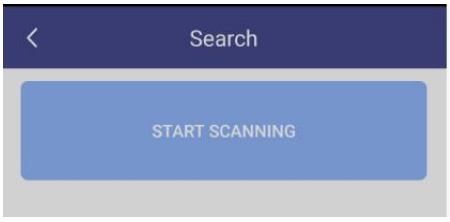
(2) Connecting devices

①Turn on the Bluetooth function of your mobile phone, and then click on the APP that has been installed earlier to enter the main page. Switch the top right corner to English. Then choose BLE mode.



②Click on [Connect Device] to enter the page for scanning devices.

③Click on [Start Scanning] to search for the devices that need to be configured. (The device name is displayed as WIFIMG111 and the address code is provided.)



【Note】 Assuming the device address is 12345678, at this time the device name is WIFIMG11112345678

④Click on the name of the device that needs to be configured (WIFIMG111 address code), and then enter the password page.

(3) ⑤ Click on the password input box, enter the device password (default 12345678), and then you will be taken to the device configuration page.

(4) Basic Parameter Configuration

Click on the "Summon Parameters" option to access the current parameter settings of the device. Based on different requirements, make the necessary changes to the parameters. After modifying the parameters, click "Send Parameters" to apply the changes to the device.

（5）Equipment Dictionary and Real-time Data Options Explanation

WIFI Name: The name of the WIFI to be connected on site

WIFI Password: The password of the WIFI to be connected on site

Device Network 8-bit Address Code: For viewing only, cannot be modified.

6. Access monitoring platform

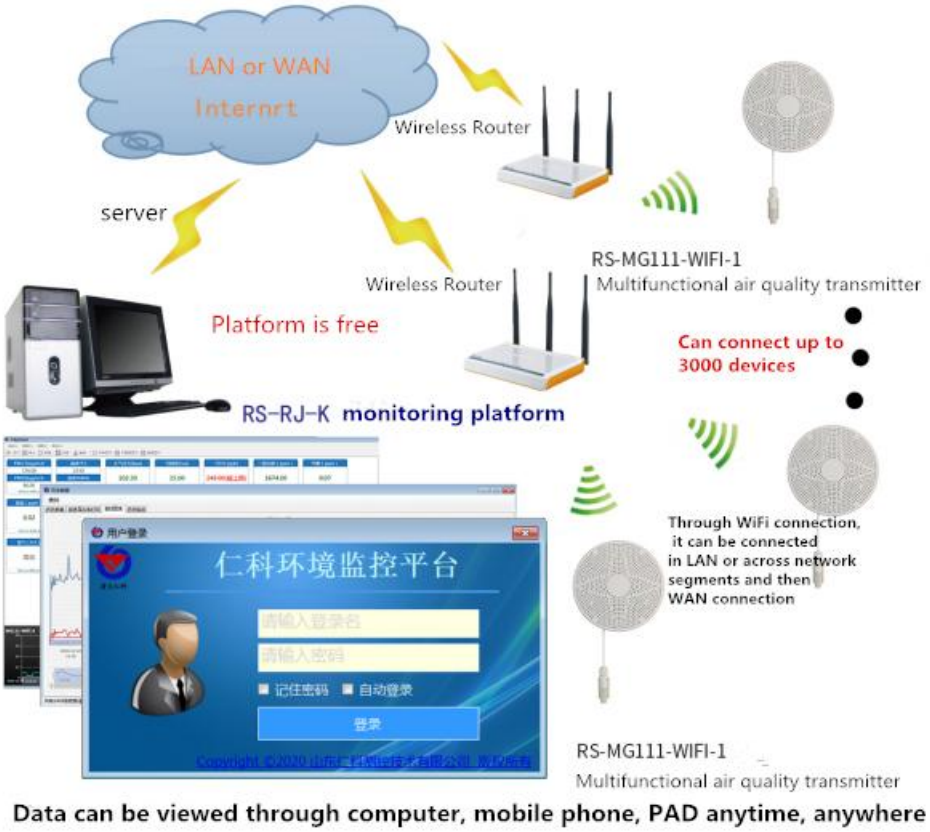
RS-MG111-WIFI-1 products can be connected to two platforms of our company:

Comparison of two software platforms:

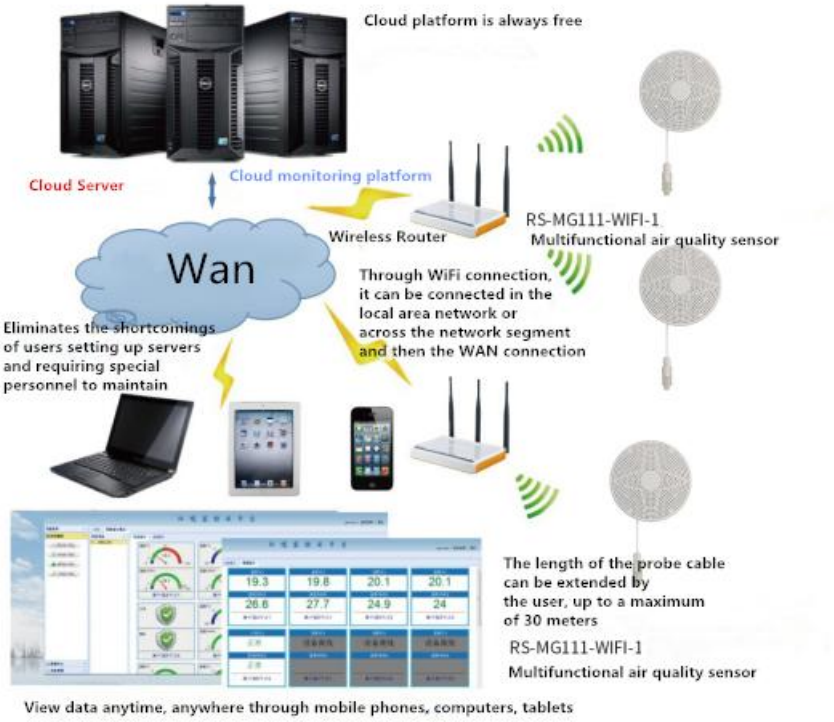
“■” Means this function； “□” Means no such function；

Features	Software platform name	
	RS-RJ-K Renke Environmental Monitoring Platform	IoT Cloud Platform
Gas parameter data background real-time monitoring	■	□
WEB real-time monitoring of gas parameter data	■	■
Gas parameter upper and lower limit setting	■	■
Real-time alarm on the monitoring interface	■	■
Email alarm	■	■
WEB front-end export historical data and alarm data	■	■
Custom monitor data unit, name and coefficient	■	■
Equipment sub-authority management	■	■
Provide software upgrade service	■	■
Customer self-built server	Client's own server is required	No need to build any server

Platform 1: RS-RJ-K software platform. This software is provided by our company for free and can be installed on the customer's computer or server, and the device uploads the data to the software through the network. For the introduction of RS-RJ-K software platform, please refer to "RS-RJ-K PeopleSoft Temperature and Humidity Monitoring Platform Instructions".



Platform 2: Cloud monitoring platform. The RS-MG111-WIFI-1 product uploads data to the company's cloud monitoring platform， url:en.0531yun.com. The device setting is the simplest. Customers do not need to build a server by themselves, just connect the device to the on-site WIFI network and configure the local network parameters.



8. Notes

1) Do not apply this device to systems involving personal safety.
2) Do not install the device in an environment with strong convective air.
3) The device should avoid contact with organic solvents (including silica gel and other adhesives), coatings, chemicals, oils, and high-concentration (more than 80% of the equipment's range) gases.
4) The device cannot be used for a long time in environments containing corrosive gases (such as various sulfides, etc.), as corrosive gases can damage the sensor.
5) Do not leave the device in a high-concentration organic gas environment (such as methane, ethylene, benzene, etc.) for a long time. Long-term placement will cause the sensor's zero point to drift and take a long time to recover.
6) Do not store and use the device in a high-concentration alkaline gas environment (such as ammonia gas).
7) The device is only used for measuring ppm-level gas content in indoor environments (except for CO2). It cannot be used for ppb-level measurement environments in outdoor atmospheric measurement.
8) Although this product has high reliability, we recommend checking the device's reaction to the target gas before use to ensure on-site use.
9) When testing the device's reaction to the target gas, it is recommended to use corresponding gas standard substances with a concentration not exceeding the equipment's range for testing. Abnormal measurement values caused by using the non-recommended testing method will not be the responsibility of our company.
10) The device cannot be used in environments with an oxygen content of less than 10% VOL. For abnormal measurement values caused by using the device in low-oxygen environments, our

company will not be responsible.

11) The non-consumable electrochemical principle ammonia element for livestock farms has been tested by our company. In a 20ppm ammonia gas environment (25℃, 50% RH) without other gas interference, the lifespan can reach more than one and a half years. If used at a concentration higher than this, the lifespan will be reduced.

12) When the device is powered off, it should be stored in a normal air environment (without toxic or harmful gases) to avoid lifespan reduction.

13) The preheating time for different elements of the device varies. It is recommended to power on and preheat for 48 hours before measuring and using.

14) The device prohibits pure gas tests and strictly prohibit using a lighter to smoke test. To avoid premature failure of the device due to excessive gas concentration testing， it is strictly prohibited.

15) The humidity sensor used by our company is of capacitive principle. It should avoid use in environments with volatile organic compounds.

9.Contact information

Shandong Renke Measurement and Control Technology Co., Ltd.
Address: No. 2886, Fengqi Road, High-tech Zone, Jinan City, Shandong Province
Zip code: 250101
Phone: 400-085-5807
Fax: (86)0531-67805165
Website: www.renkeer.com
Cloud platform address: en.0531yun.com

Appendix Platform Node Configuration

Feature name	Node number	type of data	Node information
PM10	1	Analog 1 enable Analog 2 enable	Analog quantity 1, coefficient 1, unit ug/m3, range 0~1000ug/m3
PM2.5	1	Analog 1 enable Analog 2 enable	Analog quantity 2, coefficient 1, unit ug/m3, range 0~1000ug/m3
humidity	2	Analog 1 enable Analog 2 enable	Analog quantity 1, coefficient 0.1, unit %RH, range 0~100%RH
temperature	2	Analog 1 enable Analog 2 enable	Analog quantity 2, coefficient 0.1, unit ℃, range -40~120℃
Atmospheric pressure	3	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 0.1, unit Kpa, range 0~120Kpa
illumination	4	32-bit unsigned integer	Coefficient 1, unit Lux, range 0~200000 Lux
TVOC	5	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 1, unit ppb, range 0~60000ppb
carbon dioxide	6	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 1, unit ppm, range 0~5000ppm
formaldehyde	7	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 0.01, unit ppm, range 0~5ppm
ozone	8	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 0.01, unit ppm, range 0~10ppm
O2	9	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 0.1, unit %VOL, range 0~30%VOL
Hydrogen sulfide	10	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 1, unit ppm, range 0~100ppm
Methane	11	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 1, unit %LEL, range 0~100%LEL
Carbon monoxide	12	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 1, unit ppm, range 0~1000ppm
Nitrogen Dioxide	13	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 0.1, unit ppm, range 0~20ppm
Sulfur dioxide	14	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 0.1, unit ppm, range 0~20ppm

hydrogen	15	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 1, unit ppm, range 0~1000ppm
Ammonia	16	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 1, unit ppm, range 0~100ppm
Noise	17	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 0.1, unit dB, range 30 - 130 dB
Odor (electrochemical type, high precision type)	18	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 0.001, unit ppm, range 0 - 5 ppm
Odor (semiconductor type)	18	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 0.001, unit ppm, range 0 - 5 ppm. Analog quantity 1, coefficient 0.001, unit ppm, range 0.03 - 3 ppm.
TSP	19	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 1, Unit: μg/m3, Range: 0 - 20000 μg/m3
Smoke	20	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 1, unit ppm, range 0 - 10000 ppm

TSP (High Precision) Element Configuration Node

Feature name	Node number	type of data	Node information
TSP(High accuracy)	1	Analog 1 enable Analog 2 disable	Analog quantity 1, coefficient 1, Unit: μg/m3, Range: 0 - 20000 μg/m3

10. Document history

V1.0 document creation

V1.1 adds cloud platform address

V1.2 update maximum power consumption

V1.3 Added noise selection option

V1.4 Added odor selection option

V1.5 Standardized precision description

V1.6 Added TSP element

V1.7 Added high-precision odor TSP element

V1.8 Added smoke selection option

V1.9 Changed to Bluetooth configuration