

SPECIFICATION

Product Name: Indoor Air Quality Monitor

Item No.: AM6108B

Version: V0.1

Date: 2022-3-4

Revision

No.	Version	Content	Date
1	V0.1	First edition	2022-3-4

Indoor Air Quality Monitor

AM6108B



Applications

- Residential ventilation system
- Business ventilation system
- Industrial ventilation system

Description

AM6108B is a HVAC air quality monitor with screen, provides customers with visual indoor air quality indicators, such as PM1.0, PM2.5, PM10, CO2, temperature, humidity, etc.; The device supports device ID setting through RS485 interface. It is widely used in residential, commercial and industrial applications, it can effectively help to improve air quality and create a healthy, comfortable, efficient, environmentally friendly, energy-saving living and working environment.

Features

- Modbus-RTU protocol
- IoT wireless monitoring is available
- Low power consumption
- Using standard 86 box size, thickness <24mm;
- Standard configuration: CO2+PM+RH&T+VOC+Wi-Fi
- Customizable filter alert function

Working Principle

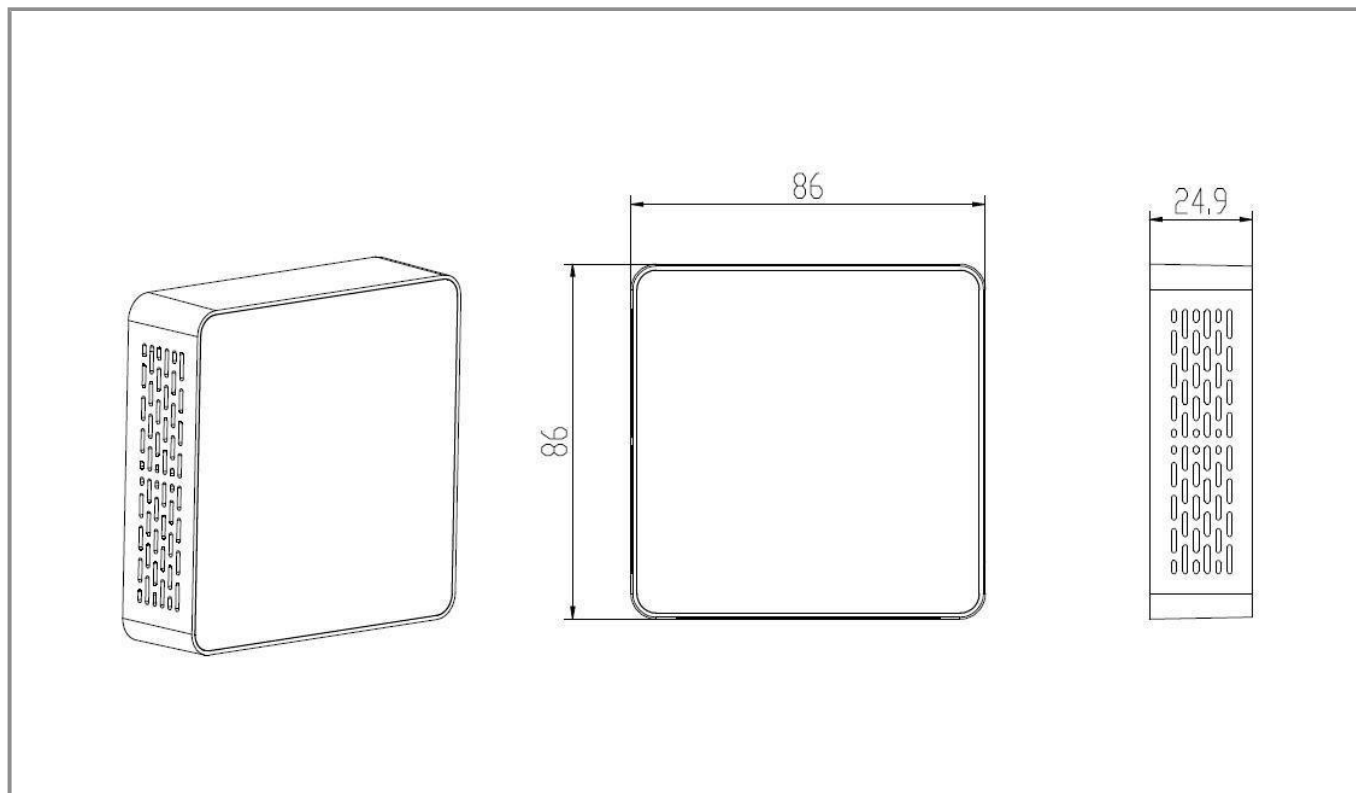
- The built-in dust sensor uses the principle of laser scattering technology to detect the indoor PM2.5 mass concentration in real time ($\mu\text{g}/\text{m}^3$) ;
- The built-in carbon dioxide sensor uses the principle of NDIR technology to detect indoor CO2 concentration in real time (ppm);
- The temperature and humidity sensor use capacitor resistance material to detect the indoor temperature (° C) and humidity (%) in real time.

Specifications

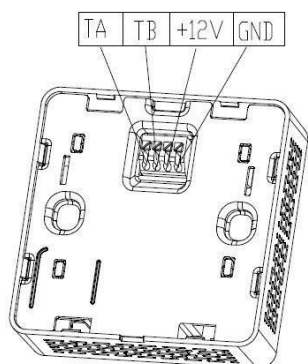
Specifications	
Working principle	CO ₂ : NDIR PM: Laser scattering principle
Measurement range	PM2.5: 0~999 μ g/m ³ CO ₂ : 0~5000ppm VOC: 0~10ppm Temperature: -10~50 $^{\circ}$ C Humidity: 0%~95%RH
PM2.5 measurement accuracy	PM2.5: 0~100 μ g/m ³ , $\pm$ 10 μ g/m ³ ; 101~500 μ g/m ³ , $\pm$ 10% of reading; PM10: 0~1 00 μ g/m ³ , $\pm$ 25 μ g/m ³ ; 101~5 00 μ g/ m ³ , $\pm$ 25% of reading; (25 $^{\circ}$ C $\pm$ 2 $^{\circ}$ C, 50 $\pm$ 10%RH, GRIMM)
CO ₂ measurement accuracy	$\pm$ (50ppm+5% reading) @ 0~50 $^{\circ}$ C
VOC consistency	Typical/Max: 200ppb/250ppb OR 20%/25%, whichever is larger
Temperature measurement accuracy	$\pm$ 1 $^{\circ}$ C
Humidity measurement accuracy	$\pm$ 8%RH
PM response time	$\leq$ 8s
CO ₂ response time	<30s
Working condition	-10~50 $^{\circ}$ C, 0~95%RH (Non-condensing)
Storage condition	-20~60 $^{\circ}$ C, 0~95%RH (Non-condensing)
Working voltage	DC 12V
Working current	<140mA
Standby current	$\leq$ 80mA
Interface	RS485
Protocol	Modbus-RTU
Installation hole distance	60mm (standard)
Dimension	86*86*24.9 mm
Lifetime	$\geq$ 10 years

Dimensions and Interface Definition

1. Dimensions (Unit : mm, tolerance: ± 0.2 mm)



2. Pin definition



No.	Pin	Description
1	TA	Communication port (RS485_TA)
2	TB	Communication port (RS485_TB)
3	+12V	Power input (+12V)
4	GND	Power input (GND)

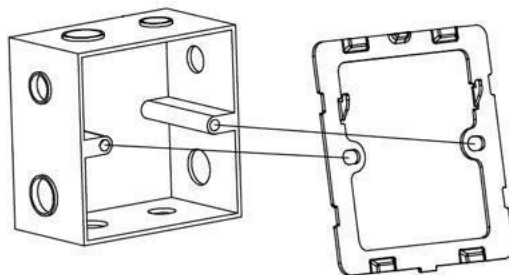
UI Interface Description



Parameter Range corresponding to color LIST			
Gas	Level	Range	Color
PM2.5 ($\mu\text{g}/\text{m}^3$)	Good	0~75	Green
	Just so so	75~115	Yellow
	Bad	≥ 115	Red
CO2 (ppm)	Good	0~600	Green
	Just so so	600~1000	Yellow
	Bad	≥ 1000	Red

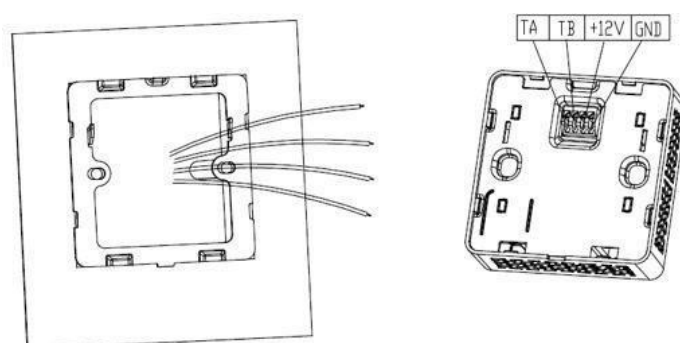
Installation Instructions

Step 1: Fix the wall mounted bracket with screws on the 86 box which in the embedded wall, as shown

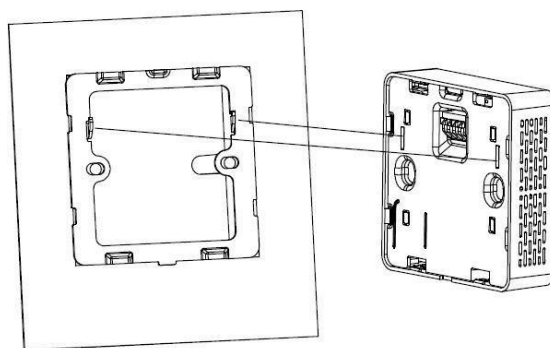


below

Step 2: Connecting Cable, connect the corresponding cable to the controller's RS485 interface according to the interface definition, as shown below:



Step 3: Match the two holes in the controller with the hooks in the wall mount bracket and slide the controller down to ensure that the controller is tightly locked with the bracket.



Precautions for use

- Do not place the controller in an environment where the ambient temperature is too high (above 60 ° C) or too low (below -20 ° C).
- Keep it out of reach of children as much as possible to prevent injury from collision and fall.
- Do not drop the controller or rub it against hard objects during use, otherwise it may cause damage to the controller's external light and damage.
- Do not place the controller in a dusty environment to avoid dust accumulation in the controller and affect the measurement accuracy.
- When using the controller, do not cover or block the vent hole with any object to avoid affecting the air quality monitoring.
- Do not disassemble, repair or modify the controller without permission.

Communication Method

1. General Statement

- 1) The AM6108 monitor can send the measurement data through RS485 or via Wi-Fi. After connected with a server, sending a command to get the measurement data by communication protocol ModBus-RTU
- 2) The device ID can be set via RS485
- 3) Baud rate : 9600, Data Bits: 8, Stop Bits: 1, Parity: No ;

2. Communication via RS485—Measurement Data Transmission & Device ID Setting

2.1 Read measurement data via RS485

Send: 01 04 00 0A 00 07 [ModbusCRC16]

Response: 01 04 0E DF1- DF14 [ModbusCRC16]

Function: Read measured result of PM2.5, CO2, VOC, RH&T

Note:

PM2.5 measured result= $DF3 \times 256 + DF4$ (unit: $\mu\text{g}/\text{m}^3$)

CO₂ measured result = $DF7 \times 256 + DF8$ (unit: ppm)

VOC= $DF9 \times 256 + DF10$ (level)

Temp.= $(DF11 \times 256 + DF12) / 10$ (unit: °C)

Humidity= $(DF13 \times 256 + DF14) / 10$ (unit: %)

DF1 DF2 DF5 DF6 is reserved

Example:

Response: 01 04 0E 00 00 00 0B 00 00 03 36 00 03 01 07 03 5C 2E E1

Explanation:

Hex is converted to decimal:

PM2.5 concentration= $00 \times 256 + 11 = 11 \mu\text{g}/\text{m}^3$ CO₂

concentration = $03 \times 256 + 54 = 822 \text{ppm}$

VOC= $00 \times 256 + 03 = 3 \text{ppb}$

Temperature= $(01 \times 256 + 07) / 10 = 26.3^\circ\text{C}$

Humidity= $(03 \times 256 + 92) / 10 = 86\%$

2.2 Set the device ID via RS485

Send: DF1 06 00 11 00 DF2 [ModbusCRC16]

Response: DF2 06 00 11 00 DF2 CKS [ModbusCRC16]

Function: Change the device ID,

Explanation: DF1 is the existing ID(01 defaulted), DF2 is the new ID to be set.



3. Communication via Wi-Fi--Wireless Data Transmission

There is Wi-Fi module inside AM6108B, which support wireless data transmission. Users can set the sever address, then get the data via server.

4. ModBus-RTU Register

4.1 Restrictions

- Read-only registers and readable and writable registers are not allowed to overlap
- The total number of registers is limited, and currently supports 32 input registers and 32 save registers
- The current version does not support file transfer with a large amount of data
- Registers are shown in Table 1 and Table 2. All registers are 16-bit words, and the register address is the register number

4.2 Table1: Input Register Table

Data serial number	Address	Meaning
R10	10	Reserved
R11	11	PM2.5 dust reading(ug/m ³)
R12	12	PM10 dust reading(ug/m ³)
R13	13	CO2 reading(ppm)
R14	14	TVOC level
R15	15	Temperature reading/10 is the actual temperature value
R16	16	Humidity reading/10 is the actual humidity value
R17	17	Reserved
R18	18	Reserved
R19	19	Reserved
R20	20	Reserved
R21	21	Reserved
R22	22	Reserved
R23	23	Reserved
R24	24	Reserved
R25	25	Reserved

4.3 Table2: Save Register Table

Data serial number	Address	Meaning
R10	10	Reserved
R11	11	Reserved
R12	12	Reserved
R13	13	Reserved
R14	14	Reserved
R15	15	Reserved
R16	16	Reserved
R17	17	Device slave ID
R18	18	Reserved
R19	19	Reserved
R20	20	Reserved
R21	21	Server Port
R22	22	Server IP-Byte 1 and 2
R23	23	Server IP-Byte 3 and 4
R24	24	Reserved
R25	25	Reserved

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