

User Manual

(Version V1.0)

IAQ

Indoor Air Quality module



Introduction

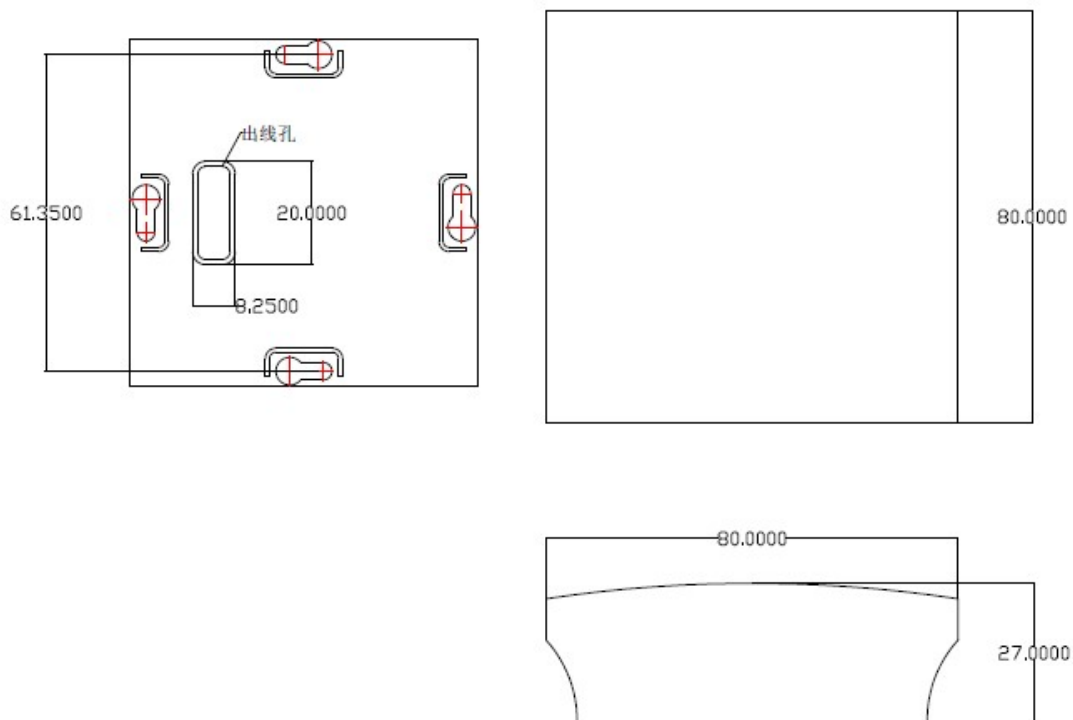
The product is designed for indoor air quality detection of fresh air/air conditioning systems. It adopts wide voltage power supply and modular design. It can freely match a variety of air quality parameters (temperature/humidity/PM1.0/PM2.5/PM10/VOC/CO2/dew point) and can be connected to the control system through MODBUS RTU protocol. The module adopts a compact design, which can help customers save installation space.

The module is installed by wall mounting, and different solutions are provided for customers to choose for different indoor and outdoor applications.

Features

- Modular design, multiple parameters can be freely matched;
- Wide voltage power supply, suitable for a variety of working environments;
- CO2 sensor is an independent sensor, using NDIR technology;
- PM2.5 sensor uses advanced laser technology;
- Temperature, humidity and VOC both use automotive-grade sensors;
- Standard MODBUS RTU output

Dimensions(Unit: mm)



Wiring

12V	Power supply V+
A	RS485 A+
B	RS485 B-
GND	Power supply V-

Electronic characters

Power supply	12/24 Vac 50/60 Hz, 10~36 Vdc
Nominal current (average)	<150mA
Installation	Wall mounting
terminal	Screw terminal blocks with 4pin, pitch 2.54mm, strong suggest using cables with shielding
Dimensions(mm)	LengthxHeightxWidth=80x80x27
Working condition	-25 - 60°C , RH<90%, non-condensing
Storage condition	-35 - 70°C, RH<90%rH, non-condensing
Protection level	IP20
Air quality parameters' precision	CO2 ±40ppm±3% reading
	PM2.5 <100ug/m ³ : ±10ug/m ³ >=100ug/m ³ : ±10%
	PM10 <100ug/m ³ : ±10ug/m ³ >=100ug/m ³ : ±10%
	Temperature ±0.3 (°C)
	Humidity ±3% (RH)
	Dew point ±5% F.S
	VOC ±20%
	Air pressure Absolute pressure ±0.6KPa, Relative pressure±0.12Kpa

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Order P/N:

ESR33-TH	IAQ, Temperature + Humidity, Modbus RTU, wall mounting
ESR33-THP	IAQ, Temperature + Humidity+PM2.5+PM10, Modbus RTU, wall mounting
ESR33-THC	IAQ, Temperature + Humidity+CO2, Modbus RTU, wall mounting
ESR33-THV	IAQ, Temperature + Humidity+VOC, Modbus RTU, wall mounting
ESR33-THVC	IAQ, Temperature + Humidity+VOC+CO2, Modbus RTU, wall mounting
ESR33-THPV	IAQ, Temperature + Humidity+PM2.5+PM10+VOC, Modbus RTU, wall mounting
ESR33-THPC	IAQ, Temperature + Humidity+PM2.5+PM10+CO2, Modbus RTU, wall mounting
ESR33-THPVC	IAQ, Temperature + Humidity+PM2.5+PM10+VOC+CO2, Modbus RTU, wall mounting

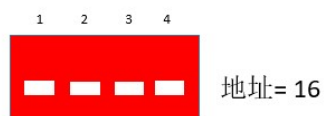
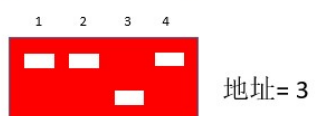
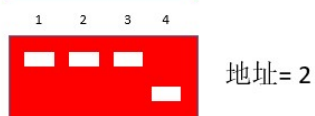
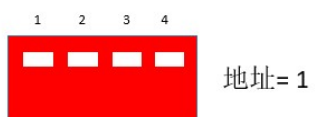
Modbus RTU communication

Communication settings: 9600, N, 8, 1

Address:

Rules: ON = 1, OFF = 0

example:



NOTE:

The new address will take effect only after the module is powered off and then on again.

Registers

1. Read only registers (0x04 function)

Modbus Address	Meaning	Description																
0X00	Alarms	<table border="1"> <tr> <td>DI 16</td><td>DI 15</td><td>DI 14</td><td>DI 13</td><td>DI 12</td><td>DI 11</td><td>DI 10</td><td>DI 9</td><td>DI 8</td><td>DI 7</td><td>DI 6</td><td>DI 5</td><td>DI 4</td><td>DI 3</td><td>DI 2</td><td>DI 1</td> </tr> </table> <p>DI 1 – CO2 DI 2 –Particle matters DI 3 –Temperature DI 4 – Humidity DI 5 –VOC DI 6 –Air pressure DI 7 ~16–reserved</p> <p>(1=YES, 0=NO)</p>	DI 16	DI 15	DI 14	DI 13	DI 12	DI 11	DI 10	DI 9	DI 8	DI 7	DI 6	DI 5	DI 4	DI 3	DI 2	DI 1
DI 16	DI 15	DI 14	DI 13	DI 12	DI 11	DI 10	DI 9	DI 8	DI 7	DI 6	DI 5	DI 4	DI 3	DI 2	DI 1			
0X01	Function mapping	<table border="1"> <tr> <td>DI 16</td><td>DI 15</td><td>DI 14</td><td>DI 13</td><td>DI 12</td><td>DI 11</td><td>DI 10</td><td>DI 9</td><td>DI 8</td><td>DI 7</td><td>DI 6</td><td>DI 5</td><td>DI 4</td><td>DI 3</td><td>DI 2</td><td>DI 1</td> </tr> </table> <p>DI 17 – CO2 function DI 18 –Particle matters DI 19 – Temperature function DI 20 – Humidity function DI 21 – VOC function DI 22 – Air pressure function DI 23~32 – reserved</p> <p>(1=YES, 0=NO)</p>	DI 16	DI 15	DI 14	DI 13	DI 12	DI 11	DI 10	DI 9	DI 8	DI 7	DI 6	DI 5	DI 4	DI 3	DI 2	DI 1
DI 16	DI 15	DI 14	DI 13	DI 12	DI 11	DI 10	DI 9	DI 8	DI 7	DI 6	DI 5	DI 4	DI 3	DI 2	DI 1			
0X03	CO2	CO2 reading																
0X04	PM2.5	PM2.5 reading																
0X05	Temperature	Temperature reading in °C, real = reading/10.0																
0X06	humidity	Humidity reading, 0~100%, real=reading/10.0																
0X07	Air pressure	Air pressure 300~1100KPa, real=reading/100																
0X11	bVOC	VOC reading, ppm, real=reading/1000,																
0x18	PM1.0	PM1.0 reading																
0x19	PM10	PM10 reading																

2. Readable/writable registers (0x03 function)

Modbus Address	meaning	description
0X05	IAQ module Modbus address	1~128, default: 1
0X06	Baud rate	0X01—1200,0X02—2400,0X03—4800,0X04—9600,0X05—14400,0X06—19200,0X07—28800,0X08—38400, default--9600
0X07	Parity	0X00—NONE, 0X01—Odd, 0X02—Even, default—NONE
0X08	Stop bit	0X10—1, 0X20—2, default—2,