Seven in one air quality testing module

(Model No. ：M701)

Product specification

Version: 1.0

M701 is a multi-in-one gas sensor module, which can measure a variety of gas indicators at the same time. The sensor module adopts laser particle sensor, infrared non-spectral carbon dioxide sensor, electrochemical formaldehyde sensor and VOC sensor, which are used to obtain the concentration of particulate matter, carbon dioxide, formaldehyde and TVOC respectively. Sensor module also built-in temperature and humidity sensor chip. Various parameters will be unified output in the form of UART digital interface. It can carry out real-time comprehensive detection of the environment, with good stability, very convenient for customers to use.

Application areas:

● Hotel room air quality monitoring

● Fresh air ventilation system

● Air purifier, air conditioning

● Air quality monitoring equipment

● Ventilation control system for kitchen and bathroom

● Smart home equipment

Main features:

● Simultaneously output CO_2, formaldehyde, TVOC, PM2.5, PM10, temperature, humidity seven sets of data

●CO_2 adopts single NDIR mode, with 24 hours self-calibration function

● Formaldehyde adopts electrochemical sensor

●PM2.5 is TSI8530 as the standard, and most of the measurement bureau test equipment consistent

●VOC test results are relative values

● The temperature is accurate to 0.1℃, the humidity is accurate to 0.1%

Specifications:

Class don't	Measurement resolution	Measuring range	Accuracy of measurement
CO2	1ppm	400ppm～5000ppm	±3%+50PPM /±10%
CH20	1ug/m3	0ug～2000ug/m³	±10%
TVOC	1ug/m3	0ug~2000ug/m³	±25%
PM2.5	1ug/m3	0ug/m3～999ug/m³	±10%/±10
PM10	1ug/m3	0ug/m3～1000ug/m³	±10%/±10
Temperature	0.01℃	-40℃～100℃	±1℃
Humidity	0.04%	0～100%	±3%RH
Physical interface	Mother XH2.54 seat		
The output data	UART		
Working voltage	5.0±0.2VDC		
Working current	≤500mA（CO2 transient requires 300 mA）		
Warm up time	2 minutes (only TVOC needs to be preheated, other parameters will be displayed when powered on)		
Working temperature	0℃～50℃		
Working humidity	≤95％RH		
Overall dimensions	71*62*16mm（L×W×H）		

UART interface definition:

interface	The name of the	function
1	5V	The power supply 5 v
2	GND	The power to
3	N/A	dangling
4	TXD	UART data output pin

Serial port data stream format:

Baud rate	9600bps
Data bits	eight
Check digit	There is no
Stop bit	There is no

Communication protocol:

Word section	The name of the	instructions
B1	The frame head 1	A fixed value 3 ch
B2	The frame head 2	A fixed value 02 h
B3	data	ECO2 high byte
B4	data	ECO2 low byte
B5	data	ECH2O high byte
B6	data	ECH2O low byte
B7	data	TVOC high byte
B8	data	TVOC low byte
B9	data	PM2.5 high byte
B10	data	PM2.5 low byte
B11	data	PM10 high byte
B12	data	PM10 low byte
B13	data	Temperature Integer part
B14	data	Temperature fractional
B15	data	Humidity is an integer
B16	data	Humidity is the same as Humidity.
B17	The checksum	The checksum

Note: The checksum B17 is equal to: B1+B2+B3+B4+ B16, take the lower 8 bits.
When the bit7 of the temperature data B13 =1, it represents negative temperature; when the bit7 of B13 =0, it represents positive temperature. For example, when B13=9Bh, then bit7=1, indicating negative temperature, the actual temperature is −27℃; If B13=1Bh, then bit7=0, which means positive temperature, then the actual temperature is 27 degrees Celsius.

Connection diagram:

62MM

71MM
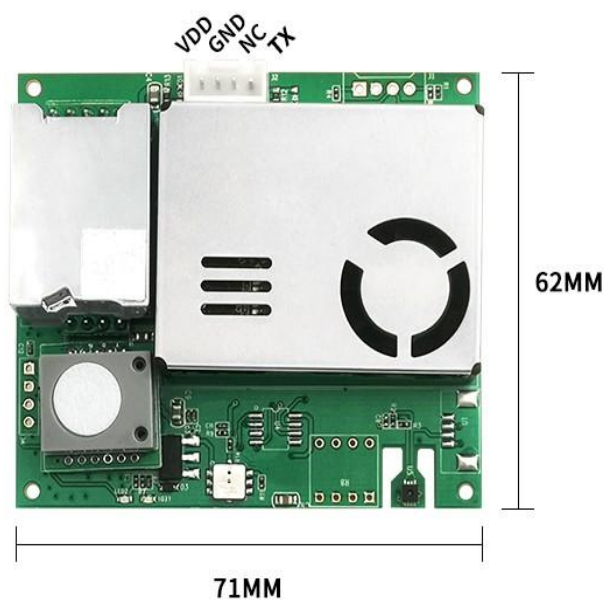
Appearance size diagram (height: 16mm) :

71.5mm

38.7mm

21.0mm

6.1mm

12.5mm

1.4mm

62.0mm

1.4mm

R1.1mm
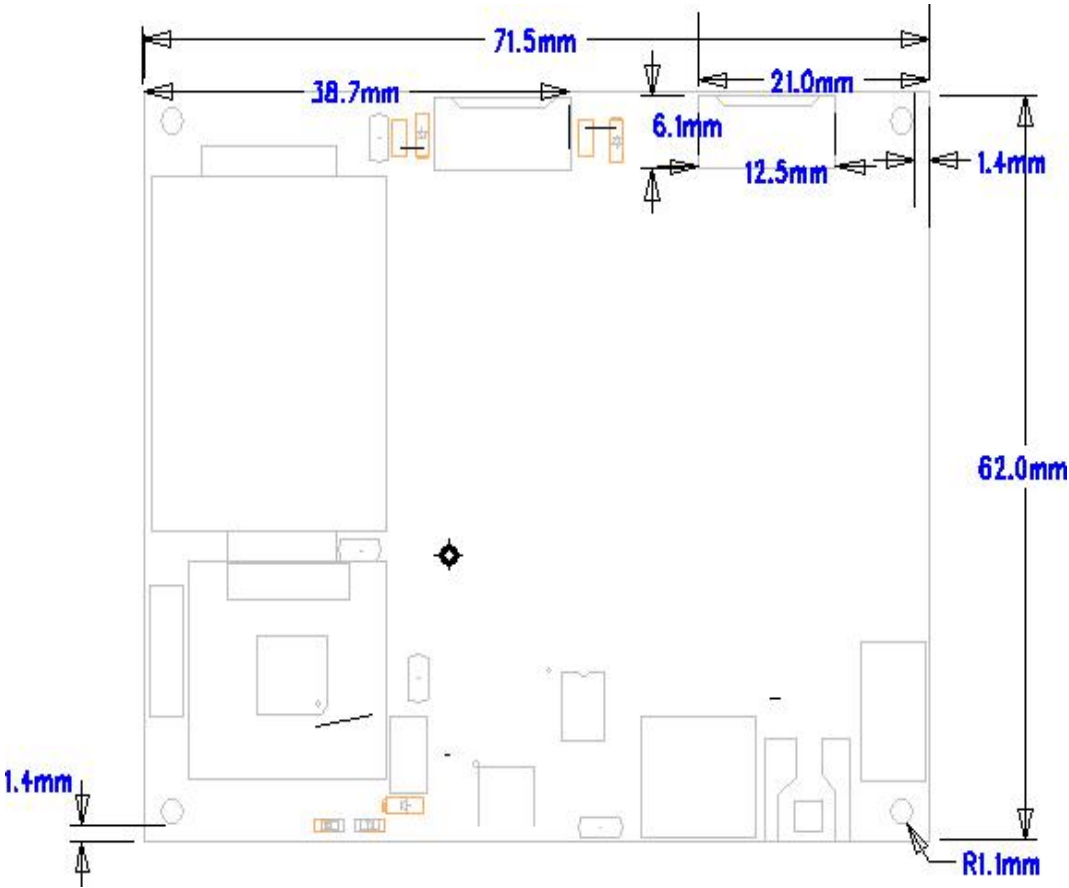
Matters needing attention

To power on a device for the first time, preheat the device for at least five minutes.
Unconsciously, do not apply this module to systems that involve personal security.
Unconsciously do not expose the module to high levels of organic gas for long periods of
Anyway, do not install a module in a strong-air convection environment.
Wired the metal shell plugs into the sensor's internal power supply, taking care not to short-circuit other external circuits or the chassis shell.
The optimal installation method is to put the air inlet and outlet in a plane that is close to the user's inner wall to connect with the outside world, and there is no shelter within 2cm around the air outlet. The air inlet and the air outlet must be isolated from each other to avoid direct backflow from the air outlet to the air inlet inside the device.
The hole sizes of the air inlet and outlet of the device should not be smaller than the hole sizes of the air inlet of the sensor.
When using something like a purifier, users avoid putting a sensor directly into the purifier's own air duct, instead designing a separate structural space where the sensor is placed to isolate itself from the air duct.
The sensor must be installed at a position 15 to 20CM above the ground. Otherwise, the fan may be affected by dust, floc, or other large dust particles. You are advised to pre-filter the device properly.
Do not disassemble the sensor, including the metal shield, to prevent irreversible damage
According to the Scheme, the sensor data ensures consistency between individuals at the factory, without using third-party instrumentation or data as a comparison standard. If the user wants the final measurement result to be consistent with a third-party testing device, the user can perform data fitting and calibration according to the actual collected results.
The sensor lends itself to a common indoor environment, where the user's device can lose data consistency due to excessive dust, oil and water accumulation: The annual dust concentration is greater than 300 μ g/m3 more than 50% of the time, or greater than 500 μ g/m3 more than 20% of the time; B) Lampblack environment; C) High water mist environment; D) outside.