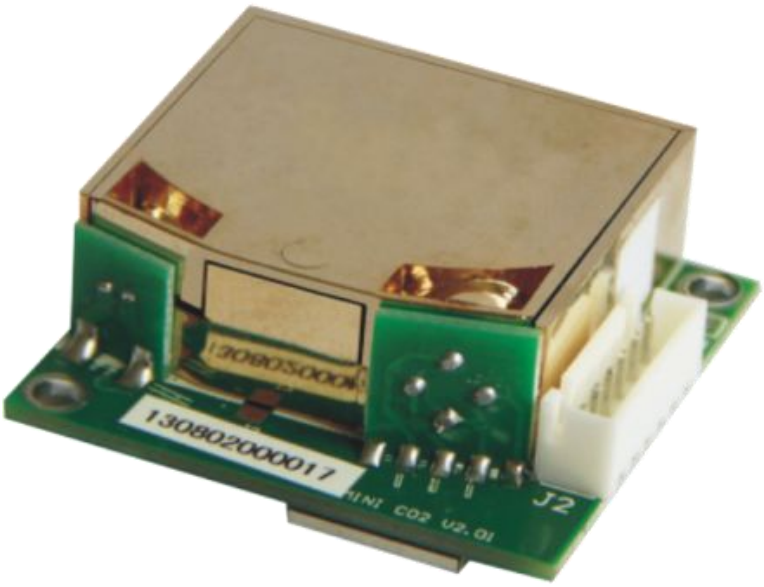
MINI INFRARED (NDIR) CARBON DIOXIDE CO2 SENSOR MODULE CM1104

USER MANUAL



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Ver.2013.11

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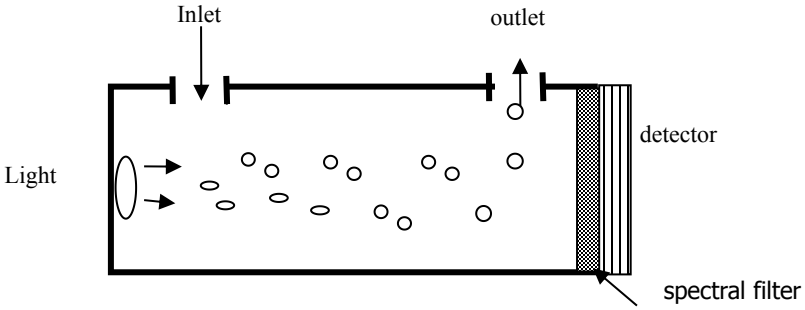
Note: The data in the picture is for reference only, and the actual delivered goods shall prevail

1. Function

CM1103 CO2 gas sensor module is mainly used to test CO2 concentration, indoor air quality measurement, such as CO2 measurement in ventilation control system, building, school, hospital and CO2 control in air-conditioner, mushroom, fireplace.

2. Working principle

CO2 gas is composed of different types of atoms have absorption spectrum in infrared range. Absorption intensity abides by Lamber-Beer's Law. Basic working principle of NDIR sensor is as below,



Basic mathematical model：A majority of both organic and inorganic polyatomic gas have specific absorptive wavelength in infrared region. It observes Lambert-Beer Law formula I＝I0e-kpl when infrared light is coming through. Light absorption intensity "i" can be described as i=I0-I= I0 (1- e-kpl). I0: intensity of incoming ray. I: transmitting beams. l :thickness of gaseous medium. p: gas concentration. k: absorption coefficient.

3 Specification

Technology: NDIR

Measurement range: 0-2000ppm,0-5000ppm,0-10000ppm

Max Drift: ±2%FS

Resolution: 10ppm

Response Time（T90）: 30S

Accuracy : 40ppm+2% reading

Size: 41*43*16 mm

Repeatability : <2%

Sampling mothed : diffusion

Working voltage: DC5V±5%

Working current：average --70mA，peak---120mA

PWM ;linear output

UART: Data bit:8; Stop bit: 1; Check bit: null

Standard baud rate：9600bps

Working voltage: 0℃ ～ 50℃

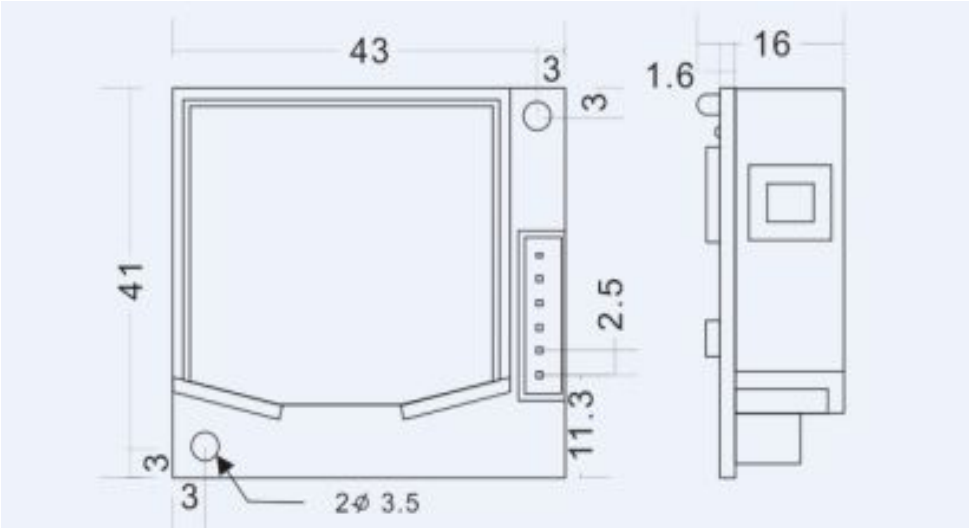
Humidity : 0～95％RH non-condensing

Singal output :PWM.RS232-TTL,0-4V，I2C

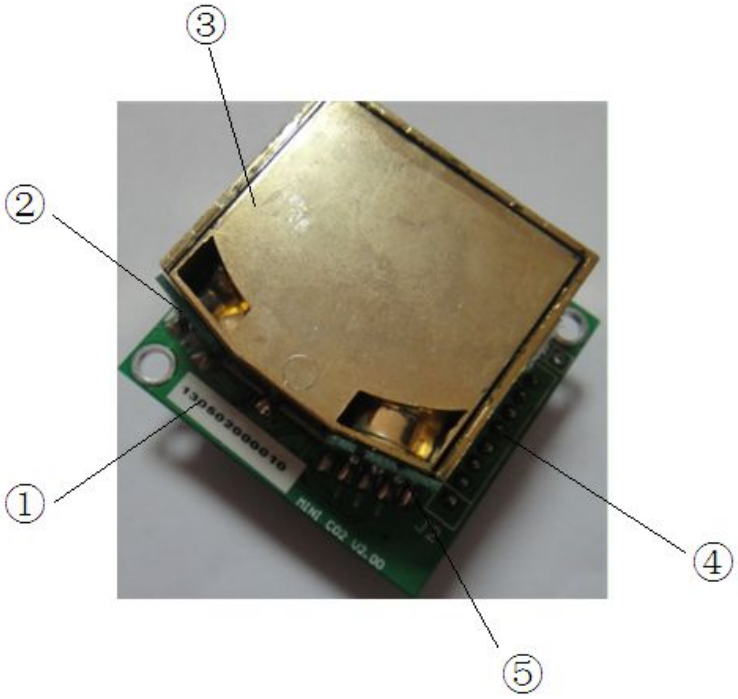
Life Time:≥ 10years

4 Dimensions

4.1 schematic diagram



4.2Product Display



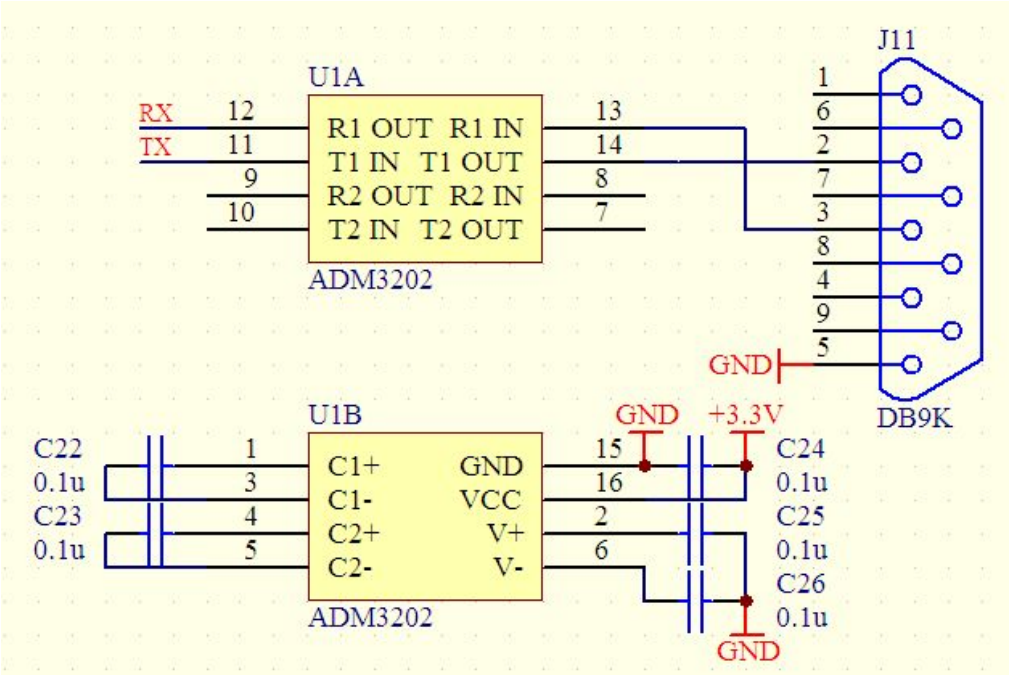
①main board ②light source ③air chamber ④contact pin ⑤probe

4.3 I/O definitions

number	Name	Description
①	TX	UART TX（SENDING）
②	RX	UART RX（RECEIVING）
③	+VI	POWER SUPPLY INPUT（+5V）
④	GD	POWER SUPPLY INPUT（GND）
⑤	P1	PWM 1
⑥	CL	Colck output（I2C reservation）
⑦	DA	Data output（I2C reservation）
⑧	P2	PWM2（Reservation）

Note: Pin1 and Pin2 are RS232 communication terminals on the board. RS232 TTL on the board is 0-3.3V, able to be compatible with 5V SCM. It should convert TTL if connecting to the computer via RS232. For example: Using transferred IC ADM3202.

RS232 communication reference diagram:

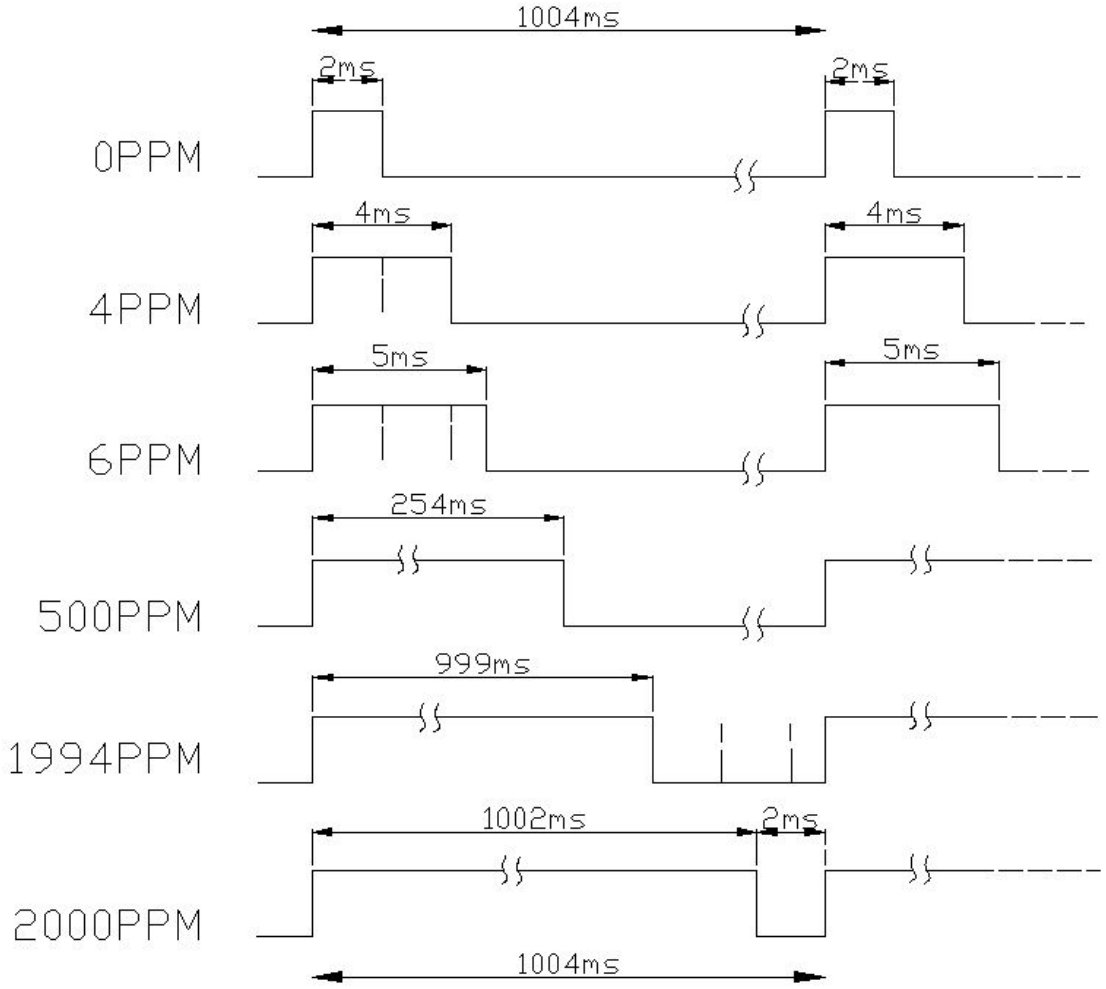


5 PWM output

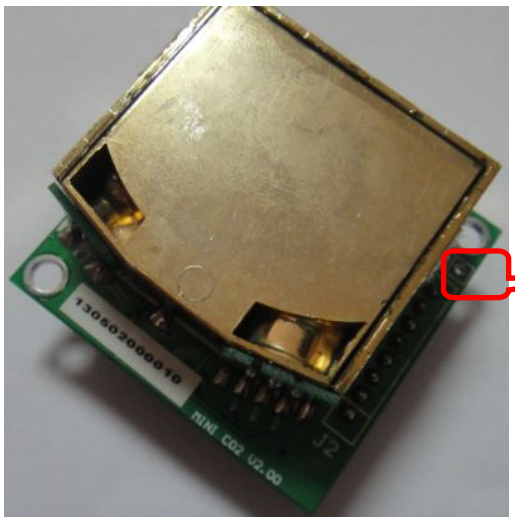
PWM cycle：1004ms

Positive pulse width: （PPM/2）+2ms

PWM output diagram：



6 zero setting

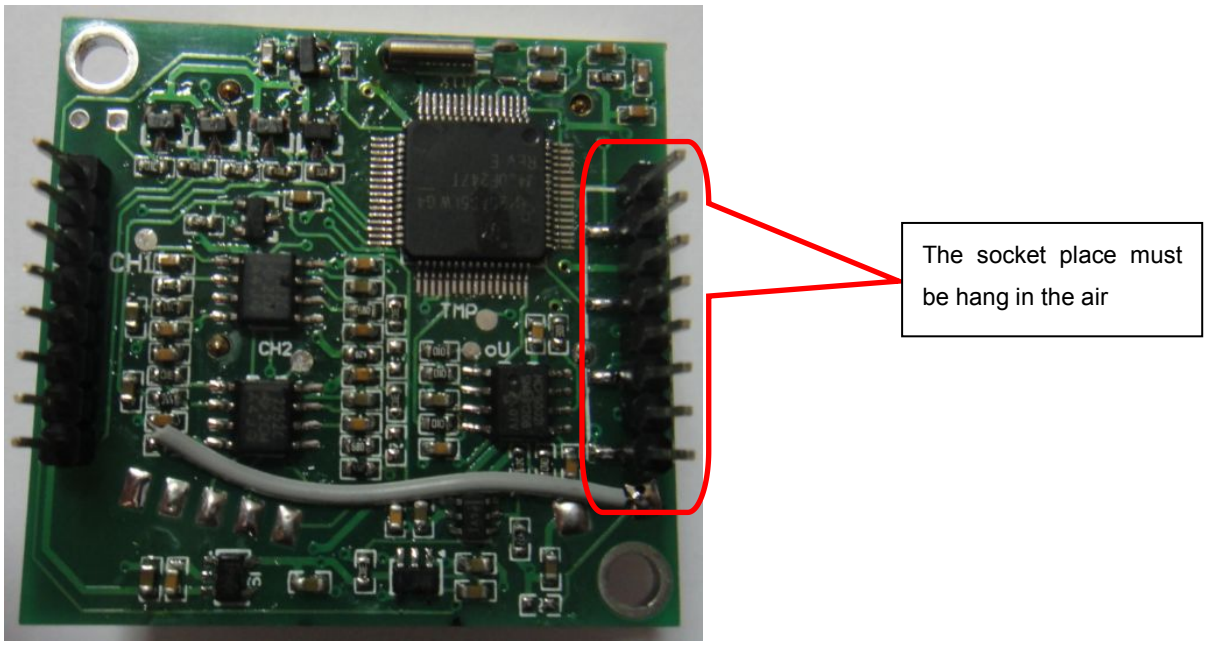


short circuit for 3seconds， the model is adjusted to 400ppm

Note: please do zero setting in Well ventilated areas

7 Note

The marked place in below picture must be hang in the air.



8. After-sales services and consultancy

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Communication protocol

Baud rate：9600bps Data bit：8 Stop bit：1 Check bit：null

Summary:

1. The data in the explanation are all hex data. Such as 46 is decimal [70]
2. [xx] is single byte data(no symbol,0-255) ;(xx) is double byte data, signed integer (-32768 to +32767),the top one is ahead. "—— " followed by explanation;
3. All the data are integer. It has (100, 10, and 1) times relationship with true data.
4. The length of command byte is [LB]+3.

Command Format:

Send： [IP] [LB] [CMD] [DF] [CS]
[IP] address（fixed as 11）。
[LB] byte length followed does not include CS
[CMD] command
[DF] parameter items with command, optional
[CS] CS= －（IP +LB+CMD +DF）

Response：
a．When the command is implemented correctly, it responses
[ACK] [LB] [CMD] [DF] [CS]
[ACK]=0X16 right command
[LB] byte length followed does not include CS
[CMD] command
[DF] parameter items with command, optional
[CS] CS=－（ACK +LB+CMD+DF）

b．When the command is not implemented correctly, it responses
[NAK] [LB] [CMD] [EC] [CS]
[NAK]=0X06 Command is not implemented correctly
[LB]=2 byte length followed does not include CS
[CMD] command
[EC] the error code that command is not implemented correctly
[CS] CS= －（NAK +LB+CMD+DF）

[EC]

01 Order length is wrong

02 There is no this command

03 Can't implement this command under current status.

Function list

No	Function	CMD	Description
1.	Check measuring results	0x01	Besides measuring data, it also has status information
2.	Check software version	0x1E	
3.	Check equipment nubmer	0x1F	
4.	Zeroing	0x03	