



# Intelligent Infrared Carbon Dioxide Module (Model: MH-Z14A)

User's Manual V1.01

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Zhengzhou Winsen Electronics Technology CO., LTD.

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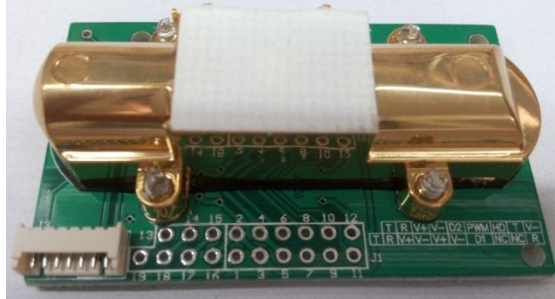
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Please keep the manual properly, in order to get help if you have questions during the usage in the future.

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# MH-Z14A NDIR CO2 Module

## 1. Profile



MH-Z14A NDIR Infrared gas module is a common type, small size sensor, using non-dispersive infrared (NDIR) principle to detect the existence of CO<sub>2</sub> in the air, with good selectivity, non-oxygen dependent and long life. Built-in temperature compensation; and it has digital output, analog voltage output, and PWM output. This commons type infrared gas sensor is developed by the tight integration of mature infrared absorbing gas detection technology, precision optical circuit design and superior circuit design.

## 2. Applications:

HVAC refrigeration equipment, air quality monitoring equipment, fresh air system, air purification equipment, smart home, and schools.

## 3. Main functions and features:

- Gold-plated chamber, waterproof & anti-corrosion treatment
- High sensitivity, Low power consumption
- Good stability
- Temperature compensation, excellent linear output
- Output modes: UART, analog voltage signal, PWM wave
- Long lifespan
- Anti-water vapor interference
- No poisoning

#### 4. Main technical parameters

Working voltage	4.5 V ~ 5.5V DC
Average current	< 60 mA(@5V input)
Peak current	150 mA(@5V input)
Interface level	3.3 V (5V compatible)
Measuring range	0~10000ppm optional (refer to table 2)
Output signal	Serial Port (UART, TTL level)
	PWM
	Analog output( DAC), 0.4-2V
Preheat time	3min
Response Time	$T_{90} < 120s$
Working temperature	0°C ~ 50°C
Working humidity	0~90%RH (no condensation)
Weight	15 g
Lifespan	>5 year

Target Gas	Measuring Range	Accuracy
Carbon Dioxide (CO <sub>2</sub> )	0~2000ppm	±(50ppm +3%reading value)
	0~5000ppm	
	0~10000ppm	±10% reading value

#### 5. Structure

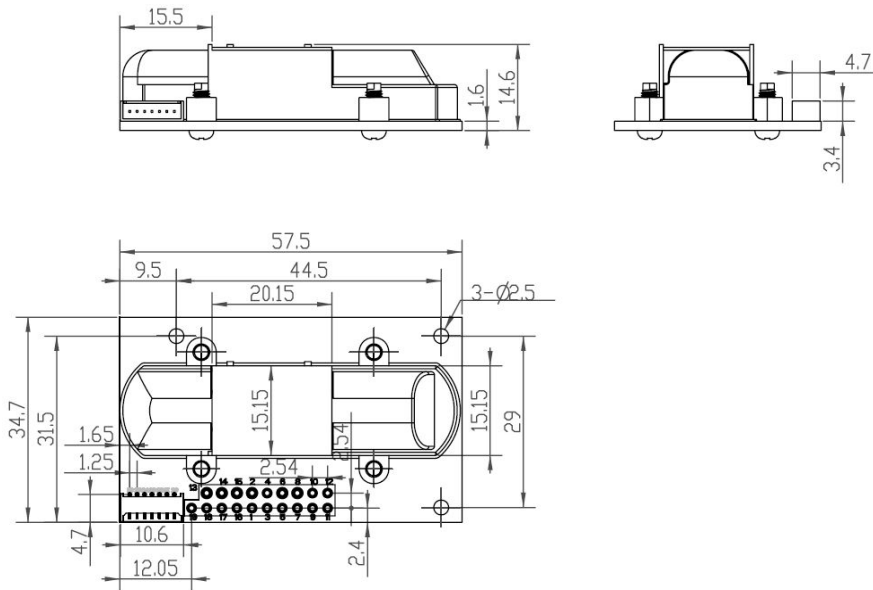


图 1 传感器结构图

#### 6. Definition for pins

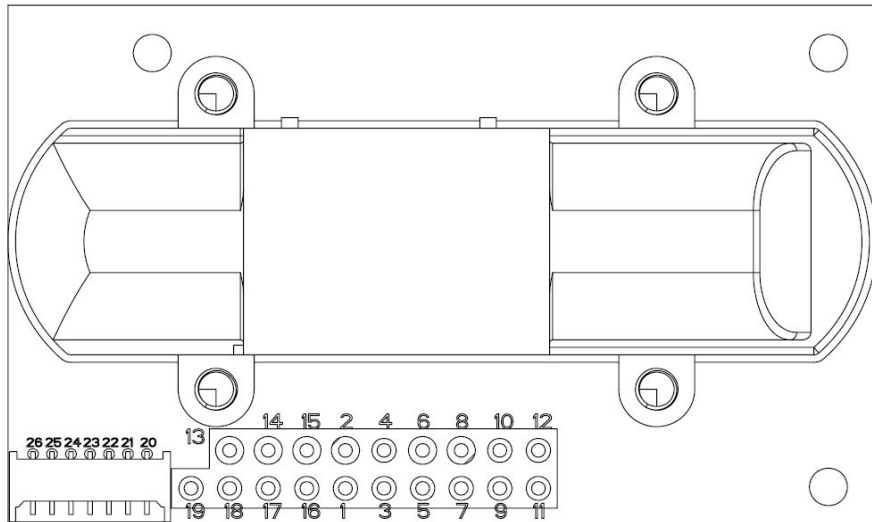


图2 引脚定义

PIN	Description
Pad1/Pad15/Pad17/Pad23	Vin Voltage Input
Pad2/Pad3/ Pad12/Pad16/Pad22	GND
Pad4/Pad21	Analog Output (0.4~2V)
Pad6/Pad26	PWM
Pad8/Pad20	HD (Zero calibration, low level for more than 7 seconds valid)
Pad7/Pad9	NC
Pad11/Pad14/Pad18/Pad24	UART (RXD) TTL Level input
Pad10/Pad13/Pad19/Pad25	UART (TXD) TTL Level output

## 7. Automatic Baseline Correction (ABC function)

ABC function refers to that sensor itself do zero point judgment and automatic calibration procedure intelligently after a continuous operation period. The automatic calibration cycle is every 24 hours after powered on. The zero point of automatic calibration is 400ppm. From July 2015, the default setting is with built-in automatic calibration function. To use the sensor better, the sensor must be placed in clean air for over 1 hour.

ABC function is suitable for office and home environment etc..., but not for green house, farms, and refrigerators etc..., in which it requires to shut down the automatic calibration function. Then the user should do zero detection regularly, and zero calibration by command or manually.

## 8. Notes

8.1 Please avoid the pressure of its gilded plastic chamber from any direction, during welding, installation, and use.

8.2 When placed in small space, the space should be well ventilated, especially for diffusion

window.

8.3 The sensor should be away from heat, and avoid direct sunlight or other heat radiation.

8.4 Do not use the sensor in the high dusty environment for long time.

8.5 To ensure the normal work, the power supply must be among 4.5V~5.5V DC rang, the power current must be not less than 150mA. Out of this range, it will result in the failure of the sensor. (The concentration output is low, or the sensor can not work normally.)

8.6 During the zero point calibration procedure by manual, the sensor must work in stable gas environment (400ppm) for over 20 minutes. Connect the HD pin to low level (0V) for over 7 seconds.

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