# Electrochemical Carbon Monoxide Gas Module ZE16B-CO

Profile

ZE16B-CO is a general-purpose and miniaturization electrochemical carbon monoxide detection module. It utilizes electrochemical principle to detect CO in air which makes the module with high selectivity and stability. It is a combination of mature electrochemical detection principle and sophisticated circuit design.
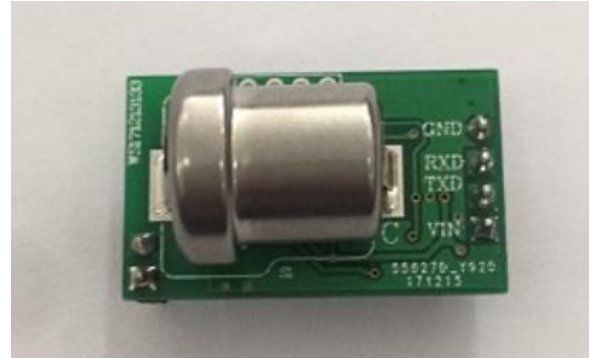
Features

Serial port output, PMW output

Built-in temperature sensor, making accuracy higher in the requested range.
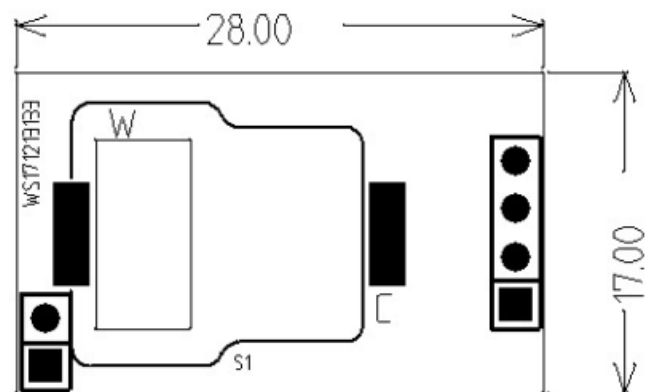
Main Applications

Development of household CO gas alarm

Detection of CO concentration at residential occasions

Technical Parameters Stable1.

Model No.	ZE16B-CO
Detection gas	Carbon Monoxide（CO gas）
Interfering gases	Alcohol &etc.
Output data	UART output
Output way	PWM output
Working voltage	5V DC
Preheating time	30 seconds
Response time	≤30 seconds
Recovery time	≤30 seconds
Detection range	0～500ppm
Solution	1ppm
Working temperature	-10℃～55℃
Working humidity	15%RH-90%RH（no condensation）
Storage temperature	-10℃～55℃
Life span	2 years（in air）

tolerance ±0.1mm

Fig1. Structure

Definition of pins   **Stable2.**

PIN1	PWM output 500ms is one period (20%~80% is corresponding 0~500ppm)
PIN2	Alarm status: output is high electrical level, to set according to users' demand (alarm range: 0~500ppm, default is that high electrical level output at 150ppm)
PIN3	GND
PIN4	UART (RXD)
PIN5	UART (TXD)
PIN6	VCC
NOTE: Inside of PIN1, PIN2, PIN4, PIN5 connected to 300 Ω IO in series, it can be customized	
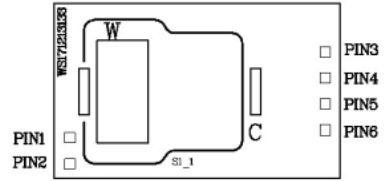
Stable2. Pins

Communication Protocol

1. General Settings

Table 3

Baud Rate	9600
Data Bits	8 byte
Stop Bits	1 byte
Check Bits	Null

2. Communication Commands

The communication is initiative upload mode, concentration value is sent every other 1s, command line as follow (300ppm concentration):   **Table 4**

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Byte	Gas Type	Unit	No. of decimal	Concentration (High Byte)	Concentration (Low Byte)	Full Range (High Byte)	Full Range (Low Byte)	Check sum
0xFF	CO=0x04	ppm=0x03	0 byte=0x00	0x01	0x2C	0x01	0xF4	0xD7

Gas concentration value = High Byte*256+Low Byte

Please note that in the above calculation formula, the byte4 and byte5 means the decimalism value changed from hexadecimal. For example: Original byte4 is 0x01 and original byte5 is 0x2C.

01 is hexadecimal and it is 1 after changing to decimalism.

2C is hexadecimal and it is 44 after changing to decimalism.

So, concentration= 1x256+44=300 ppm

3. Check sum and calculation

Check = (negation(byte1+bye2+……+byte7))+1

Please refer the following example:

```
unsigned char FucCheckSum(unsigned char *i,unsigned char ln)
{
    unsigned char j,tempq=0;
    i+=1;
    for(j=0;j<(ln-2);j++)
    {
        tempq+=*i;
        i++;
    }
    tempq=(~tempq)+1;
    return(tempq);
}
```

Installation

This module adopts Pin2.54mm*4 and Pin2.54mm*2 single row pin structure for external connection. It is just need to weld the positioning needle to the fixed connection and the welding is manual mode.

Cautions

1. DO NOT insert or extract the sensor on the PCB board.
2. DO NOT change or move the electronic part on the module.
3. Avoid sensor contact with organic solvent, coatings, medicine, oil and high concentration gases.
4. Excessive impact or vibration should be avoided.
5. Please keep the modules warming up for at least 20 minutes when first using.
6. Please do not use the modules in systems which related to human being's safety.
7. Please do not use the modules in strong air convection environment.
8. Please do not expose the modules in high concentration organic gas for a long time.