Carbon Monoxide Module

（Model No.：ZE16-CO）

Manual

Version：1.1

Date of issue：2018.05.23

Zhengzhou Winsen Electronics Technology Co., Ltd.

Tel: 86-371-67169097 67169670 Fax: 86-371-60932988 Email: sales@winsensor.com

Statement

This manual's copyright belongs to Zhengzhou Winsen Electronics Technology Co., LTD. Without the written permission, any part of this manual shall not be copied, translated, stored in database or retrieval system, also can't spread through electronic, copying, record ways.

Thanks for purchasing our product. In order to let customers use it better and reduce the faults caused by misuse, please read the manual carefully and operate it correctly in accordance with the instructions. If users disobey the terms or remove, disassemble, change the components inside of the sensor, we shall not be responsible for the loss.

The specific such as color, appearance, sizes &etc., please in kind prevail.

We are devoting ourselves to products development and technical innovation, so we reserve the right to improve the products without notice. Please confirm it is the valid version before using this manual. At the same time, users' comments on optimized using way are welcome.

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

Zhengzhou Winsen Electronics Technology CO., LTD.

Electrochemical Carbon Monoxide Gas Module ZE16-CO

Profile

ZE16-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. Built-in temperature sensor can do temperature compensation; and it has digital output and analog voltage output. It is a combination of mature electrochemical detection principle and sophisticated circuit design.

Features

Supply different output ways: UART, analog voltage &etc.

Main Applications

For residential occasions to detect CO concentration, smart home.

Technical Parameters Stable1.

Model No.	ZE16-CO
Detection gas	Carbon Monoxide（CO gas）
Interfering gases	Alcohol &etc.
Output data	UART output
Working voltage	5V (DC)
Working current	<5mA
Preheating time	30 seconds
Response time	≤30 seconds
Recovery time	≤30 seconds
Detection range	0～500ppm
Resolution	1ppm
Working temperature	-10℃～55℃
Working humidity	15%RH-90%RH（no condensation）
Storage temperature	-10℃～55℃
Life span	2 years（in air）

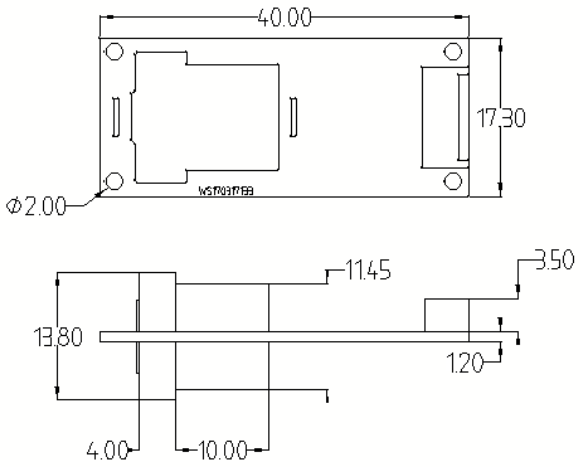
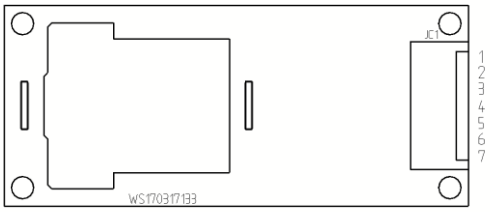


Fig1. Structure

Definition of pins **Stable2.**

PIN1	Reserved
PIN2	Preheating mode: 1.25s high electrical level, 1.25s low electrical level, the electrical level cycle lasts for 30s. Low electrical level output once preheating done. Alarm mode: 3.3V high electrical level output, to set according to users' demand (alarm range: 0-500ppm, default is that high electrical level output at 150ppm)
PIN3	GND
PIN4	VCC
PIN5	UART-RXD
PIN6	UART-TXD
PIN7	PWM output, 50ms is a cycle (20%-80% duty ratio is corresponding to 0-500ppm)



Stable2. Pins

Communication Protocol

1. General Settings

Table 3

Baud Rate	9600
Data Byte	8
Stop Byte	1
Check Byte	Null

2. Communication Commands

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

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

Gas concentration value = low 5 bits of concentration (High Byte)*256+concentration (Low Byte)

CO gas concentration=1*256+44=300ppm

Full range=Full Range(High Byte)*256+Full Range(Low Byte)

0X01f4 is 500, that means max concentration in UART mode is 500ppm

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);
 }
```

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 5 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 long time.