



Electrochemical CO Module

(Model: ZE07-CO)

User's Manual

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Zhengzhou Winsen Electronics Technology Co., Ltd

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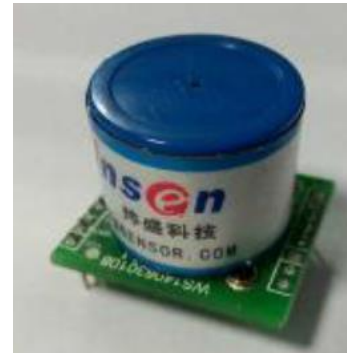
Electrochemical CO Module ZE07-CO

Product Description

ZE07-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

- *High sensitivity & resolution& Stability
- *Extremely low power consumption
- *Provide UART/Analog Voltage output
- *Excellent ability of Anti-interference
- *Provide Temperature compensation
- *Excellent Linear output



Main applications

Portable detector, air-quality monitor device, air ventilation system, smart home &etc.

Technical Parameters and Structure

Model No.	ZE07-CO
Target Gas	CO gas
Interference Gas	Alcohol and other gases
Output Data	DAC(0.4~2V standard voltage output corresponding to 0~full scale)
	UART Output (3V-TTL Electrical Level)
Working Voltage	5V~12V (No voltage reverse connect protection)
Warm up time	≤3minutes
Response time	≤60s
Resume time	≤60s
Detection Range	0~500ppm
Resolution	0.1ppm
Operating Temp.	-10°C~55°C
Operating Hum.	15%RH~90%RH(No condensation)
Storage temp.	-10°C~55°C
Working life	3-5 years (in air)

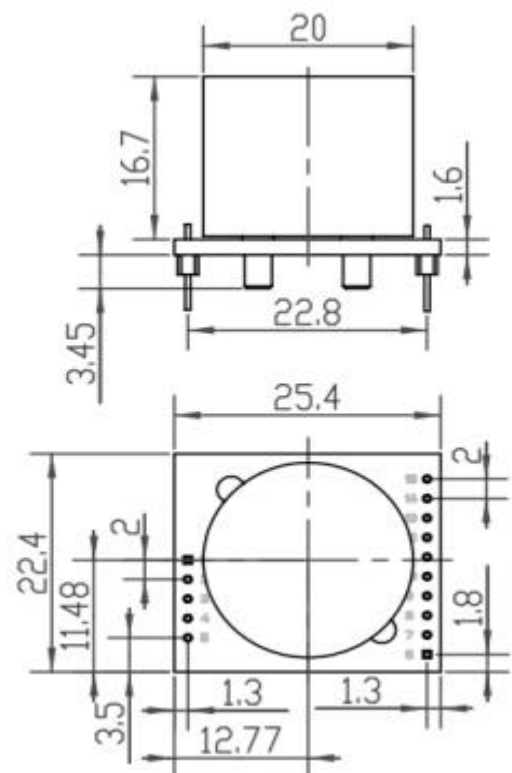


Fig1. Structure

Pin Description

PIN15	Vin (Voltage input 5V~12V)
PIN5、PIN14	GND
PIN1	Reserved
PIN3	Reserved
PIN4	Reserved
PIN7	UART (RXD) 0~3.0V Data input
PIN8	UART(TXD) 0~3.0V Data output
PIN9	Reserved
PIN10	DAC 0.4V-2V (0 - full scale)
PIN2/ PIN6/ PIN11/ PIN12/ PIN13	NC

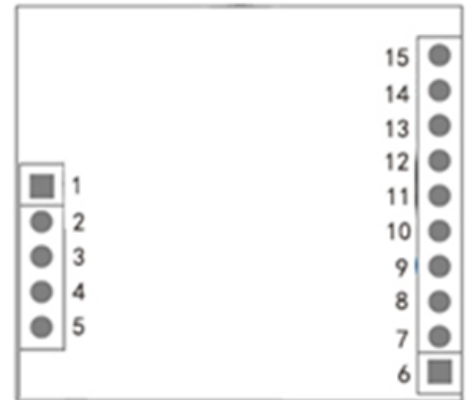


Fig 2 Pins Diagram

Communication Protocol

1. General Settings

Table 3

Baud rate	9600
Data bits	8
Stop bits	1
Parity	None

2. Communication Commands

There are two kinds of communication mode: initiative upload mode and question & answer (Q&A) mode. We take initiative upload mode as the default settings. The module sends the gas concentration value every other 1s and the command line format is as follows: **Table 4**

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte6	Byte 7	Byte 8
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	1= 0x01	0x00	0x25	0x13	0x88	0x38

Gas concentration value = (High Byte*256+Low Byte) x 0.1

Please note that in the above calculation formula, the byte4 and byte5 means the decimalism value changed from hexadecimal.

Switch to the question & answer (Q&A) mode, the command line format is as follows: **Table 5**

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte6	Byte 7	Byte 8
Start Byte	Reserve	Switch command	Q&A mode	Reserve	Reserve	Reserve	Reserve	Check sum
0xFF	0x01	0x78	0x41	0x00	0x00	0x00	0x00	0x46

Switch to the initiative upload mode, the command line format is as follows: **Table 6**

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte6	Byte 7	Byte 8
Start Byte	Reserve	Switch command	Initiative upload	Reserve	Reserve	Reserve	Reserve	Check sum
0xFF	0x01	0x78	0x40	0x00	0x00	0x00	0x00	0x47

Question & answer mode, the Question command line format is as follows: **Table 7**

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte6	Byte 7	Byte 8
Start Byte	Reserve	Command	Reserve	Reserve	Reserve	Reserve	Reserve	Check sum
0xFF	0x01	0x86	0x00	0x00	0x00	0x00	0x00	0x79

Question & answer mode, the Answer command line format is as follows: **Table 8**

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte6	Byte 7	Byte 8
Start Byte	Command	Concentration (High Byte)ppm	Concentration (Low Byte)ppm	Reserve	Reserve	Concentration (High Byte)ppm	Concentration (Low Byte)ppm	Check sum
0xFF	0x86	0x00	0x20	0x00	0x00	0x00	0x20	0x3A

Gas concentration value = (High Byte*256+Low Byte) x 0.1

Please note that in the above calculation formula, the byte4 and byte5 means the decimalism value changed from hexadecimal.

3. Check sum and calculation

```
*****  
* Function Name: unsigned ucharFucCheckSum(uchar *i,ucharIn)  
* Functional description: Sum check 【Not (Byte1+Byte2+...Byte7) +1】  
*****/  
    unsigned char FucCheckSum(unsigned char *i,unsigned char In)  
    {  
        unsigned char j,tempq=0;  
        i+=1;  
        for(j=0;j<(In-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 a long time.

Note: To keep continual product development, we reserve the right to change design features without prior notice.

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