



Electrochemical CO Module

(Model: ZE07-CO)

User's Manual

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Zhengzhou Winsen Electronics Technology Co., Ltd

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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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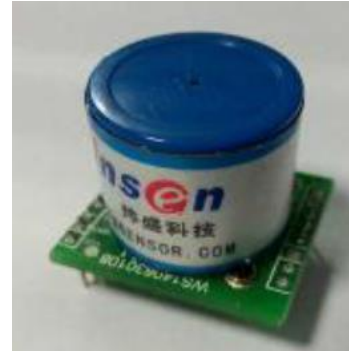
Electrochemical CO Module ZE07-CO

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/PWM wave 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
Interference Gas	Alcohol and other gases
Output Data	DAC (0.4~2V standard voltage output)
	UART Output (3V 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)

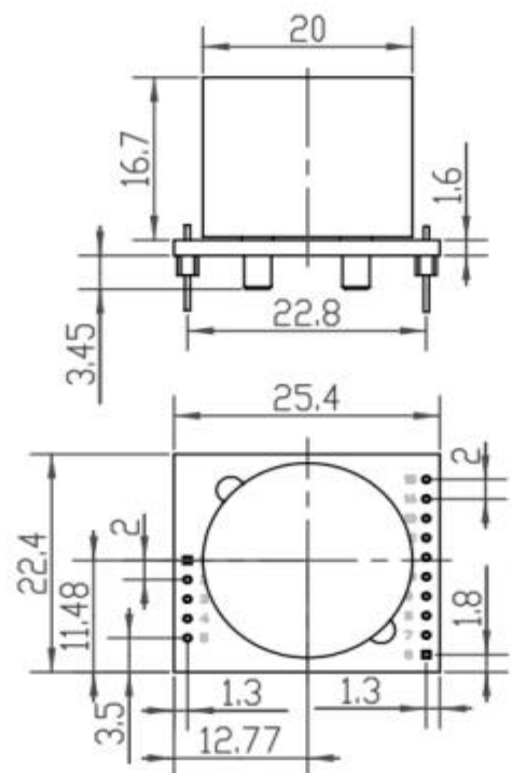


Fig1. Structure

Pin Description

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

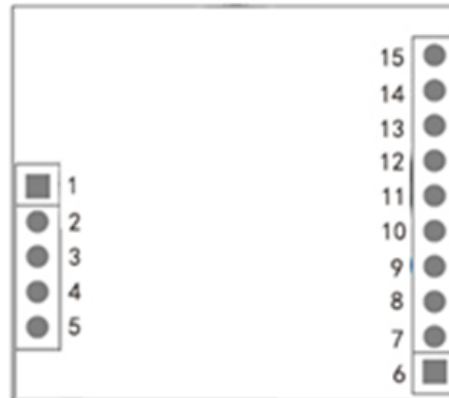


Fig 2 Pins Diagram

Communication Protocol

1. General Settings

Table 3

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

2. Communication Commands

There are two kinds of communication, initiative upload mode and question & answer mode. We take initiative upload mode as the default settings. The module upload a gas concentration value every 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	0x25

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. For example: Original byte4 is 1B and original byte5 is 2C.

1B is hexadecimal and it is 27 after changing to decimalism.

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

So, concentration= (27x256+44)x0.1

Switch command to the question & answer 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 command 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 Question 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)	Concentration (Low Byte)	Reserve	Reserve	Concentration (High Byte)	Concentration (Low Byte)	Check sum
0xFF	0x86	0x00	0x20	0x00	0x00	0x00	0x20	0x30

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

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<(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 a long time.

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

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