



# **Electrochemical Gas Detection Module**

**User's Manual V1.6  
(Model: ZE03)**

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Zhengzhou Winsen Electronics Technology Co., Ltd

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## Electrochemical Detection Module ZE03

ZE03 is a general-purpose and high-performance electrochemical module. It uses three electrodes, electrochemical gas sensor and high-performance micro-processor. By installing different gas sensor, the module could detect relevant gas. It is with built-in temperature sensor to make temperature compensation, which makes it could detect the gas concentration accurately. It has the digital output and analog voltage output at the same time which facilities the usage and calibration and shorten the development period. It is a combination of mature electrochemical detection principle and sophisticated circuit design, to meet customers' different detection needs.

### Features

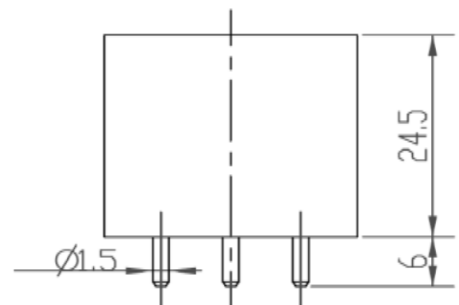
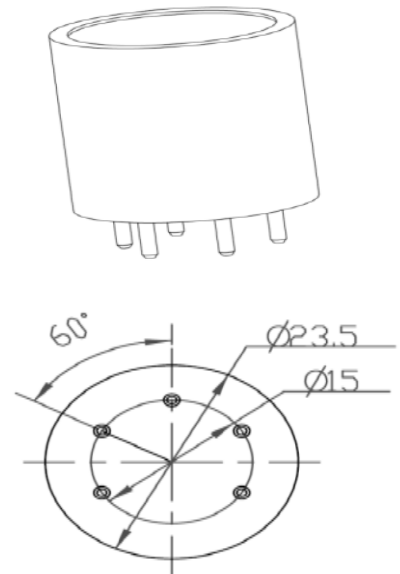
- High sensitivity & resolution
- Low power consumption
- UART and analog voltage output
- Good stability and excellent anti-interference ability

### Main Application

Portable and fixed gas detector, various gas detection equipment and situation.

### Technical Parameters

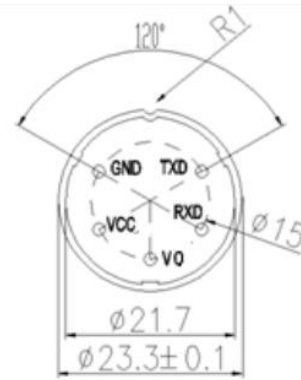
Model No.	ZE03
Target Gas	CO, SO <sub>2</sub> , NH <sub>3</sub> , H <sub>2</sub> S, O <sub>2</sub> and so on
Measurement Range	CO: 0~1000 ppm SO <sub>2</sub> : 0~20 ppm NH <sub>3</sub> : 0~100 ppm.....
Working Voltage	DC 3.7V~9V
Working Current	< 5 mA
Output Data	UART Output (3V electrical level)
	Analog Voltage
Working Life	> 1 year
Operating Environment	Temp.: 0~50°C
	Hum.: 20%RH-90%RH
Storage Environment	Temp.: 0~55°C
	Hum.: 20%RH-90%RH
Size	Ø23.5mm*24.5mm



## Communication Protocol

### 1.General Settings

Baud Rate	9600
Data Bits	8 bytes
Stop Bits	1 byte
check bits	Null



### 2.Communication Specification

The default communication type is active upload and it sends gas concentration every other one second. (the concentration 16 hexadecimal). Send 0x78 command to change communication type. After changing the communication type to 0x04 (Q&A type), only by receiving the 0x86 command (reading concentration value command), current concentration value can be sent.

### 3.Commands

0X78—amend sensor communicate type (communication type: 0x03 active upload type, 0x04 passive upload type)

1	0x78	Amend communication type							
Upload	0	1	2	3	4	5	6	7	8
	Start Byte	Address	Demand	Communication Type	--	--	--	--	Checksum
	0xFF	0X01	0x78	0x03	0	0	0	0	0x84
EXP	FF 01 78 03 00 00 00 00 84								
Receive	0	1	2	3	4	5	6	7	8
	Start Byte	Command	Return calibration	--	--	--	--	--	Checksum
	0xFF	0X78	Succeed: 1 Failure: 0	0	0	0	0	0	0x84
EXP	FF 78 01 00 00 00 00 00 87								

0x86 To read the concentration value

1	0x86	Amend communication type							
Upload	0	1	2	3	4	5	6	7	8
	Start Byte	Address	Demand	--	--	--	--	--	Checksum
	0xFF	0X01	0x86	0	0	0	0	0	0x79
EXP.	FF 01 86 03 00 00 00 00 79								
Receive	0	1	2	3	4	5	6	7	8
	Start Byte	Command	Concentration value		--	--	--	--	Checksum
	0xFF	0X86	High byte	Low byte	0	0	0	0	--
EXP.	FF 86 00 00 00 00 00 00 7A (concentration value is 0% Vol)								

#### 4.Checksum and calculation

```
/******  
* Function Name: ucharFucCheckSum (uchar *i,ucharIn)  
* Functional description: Sum check 【Take Non(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

- Please do not take away or plug the sensor in the module
- Sensor shall avoid organic solvent, coatings, medicine, oil and high concentration gases
- Excessive impact or vibration should be avoided
- Please keep the modules warming up for at least 5 minutes when first using
- Please do not use the modules in systems which related to human being's safety.
- Please do not use the modules in strong air convection environment.
- Please do not expose the modules in high concentration organic gas for a long time.

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