Electrochemical CH$_2$O Detection Module

（Model：ZE08-CH$_2$O）

User's Manual

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Zhengzhou Winsen Electronics Technology Co., Ltd

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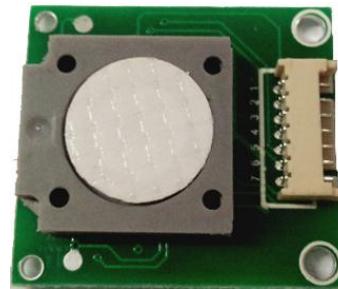
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Zhengzhou Winsen Electronics Technology CO., LTD.

Electrochemical CH2O Detection Module ZE08-CH2O

Profile

ZE08-CH2O is a general-purpose and miniaturization electrochemical formaldehyde detection module. It utilizes electrochemical principle to detect CH2O in air which makes the module with high selectivity and stability. It is built-in temperature sensor to make temperature compensation. It has the digital output and analog voltage output at the same time. It is a combination of mature electrochemical detection principle and sophisticated circuit design.

Features

*High sensitivity &resolution, Low power consumption, Long life

*UART/Analog Voltage/PWM wave output

* Good stability, Excellent ability of Anti-interference

* Temperature compensation , Excellent Linear output
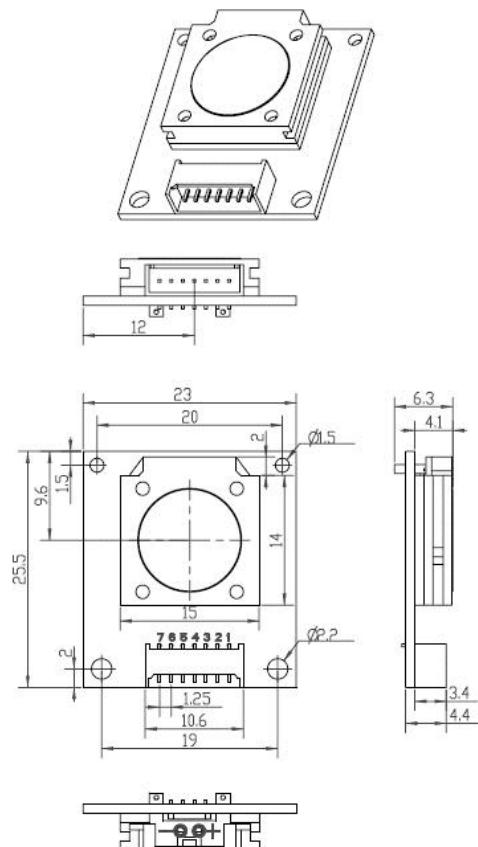
Main Application

Portable detector, air-quality monitor, air cleaner, air renewal system, air conditioner, smart home.

Technical Parameters   **Stable 1.**
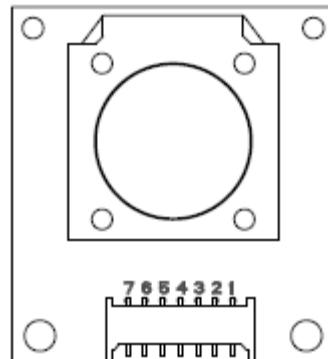
Model No.	ZE08-CH2O
Target Gas	CH2O
Interference Gas	Alcohol, CO &ect.
Output Data	DAC(0.4～2V standard voltage output)
	UART output（3V Electrical Level ）
Working Voltage	3.7V～9V（ With voltage reverse connect protection）
Warm up time	≤3 minutes
Response time	≤60s
Resume time	≤60s
Detection Range	0～5ppm
Resolution	≤0.01ppm
Operating Temp.	0～50℃
Operating Hum.	15%RH-90％RH(No condensation)
Storage temp.	0～50℃
Working life	2 years（in air）

Pin Description: **Table 2**

PIN	Instruction
Pin4	Vin（Voltage input 3.7V～9V）
Pin3	GND
Pin2	DAC (0.4～2V,for 0-5ppm)
Pin7	PWM
Pin1	HD (Zero calibration，only for factory use)
Pin5	UART（RXD） 0～3.3V data input
Pin6	UART（TXD） 0～3.3V data output

Fig. Pin figure of the Module

Communication Protocol:

1. General Settings

Table 3

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

2 .Commands

There are two communication type: active upload type and Q&A type. The default type for this module is active upload and it sends gas concentration every other one second. Commands as follow:

Table 4

0	1	2	3	4	5	6	7	8
Start Byte	Gas Name CH2O	Unit ppb	No decimal byte	Concentration (High Byte)	Concentration (Low Byte)	Full Range (High Byte)	Full Range (Low Byte)	Checksum
0XFF	0X17	0x04	0x00	0x00	0x25	0x13	0x88	0x25

Gas concentration value=High byte of concentration *256+ Low byte of concentration

Switch to Q&A type, commends as follow:

Table 5

0	1	2	3	4	5	6	7	8
Start Byte	reserved	Switch command	Q&A	reserved	reserved	reserved	reserved	checksum
0xFF	0x01	0x78	0x41	0x00	0x00	0x00	0x00	0x46

Switch to active upload type, commends as follow:

Table 6

0	1	2	3	4	5	6	7	8
Start Byte	reserved	Switch command	Active upload	reserved	reserved	reserved	reserved	checksum
0xFF	0x01	0x78	0x40	0x00	0x00	0x00	0x00	0x47

To read the concentration value, commends as follow:

Table 7

0	1	2	3	4	5	6	7	8
Start Byte	reserved	command	reserved	reserved	reserved	reserved	reserved	checksum
0xFF	0x01	0x86	0x00	0x00	0x00	0x00	0x00	0x79

To return, commends as follow:

Table 8

0	1	2	3	4	5	6	7	8
Start Byte	command	High byte(ug/m3)	Low byte (ug/m3)	reserved	reserved	High byte (ppb)	High byte (ppb)	checksum
0xFF	0x86	0x00	0x2A	0x00	0x00	0x00	0x20	0x30

Gas concentration value=High byte of concentration *256+ Low byte of concentration

3 .Checksum and calculation

```
/*********************************************************************
* Function Name: unsigned char FucCheckSum(uchar *i,ucharln)
 * Functional description: Sum check【Take Not(Byte1+Byte2+…Byte7) +1】
 * Function declaration: Take Not(Byte1+Byte2+…ByteX (X>2)

*********************************************************************/
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);
}
```

Cross interference gas: **Table 5**

Gas	Concentration	Concentration output
NH_3	50ppm	0ppm
C_6H_6	100ppm	0.1ppm
Cl_2	10ppm	0.1ppm
CH3CL	5ppm	0.1ppm
C3H6O	100ppm	0.2ppm
C2H4O	10ppm	0.5ppm
SO2	20ppm	0.8ppm

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H2S	100ppm	3.7ppm
H2	500ppm	5.5ppm
C2H5OH	131ppm	5ppm
CH3OH	42ppm	5ppm
CH2O	5ppm	5ppm

Cautions:

1. Sensor shall Avoid organic solvent, coatings, medicine, oil and high concentration gases
2. Excessive impact or vibration should be avoided；
3. Please keep the modules warming up for at least 5 minutes when first using.
4. Please do not use the modules in systems which related to human being's safety.
5. Please do not use the modules in strong air convection environment.
6. 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.