



Electrochemical CH₂O Detection Module

(Model: ZE07-CH₂O)

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.

Zhengzhou Winsen Electronics Technology CO., LTD.

Electrochemical CH2O Detection Module ZE07-CH2O

Product Description

ZE07-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 a combination of mature electrochemical detection principle and sophisticated circuit design.

Features

- *High sensitivity & resolution& Good stability
- *Extremely low power consumption
- *UART/Analog Voltage/PWM wave output
- * Excellent ability of Anti-interference
- *Temperature compensation
- *Excellent Linear output

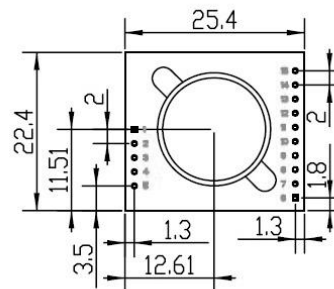
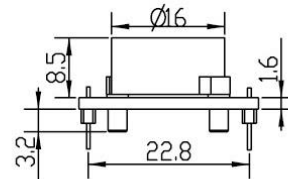
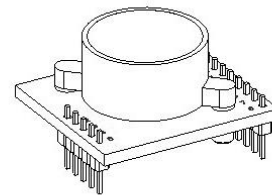


Application

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

Parameters

| | |
|------------------|---|
| Model No. | ZE07-CH2O |
| Target Gas | CH2O |
| Interference Gas | Alcohol, CO &etc. |
| Output Data | DAC(0.4~2V standard voltage output) |
| | UART Output(3V Electrical Level) |
| Working Voltage | 3.7V~9V (No 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°C ~ 50°C |
| Operating Hum. | 15%RH-90%RH (No condensation) |
| Storage temp. | 0°C ~ 50°C |
| Working life | 2 years(in air) |

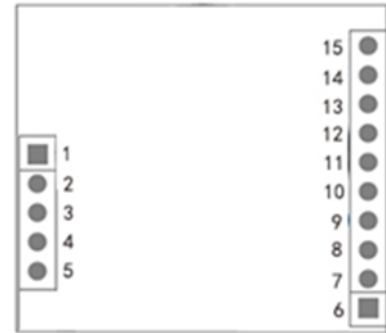


Structural drawing

Pin Description

Table 2

| | |
|-----------------------------|---|
| PIN15 | Vin (Voltage input 3.7V-9V) |
| PIN5、PIN14 | GND |
| PIN1 | VOUT(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 measuring range) |
| PIN2/PIN6/PIN11/PIN12/PIN13 | NC |



Picture 2: 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 type | Unit | No decimal byte | Concentration (High Byte) | Concentration (Low Byte) | Full Range (High Byte) | Full Range (Low Byte) | Checksum |
| 0XFF | CH2O =0X17 | Ppb=0x04 | 0x00 | 0x00 | 0x25 | 0x13 | 0x88 | 0x25 |

Gas concentration value= Concentration High Byte *256+ Concentration Low Byte

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 | Concentration High byte(ug/m3) | Concentration Low byte (ug/m3) | reserved | reserved | Concentration High byte (ppb) | Concentration High byte (ppb) | Checksum |
| 0xFF | 0x86 | 0x00 | 0x2A | 0x00 | 0x00 | 0x00 | 0x20 | 0x30 |

3 Checksum and calculation

* Function Name: ucharFucCheckSum(uchar *i,uchar ln)

* Functional description: Sum check 【Take Not(Byte1+Byte2+...Byte7) +1】

*****/

```
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 ₆ H ₆ | 100ppm | 0.1ppm |
| Cl ₂ | 10ppm | 0.1ppm |
| CH ₃ L | 5ppm | 0.1ppm |
| C ₃ H ₆ O | 100ppm | 0.2ppm |
| C ₂ H ₄ O | 10ppm | 0.5ppm |
| SO ₂ | 20ppm | 0.8ppm |
| H ₂ S | 100ppm | 3.7ppm |
| H ₂ | 450ppm | 5ppm |
| C ₂ H ₅ OH | 131ppm | 5ppm |
| CH ₃ OH | 42ppm | 5ppm |
| CH ₂ O | 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.
7. Sensor can't be pulled out.
8. The component can't be removed or replaced.

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

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