

# ZE08-CH2O

## Product description:

The ZE08-CH2O electrochemical formaldehyde module is a general-purpose, compact module. The electrochemical principle is used to detect the CH2O present in the air, which has good selectivity and stability. Built-in temperature sensor for temperature compensation; digital output and analog voltage output for easy use. ZE08-CH2O is a universal gas module designed and manufactured by combining sophisticated electrochemical detection technology with sophisticated circuit design.

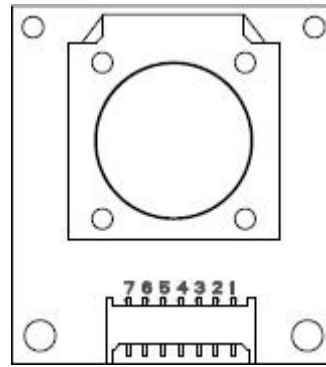
## Main application:

Portable instruments, air quality monitoring equipment, air purifiers, fresh air ventilation systems, air conditioners, smart home equipment and other places.

Product number	ZE08-CH2O
Gas detection	formaldehyde
Interference gas	Alcohol, carbon monoxide, etc.
Output Data	DAC (0.4~2V voltage signal corresponding
	Concentration: 0~ full scale)
Operating Voltage	UART output (3V TTL level)
Preheat time	3.7V to 5.5V
Response time	≤3 minutes
Recovery Time	≤60 seconds
Range	≤60 seconds
Resolution	0 to 5 ppm
Operating temperature	≤0.01ppm
Working humidity	-20 ° C ~ 50 ° C
storage temperature	15% RH-90% RH (no condensation)
Service life	0 to 25 ° C

## PIN function:

PIN name	Pin description
Pin1	Reserved
Pin2	DAC (0.4~2V, corresponding to 0-full scale)
Pin3	GND
Pin4	Vin (voltage input 3.7V ~ 5.5V)
Pin5	UART (RXD) 0~3.3V data input
Pin6	UART (TXD) 0 ~ 3.3V data output
Pin7	Reserved



## Protocol

### 1. Universal settings

Baud rate	9600
Data bit	8 bit
Stop bit	1 bit
Check Digit	NO

### 2. Communication commands

The communication is divided into active uploading and question answering. The factory default upload is active, and the concentration value is sent once every interval of 1S.

If the user switches to the Q&A mode and needs to switch back to active upload, send the following command line format:

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Bit	Save	Switch command	Active upload	Save	Save	Save	Save	Check value
0xFF	0x01	0x78	0x40	0x00	0x00	0x00	0x00	0x47

The format of the active upload data is as follows:

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Bit	Gas name (CH2O)	Unit (ppb)	Decimal number	High gas concentration	Low gas concentration	full range High	full range Low	Check value
0xFF	0x17	0x04	0x00	0x00	0x25	0x13	0x88	0x25

Note: Gas concentration value (PPB) = (gas concentration high \*256 + gas concentration low).

When converted to PPM: PPM = PPB/1000.

1PPM × 1.25 = 1.25mg/m<sup>3</sup>.

When the user needs the question and answer mode, the Active upload data can be closed by sending the following command format, and then the command to read the density can be sent.

The command line format for closing Active upload is as follows:

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Bit	Save	Switch command	问答	Save	Save	Save	Save	Check value
0xFF	0x01	0x78	0x41	0x00	0x00	0x00	0x00	0x46

In the Q&A mode, the command format for reading the density is as follows:

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Bit	Save	Command	Save	Save	Save	Save	Save	Check value
0xFF	0x01	0x86	0x00	0x00	0x00	0x00	0x00	0x79

The returned sensor concentration value display format is as follows:

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start Bit	Command	High gas concentration (ug/m3)	Low gas concentration (ug/m3)	Save	Save	High gas concentration (ppb)	Low gas concentration (ppb)	Check value
0xFF	0x86	0x00	0x2A	0x00	0x00	0x00	0x20	0x30

Gas concentration value = High gas concentration \* 256 + low gas concentration

### 3. Checksum calculation

Checksum = (inverse (Byte1+Byte2+...+Byte7)) + 1 reference routine is as follows:

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/*****

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*Function name: unsigned char FucCheckSum(uchar *i,uchar ln)

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*Function description: summation check (take 1\2\3\4\5\6\7 of the sending and receiving protocols and invert +1)

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*Function description: Add the elements of the array 1 - the second to last element and then invert +1 (the number of elements must be greater than 2)

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```

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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 characteristics:**

gas	concentration/ppm	HCHO
formaldehyde	5	5
benzene	10	0.1
Toluene	10	0.46
Acetic acid	200	0.52
alcohol	100	40.6
Hydrogen sulfide	50	3
Carbon monoxide	200	0.64

### **Precautions:**

1. The module avoids contact with organic solvents (including silica gel and other adhesives), paints, chemicals, oils and high-concentration gases.
2. The module can not be completely encapsulated with resin material, nor can it be immersed in an oxygen-free environment, otherwise it will damage the performance of the sensor;
- 3, the module can not be used for a long time in the environment containing corrosive gases, corrosive gases will damage the sensor;
2. The module cannot withstand excessive impact or vibration.
3. The module needs to be preheated for 24-48 hours when it is first powered on, so that the module can be fully stabilized and then tested normally.
4. Do not apply the module to systems that involve personal safety.
5. Do not install the module in a strong convection air environment.
6. Do not place the module in a high concentration of organic gas for a long time. If it is placed for a long time, it will cause the sensor zero to drift and recover slowly.
7. It is forbidden to use hot melt adhesive or sealant package module with curing temperature higher than 80 °C;
8. It is forbidden to store and use in high concentration alkaline gas for a long time.

