



Electrochemical H2 Module

(Model: ZE610-H2)

User's Manual

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Zhengzhou Winsen Electronics Technology Co., Ltd

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Zhengzhou Winsen Electronics Technology CO., LTD.

Electrochemical H2 Module ZE610-H2

Product Description

ZE610-H2 is a general-purpose and miniaturization electrochemical hydrogen detection module. It utilizes electrochemical principle to detect H2 gas 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, low power consumption, long lifespan
- *UART/Analog Voltage output
- *Good stability, excellent ability of anti-interference
- *Temperature compensated, excellent Linear output
- *Anti fall-off test



Main applications

Portable detector, air-quality monitor device, air ventilation system, smart home, energy storage occasion &etc.

Technical Parameters and Structure

Model No.	ZE610-H2
Target Gas	Hydrogen gas (H2)
Interference Gas	Alcohol and other gases
Output Data	DAC(0.4~2V standard voltage output corresponding to 0~full scale)
	UART Output (3V-TTL Electrical Level)
Working Voltage	5V~12V (No voltage reverse connect protection)
Warm up time	≤5minutes
Response time	≤60s
Resume time	≤60s
Detection Range	0~5000ppm
Resolution	10ppm
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)

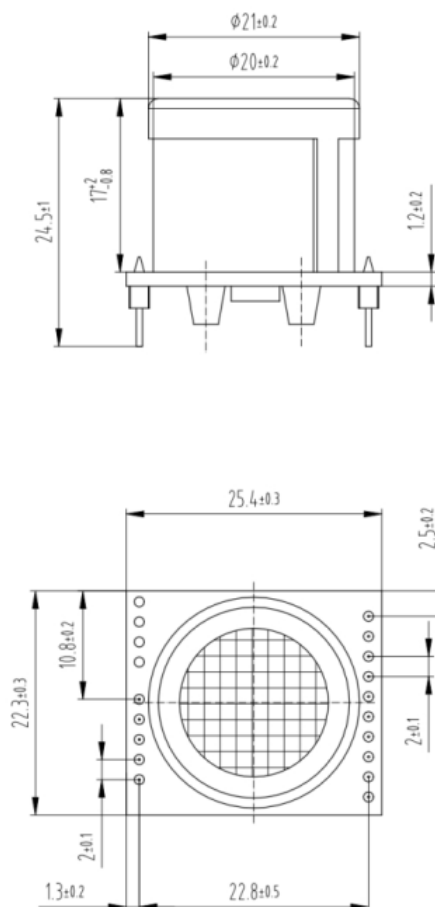
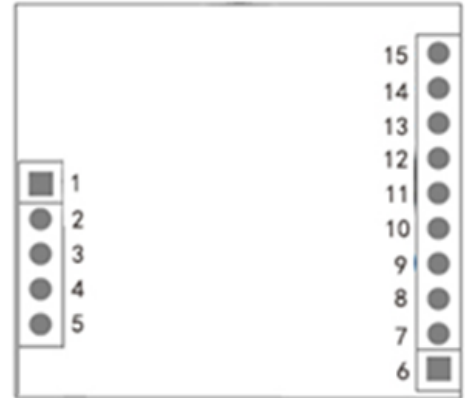


Fig1. Structure

Pin Description table2

PIN15	Vin (Voltage input 5V~12V)
PIN5, PIN14	GND
PIN1, PIN2, PIN3, PIN4, PIN9	Reserved
PIN7	UART (RXD) 0~3.0V Data input
PIN8	UART(TXD) 0~3.0V Data output
PIN10	DAC 0.4V-2V (0 – 5000ppm)



Communication Protocol

1. General Settings

Table 3

Baud rate	9600
Data bits	8
Stop bit	1
Parity	None

2. Communication Commands

There are two kinds of communication mode: active upload mode and question & answer (Q&A) mode.

When it is at active upload mode, the concentration data will be sent every other one second.

1.If users send question command, it will switch into Q&A mode automatically.

2.When it is at Q&A mode, if there is no question command in 30s, it will switch into active upload mode automatically.

Table 4. At active upload mode, users will receive the following data.

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	0x06	0x03	0x00	0x00	0x25	0x13	0x88	0x37

Gas type of 0x06 stands for H2 gas, unit of 0x03 stands ppm.

The most significant digit of Byte4 is failure predication. If it returns 1, failure. If returns 0, work normally.

Gas concentration value = The low 7 digits of Byte4*256+Byte5

Full range=Byte6*256+Byte7

Table5. At Question & answer mode, the Question command line format is as follows:

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

Table6. Question & answer mode, the Answer command line format is as follows:

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

The most significant digit of Byte4 is failure predication. If it returns 1, failure. If returns 0, work normally.

Gas concentration value = The low 7 digits of Byte2*256+Byte3

3. Check sum and calculation

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

* Functional description: Sum check 【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);
}
    
```

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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