



pH Water Quality Detection Module

(Model: ZW03)

Manual

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Zhengzhou Winsen Electronic Technology Co., Ltd

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Zhengzhou Winsen Electronics Technology CO., LTD

ZW03 pH water quality detection module

Profile

The ZW03 pH water quality detection module is a universal module that uses electrochemical principles to detect the H⁺ content in water, with good selectivity and stability. Using the digital signal output, very easy to use. ZW03 is designed and manufactured with mature electrochemical detection technology closely combined with sophisticated circuit design.



Fig1. Sensor image

Sensor characteristics

Low power consumption, high accuracy, linear output, easy calibration and excellent stability.

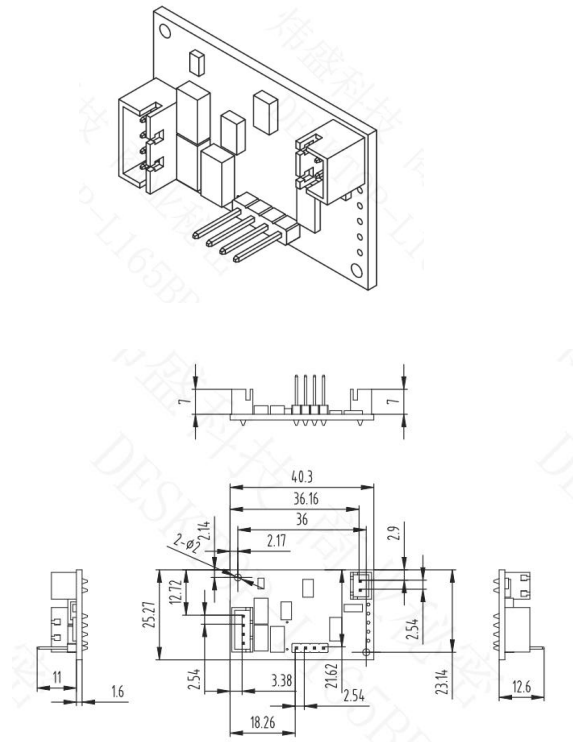
Main application

It is widely used for water quality pH detection in laboratory research, water plant water supply, waste-water treatment, aquaculture, farmland irrigation and other fields.

Technical indicators

Items	Parameter
Working voltage	12V(DC)
Consumption	<25mW
Temperature range	0-50°C
Output mode	RS485 (5V)
Output linearity	Linear
Response time	≤180S
Detection Temperature range	0-50°C

Items	Parameter
Measure range	0-14
Resolution ratio	0.02pH
Size	40×25mm
Response time	≤180 s
Output linearity	Linear
Service life	3year
Working current	<5mA



Note: The tolerance range is $\pm 0.25\text{mm}$

Fig1. Sensor Structure

Stable 2. Pin definition

PIN1	VCC
PIN2	GND
PIN3	A
PIN4	B
PIN5	GND
PIN6	RXD (3V TTL level)
PIN7	TXD (3V TTL level)
PIN8	+5V
PIN9(BNC)	Sensor negative pole
PIN10(BNC)	Sensor positive pole

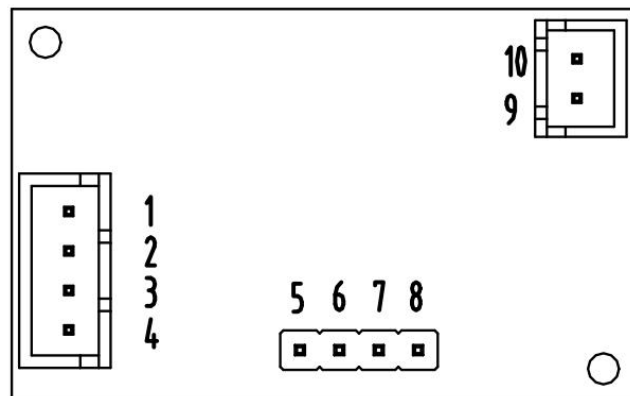


Fig2. Module Pins

Sensor linearity

The sensor be placed in standard pH buffer: pH4.01, pH 6.86 and pH 9.18 to record the output of the module as shown in the figure below.

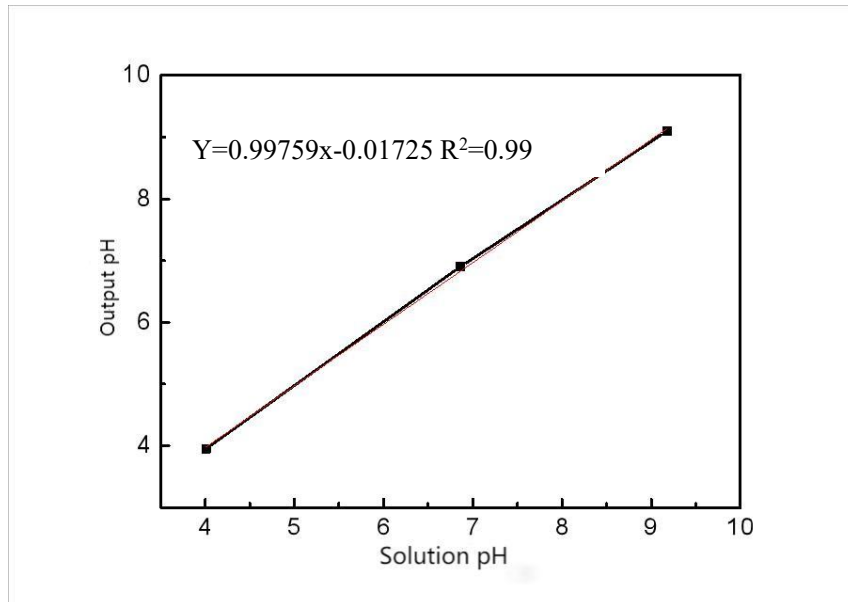


Fig3. Linear sensor curve

Communication Protocol

1.General settings

Baud rate	9600
Data byte	8
Stop byte	1
Check	Null

2.General command

Host-computer software send format

	Type	Instructions	Note
Integer	16 byte	Indicates that high and low bytes are not reversed	For example :0x 0032 turn into the decimal number is 50
Floating point number	ABCD	Represents analyze in order	For example: 41 DB 72 37Z turn into a floating point number is 27.4

Read the current concentration value sending format:

	Module address	FC	start address		Number of registers		CRC16	
			High byte	Low byte	High byte	Low byte	Low byte	High byte
Device 1	0X01	0X03	0X00	0X01	0X00	0X02	0X95	0XCB
Device 2	0X02	0X03	0X00	0X01	0X00	0X02	0X95	0XF8

Write the device address sending format:

	Device ID address	FC	Register initial address		Write Equipment address (The HEX integer)		CRC16	
			High byte	Low byte	High byte	Low byte	Low byte	High byte
Device 1	0XFE	0X06	0X00	0X19	0X00	0X01	0X8D	0XC2
Device 2	0XFE	0X06	0X00	0X19	0X00	0X02	0XCD	0XC3

The calibration of the sensor:

	Device ID address	FC	Register address		Write zero point concentration value (The HEX integer)		CRC16	
			High byte	Low byte	High byte	Low byte	Low byte	High byte
pH4.01	0X01	0X03	0X00	0X66	0X01	0X91	0X65	0XE9
pH6.86	0X01	0X03	0X00	0X66	0X02	0XAE	0X25	0X09
pH9.18	0X01	0X03	0X00	0X66	0X03	0X96	0X25	0X4B

3.Check and calculation

/******

Name: crcl6 verification

Function: crcl6 verification

Enter: (byte pointer)*ptr, (data lenth) len

Return: (double byte) crc

*****/

```
uint16_t getCRC16_485(volatile unsigned char* ptr, unsigned char len)
```

```
{
```

```
    unsigned char i;
```

```
    uint16_t crc = 0xFFFF;
```

```
    while (len--)
```

```
    {
```

```
        crc ^= *ptr;
```

```
        for (i = 0; i < 8; i++)
```

```
        {
```

```
            if (crc & 1)
```

```
    {
        crc >>= 1;
        crc ^= 0xA001;
    }
    else
    {
        crc >>= 1;
    }
}
ptr++;
}
return(crc);
}
```

Precautions

1. The module shall avoid contact with organic solvents, coatings, agents and oils.
2. Do not apply the module to systems involving personal safety.
3. Do not install the module in a strong air convection environment.
4. The module shall not withstand excessive impact or vibration, and can not shake during use, otherwise the value returned will be inaccurate.
5. Please supply the module in strict accordance with the power supply voltage of the module. The voltage exceeding 12V will lead to irreversible damage to the module.
6. Do not place the module in a strong air convection environment.
7. Do not place the module in a high concentration of organic gas for a long time.