



ORP Water Quality Sensor Module

(Model: ZW-ORP101)

Manual

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Zhengzhou Winsen Electronics Technology CO., LTD.

ZW-ORP101 water quality detection sensor module

Description

ZW-ORP101 ORP detection module is a universal module, which uses electrochemical principle to detect REDOX potential in water. It has good selectivity & stability and digital signal output, easy to use. ZW-ORP101 is a universal module designed and manufactured with mature electrochemical detection technology and sophisticated circuit design.



Sensor characteristics

Low power consumption, high precision, easy calibration, good stability.

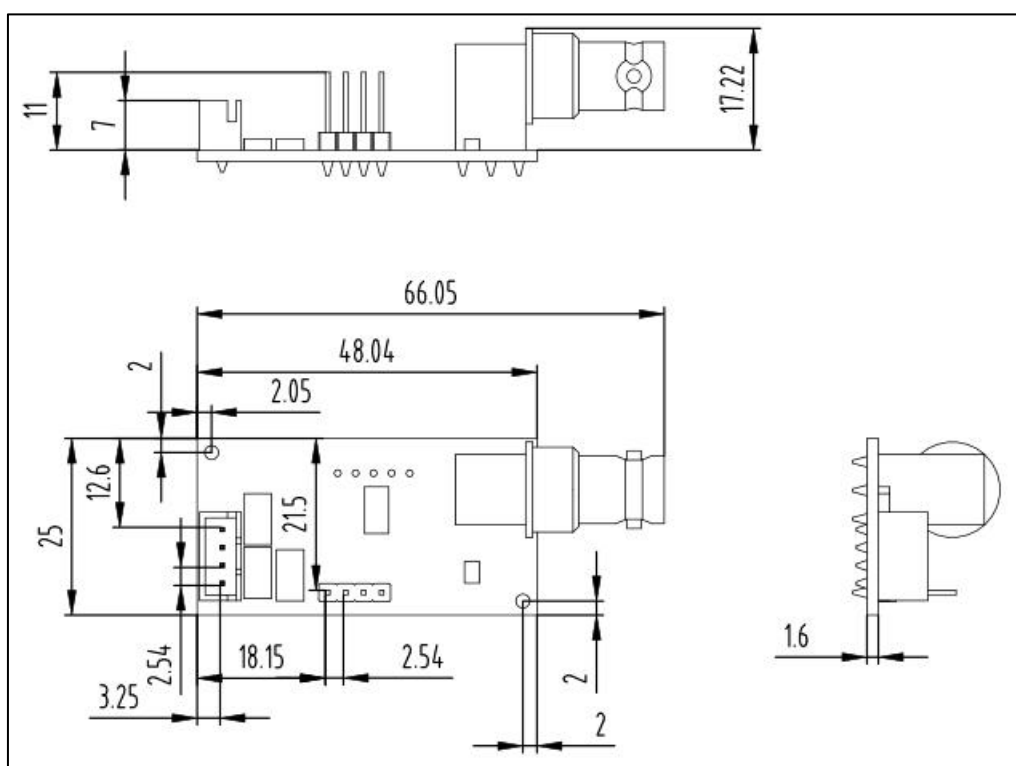
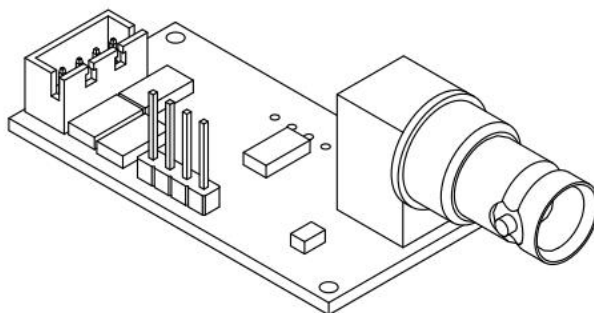
Main application

Widely used in laboratory research, water supply, wastewater treatment, aquaculture, farmland irrigation and other fields of ORP value detection.

Technical Data

Table 1.

Working voltage	12V(DC)	Working current	<5mA
Consumption	<25mW	Detection range	-2000 mV ~ + 2000 mV
Detection temperature range	0-50℃	Resolution	1mV
Output Signal	RS485 (5V Electric level)	Dimension	40×25mm
Response time	≤180S	Output linearity	linearity
Temperature range	0~50℃	Lifespan	3years



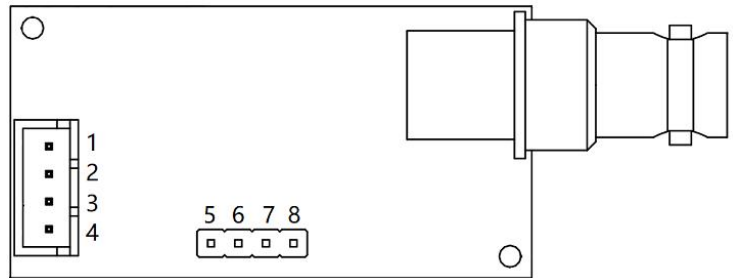
Note: Tolerance range $\pm 0.2\text{mm}$

Pic 1: Module structure diagram

Pin definition

Table 2

PIN1	Power supply VCC
PIN2	Power supply GND
PIN3	A
PIN4	B
PIN5	GND
PIN6	RXD (Electric level)
PIN7	TXD (Electric level)
PIN8	+5V



Pic 2: Module pin diagram

Communication protocol

1. General Configuration

Baud rate	9600
Data bit	8bits
Stop bit	1bit
Check bit	None

2. General command

The upper computer sends the format:

	Data type	Analytic specification	Remark
Integer	16digit integer	Indicates that the high and low bytes of the word element are not reversed	For example, 0x 0032 converts the decimal number to 50
Floating Point Number	ABCD	The value is parsed in sequence	Example: 41 DB 72 37 RPM is 27.4

The lower computer reply format:

	Data type	Analytic specification				Remark
Floating Point Number	ABCD	Data content				Example: 41 DB 72 37 to floating point number, the order is ABCD(AB high byte, CD low byte), 41 DB 72 37 to floating point number is 27.4
		A	B	C	D	

Function code specification:

03	Read concentration values and write calibration data
06	Write address

Read the sending format of the current concentration value:

	Module address	Function code	Origin address		Number of registers		CRC16	
			High byte	Low byte	High byte	Low byte	Low byte	High byte
Read measurement	0X01	0X03	0X00	0X01	0X00	0X02	0X95	0XCB

Answer format::

	Module address	Number of bytes	Read the concentration value (32-bit floating point)				CRC16	
			High byte	Low byte	Low byte	High byte		
Measurement return	0X01	0X04	0X43	0X64	0X2D	0X00	0XB3	0X38

Concentration display unit: mV

Sending format of address writing device

	Device ID address	Function code	Register origin address		Write device address (hexadecimal integer)		CRC16	
			High byte	Low byte	High byte	Low byte	Low byte	High byte
Write device address	0XFE	0X06	0X00	0X19	0X00	0X01	0X8D	0XC2

Return format:

	Device ID address	Function code	Register origin address		New device address (hexadecimal integer)		CRC16	
			High	Low	High	Low	Low	High

			byte	byte	byte	byte	byte	byte
Return value	0X01	0X06	0X00	0X19	0X00	0X01	0X99	0XCD

Write marker point:

	Device ID address	Function code	Register origin address		Write the zero concentration value (hexadecimal integer)		CRC16	
			High byte	Low byte	High byte	Low byte	Low byte	High byte
Write zero point	0X01	0X03	0X00	0X66	0X00	0XDE	0X25	0X8D

Return format

	Device ID address	Function code	Register origin address		Return zero AD value (hexadecimal integer)		CRC16	
			High byte	Low byte	High byte	Low byte	Low byte	High byte
Write return	0X01	0X66	0X10	0X00	0X00	0X00	0X0D	0X02

3. Check sum calculator

/******

Function name: crc16 check

Function Function: crc16 check

Function input: byte pointer *ptr, data length len

Function returns: 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);  
}
```

Note:

1. The module should avoid contact with organic solvents, paints, chemicals 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 can not withstand excessive impact or vibration, the use of the process can not produce shaking, otherwise the return value will not be accurate.
5. Please supply power to the module in strict accordance with the power supply voltage of the module. Voltage over 12V will cause irreversible damage to the module.
6. Do not place the module in a strong air convection environment.
7. Do not place the mold in high concentration of organic gas for a long time.

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