Dissolved Oxygen Water Quality Sensor

(Model：ZW-O101)

User's Manual

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Zhengzhou Winsen Electronic Technology Co., Ltd

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Zhengzhou Winsen Electronics Technology CO., LTD

ZW-O101 dissolved oxygen water quality detection module

Profile

ZW-O101 dissolved oxygen water quality detection module is a universal module that uses electrochemical principle to detect oxygen content in water with good selectivity and stability, using digital signal output which is easy to use. The ZW-O101 module is designed and manufactured with a close combination of mature electrochemical detection technology and sophisticated circuit design.



Features:

*Low power consumption

*High accuracy

*Linear output

*Easy to calibrate

*Better stability

Applications:

It is widely used in the detection of dissolved oxygen water quality in aquaculture and other fields.

Technical indicators:

Items	Parameter	Items	Parameter
Working voltage	12V(DC)	Working current	<5mA
Consumption	<25mW	Detecting Range	0-20mg/L
Detection temperature	0-40℃	Resolution	0.01mg/L
Output mode	RS485（5V）	Dimension Size	40X25mm
Response time	≤20S	Output linearity	Linear
Temperature range	0-40℃	Service life	3year

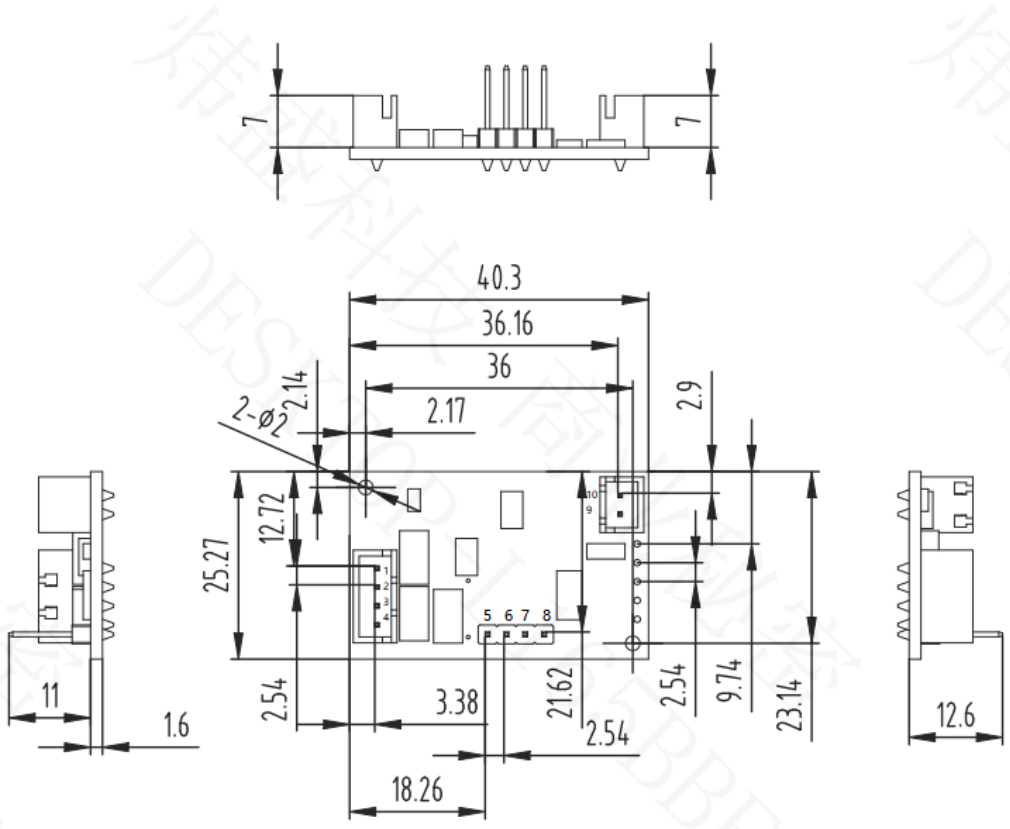
Table 1

Pin Definition:

1	PIN1	VCC
2	PIN2	GND
3	PIN3	A
4	PIN4	B
5	PIN5	GND
6	PIN6	RXD（3V）
7	PIN7	TXD（3V）
8	PIN8	VCC
9	PIN9	Negative terminal
10	PIN10	Positive terminal

Table 2

Module structure:



*Note: Tolerance range ±0.25mm

Figure 1: Module structure diagram

Sensitivity Curve:

Put the module in pure water and oxygen-free water, and the data is as shown in the figure below.

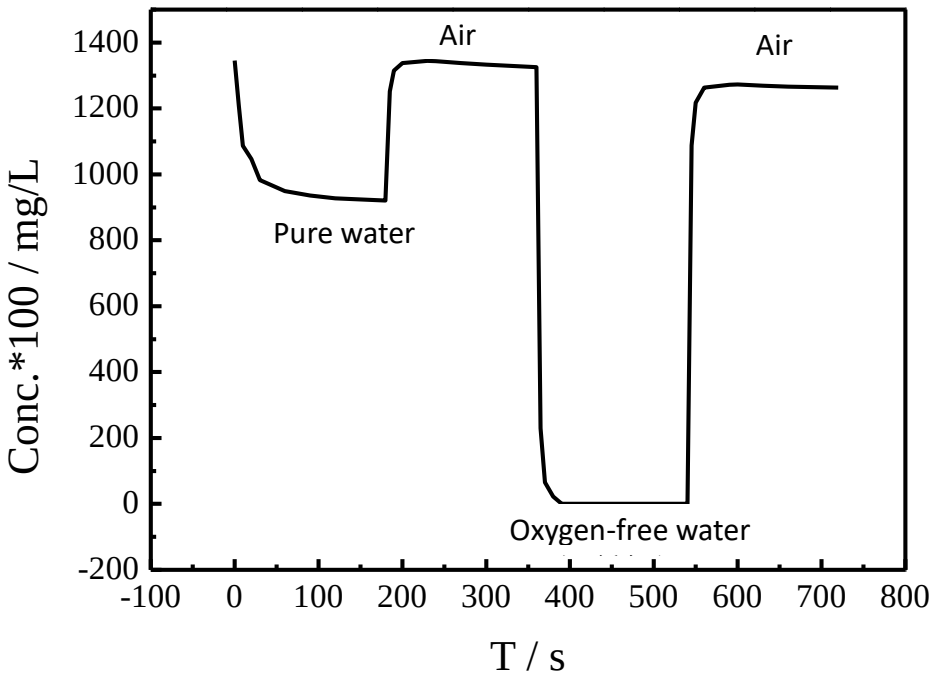


Figure 2: Response and recovery curves

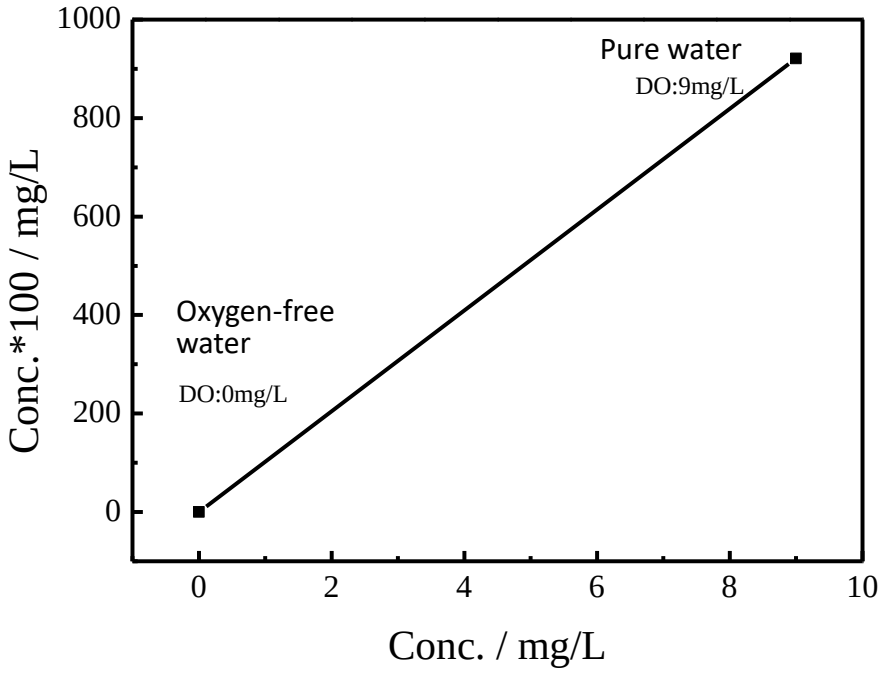


Figure 3: Linear curve

Communication protocols

1. General setting

Items	Parameter
Baud Rate	9600
Data bits	8 bits
Stop bits	1 bit
Check bits	No

2. General commands

Host computer sending format:

	Data Type	Parsing Description	Remarks
Integer	16-bit integer	Means the high and low bytes of the word component are not reversed	Example: 0x 0032 to decimal number 50
Floating number	ABCD	Means parsing in order	Example:41 DB 72 37Z to floating number is 27.4

Function code description:

03	Read single or multiple registers
06	Write a single register
16	Write multiple registers

Reading current concentration value sending format:

	Module address	Function code	Start address		Number of registers		CRC16	
			High byte	Low byte	High byte	Low byte	Low byte	High byte
Reading measured value	0X01	0X03	0X00	0X20	0X00	0X01	0X85	0XC0

Response format:

	Module address	Function code	Number of bytes	Read concentration value (hexadecimal integer)		CRC16	
				High byte	Low byte	Low byte	High byte
Measured value return	0X01	0X03	0X02	0X01	0X01	0X78	0X14

Concentration display unit: ug/L.

Write device address sending format:

	Device ID address	Function code	Register start 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	0X10	0X00	0X01	0X5D	0XC0

Returning Format:

	Device ID address	Function code	Register start address		New device address (Hexadecimal integer)		CRC16	
			High byte	Low byte	High byte	Low byte	Low byte	High byte
Returning Value	0X01	0X06	0X00	0X10	0X00	0X01	0X49	0XCF

Writing 0 point:

	Device ID address	Function code	Register start address		Writing 0 point concentration value (Hexadecimal integer)		CRC16	
			High byte	Low byte	High byte	Low byte	Low byte	High byte
Writing 0 point	0X01	0X06	0X00	0X22	0X00	0X00	0X29	0XC0

Returning Format:

	Device ID address	Function code	Register start address		Return the 0 point AD value (Hexadecimal integer)		CRC16	
			High byte	Low byte	High byte	Low byte	Low byte	High byte
Writing Return	0X01	0X06	0X00	0X22	0X00	0X00	0X29	0XC0

Writing SPAN point:

	Device ID address	Function code	Register start address		Writing SPAN point concentration value (Hexadecimal integer)		CRC16	
			High byte	Low byte	High byte	Low byte	Low byte	High byte
Writing SPAN point	0X01	0X06	0X00	0X23	0X23	0X28	0X61	0X2E

Returning Format:

	Device ID address	Function code	Register start address		Return the SPAN point AD value (Hexadecimal integer)		CRC16	
			High byte	Low byte	High byte	Low byte	Low byte	High byte
Writing Return	0X01	0X06	0X00	0X23	0X00	0X00	0X78	0X00

	Module address	Function code	Start address		Number of registers		CRC16	
			High byte	Low byte	High byte	Low byte	Low byte	High byte
Reading the 0 point AD value	0X01	0X03	0X00	0X22	0X00	0X01	0X24	0X00

Reading the 0 point AD value:

Returning Format:

	Module address	Function code	Number of bytes	Return the 0 point AD value (Hexadecimal integer)		CRC16	
				High byte	Low byte	Low byte	High byte
Reading Return	0X01	0X03	0X02	0X00	0X02	0X39	0X85

Reading the SPAN point AD value:

	Module address	Functio n code	Start address		Number of registers		CRC16	
			High byte	Low byte	High byte	Low byte	Low byte	High byte
Reading the SPAN point AD value	0X01	0X03	0X00	0X23	0X00	0X01	0X75	0XC0

Returning Format:

	Module address	Function code	Number of bytes	Return the SPAN point. AD value (Hexadecimal integer)		CRC16	
				High byte	Low byte	Low byte	High byte
Reading Return	0X01	0X03	0X02	0X00	0X02	0X39	0X85

3. Verification and calculation

```
/*****************************************************************************

Function Name：crc16 Verification

Function ：crc16 Verification

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);
}
```

Cautions:

1. The module shall avoid contact with organic solvents, coatings, pharmaceuticals, 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 be subjected to excessive impact or vibration, and can not be shaken during use, otherwise the returned value will be inaccurate.
5. Please supply the module in strict accordance with the power supply voltage of the module, the voltage exceeds 12V will lead to irreversible damage of the module.
6. Please do not place the module in high concentration organic gas for a long time.

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