iZS-306 Online Turbidity Sensor
User Manual

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base No. 15

User Notes

- Before use please read this description, and save it for reference.
- Please follow this manual procedures and precautions.
- Upon receipt of the instrument, carefully open the package, whether viewing instruments and accessories due to shipping damage, if any damage is found, immediately notify the manufacturers and distributors, and retain the packaging material for return processing.
- When the instrument malfunction, do not repair itself, please contact the manufacturer's after-sales department.

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Ⅰ.Working principle

iZS-306 integral line turbidity sensor design uses the principle of scattered light produced by turbidity measurement. When the one beam is incident on water samples, water samples since the light scattering turbidity substance, by measuring the scattered light intensity of the incident light in the vertical direction, and alignment of the internal calibration value, thereby calculating the turbid water sample degree, the final processed output linearized value.

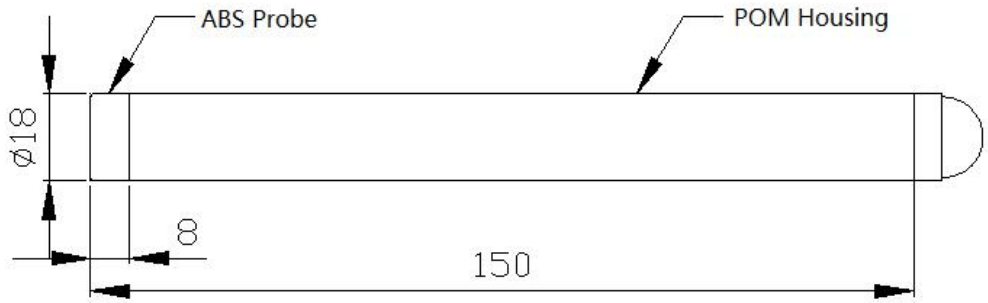
- 90 ° angle scattered light principle, built-in temperature sensor
- Supports RS-485, Modbus / RTUprotocol
- Fiber structure, external light anti-interference ability
- Infrared LED light source, high stability
- IP68 protection class.The water depth is within 20 meters
- Convenient, fast, stable, easy to maintain

Ⅱ.Technical performance and specifications

1. Technical parameter

Model	iZS-306
Measuring principle	Light scattering method
Measuring range	0～100NTUor 0～1000NTU
Resolution	0.01NTU,0.1℃
Accuracy	±3% or ≦±3NTU, is subject to the larger, ±0.5℃
Calibration methods	Two-point calibration
Temperature compensation	Automatic temperature compensation (Pt1000)
output method	RS-485 (Modbus / RTU)
Working conditions	0 ~ 50 ℃, <0.2MPa
Storage temperature	-5 ~ 65 ℃
Mounting	Immersion installation
Power	0.1W@12V
Power supply	12~24VDC
Protection class	IP68

2.Dimensions



Note: The sensor joint is M16-5 waterproof joint.

Ⅲ.Installation and electrical connection

1. Installation

Installation distance requirements: keep 5cm above the side wall and 10cm above the bottom.

2. Electrical connection

The cable is 4 - core double - stranded shielding wire, the line order definition：

a)Red line - power line (12~ 24VDC)

b) Black line - ground (GND)

c) blue line - 485A

d) white line - 485B

After wiring is completed, it should be carefully checked to avoid incorrect connections before powering up.

Cable specification: Considering that the cable is immersed in water (including sea water) for a long time or exposed to the air, all the wiring points are required to do waterproof treatment, the user cable should has certain corrosion resistance.

Ⅳ.Care and maintenance

1.Maintenance procedures and methods

1.1Maintenance schedule

Maintenance schedule The cleanliness of the measurement window is very important to maintain accurate readings.

Maintenance task	Recommended maintenance frequency
Calibrate sensors (if required by the competent authority)）	According to the maintenance schedule required by the competent department

1.2Maintenance method

- Sensor outer surface: clean the outer surface of the sensor with tap water, if there is still debris residue, wipe with wet soft cloth, for some stubborn dirt, you can add some household washing liquid to tap water to clean.
- Check the cable of the sensor: the cable should not be tightened when it is working properly, otherwise it is easy to break the wire inside the cable and cause the sensor to fail to work properly.
- Check the measuring window of the sensor is dirty or not and the cleaning brush is normal or not.

1.3 Attention

The probe contains sensitive optical and electronic components.Ensure that the probe is not subjected to violent mechanical impact.There is no part of the probe that requires user maintenance.

2.Calibration of sensors

a) Zero calibration: take proper amount of zero turbidity solution with large beaker, put the sensor vertically in the solution, the front end of the sensor is at least 10 cm from the bottom of the beaker, and the zero calibration will be carried out after the value is stabilized for 3-5 minutes. The instructions refer to the appendix.

b) Slope calibration: the sensor probe is placed in the standard solution, the front end of the sensor is at least 10 cm from the bottom of the beaker, and the slope calibration is carried out after 3 -5 minutes of numerical stability. The instructions refer to the appendix.

3.Frequently asked questions

Wrong	Probable cause	Resolvent
The operating interface cannot connect or does not display the measurement results	The measured value is too high, too low, or the numerical value remains unstable.	Reconnect the controller and cable.
	Cable failure	Please contact us.
The measured value is too high, too low, or the numerical value remains unstable.	The sensor window is attached to the external object.	Clean the window surface of the sensor.

Ⅴ.Quality and servings

1. Quality assurance

- The quality inspection department has standardized inspection procedures, advanced and perfect testing equipment and means, and strictly in accordance with the regulations, 72 hours of aging experiments and stability tests on the products, and does not allow a substandard product to leave the factory.

- The receiving party directly returns the batch of products with a non-conformity rate of 2%, and all the costs incurred are borne by the supplier. The reference standard refers to the product description provided by the supplier.

- Guarantee the quantity of goods and the speed of shipment.

2. Accessories and spare parts

This product includes:

- Sensor 1
- Manual 1
- Certificate 1

3. After sales service commitment

The company provides local after-sales service within one year from the date of sale, but does not include damage caused by improper use. If repair or adjustment is required, please return it, but the shipping cost must be conceited. Damaged on the way, the company will repair the damage of the instrument for free.

Appendix data communication

1. Data format

Modbus communication default data format is 9600, n, 8, 1 (baud rate 9600bps, 1 start bit, 8 data bits, no check, 1 stop bit).

2. Information frame format (xx represents one byte)

a) Read data instruction frame

06	03	xx xx	xx xx	xx xx
Address	FC	Register start address	Number of registers	CRC check code (low bytes in front)

b) Read data response frame

06	03	xx	xx xx	xx xx
Address	FC	Number of bytes	Response data	CRC check code (low bytes in front)

c) Write data instruction frame

06	06	xx xx	xx xx	xx xx
Address	FC	Register address	Read-in data	CRC check code (low bytes in front)

d) Data response frame

06	06	xx xx	xx xx	xx xx
Address	FC	Register address	Read-in data	CRC check code (low bytes in front)

3. Register address

Register Address	Name	Explanation	Register number	Interview method
40001 (0x0000)	Measured value+temperature	Four double-byte integers, measured, measured decimal, temperature decimal places, respectively, measured, decimal places.	4 (8 bytes)	Read
44097 (0x1000)	Zero calibration	Calibration in zero turbidity water, write data is 0, read data is zero offset. (It can also be calibrated in the turbidity standard solution of 0-10NTU, and the calibration method is calibrated with reference to the slope.)	1 (2 bytes)	Write/Read

44101 (0x1004)	Slope calibration	Calibrated in the known standard solution (20% full range-full range), the written data is the actual value of the standard solution × 10, and the read data is the slope value × 1000.	1（2 bytes）	Write/ Read
44113 (0x1010)	Temperature Calibration	In the calibration solution, write data is the actual temperature value × 10; read data to the offset temperature calibration × 10.	1 (2 bytes)	Write/Read
48195 (0x2002)	Sensor address	The default is 6 and writes data range 1-127	1 (2 bytes)	Write/Read
48225 (0x2020)	Reset Sensor	The calibration value restores the default value, and the write data is 0. Note that the sensor needs to be calibrated again after resetting.	1 (2 bytes)	Write

4. Command sample

a) Start measurement instructions
Function: Obtain the turbidity value and temperature of the measuring probe; the unit of temperature is Celsius, and the unit of turbidity is NTU.
Request frame: 06 03 00 00 00 04 45 BE
Response frame: 06 03 08 01 02 00 01 00 B0 00 01 90 48
Example of reading:

Turbidity value	Temperature values
01 02 00 01	00 B0 00 01

For example: turbidity value 01 02 means hexadecimal reading turbidity value, 00 01 means turbidity value with 1 decimal point, converted to decimal value is 25.8.

The temperature value 00 B0 represents the hexadecimal reading temperature value, and 00 01 represents the temperature value with a decimal point converted to a decimal value of 17.6.

b) Calibration instructions
Zero calibration

Function: Set the zero calibration value of the turbidity of the sensor; here the zero calibration is performed in zero turbidity water;

Request frame: 06 06 10 00 00 00 8C BD

Response frame: 06 06 10 00 00 00 8C BD

Slope calibration

Function: Set the slope calibration value of the sensor turbidity; here the slope value is based on the actual standard solution value x10, with 1000NTU as an example for calibration;

Request frame: 06 06 10 04 27 10 D7 40

Response frame: 06 06 10 04 27 10 D7 40

c) Set the device ID address:

Role: set the MODBUS device address of the electrode;

Change the device address 06 to 01. The example is as follows

Request frame: 06 06 20 02 00 01 E3 BD

Response frame: 06 06 20 02 00 01 E3 BD

5. Error response

If the sensor does not execute the host command correctly, it will return the following format information:

Definition	Address	Function code	Code	CRC check
Data	ADDR	COM + 80H	xx	CRC 16
Number of bytes	1	1	1	2

a) CODE: 01 - Function code error
03 - Data error

b) COM: Function code received