

BGA-406-S Online Blue Green Algae Sensor

User Manual



Hangzhou Chemins Sensor Technology Co. , Ltd.

Tel: 0571-87185831 0535-3463801

E-mail: service@chemins-tech.com Website: www.chemins-tech.com

address: Building 904, building 17, Singapore Science and Technology Park,
Qiantang district, Hangzhou City, Zhejiang Province

User Notes

- Please read the instructions carefully before using and save it for reference.
- Please follow the instructions and precautions.
- When receiving the instrument, please open the packaging carefully, inspect equipment's damage level in case of transportation, if you found spoiled equipment, please immediately notify the manufacturer and distributor, and retain the packaging, in order to send back to processing.
- When the instrument is in trouble, please don't repair it by yourself, please directly contact the maintenance department of the manufacturer.

Content

I、 Working principle	错误！未定义书签。
II、 Technical performance and specifications	错误！未定义书签。
1. Technical parameters	4
2. Dimensional drawing	错误！未定义书签。
III、 Installation and electrical connection	5
1. Installation	错误！未定义书签。
2. Electrical connection	错误！未定义书签。
IV、 Maintenance	6
1. Maintenance procedures and methods	6
2. Sensor calibration	错误！未定义书签。
3. Frequently asked questions	错误！未定义书签。
V、 Quality and service	7
1. Quality assurance	7
2. Accessories and spare parts	7
3. After-sales service commitment	错误！未定义书签。
Appendix data communication	错误！未定义书签。

I 、 Working principle

The blue-green algae sensor utilizes the characteristic that the cyanobacteria has in terms of an absorption peak and an emission peak in the spectrum. The spectral absorption peak of the cyanobacteria emits monochromatic light to the water, and the cyanobacteria in the water absorbs the energy of the monochromatic light, releasing another wavelength. The light intensity emitted by cyanobacteria is proportional to the content of cyanobacteria in the water.

- Monitoring the concentration of microalgae in the ocean harbor
- Monitoring green algae and cyanobacteria such as rivers and lakes
- Monitoring marine algae red algae *Monitoring red algae in mariculture*
- Determination of green algae concentration in the treatment of green algae cultivation equipment
- Support RS-485 (Modbus/RTU protocol)
- Convenient, fast, stable and easy to maintain

II 、 Technical performance and specifications

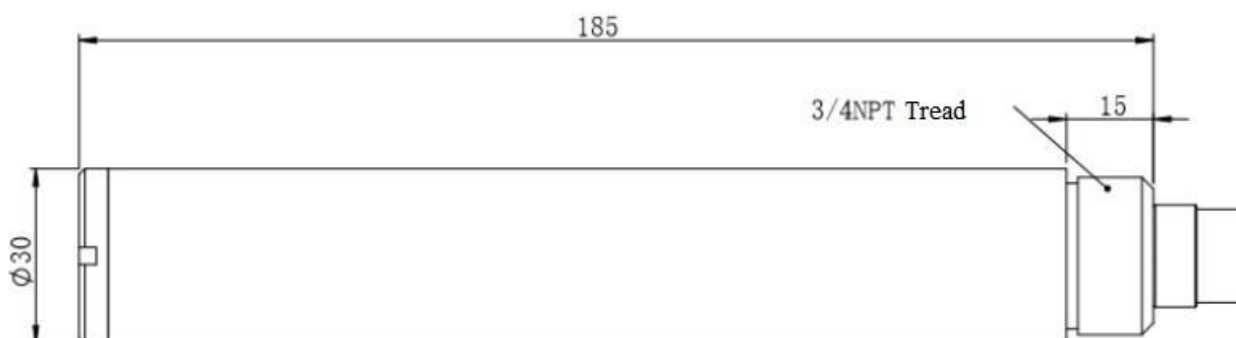
1. Technical parameters

Model	BGA-406-S
Measuring range	0~300.0Kcells/mL
Resolution	0.1Kcells/mL
Accuracy	±3%, ±0.3℃
Calibration	Two-point calibration
Protection grade	IP68
Deepest depth	0~50℃, <0.2MPa
Storage temperature	-5~65℃
Signal output	RS-485(Modbus/RTU) 、 4-20mA
Power supply	12~24VDC
Power	0.2W@12V
Cable length	5 meters, can be customized
Shell material	ABS and 316L stainless steel

Conditional requirements

The distribution of blue-green algae in water is uneven, and it is recommended to monitor more;
The water turbidity is less than 50 NTU.

2. Dimension



Note: the sensor joint is M16-5 waterproof joint

III、 Installation and electrical connection

1. Installation

Installation distance requirement: keep more than 5cm with the side wall and 20cm or more with the bottom.

2. Electrical connection

The cable is 5-core twisted pair shielded wire, the wire sequence definition:

- Red cord—power cord (12V~24VDC)
- Black cord —ground cord (GND)
- Blue cord—485A
- Green cord—485B
- Yellow cord—Current output (if unused, suspended)

The wiring sequence should be carefully checked before power-on to avoid unnecessary losses caused by faulty wiring.

Wiring instructions: considering the cable long-term Immersion in water (including sea water) or exposure to air, all wiring are required to do waterproof treatment, the user cable should have a certain degree of corrosion resistance.

IV、 Maintenance

1. Maintenance procedures and methods

1.1 Maintenance schedule

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

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

1.2 Maintenance methods

- Sensor outer surface: Clean the outer surface of the sensor with tap water. If there is still debris left, wipe it with a soft, damp cloth. For some stubborn dirt, add some household washing liquid to the tap water to clean it.
- Check the cable of the sensor: the cable should not be tightened during normal operation. Otherwise, the internal cable of the cable may be broken and the sensor may not work normally.
- Check whether the sensor's measurement window is dirty or not.

1.3 Cautions

The probe contains sensitive optical and electronic components. Make sure the probe is not subject to severe mechanical shock. There are no parts inside the probe that require user maintenance.

2. Sensor calibration

a) Zero calibration: Take a proper amount of distilled water in a large bucket and place the sensor vertically in the solution. The front end of the sensor is at least 20 cm away from the bottom of the beaker. After 3 to 5 minutes, the value is stabilized and the zero point is calibrated. The instructions refer to the appendix.

b) Slope calibration: Place the sensor probe in the standard solution. The front end of the sensor is at least 20cm away from the bottom of the beaker. After 3 to 5 minutes, the slope is calibrated after the value is stable. The instructions refer to the appendix.

3. Frequently asked questions

Error	Possible reason	Solution

The operation interface cannot be connected or the measurement result is not displayed.	The measured value is too high, too low or the value is continuously unstable	Reconnect controller and cable
	Cable failure	Please contact us
The measured value is too high, too low or the value is continuously unstable	The sensor window is attached by a foreign object	Cleaning the sensor window surface

V 、 Quality and service

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, to do a 72-hour aging test and stability test on the product, and not to allow one unqualified product to leave the factory.
- The receiving party directly returns the product batch with a failure 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 spare and parts

This product includes:

- 1 sensor
- 1 copy of the manual
- 1 certificate
- 1 Cable (5 m)

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. If damaged on the way, the company will repair the damage of the instrument for free.

Appendix data communication

1. Data format

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

2. Information frame format

a) read data instruction frame

06	03	xx xx	xx xx	xx xx
Address	Function code	Register address	Number of registers	CRC check code (low byte first)

b) read data response frame

06	03	xx	xx.....xx	xx xx
Address	Function code	Bytes	Answer data	CRC check code (low byte first)

c) write data instruction frame

06	06	xx xx	xx xx	xx xx
Address	Function code	Register address	Write data	CRC check code (low byte first)

d) Write data response frame (same data command frame)

06	06	xx xx	xx xx	xx xx
Address	Function code	Register address	Write data	CRC check code (low byte first)

3. Register address

Register address	Name	Instruction	Number of registers	Access method
40001 (0x0000)	Value	Two double-byte integers, which are measured values and measured decimal places.	2 (4 bytes)	Read
44097 (0x1000)	Zero calibration	Calibrated in distillation, the write data is 0; the read data is zero offset. (It can also be calibrated in a standard solution of 0-100 Kcells/mL. The calibration method is based on the slope calibration)	1 (2 bytes)	Write

44101 (0x1004)	Slope calibration (9.18PH)	Calibrate in the known standard solution (100 Kcells/mL -- 300 Kcells/mL), and write the data as the actual value of the standard solution $\times 10$; The read data is the slope value $\times 1000$.	1 (2 bytes)	Write
48195 (0x2002)	Device address	Default address is 6, data range is 1-64.	1 (2 bytes)	Write/ Read
48225 (0x2020)	factory reset	Restore calibration values to factory settings, write data to 0.	1 (2 bytes)	Write

4. Command example

a) Start measurement instructions

Function: Obtain the blue-green algae value of the measuring probe; the unit of blue-green algae is Kcells/mL.

Request frame: 06 03 00 00 00 02 C5 BC

Response frame: 06 03 04 01 02 00 01 ED 0F

Example of reading:

Blue green algae
01 02 00 01

For example: blue green algae value 01 02 means hexadecimal reading blue green algae value, 00 01 means blue green algae value with 1 decimal point, converted to decimal value 25.8.

b) Calibration instructions

Zero calibration

Function: Set the zero calibration value of the sensor blue-green algae; here the zero calibration is carried out in distilled water;

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

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

Slope calibration

Role: Set the slope calibration value of the sensor blue-green algae; here the slope value is based on the actual standard solution value $\times 10$, with 300Kcells/mL as an example for calibration;

Request frame: 06 06 10 04 0B B8 CA 3E

Response frame: 06 06 10 04 0B B8 CA 3E

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 respond

If the sensor does not correctly execute the host command, 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 is wrong
- b) COM: The received function code