

LW108 LoRaWAN Integral Blue Green Algae Transmitter User Manual



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1. Overview

The LoRaWAN blue-green algae transmitter is a device used to measure the concentration of blue-green algae in water; Adopting the principle of fluorescence, it is more efficient and fast compared to traditional manual counting methods, and can be monitored in real-time online; Internally added filtering algorithm, with strong resistance to external light interference; Built in temperature transmitter, capable of automatic temperature compensation Supports LoRa TDMA networking and standard LoRaWAN protocol.

2. Technical Parameters

Power Supply	DC12/24V
Weight	150g
Measuring Range	0~300000 cells/ml
Temperature Measurement Range	-20-80℃
Resolution	1cells/ml; Temperature: 0.1℃
Pressure Resistance	0.6Mpa
Electrode Usage Cycle	6-12 months
Transmitter Line length	Default 5m (other lengths can be customized)
Frequency	CN470/IN865/EU868/RU864/US915/AU915/ KR920/AS923-1&2&3&4
Mode	OTAA Class A/C
Reporting cycle	5min(Default)
Communication Protocol	LoRaWAN,LoRa TDMA Networking

Equipment information (Reference)	AppEUI: 0000000000000001 DevEUI: aaaa202404150001 AppKey: 00001111222233334444555566667777 MAC Version: LoRaWAN 1.0.3
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2.2 Product List

- LW108 LoRaWAN Terminal 1 piece
- TYPE-C data cable 1 piece
- Blue Green Algae Transmitter 1piece(individual packing)

3. Configuration and Installation

3.1 LW108 Interface Description



1. **DC Power Interface:**DC5.5 * 2.1 female socket, power supply interface, DC10-28V.
2. **TYPE-C Interface:**Used for device serial port configuration.
3. **Transmitter Interface:**Used for connecting integrated DO Transmitters
1.RD: VCC **2.BK:** GND **3.YL:** RS485A **4.GN:** RS485B

3.2 LW108 Parameter Configuration Instructions

Configuration preparation:

- ◆ USB Type-C data cable
- ◆ Computer (Windows system)
- ◆ Configuration Tool Toolbox

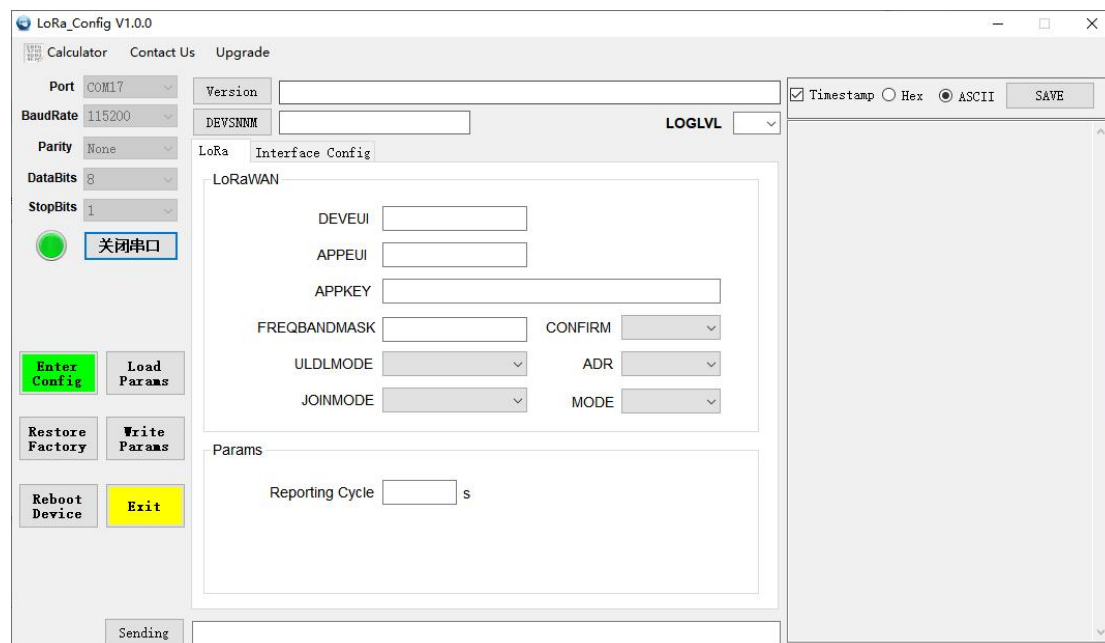
Download: <http://www.zonewu.com/en/Configuration-Tools.html>

1. Install serial port driver program.CH340 USB to serial port .
2. Connect the LW101 to the PC using a USB cable and check if there is a COM port. If not, please recheck the equipment wiring and driver installation.
3. Open the configuration tool LoRa_config  LoRa_config V1.0.0 .open the corresponding COM port .

Port default parameters:

BaudRate	115200bit/s
Parity	None
DataBits	8
StopBits	1

As follows:



4. 1.Enter Config → 2.Load Params → 3.LoRaWAN → 4.Write Params → 5.Reboot Device

LoRa_Config V1.0.0

Calculator Contact Us Upgrade

Port COM17 BaudRate 115200 Parity None DataBits 8 StopBits 1

Version DEVSNNM LOGLV

Timestamp Hex ASCII SAVE

LoRa Interface Config

LoRaWAN

DEVEUI APPEUI APPKEY

FREQBANDMASK CONFIRM

ULDLMODE ADR

JOINMODE MODE

Params

Reporting Cycle s

Enter Config Load Params

Restore Factory Write Params

Reboot Device Exit

Sending

LoRa Interface Config

LoRaWAN

DEVEUI BF01240726D00001

APPEUI 331341E186891989

APPKEY 5572404c696e6b4c6f52613230313823

FREQBANDMASK 0002 CONFIRM Close ACK

ULDLMODE Abnormal Freq Mo ADR Close

MODE ClassC

Params

Reporting Cycle 600 s

LoRaWAN Interface:

Item	Describe	Notes
DevEUI	Node's globally unique identifier code	64bit
AppEUI	Node's application identifier code	64bit
AppKey	Assigned to the terminal by the application owner.	128bit

FREQBANDMASK	Set frequency group mask	
ULDLMODE	Set up uplink and downlink same frequency but different frequency	
CONFIRM	Set uplink transmission type	
ADR	Set adaptive speed	
MODE	Set device working mode	

The device will be configured with ternary parameters by default when it leaves the factory:

DevEUI: BF01240726D00001

AppEUI: 331341E186891989

AppKey: 5572404c696e6b4c6f52613230313823

NOTE: All sensors are shipped with AppEUI and AppKey default to 331341E186891989 and 5572404c696e6b4c6f52613230313823.

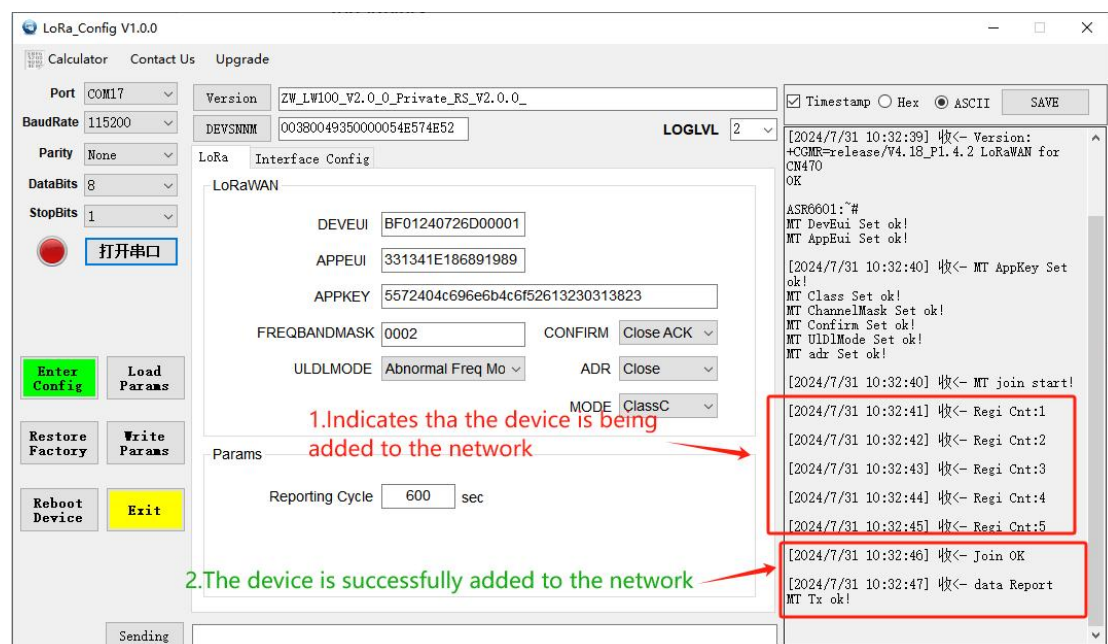
Users can customize according to their own applications

FREQBANDMASK: The frequency group mask for LoRaWAN operation, with 16 bits corresponding to 16 frequency groups. Default is 0001. Users need to configure it according to the actual application region.

Params Interface:

Item	Describe	Notes
Reporting cycle	adjustable range 1-65535, default is 300s (5min)	

Printing logs of device startup and network connection:

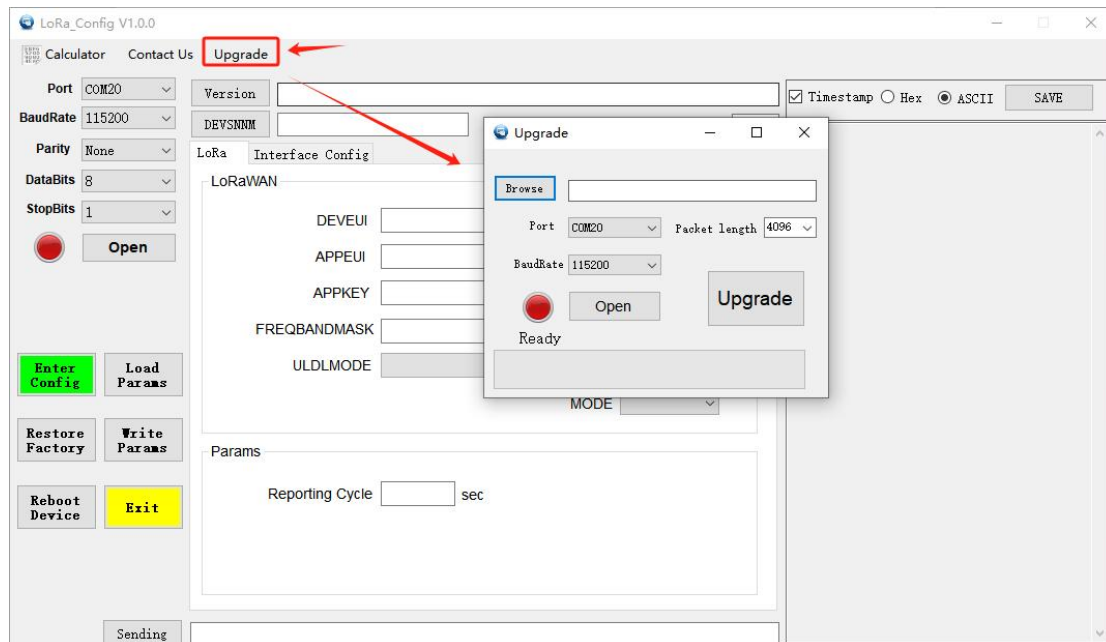


The device is equipped with a built-in LED indicator light, which is located next

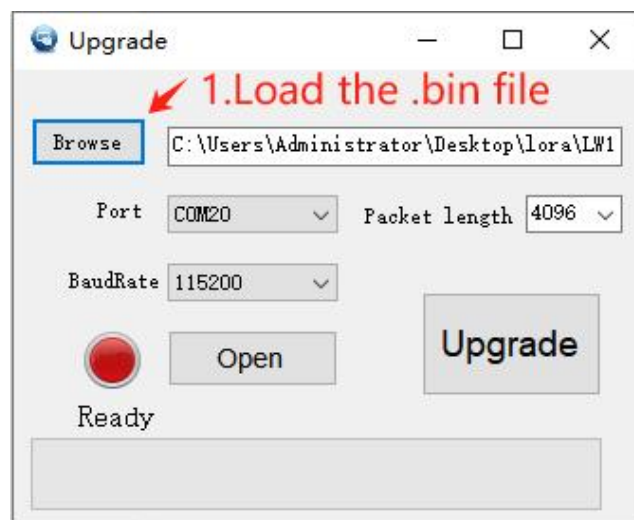
to the antenna interface and can be seen as a green light through the casing.

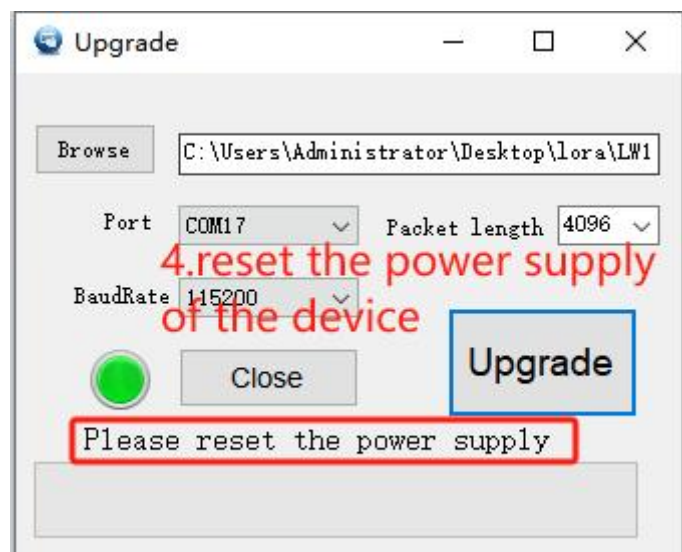
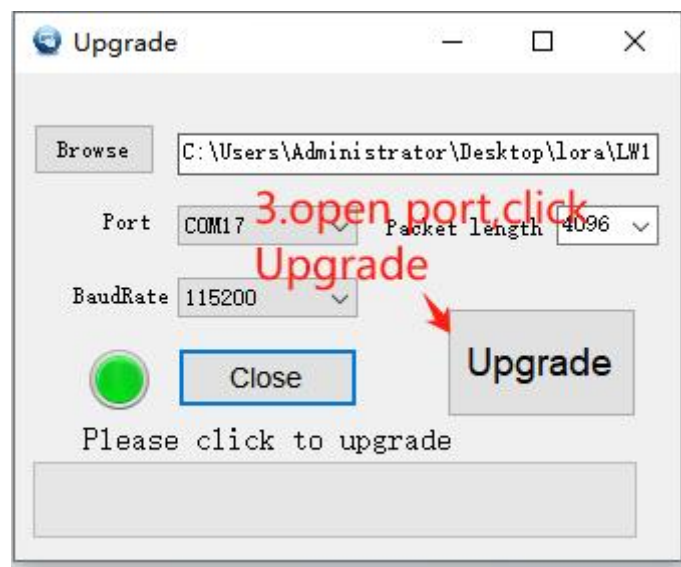
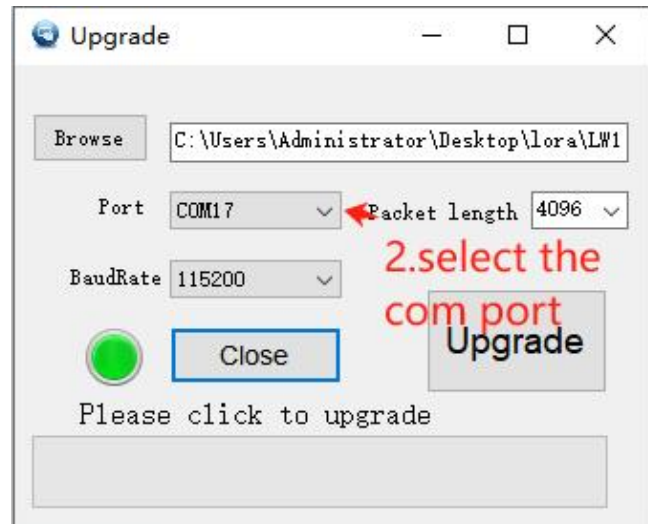
LED	Status	Describe
Green indicator light	Flicker	Add to the network
	Light	Successfully added to the network

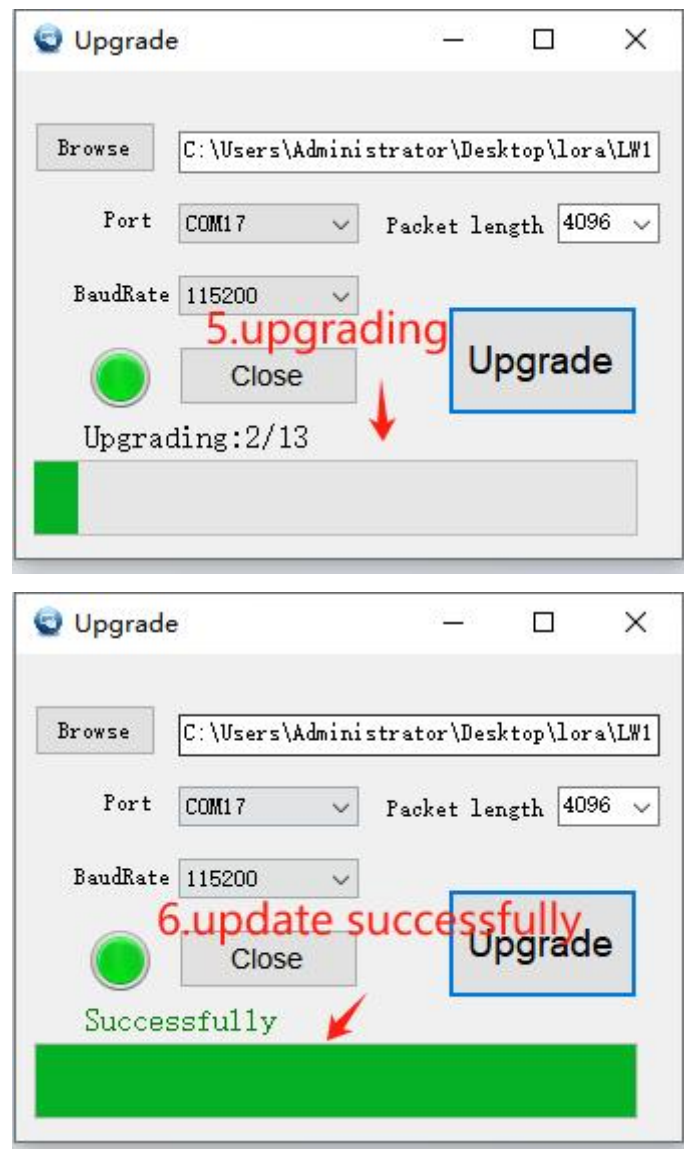
Firmware upgrade:



Click to upgrade → Pop up upgrade window





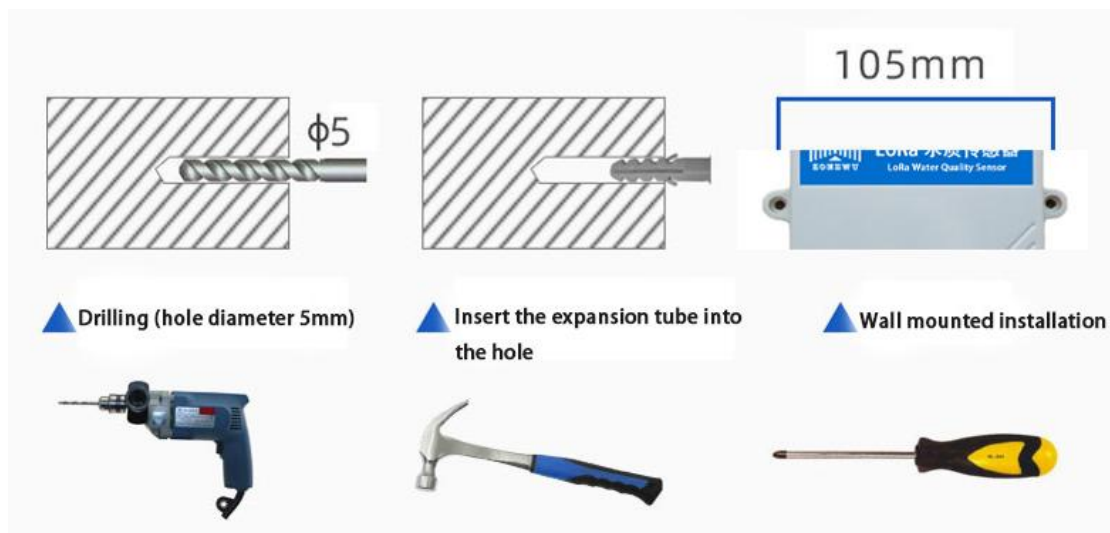


If there is an upgrade error during the upgrade process, you can close and reopen the upgrade window and follow the instructions to upgrade again.

3.3 LW108 Size and Installation



Product size



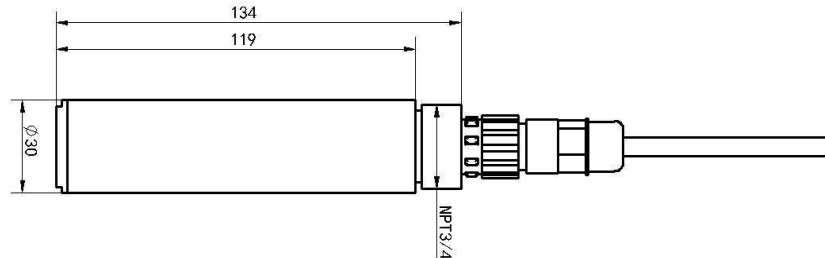
Installation instructions

3.4 Blue Green Algae Transmitter Size and Installation



Integrated Blue Green Algae Transmitter Description

3.4.1 Blue Green Algae Transmitter Size

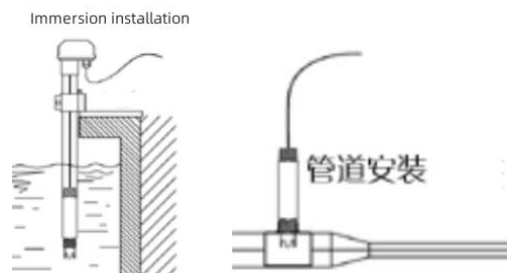


3.4.2 Installation

The sensor should be immersed below the liquid level for fixed installation. During installation and use, avoid collision or scratching of the surface of the fluorescent film head. The fluorescent film head should be avoided from being attached by sediment at the bottom of the water. The rubber protective cover should be removed during use.

Submerged installation:

Equipped with NPT3/4 thread, it can be used in conjunction with our waterproof pipes. The cable is threaded out of the pipe and the device is screwed into the waterproof pipe thread.



4. Protocol Description

4.1 Data Format

The up/down data of the device is based on hexadecimal format. High position in front, low position in back.

address	code	length	data	
1 byte	1 byte	1 byte	2 byte	2 byte

4.2 Upward Data

The device information is reported once during network access or restart.

0108080D2E00DB015E					
Sensor address	Instruction type	Data Length	DATA		
			Chlorophyll Concentration Value	Temp	RFU
01	08	08	0D2E	00DB	015E
01	08	08	337.4	21.9	35

Note: If the received data is FFFF FFFF, it indicates that the sensor is not connected or the sensor is abnormal.

4.2.1 Register Address Description

Register address	0001H	0002H	0003H
Parameter	Ammonia Nitrogen	Temp	RFU
Unit	μg/L	℃	RFU
Range	0~400μg/L	0-50℃	0~100RFU
Data Type	uint16	int16	uint16
Sample Value	/10	/10	/10
Operate	Read	Read	Read

4.3 Downward data

Support configuring devices through downstream commands. When the downlink command is in confirmation packet mode, the device will immediately send a reply packet after executing the command.

4.3.1 Restart the device

Starting byte (1byte)	Instruction type (1byte)	Trail byte (1byte)
0xFE	01	0xEF

Response:

Starting byte (1byte)	Instruction type (1byte)	Trail byte (1byte)
0xEF	01	0xFE

4.3.2 Set Reporting cycle

Starting byte (1byte)	Instruction type (1byte)	Reporting cycle (2byte)	Trail byte (1byte)
0xFE	02	X	0xEF

Response:

Starting byte (1byte)	Instruction type (1byte)	Reporting cycle (2byte)	Trail byte (1byte)
0xEF	02	X	0xFE

4.3.3 Set the slope of chlorophyll concentration

Output data value=(actual data - deviation value) * slope

If a standard solution of 100 μ g/L is measured and the value after setting the deviation value is 125.0 μ g/L, then write 100/125=0.80 to the 0x0060 register. After enlarging it by 100 times, write the value to 80 and convert it to hexadecimal as 0x0050

Issued frame:

Starting byte (1byte)	Instruction type (1byte)	Register 0x0060 (2byte)	Trail byte (1byte)
0xFE	03	0X0050	0xEF

Response:

Starting byte (1byte)	Instruction type (1byte)	Register 0x0060 (2byte)	Trail byte (1byte)
0xEF	03	0X0050	0xFE

4.3.3 Setting of chlorophyll concentration deviation value

Issue frame: Write a deviation value of -10 μ g/L to the device, which should be -100 and converted to hexadecimal as 0xff9c

Starting byte (1byte)	Instruction type (1byte)	Register 0x0050 (2byte)	Trail byte (1byte)
0xFE	04	0XFF9C	0xEF

Response:

Starting byte (1byte)	Instruction type (1byte)	Register 0x0050 (2byte)	Trail byte (1byte)
0xEF	04	0XFF9C	0xFE

4.4 Precautions and Maintenance

◆ The equipment itself generally does not require daily maintenance. In case of obvious malfunctions, please do not open it for self repair and contact us as soon as possible!

◆ After use, please clean the electrode head with clean water and cover it with a protective cover.

◆ If dirt and mineral components are attached to the electrode membrane, the sensitivity may decrease, making it difficult to perform sufficient measurements. Please ensure that the platinum ring is clean.

◆ A good Ammonia Nitrogen electrode should always keep its platinum sensing ring clean and bright. If the platinum ring of the electrode becomes rough or covered with pollutants after measurement, please clean it according to the following method: (for reference)

Inorganic contamination: Immerse the electrode in 0.1mol/L dilute hydrochloric acid for 15 minutes, gently wipe the platinum ring of the Ammonia Nitrogen electrode with a cotton swab, and then clean with tap water.

Organic or oil pollution: Immerse the electrode in tap water with a small amount of detergent, such as dishwashing detergent, to thoroughly clean the sensing surface of the electrode sensor. Gently wipe the platinum ring of the electrode with a cotton swab, then rinse with tap water and clean it. If the platinum ring of the electrode has formed an oxide film, please polish the sensing surface moderately with toothpaste or 1000 grit sandpaper, and then clean it with tap water. The platinum ring is connected to the glass, please handle it carefully when polishing.

- ◆ The electrode has a service life of about one year, and should be replaced with a new electrode in a timely manner after aging.