LW104 LoRaWAN Integral Residual Chlorine Transmitter User Manual

Contents

1. Overview

The LoRa water quality residual chlorine sensor is a device that measures the residual chlorine concentration (hypochlorous acid, hypochlorous acid ion concentration) in water bodies. Integrated design to eliminate signal interference. The use of a three electrode system has advantages such as high measurement accuracy, long working life, and no need for frequent calibration. Supports LoRa TDMA networking and standard LoRaWAN protocol.

2. Technical Parameters

Power Supply	DC12/24V
Weight	150g
Working Conditions	Temperature resistance of transmitter components: 0-50 ℃ PH：4-9 Flow rate: 30-60L/h
Measuring Range	0-2mg/L,0-10mg/L（default）,0-20mg/L
Measurement Error	±5%FS
Repeatability Error	±0.05mg/L
Electrode usage cycle	12 months
Pressurization	0.6Mpa
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：331341E186891989 DevEUI：aaaa202404150001 AppKey：5572404c696e6b4c6f526132330313823 MAC Version: LoRaWAN 1.0.3

2.2 Product List

- LW104 LoRaWAN Terminal 1 piece
- TYPE-C data cable 1 piece
- Residual Chlorine Transmitter 1piece(individual packing)

3. Configuration and Installation

3.1 LW104 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 LW104 Parameter Configuration Instructions

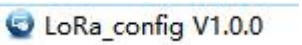
Configuration preparation:

- 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 LW104 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.

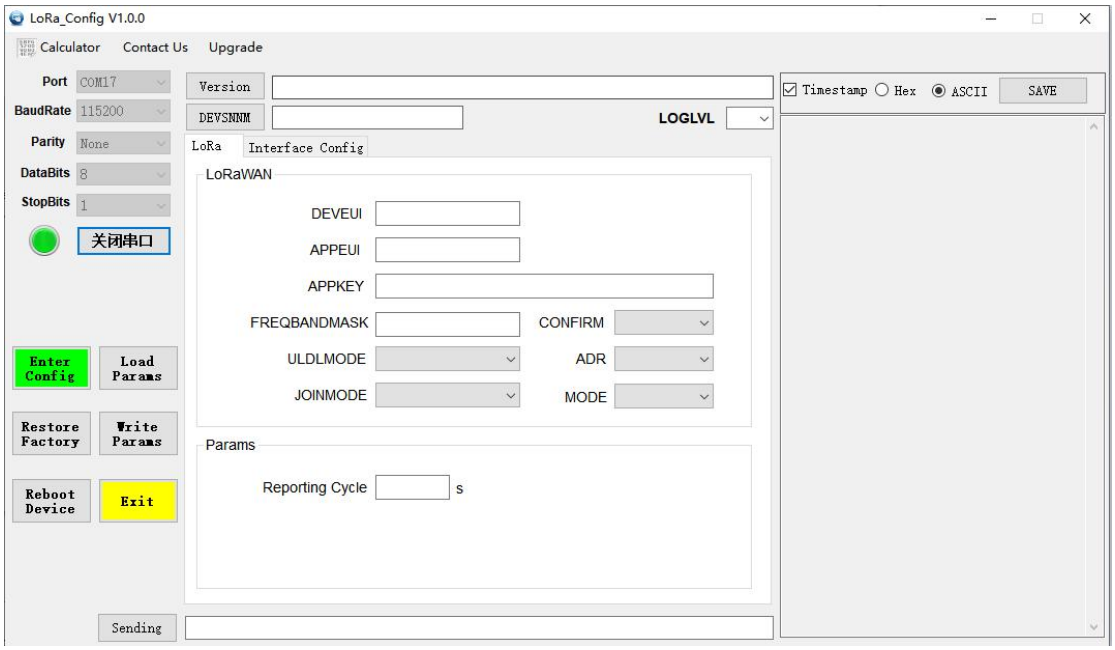
3. Open the configuration tool LoRa_config 

.open the corresponding COM port .

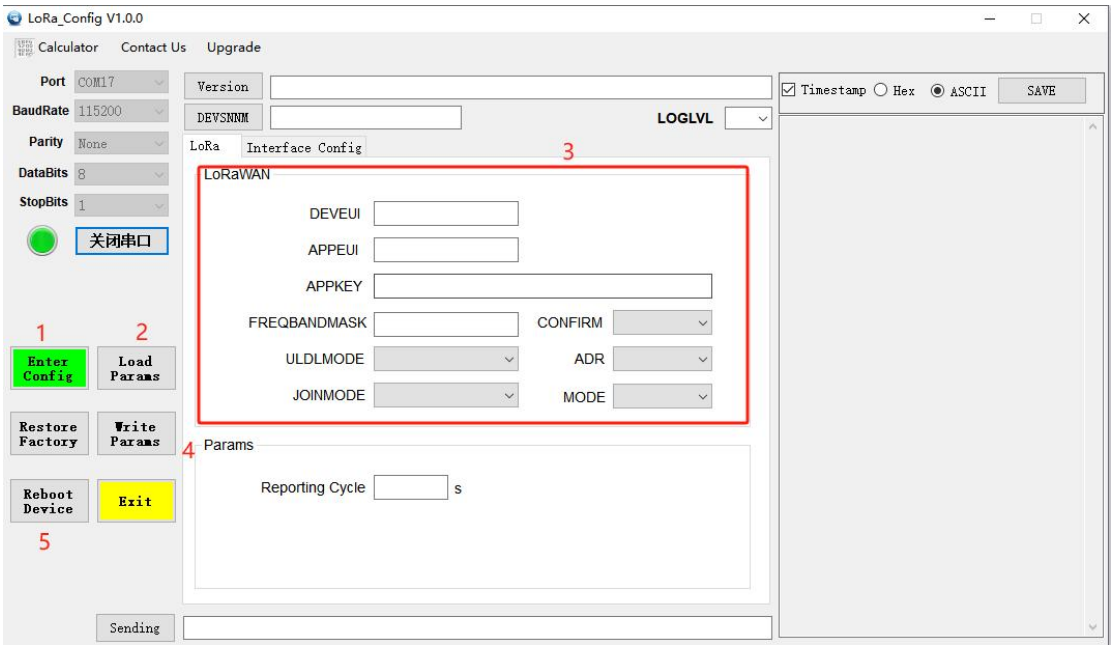
Port default parameters:

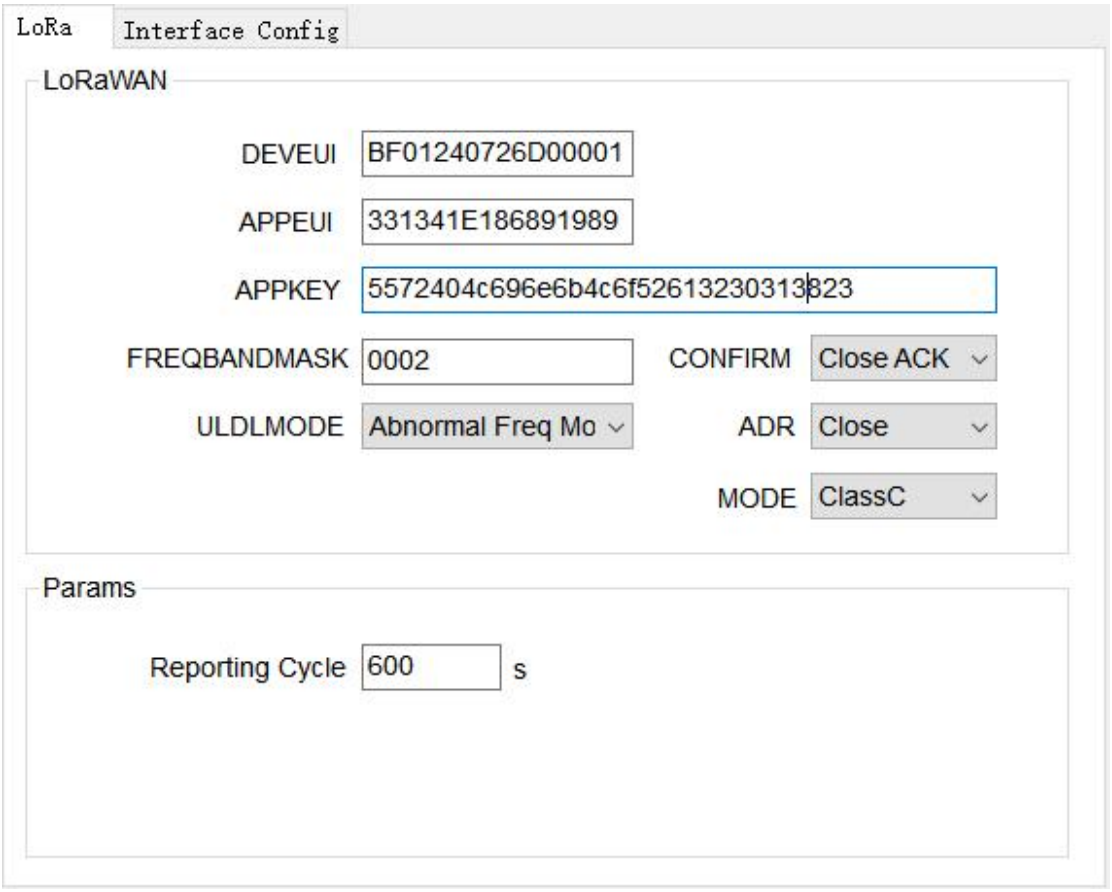
BaudRate	115200bit/s
Parity	None
DataBits	8
StopBits	1

As follows:



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





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

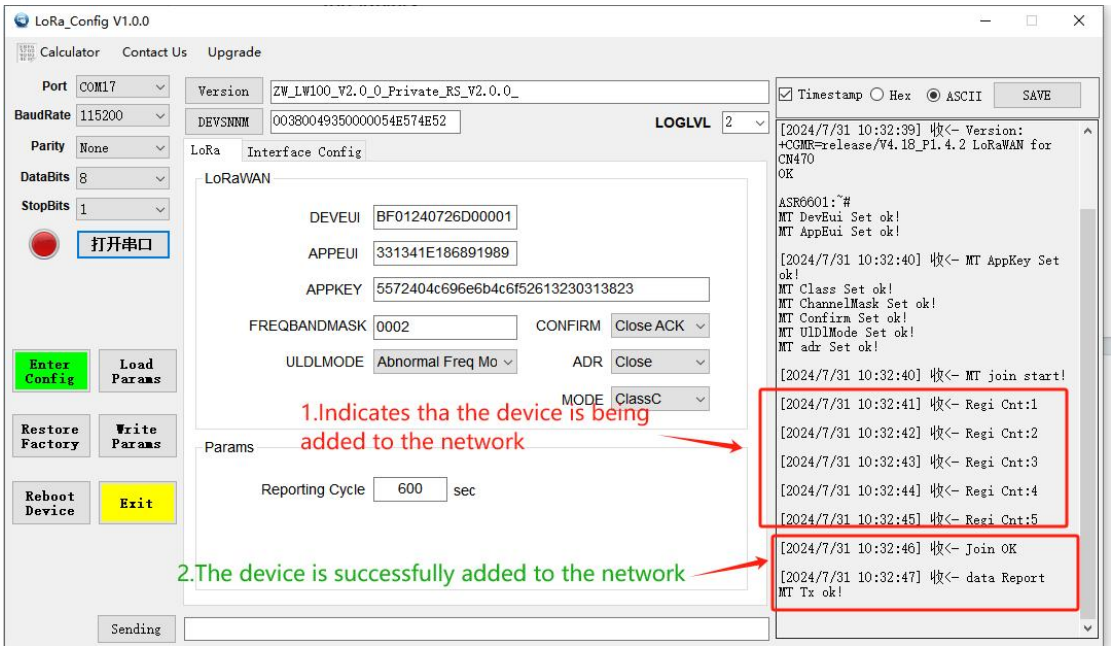
FREQBANDMASK	Set frequency group mask	
ULDLMODE	Set up uplink and downlink same frequency but different frequency	
CONFIRM	Set uplink transmission type	
ADR	Set adaptive speed	
MODE	Set device working mode	

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 **5572404c696e6b4c6f526132330313823**.
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 600s (10min)	

Printing logs of device startup and network connection：

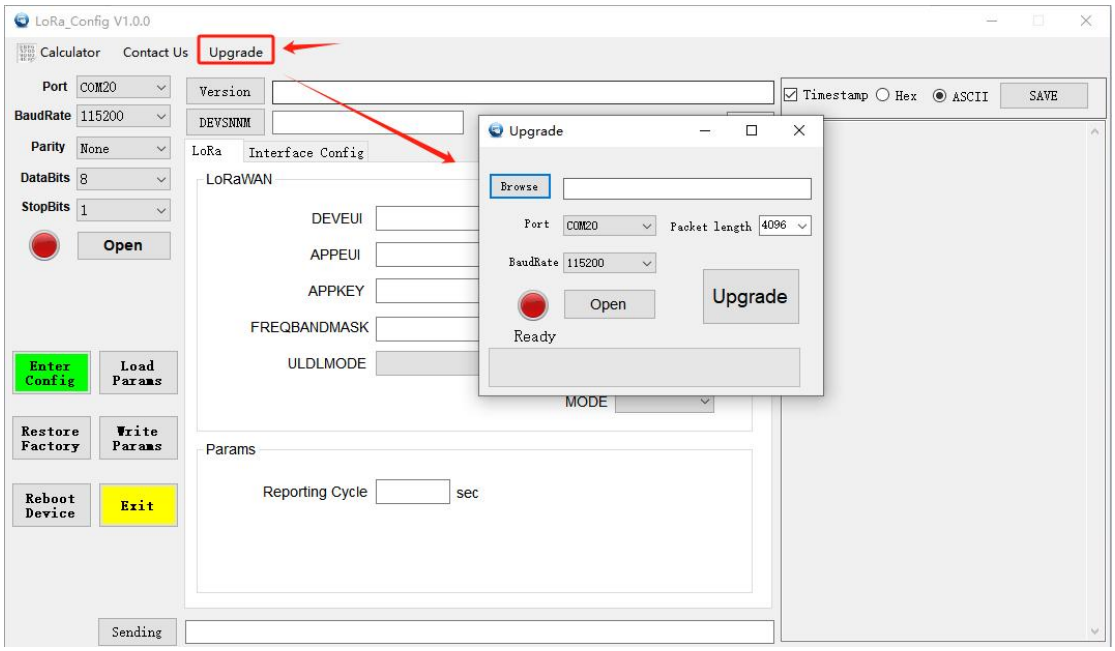


The device is equipped with a built-in LED indicator light, which is located next

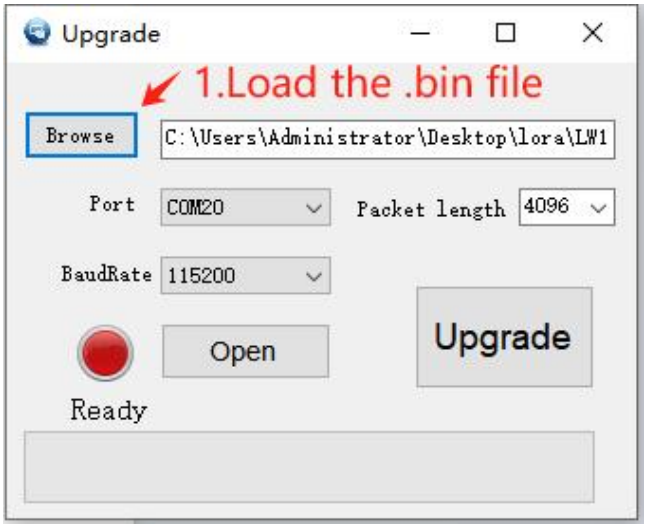
to the antenna interface and can be seen as a green light through the casing.

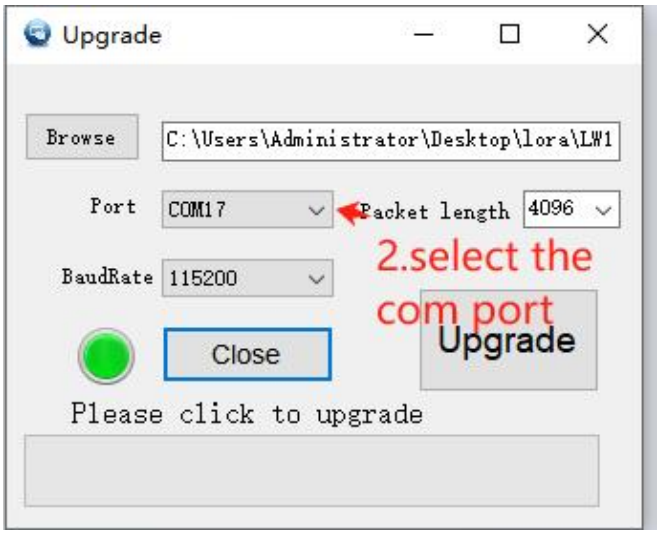
LED	Status	Describe
Green indicator light	Flicker	Add to the network
	Light	Successfully added to the network

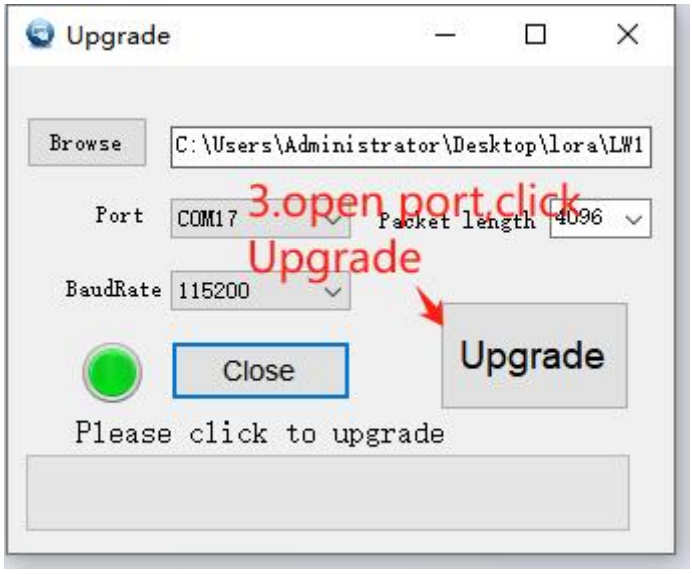
Firmware upgrade:

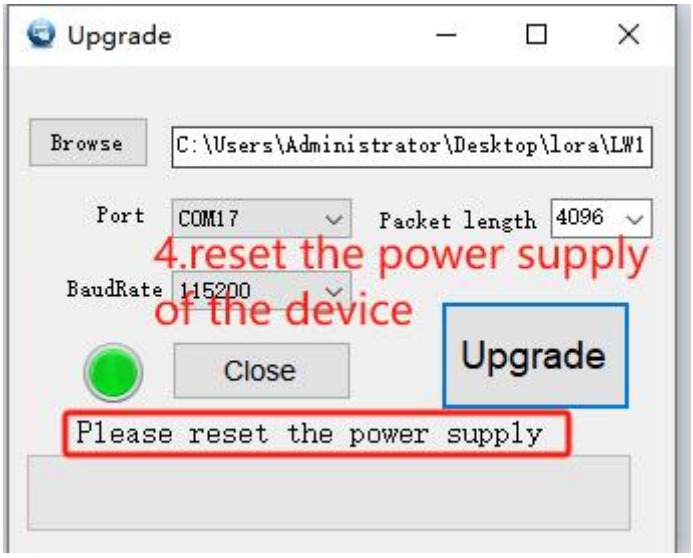


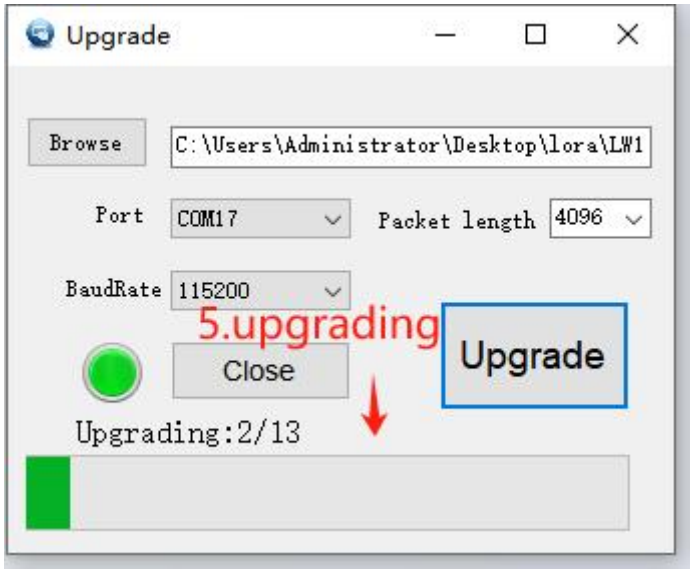
Click to upgrade → Pop up upgrade window

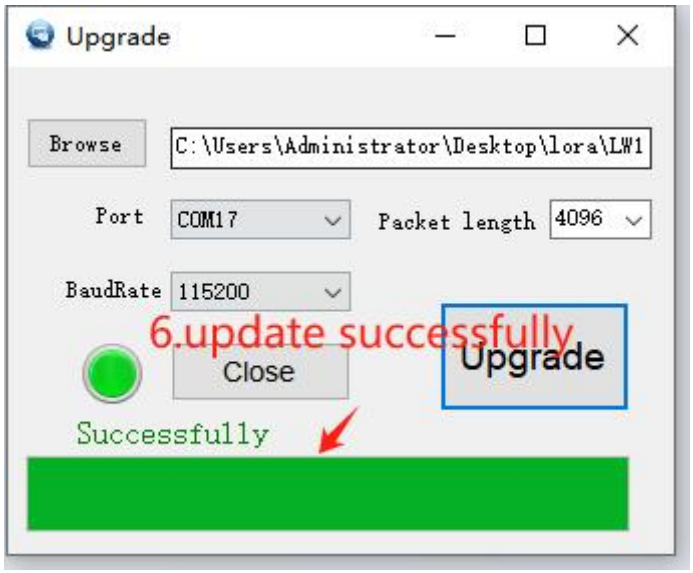



Upgrade
Browse
C:\Users\Administrator\Desktop\lora\LW1
Port
COM17
Packet length
4096
2.select the com port
BaudRate
115200
Close
Upgrade
Please click to upgrade


Upgrade
Browse
C:\Users\Administrator\Desktop\lora\LW1
Port
COM17
3.open port,click Upgrade
Packet length
4096
BaudRate
115200
Close
Upgrade
Please click to upgrade


Upgrade
Browse
C:\Users\Administrator\Desktop\lora\LW1
Port
COM17
Packet length
4096
4.reset the power supply of the device
BaudRate
115200
Close
Upgrade
Please reset the power supply

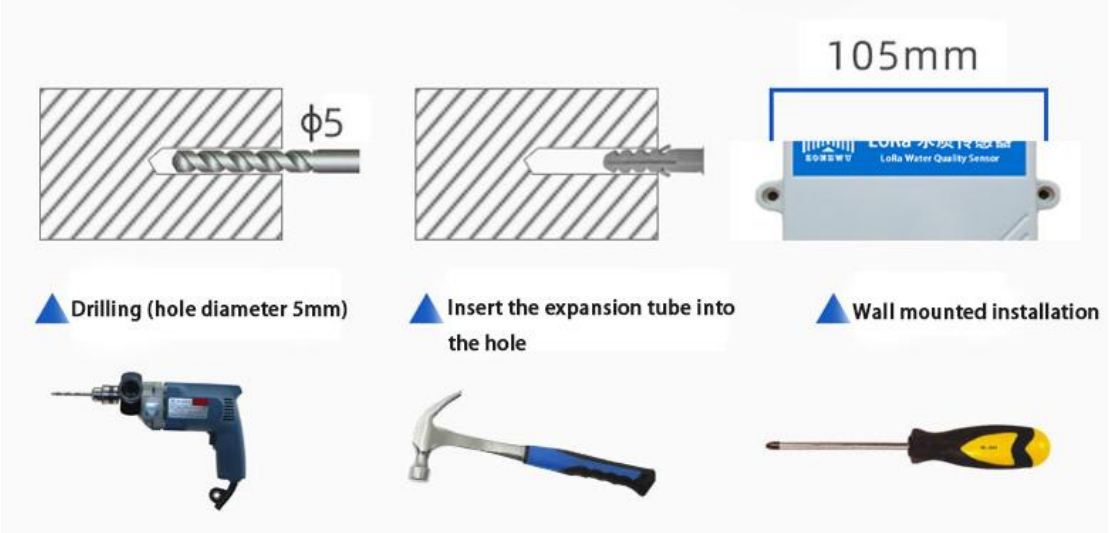




If there is an upgrade error during the upgrade process, you can close and reopen the upgrade window and follow the instructions to upgrade again.

3.3 LW104 Size and Installation

Product size

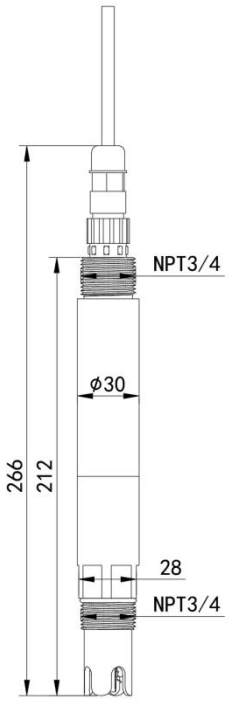


Installation instructions

3.4 Residual ChlorineTransmitter Size and Installation

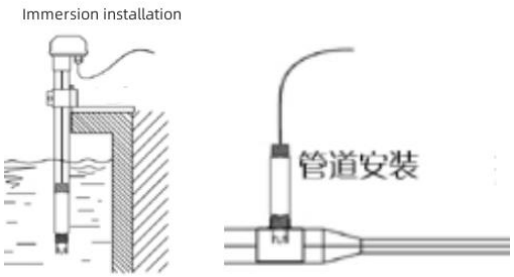
Integrated Residual Chlorine Transmitter Description

3.4.1 Residual Chlorine 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

4.2 Upward Data

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

0104020316			
Sensor address	**Instruction type**	**Data Length**	DATA
			Residual Chlorine
01	04	02	0316
1	4	2	7.90

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

4.2.1 Register Address Description

Register address	**0001H**
Parameter	Residual Chlorine
Unit	mg/L
Range	0-10mg/L
Data Type	uint16
Sample Value	/100
Operate	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

4.4 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 residual chlorine 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 residual chlorine 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.