QIJIAN 3 WQS

Water quality analyst

User Manual

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Kamoer Fluid Tech(Shanghai) Co.,Ltd.

www.kamoer.com

Tips for reading

Quickly search for keywords

PDF electronic documents can search for keywords using the search function. For example, in Adobe Reader, Windows users use the shortcut Ctrl+F, and Mac users use Command+F to search for keywords.

Click Catalog to the certain page

Users can understand the content structure of the document through the table of contents, and click the title to jump to the corresponding page.

Print the document

This document supports high-quality printing

Explanation of symbols

Forbidden Important Precautions Tips for Operation Vocabulary Interpretation reference information

Recommendations for use

Kamoer provides the following documentation for QIJIAN 3 WQS smart sensor users:

1. "QIJIAN 3 WQS User Manual"

2. "QIJIAN 3 WQS Quick Start Guide"

It is recommended that users first read the "QIJIAN 3 WQS Quick Start Guide" to understand the usage process. For detailed product information, please read the QIJIAN 3 WQS User Manual.

Download Kamoer Remote App

1. Scan the QR code and download the app corresponding to the following icon.

iOS

Android

2. Apple users enter the App Store App Store, Android users enter the Baidu App Store, search for "Kamoer Remote", and find the corresponding icon of the application download.

   Kamoer Remote App supports Android 4.4 and above, and iOS 9.1 and above.

Get the tutorial

After installing the App, open it, and click "? button to enter the tutorial page, click to enter the corresponding device model, including the user manual and frequently used questions.

Catalog

Tips for reading I
Explanation of symbols I
Recommendations for use I
Download Kamoer Remote App II
Get the tutorial II
1. Product Overview 1
1.1 Introduction 1
1.2 Feature Highlights 1
1.3 Application 3
1.4 Unpacking Preparation 3
1.5 Parts Name 4
2.Product Installation 4
2.1 Secure the device to the wall 4
2.2 Connecting Sensors (Connection Diagram) 5
2.3 To secure the sensor to the cylinder (Schematic) 5
3. App Usage 6
3.1 Network Configuration 6
3.2 Bind the device 7
3.3 Device Control Interface Overview 8
3.4 List of sensor channels 9
3.5 Individual sensor details page 11
3.6 System Settings 12
3.7 Firmware Upgrade 12
3.8 Time Settings 13
3.9 Electrode calibration 14
3.10 Electrode maintenance 14
Storage and maintenance of pH electrodes 14
Storage and maintenance of ORP electrodes 15
Protection and maintenance of EC electrodes 15
Protection and maintenance of dissolved oxygen electrodes 16
4. Appendix 16
4.1 Technical parameters 16
4.2 After-sales warranty information 17

1. Product Overview

1.1 Introduction

QIJIAN 3 is a smart sensor with WIFI remote function, including 5 sensors, namely pH, redox ORP, salinity and conductivity EC, temperature Temp, dissolved oxygen DO, you can monitor the value of these sensors in the cylinder in real time, you can query the history of these sensors on Kamoer Remote App to help users better understand the water quality in the tank. When the sensor value is abnormal, the app can receive an exception alert push.

1.2 Feature Highlights

- Small form factor and powerful function
- It can measure 6 sensor parameters of pH, ORP, EC, salinity, DO, and temperature online at the same time
- App remote control, can see the real-time value of the sensor, historical history
- Sensor value exception alert push
- Support online firmware upgrade
- Built-in display to view real-time sensor values and status
- Support sensor calibration

Six parameters for water quality monitoring:

Parameters	Meaning and impact	Normal measurement range
pH	Hydrogen ion concentration index, reflecting the acidity and alkalinity of water bodies; Various organisms have their most suitable pH range; High pH water has a corrosive effect on gill tissue; Low pH values can lead to the proliferation of pathogenic bacteria and increase the toxicity of hydrogen sulfide;	6.5~7.5 (Dragon fish tank) 7.5~8.2 (seawater fish tank)
ORP	Refers to the redox capacity of water bodies, which refers to the total potential of water bodies; Generally, aquaculture ponds require an increase in redox potential; Low ORP will provide conditions for the accumulation of toxic substances such as ammonia nitrogen, nitrite, and	350-450mv (seawater fish tank)

	hydrogen sulfide;	
EC	Refers to the concentration of soluble salts in the solution or the concentration of soluble ions in liquid fertilizers or planting media; As an indicator to ensure the health of the ocean and its living organisms, it is often used in conjunction with salinity; The higher the conductivity value, the better the conductivity. The more impurities, the worse the water quality;	<2000us/cm (fresh water) 45000uS/cm~55000uS/cm (Seawater fish tank)
Salinity	Refers to the amount of salt that has been appropriately dissolved in the water body, determining the suitable species of aquatic animals; And salinity can affect the solubility of dissolved oxygen, which is crucial for water quality; The optimal salinity can increase the body's food intake and enhance the body's epidemic prevention mechanism; Low salinity can lead to increased weight and mortality of marine organisms;	1.021-1.025 (seawater fish tank)
DO	Molecular oxygen dissolved in water directly affects the metabolic intensity of fish and shrimp, thereby affecting their growth; Generally, it is inversely proportional to water temperature and salinity, and directly proportional to atmospheric pressure; It is necessary to ensure sufficient oxygen supply in the aquaculture environment. High dissolved oxygen is conducive to the degradation of various pollutants in the water body, thus enabling the water to be purified quickly. However, if it is too high, it can cause fish to develop	5~8mg/L

	bubble disease; Low indicators lead to slow degradation of pollutants and hypoxia in cultured animals;	
Temperature	Temperature is the most important factor affecting animal growth rate, digestion and absorption; Different organisms have different requirements for water temperature; Within the optimal temperature range, fish exhibit vigorous feeding, respiratory, and digestive functions, enhanced metabolic function, and rapid growth; Exceeding the appropriate temperature range can lead to metabolic dysfunction, growth inhibition, and even death;	25 ± 3 °C (seawater fish tank)

1.3 Application

- Marine life feeding
- Includes teleost corals (SPS), mollusc corals (LPS) and polyculture corals (SPS/LPS).
- Plant farming
- Occasions where water quality needs to be measured
- Other occasions where water quality needs to be tested

1.4 Unpacking Preparation

- Before opening the box, check whether the outer packaging is damaged during the transportation.
- After opening the box, refer to the packing list in the appendix to confirm that all parts are not missing and check for visible damage.

1.5 Parts Name

1. Dissolved oxygen electrode connector
2. ORP electrode connector
3. pH electrode connector
4. Temperature electrode connector
5. EC electrode connector
6. Color display
7. CAN communication interface 1
8. CAN communication interface 2
9. Alternate interface
10. Status indicator
11. DC24V power interface

2.Product Installation

2.1 Secure the device to the wall

1.Use a dry rag to wipe the wall to ensure that the wall is day, smooth and flat

2.Peel off the non-marking glue that fixes the sticker (concave surface)

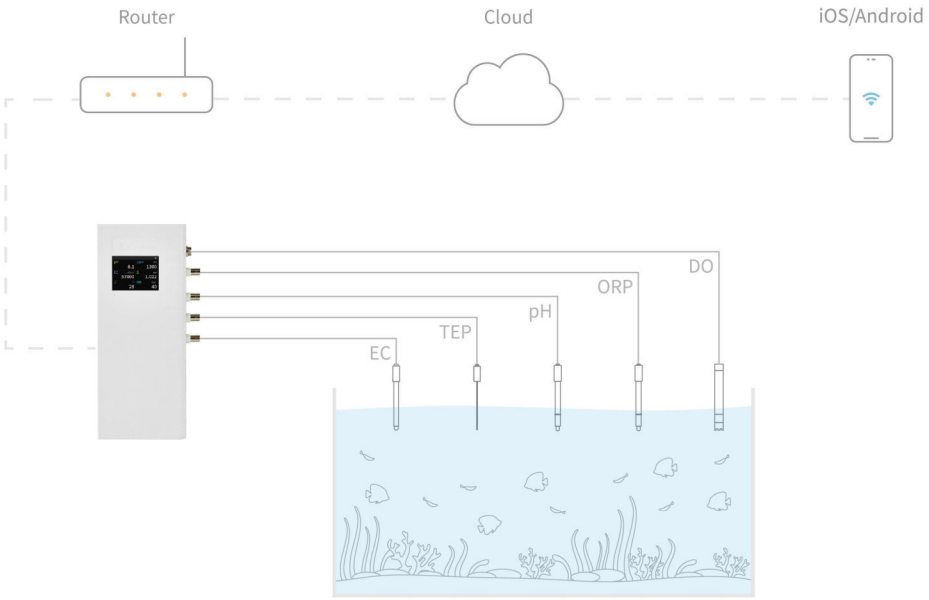
3.Choose a flat wall, exhaust the air between the sticker and the wall, and press firmly

4.Peel off the non-marking glue that is fixed to the hook surface and paste it on the back of QIJIAN 3

5.Insert the QIJIAN3 with a fixed sticker(hook) into the card slot on the wall to fix it.

6.After installation, it is recommended to stand for more than 12 hours for better results.

2.2 Connecting Sensors (Connection Diagram)

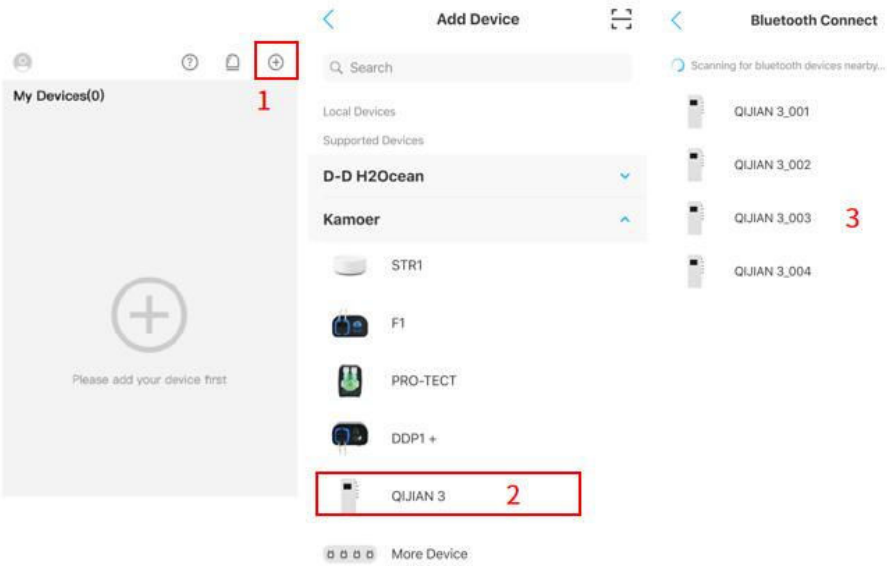


2.3 To secure the sensor to the cylinder (Schematic)

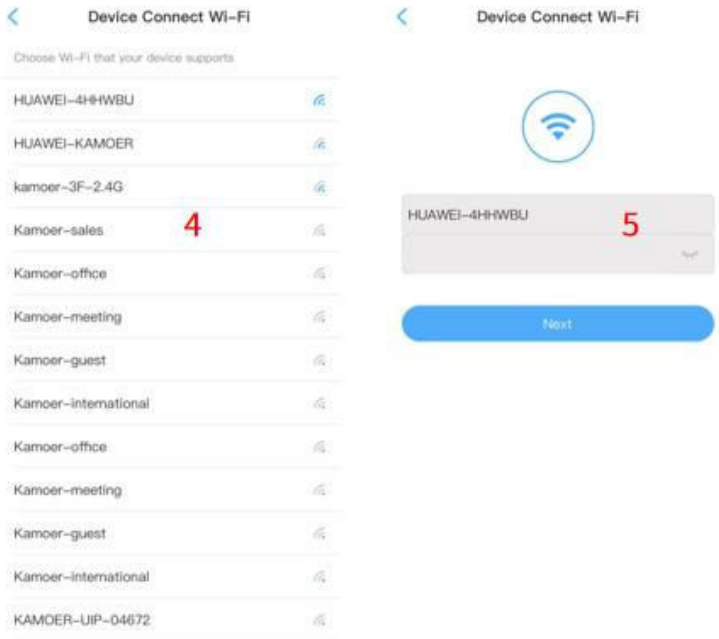
3. App Usage

3.1 Network Configuration

The app needs to set and read the parameters of the device through a network connection, so the device configuration needs to be connected to the network.



1. The device is powered on, see the device display light up, enter the App, click the Add button in the upper right corner, and enter the device addition list
2. Select Qijian 3 and enter the Add Qijian 3 addition interface
3. Find the corresponding device to be added by the serial number and enter the network configuration interface



4. Select the WiFi you need to connect to and enter the interface of entering the WiFi password
5. Enter the WiFi password and click Next to enter the device networking interface

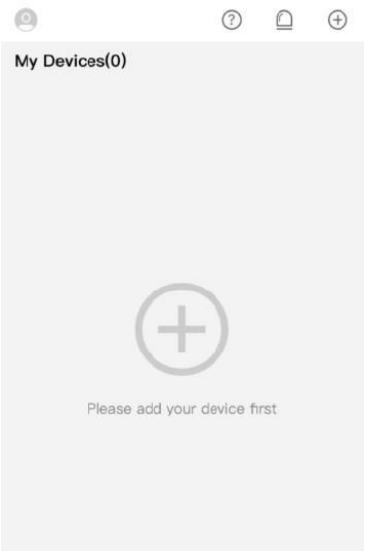
6. Wait for networking to complete
7. Click Start to bind the device, and the device configuration and binding work is completed

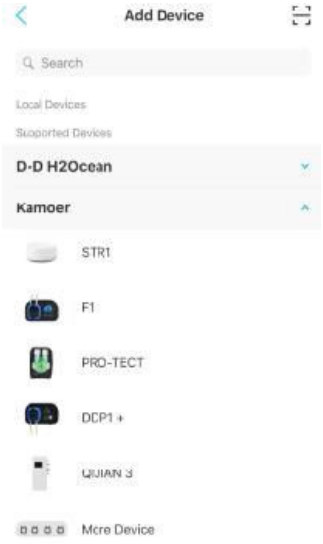
a. You only need to configure the device to connect to Wi-Fi once. After the configuration is successful, as long as the App can connect to the Internet , you can find the device in the device list after opening the App .

b. If the device configuration fails to connect to Wi-Fi, start over from the first step .

3.2 Bind the device

There are two ways for users to bind devices, the first way is to bind devices through the above reconfiguration method; The second way is that the device has been connected to the cloud through the wireless router, at this time the mobile phone can be connected to the wireless router, the App will display the locally available devices, the user can scan the local available device list, click the corresponding device, bind, the specific operation is as follows:





1. Open the App, click the "+" button in the upper right corner of the device to add a device, select "Add Device" to enter the add device interface, select "Qijian 3" in the local available device list and click to enter;

2.After the binding is successful, a prompt will pop up for successful binding, click Start to return to the device list;

3.3 Device Control Interface Overview

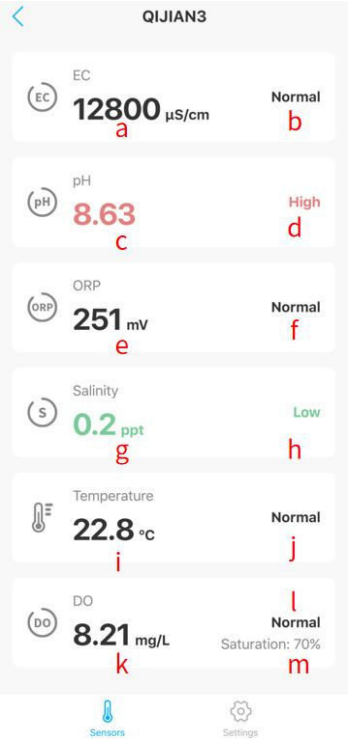
Open the App, click the device in the device list to enter the device operation interface, the device operation interface contains two modules:

a) Status: display the 5 sensor information of the device (EC, PH, ORP, SALINITY, TEMPERATURE, DISSOLVED OXYGEN);

b) Settings: including device version and serial number viewing, modifying device name, firmware upgrade, time synchronization, factory reset, etc.;

3.4 List of sensor channels

In the sensor channel list, you can view the real-time value of the sensor and the alarm status information:



a) **EC value:** the EC value of the test solution, click to view the EC historical value on the details interface.

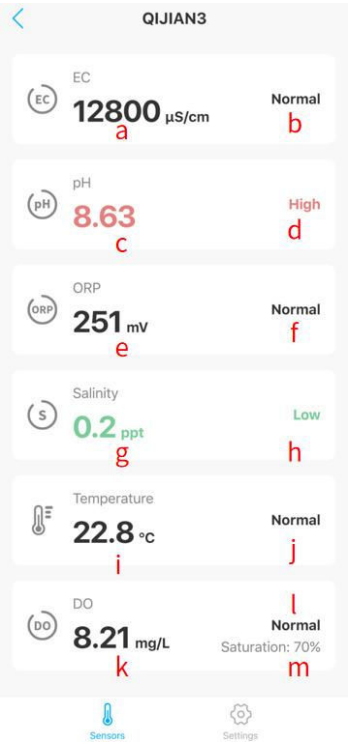
b) **EC status display:** normal (above or equal to the minimum value of the threshold range, or below or equal to the maximum value of the threshold range), high (above the maximum value of the threshold range), low (below the minimum value of the threshold range), the threshold range can be modified in the EC setting interface, below or above the threshold will generate an alarm, to push the alarm can be turned on the push alarm switch in the EC setting interface, otherwise the alarm will not be actively pushed.

c) **pH value:** the pH value of the detection solution, click to view the pH history value on the details interface

d) **PH status display:** normal (above or equal to the minimum value of the threshold range, or below or equal to the maximum value of the threshold range), high (above the maximum value of the threshold range), low (below the minimum value of the threshold range), the threshold range can be modified in the PH setting interface, below or above the threshold will generate an alarm, to push the alarm can be turned on the push alarm switch in the PH setting interface, otherwise do not actively push the alarm.

e) **ORP value:** the ORP value of the detection solution, click to view the ORP historical value on the details interface

f) **ORP status display:** normal (above or equal to the minimum value of the threshold range, or below equal to the maximum value of the threshold range), high (above the maximum value of the threshold range), low (below the minimum value of the threshold range), the threshold range can be modified in the ORP setting interface, below or above the threshold will generate an alarm, to push the alarm can be turned on the ORP setting interface to open the push alarm switch, otherwise do not actively push the alarm.



g) **Salinity:** The salinity value of the detection solution, click to view the historical value of salinity on the details interface

h) **Salinity status:** normal (above or equal to the minimum value of the threshold range, or below equal to the maximum value of the threshold range), high (above the maximum value of the threshold range), low (below the minimum value of the threshold range), the threshold range can be modified in the salinity setting interface, below or above the threshold will generate an alarm, to push the alarm can be turned on the salinity setting interface to open the push alarm switch, otherwise do not actively push the alarm.

i) **Temperature:** The temperature value of the detection liquid, click to view the temperature history value on the details interface

j) **Temperature status:** normal (above or equal to the minimum value of the threshold range, or below or equal to the maximum value of the threshold range), high (above the maximum value of the threshold range), low (below the minimum value of the threshold range), the threshold range can be modified in the temperature setting interface, below or above the threshold will generate an alarm, to push the alarm can be turned on the temperature setting interface to open the push alarm switch, otherwise do not actively push the alarm.

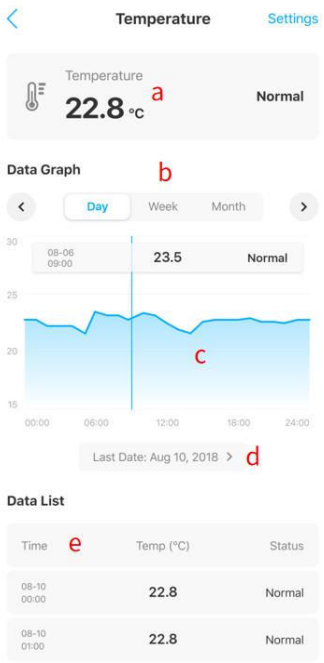
k) **Dissolved oxygen value:** the dissolved oxygen value of the detection solution, click to view the historical value of dissolved oxygen on the details interface

l) **Dissolved oxygen status:** normal (above or equal to the minimum value of the threshold range, or below equal to the maximum value of the threshold range), high (above the maximum value of the threshold range), low (below the minimum value of the threshold range), the threshold range can be modified in the dissolved oxygen setting interface, below or above the threshold will generate an alarm, to push the alarm can be turned on the dissolved oxygen setting interface to open the push alarm switch, otherwise do not actively push the alarm.

m) **Dissolved oxygen saturation:** (measured content of dissolved oxygen / saturated content of dissolved oxygen under measured conditions)%;

3.5 Individual sensor details page

In the sensor list, click a sensor to enter the sensor details page, and you can view the sensor history chart on the sensor details page:



a) **The most recent solution test value**

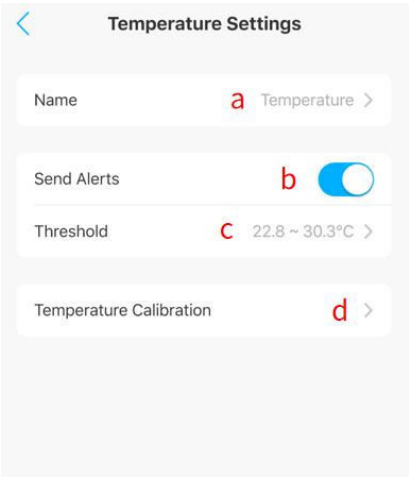
b) **View data period:** (day/week/month) You can choose to view the data of one day, one week or one month;

c) **Graphical display of historical data;**

d) **View data deadline:** set the deadline, the data displayed in the chart is the data before this deadline;

e) **Data list:** The data list displays the details of the detection history data (date, value, whether the value is within the set threshold range);

Setting Interface



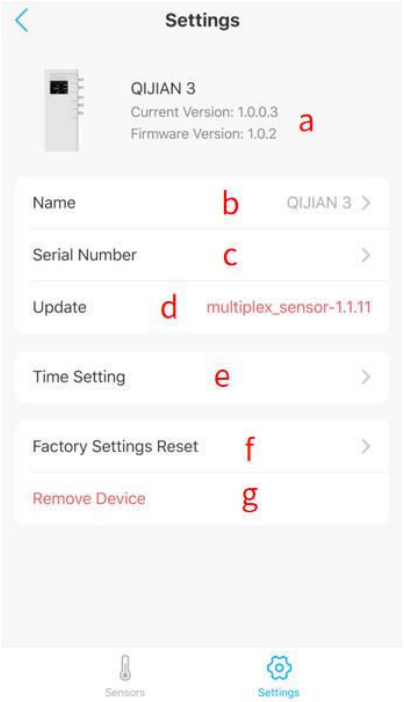
a) **Sensor name:** click to modify the name;

b) **Push alarm switch:** here you can turn push alarm on and off;

c) **Threshold range:** Click to modify the threshold range, the detected value will show normal within the set threshold range, the minimum value below the threshold range will be displayed low, the maximum value above the threshold range will be displayed high, and the relevant alarm will be pushed when the alarm switch is turned on and the detection value is not within the threshold range.

d) **Sensor calibration:** click to jump to the calibration interface to calibrate the corresponding sensor;

3.6 System Settings



a) **Device firmware version display:** current version, firmware version;

b) **Device name:** the setting and modification of the device name is displayed here;

c) **Serial number:** the serial number of the device is displayed here;

d) **Firmware upgrade:** the new version number will be displayed when there is a new version, and the latest version will be displayed when there is no new version

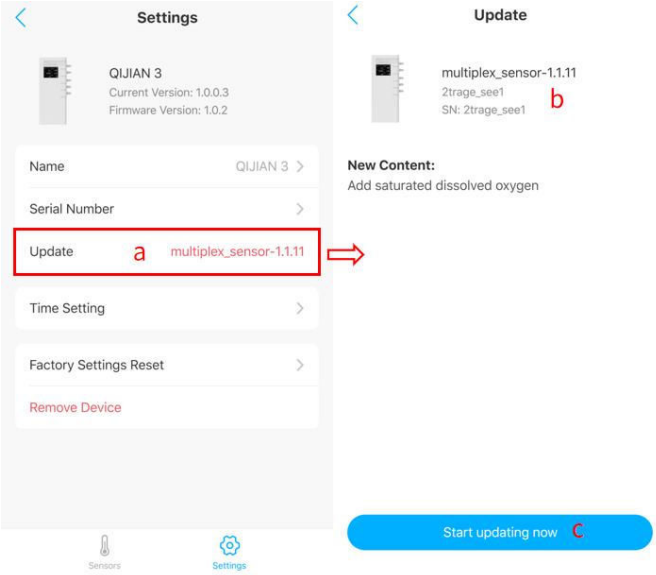
e) **Time setting:** here you can set the real-time clock time of the firmware, App time, and synchronize the time to ensure the correct execution of the pump titration plan;

f) **Factory reset:** Click Factory reset, after factory reset, the parameters of the device will be restored to factory state

g) **Remove the device:** Click here to unbind the App and the device;

3.7 Firmware Upgrade

When the firmware program of the device is updated, it is recommended that the user upgrade the firmware and continue to use it.



a-1) If the latest firmware is available for upgrading, the latest version number is displayed here: you can click to enter the upgrade process

a-2) If the latest firmware is not available, it is shown here: It is the latest version

b) New version prompt: The new version information is displayed, and the description of the new version is displayed below

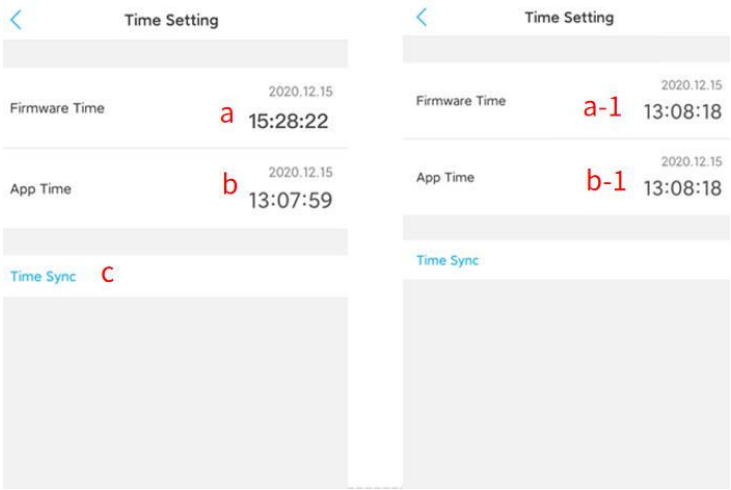
c) Click Update Firmware Program: the status will be displayed after the firmware update is completed;

The upgrade operation steps are as follows: Enter the App settings interface, if you find that a new firmware version appears, click the c update button to update the firmware, do not perform other operations at this time, do not exit the App or re-enter the App, wait until the upgrade is completed, the red status indicator of the titration pump will be long on 2 times, and the buzzer will sound twice, indicating that the equipment firmware upgrade is complete. After the device upgrade is completed, you can perform normal operations, if the upgrade fails, return to the device settings interface and prepare for the new upgrade.

Note: The power cannot be turned off during the upgrade process, and the app should not perform other operations during the upgrade process

3.8 Time Settings

When the time of the device does not match the local time, it is necessary to synchronize the real-time clock time of the device through the App to ensure the normal execution of the equipment titration plan;



a. Device time: the current real-time clock time of the device;

b.App time: the current time of the phone;

c. Time synchronization: click to start the device time synchronization, after time synchronization, the running time of the device will be the same as the time of the mobile phone;

A-1, B-1 are the real-time clock time and mobile phone time of the device after time synchronization;

3.9 Electrode calibration

The electrode needs to be calibrated regularly during use to ensure the accuracy of the electrode test. Among them, PH, ORP, EC electrodes, it is recommended to calibrate once a month, and dissolved oxygen electrodes determine whether calibration is required according to actual usage.
The calibration of the electrode can be found in the setting function of each electrode in the app, and you can operate according to the instructions of the app.

3.10 Electrode maintenance

Storage and maintenance of pH electrodes

pH electrode has a service life, the life of the electrode depends on the use of the environment and the quality of maintenance, in order to extend the service life of the pH electrode, please follow the instructions below

- pH electrode is recommended to be replaced after more than 1 year, and recalibration is required after replacing the electrode
- After the electrode head bulb is dirty, rinse with clean or drinking water, and wipe off the dirt with a soft facial tissue or towel; Avoid removing dirt with a brush or hard objects
- If the electrode is not used for a long period of time, do not let the electrode head dry and place, rinse it clean, absorb the residual distilled water, and put it into the attached soaking bottle or rubber sleeve containing the soaking liquid for storage.
- Do not bend the electrode, bending the electrode will cause damage to the glass inside the electrode
- The sensitive bulb of the electrode tip is a glass-sensitive material, which prevents hard object impact damage and prohibits wiping the bulb with hard objects
- The sensitive bulbs of the electrode tip should not come into contact with oils and fats, especially silicone substances.
- The electrode does not have a waterproof function, do not immerse the whole electrode and the wire in water when using and cleaning. Only the lower part of the electrode cap can be cleaned.
- Do not put cold electrodes into hot water, or hot electrodes into cold water, severe temperature changes will cause damage to the electrode glass, resulting in permanent damage to the electrode
- Do not bend the electrode wire at a large angle, do not stretch the electrode wire

Storage and maintenance of ORP electrodes

ORP electrode has a service life, the life of the electrode depends on the use of the environment and the quality of maintenance, in order to extend the service life of the ORP electrode, please follow the instructions below

- ORP electrode is recommended to be replaced if used for more than 1 year, and recalibration is required after replacing the electrode
- After the electrode tip is dirty, rinse with clean water or drinking water, and wipe off the dirt with a soft facial tissue or towel; Avoid removing dirt with a brush or hard objects
- If the electrode is not used for a long period of time, do not let the electrode head dry and place, rinse it clean, absorb the residual distilled water, and put it into the attached soaking bottle or rubber sleeve containing the soaking liquid for storage.
- Do not bend the electrode, bending the electrode will cause damage to the glass inside the electrode
- The electrode tip is a sensitive material to prevent hard object impact damage, and it is forbidden to wipe the electrode tip with hard objects
- The electrode tip should not come into contact with greases, especially silicone substances.
- The electrode does not have a waterproof function, do not immerse the whole electrode and the wire in water when using and cleaning. Only the lower part of the electrode cap can be cleaned.
- Do not bend the electrode wire at a large angle, do not stretch the electrode wire
- ORP electrode is recommended to be replaced if used for more than 1 year, and recalibration is required after replacing the electrode

Protection and maintenance of EC electrodes

EC electrodes are properly maintained and can be used all the time.

- After the electrode tip is dirty, rinse with clean water or drinking water, and wipe off the dirt with a soft facial tissue or towel; Avoid removing dirt with a brush or hard objects
- Do not bend the electrode, bending the electrode will cause damage to the glass inside the electrode
- The electrode tip is a sensitive material to prevent hard object impact damage, and it is forbidden to wipe the electrode tip with hard objects.
- The electrode tip should not come into contact with greases, especially silicone substances.
- The electrode does not have a waterproof function, do not immerse the whole electrode and the wire in water when using and cleaning. Only the lower part of the electrode cap can be

cleaned.

- Do not bend the electrode wire at a large angle, do not stretch the electrode wire

Protection and maintenance of dissolved oxygen electrodes

- Film cap

a) After rinsing with clean or drinking water, wipe off the dirt with a facial tissue or towel, and avoid removing the dirt with a brush or hard object;

b) When the sensor reading jumps obviously, unscrew the membrane cap to check whether the membrane cap has entered the water or scratched the surface;

c) When the sensor membrane cap is used for more than 1 year, it is recommended to replace the membrane cap; d) Calibration is required after each replacement of the membrane cap.

- Housings and wires

After rinsing with clean or drinking water, wipe off the dirt with a soft facial tissue or towel; Avoid removing dirt with a brush or hard objects.

4. Appendix

4.1 Technical parameters

Dimensions(LxWxH)	280x133.5x30 MM
Weight	Approx. 366g（without power adapter）
Power adapter Input	Input：100VAC -240VAC Output：DC24V 1A
pH electrode parameters	Range 0~14，accuracy±0.1，wire length 3 m，life 1 year
ORP electrode parameters	Range 0~1000mV，accuracy±1，wire length 3 m，life 1 year
EC electrode parameters	Range <60000us/cm，accuracy1%FS，wire length 3 m，maintenance can be used all the time
Temp electrode parameters	Range 0~70°C，accuracy±0.1°C，wire length 3 m，can be used all the time
Dissolved oxygen electrode parameters	Range 0~20mg/L，accuracy±0.1mg/L，wire length 3 m，electrode can be used all the time, membrane cap is recommended to be replaced for 1 year
Interface	WIFI, CAN communication interface
Working environment	Temperature 0 - 60°C，Humidity 10% - 90%（non-condensing）
Storage environment	Temperature -20°C - 85°C，Humidity 10% - 90%（non-condensing）

4.2 After-sales warranty information

1. Warranty Conditions

The free service during the warranty period is only valid under normal use and maintenance according to the user manual, and all man-made faults or damages are not covered by the warranty. Users should keep the purchase invoice and user manual properly, so that you can get satisfactory after-sales service in time.

2. Warranty Coverage

If any damage caused by manufacturing process or components occurs within one year from the date of purchase, the company will provide free warranty service.

The free maintenance service provided during the warranty period includes free repair, free provision and replacement of faulty spare parts, and the product that cannot be repaired is replaced with the same model (if the model has been discontinued, it is a model close to it). The free service does not cover shipping costs incurred by the product due to repairs.

3. Non-warranty Coverage

The following factors are not covered by the free warranty and are subject to customer repair.

1) Product appearance (please confirm at the time of purchase);

2) Improper use, maintenance or storage (please use, maintain and store correctly according to the user manual);

3) Access to inappropriate power supply;

4) Damage to components caused by short circuit of circuit board caused by various insects entering the machine;

5) Losses caused by accidents;

6) Use of inappropriate spare parts (non-company spare parts are not applicable);

7) Negligence of personnel not authorized by the company to handle, modify or repair (please do not disassemble and renovate without authorization);

8) Failure or damage caused by use outside the applicable place;

9) Damage caused by force majeure, etc.;

10) Consumable and consumable parts (such as pH electrode, ORP electrode, EC electrode, dissolved oxygen electrode, etc.);

11) Warranty period expires.

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FCC Warnning:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection againstharmful interference in a residential installation. This equipment generates, uses and can radiateradio frequency energy and, if not installed and used in accordance with the instructions, maycause harmful interference to radio communications. However, there is no guarantee thatinterference will not occur in a particular installation. If this equipment does cause harmfulinterference to radio or television reception, which can be determined by turning the equipmentoff and on, the user is encouraged to try to correct the interference by one or more of thefollowing measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1)This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.