BQ401 Integrated Multi-parameter Sensor Operation manual

SHANGHAI BOQU INSTRUMENT CO.,LTD

Catalog

Introduction

Dear Customers,
Thank you very much for choose the high-quality BQ401 handheld multi-parameter probe and meter from Shanghai BOQU Instrument CO., Ltd. Before you use it, please read this manual in detail, it will be help you for using and maintenance of this instrument, and can avoid unnecessary troubles due to improper operation and maintenance.

Please follow the operating procedures and precautions of this manual.

- To ensure that the after-sales protection provided by this instrument is effective, please do not use and maintain this instrument by methods other than those specified in this manual.

- Any failures and losses caused by non-compliance with the precautions specified in this manual are not covered by the manufacturer's warranty, and the manufacturer does not assume any related responsibilities. Please keep all documents in a safe place. If you have any questions, please contact our after-sales service department.

- When receiving the instrument, please carefully open the package and check whether the instrument and accessories are damaged due to transportation. If any damage is found, please contact our company's after-sales service department and save the packaging for return processing.

- When the instrument breaks down, please do not repair it by yourself, please contact our after-sales service department.

1 Summary

BQ401 are independently developed by BOQU Instrument. This combination can measure temperature, optical dissolved oxygen, fiber optic turbidity, four-electrode conductivity, pH, salinity, etc. The BQ401 multi-parameter handheld probe can support up to 4 types of probe measurements. When connected to instrument, these data can be automatically identified. This meter is equipped with a back light display and operation keyboard. It has comprehensive functions and simple operation. The interface is simple. It can also show measurement data storage, sensor calibration and other functions at the same time, and it can export USB data to achieve more high-end functions. The pursuit of high cost performance is our consistent pursuit.

The dissolved oxygen sensor included in the product uses the world's leading fluorescence lifetime technology, which is based on the principle of quenching active fluorescence by specific substances in physics. The significant advantage of this fluorescence method for measuring dissolved oxygen is that it does not consume oxygen during the measurement process, so there is no flow rate limitation, at the same time, no preheating, no electrolyte, maintenance and frequent calibration, and the response time of the BOQU optical dissolved oxygen probe is even lower. Up to 30 seconds, making dissolved oxygen measurement more accurate, more stable, faster and more convenient.

1.1 Introduction

Pic 1-1 Instrument connect sensor→

Pic1-2 Multi-parameter sensor

1.2 Technical Indexes

Multi-parameter Sensor Indexes		
Optical dissolved oxygen sensor	Range	0-20mg/L or 0-200% saturation
	Accuracy	±1%
	Resolution	0.01mg/L
	Calibration	One or two point calibration
Turbidity Sensor	Range	0.1~1000 NTU
	Accuracy	±5% or ±0.3 NTU（whichever is greater）

	Resolution	0.1 NTU
	Calibration	Zero, one or two point calibration
Four-electrode conductivity sensor	Range	1uS/cm～100mS/cm or 0~5mS/cm
	Accuracy	±1%
	Resolution	1uS/cm～100mS/cm: 0.01mS/cm 0~5mS/cm: 0.01uS/cm
	Calibration	One or two point calibration
Digital pH sensor	Range	pH:0～14
	Accuracy	±0.1
	Resolution	0.01
	Calibration	Three-point calibration
Salinity sensor	Range	0~80ppt
	Accuracy	±1ppt
	Resolution	0.01 ppt
	Calibration	One or two point calibration
Temperature	Range	0~50℃（no freezing）
	Accuracy	±0.2℃
	Resolution	0.01℃
Other information	Protection grade	IP68
	Size	Φ22×166mm
	Interface	RS-485, MODBUS protocol
	Power supply	DC 5~12V, current <50mA
Instrument specifications		
Size	220 x 96 x 44mm	
Weight	460g	
Power supply	2 18650 rechargeable batteries	
Storage temperature range	-40~85℃	
Display	54.38 x 54.38LCD with backlight	

Data storage	support
Air pressure compensation	Built-in instrument, automatic compensation 50~115kPa
Protection grade	IP67
Timed shutdown	support

2 Installation

2.1 Configuration

Standard Configuration	Qty	Unit	Remark
BQ600 Handheld Instrument	1	pc	
BQ401 Handheld multi-parameter sensor	1	pc	Connect 4pcs sensor Max
18650 Rechargeable battery	2	pc	3.7V，use for BQ600
AA battery	2	pc	Use for BQ401
USB connection cable	1	pc	Micro USB
Plug	4	pc	
Wristband	1	pc	
Screwdriver	1	pc	Use to open battery cover
O-ring	1	pc	Fluorescent cap sealed replacement
Sponge	2	pc	Fluorescent cap moisturizing
Rubber Sleeve	1	pc	Fluorescent cap storage

Please carefully check whether the product and accessories are damaged before installation. If damaged, please contact the after-sales service department.

2.2 Install Battery

BQ600 battery installation

The normal use of the meter requires two lithium batteries, please follow up below steps to install the batteries:

1) Unscrew the screws on the battery cover and open the battery cover. Note: The screw cannot be removed, and the battery cover can be opened by screwing it until it stops;

2) Put the battery into the battery box according to the mark on the battery cover of the meter, as shown in the figure below, pay attention not to install the positive and negative poles reversely.

3) Close the battery cover, pay attention to the sealing ring not to fall off or be uneven, and confirm that the direction of the battery cover is correct, and tighten the screws.

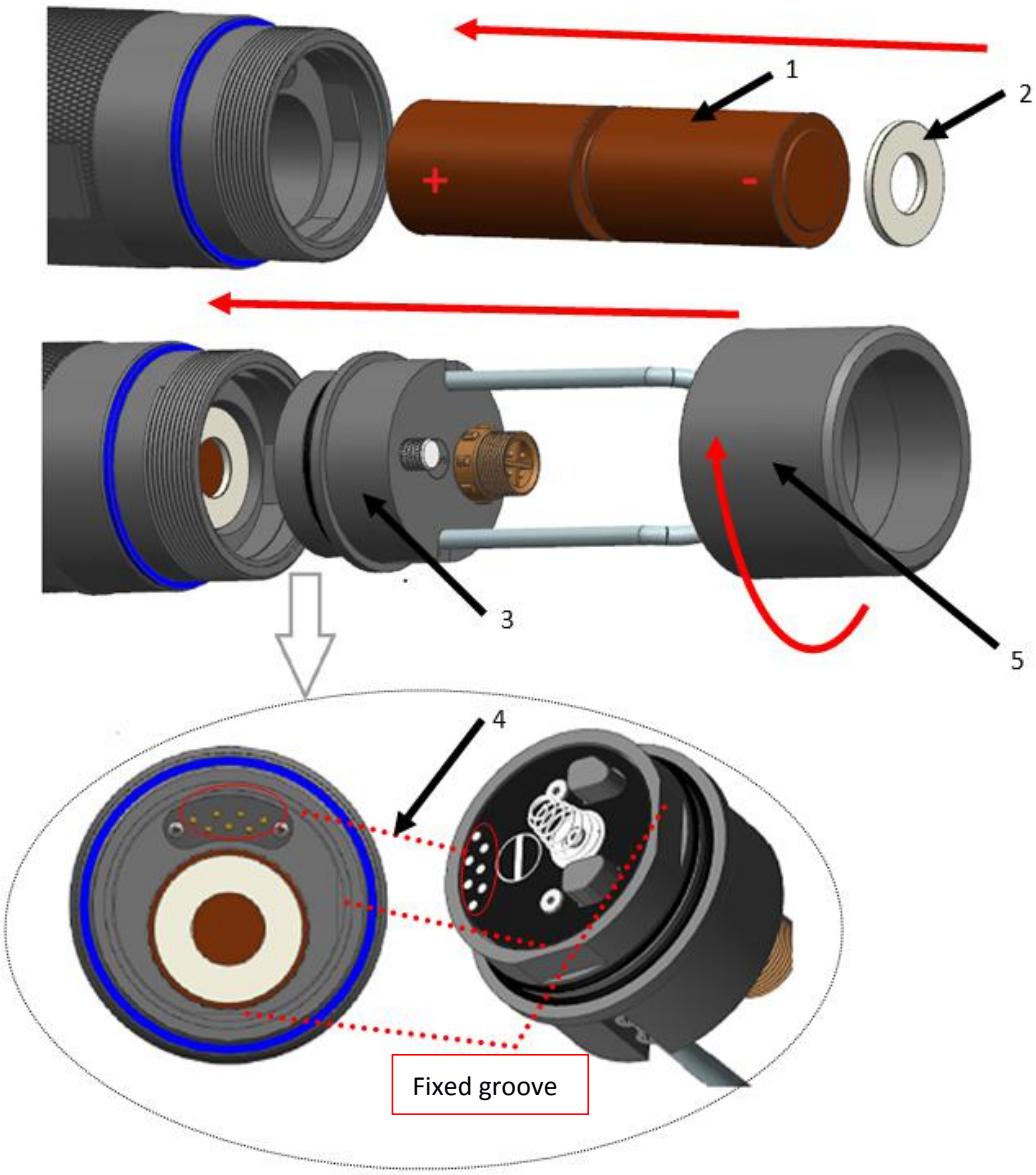
BQ401 Multi-parameter probe Battery Installation

The handheld multi-parameter probe requires two AA batteries for normal use. Please install the batteries according to the following steps:

1) Rotate the tail cap counterclockwise to remove it, and pull out the tail plug.

2) Install two AA batteries and gaskets according to the schematic diagram, paying attention to the positive and negative poles.

3) Install the tail plug and pay attention to the alignment of the data transmission interface with the two positioning slots. Tighten the tail cap clockwise and the installation is complete.



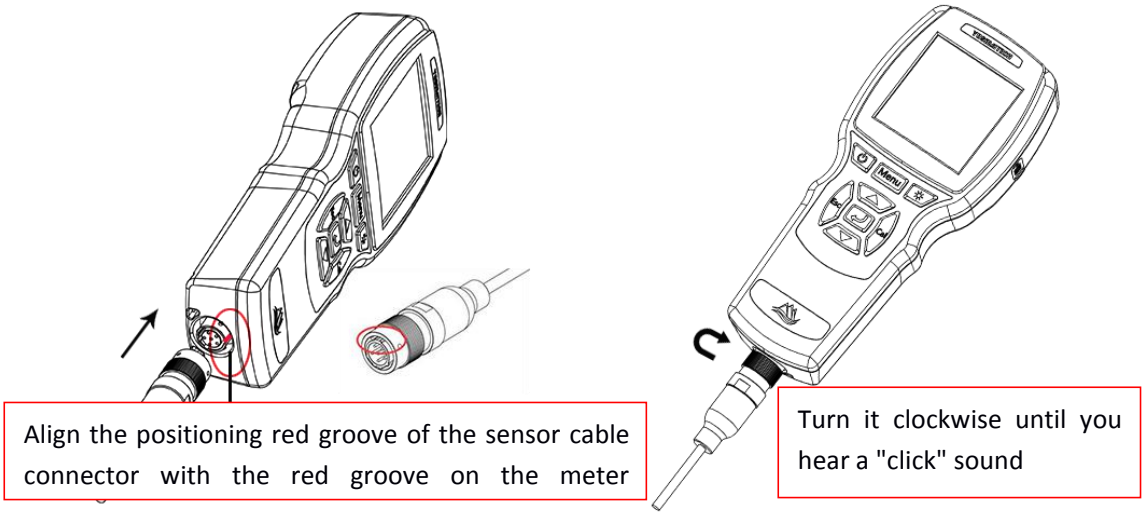
1.Two AA batteries	2 . Gasket	3. Tale Plug	4. Data transmission interface	5. Tale Cover

2.3 Connection

Cable connect to Instrument

As shown in the figure below, align the positioning red groove of the sensor cable connector with the red groove on the meter connector, gently insert it, and then turn it clockwise until you hear a "click" sound, and the connection is successful.
When the sensor probe is to be removed, first push the sensor cable connector inward, and then turn it out counterclockwise.

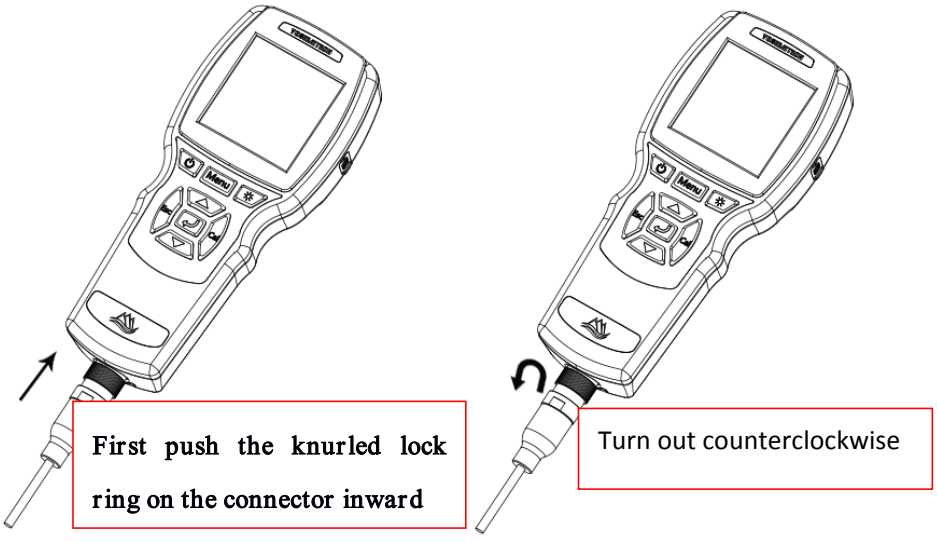
Installation：



Align the positioning red groove of the sensor cable connector with the red groove on the meter

Turn it clockwise until you hear a "click" sound

Take Off：



First push the knurled lock ring on the connector inward

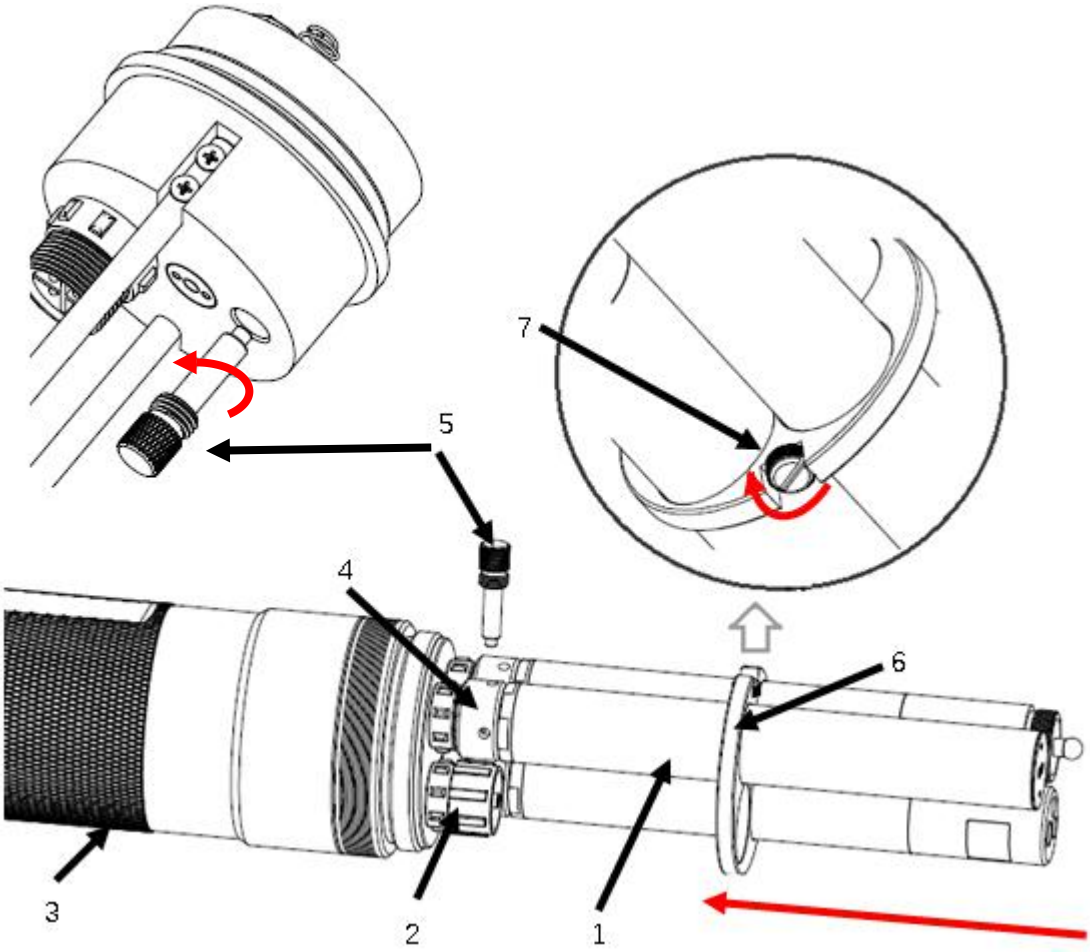
Turn out counterclockwise

Probe Installation

Firstly, turn the probe removal tool counterclockwise from the top of the probe to take it out, as shown in the figure below.

Insert the sensor into the port and carefully tighten the connecting nut clockwise by hand. If you feel any resistance, loosen the connection nut completely and use the probe removal tool to tighten the connection nut clockwise until it is snug. Insert the fixing ring and tighten the fixing screw clockwise.

Note: Do not over tighten the fixing screws. Over tightening may damage the sensor or the retaining ring.



1. Probe	2.Plug	3.Main case	4. Probe connect nut
5.Probe removal tool	6. Fixed ring	7. Fixed screws	

Take out probe:

Firstly, remove the fixing screw counterclockwise and pull out the fixing ring. Then insert the sensor connection nut with the probe removal tool, and turn the fixing nut counterclockwise. After completely loosening, pull the sensor directly out of the port and place it on a clean surface.

Attention

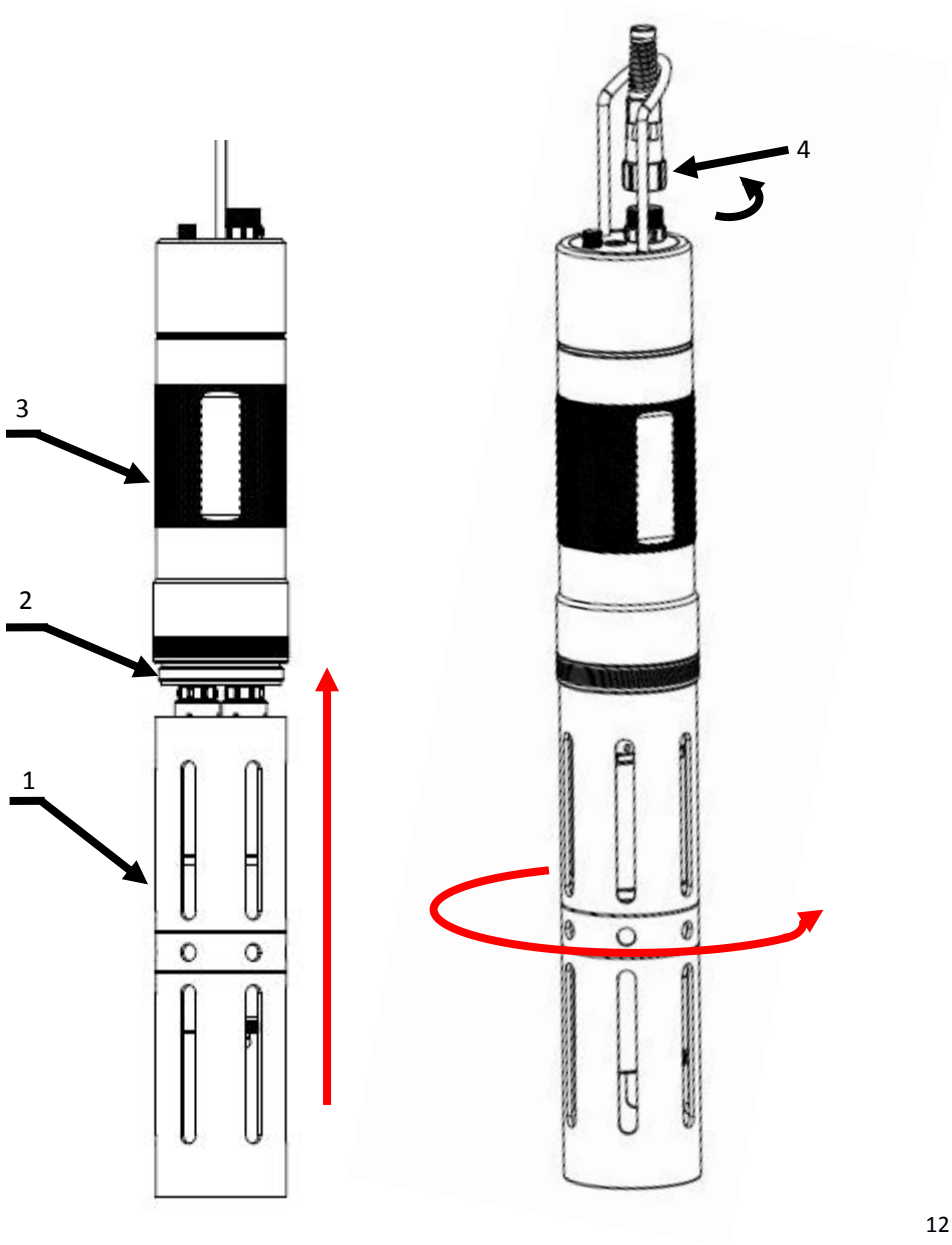
If a port is not installed with a probe, please install a plug. Otherwise exposure to water will cause damage or corrosion of the connector

Sleeve installation and cable connection to the probe

1） Carefully push the sensor shield toward the main body until the threads of the sensor shield are aligned with the threads of the main body.

2） Carefully tighten the sensor shield clockwise with your fingers.

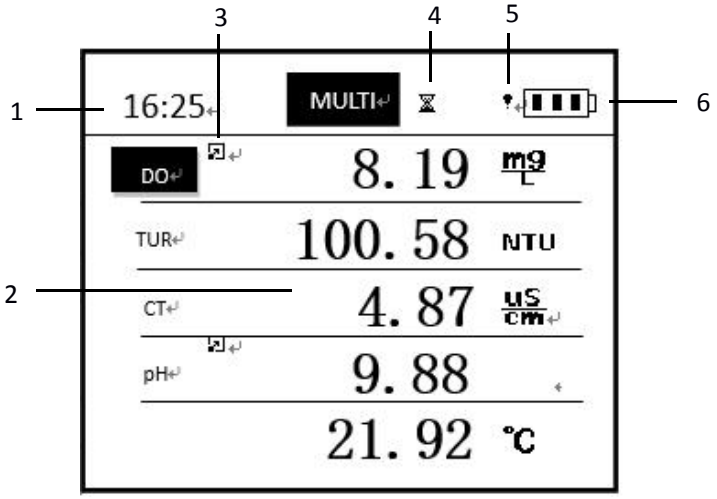
3 ） Connect the cable to the sensor according to the schematic diagram, and tighten the connector clockwise.

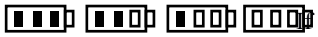


1. Protection cover	2. Thread	3. Main case	4.Cable probe port

3 Operation

Short click button to turn on instrument， BQ600 instrument supports hot-swappable probe. When there is no probe, the measurement interface will display “No Signal!” after power on. If the probe is inserted again, the measurement interface will display all the probe data, as shown in the figure below

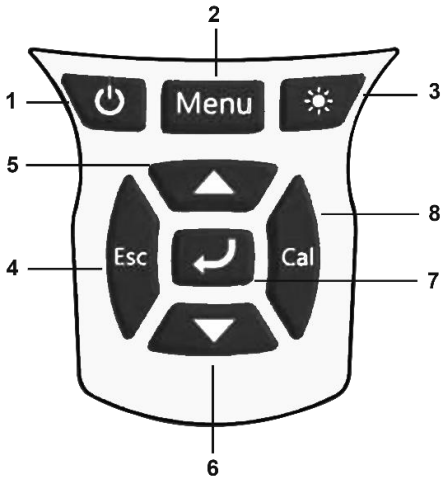


1	Time（Minutes：second）
2	Probe reading: 5 kinds of parameters including measured temperature can be displayed at the same time
3	Indicates that you can switch the probe unit by pressing the OK key
4	Data is being recorded, with an interval of 1 second
5	The meter battery is too low and will be shut down soon
6	Battery status chart, indicating battery level  show  Directly charge the instrument usb or remove the rechargeable battery to charge.

1		Short click	Turn on
		Long click	Turn off
2		Short click	Enter to Menu page
3		Short click	Back light open/off
4		Short click	Exit settings; Return to the previous interface
5		Short click	Scroll up to view menu options Increase value when setting
6		Short click	Scroll down to view menu options Decrease value when setting

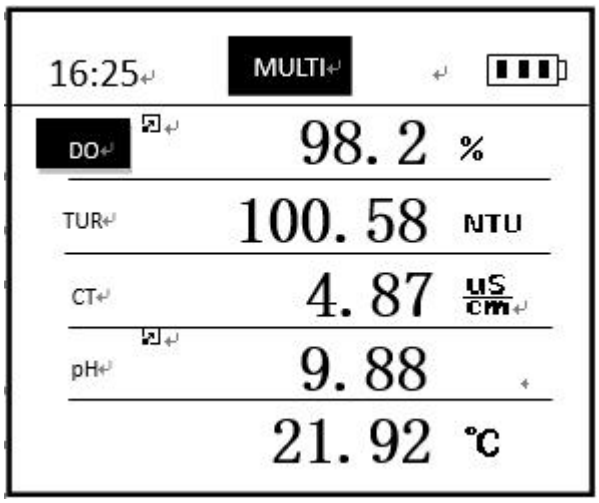
Button Instruction

Short click：Button less 2s



7		Short click	Enter the selected menu Confirm the setting, save the parameter value Switch unit
8		Short click	Enter the calibration interface of the selected probe
		Long click	Enter the calibration recovery interface of the selected probe

Measurement Display



The measurement interface on the right contains the parameters of 4 probes: DO, turbidity, conductivity, and pH. The user can press "▲" and "▼" to switch up and down to select each probe. If there is a "" mark next to the probe, press "↙" to switch the unit.

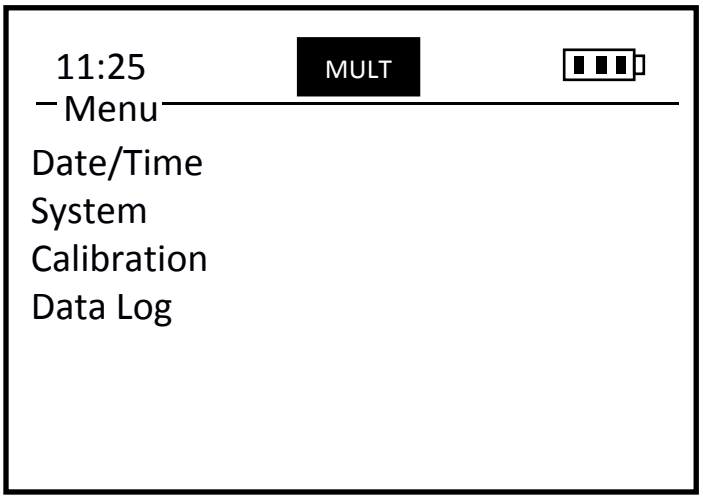
If the probe data exceeds the floating point number range, the "ovf" mark will flash.

If "--" appears, it means that the probe is disconnected or does not exist.

Definition for parameters

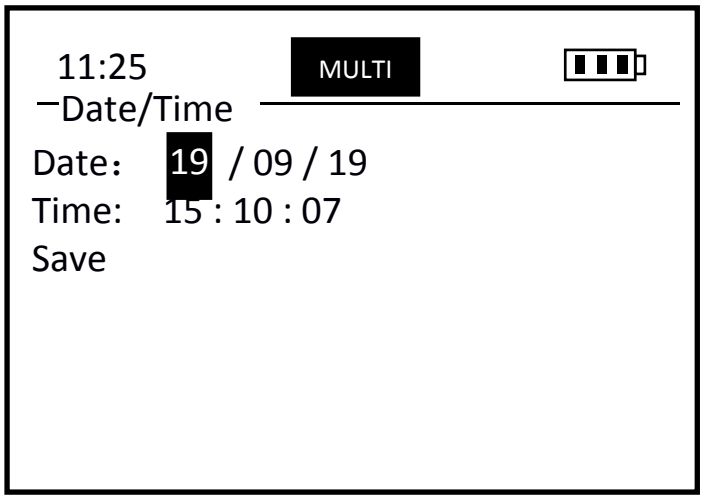
DO	**Dissolved Oxygen**	**SAL**	**Salinity**
TUR	Turbidity	**BGA**	Blue-green Algae
CT	Conductivity	**pH**	pH
CHL	Chlorophyll	**TSS**	Total suspended solids
OIW	Oil in water	**CDOM**	Colored soluble organic matter

Menu



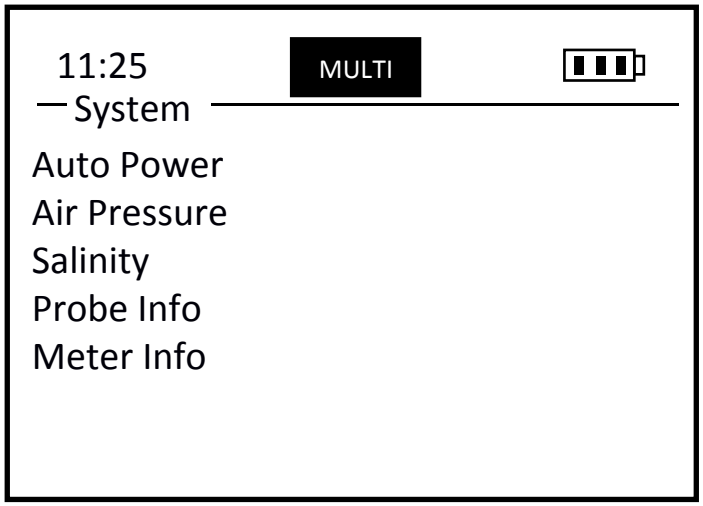
Press "Menu" to enter the menu interface. Press the "▲▼" key to highlight the menu option you have selected, the "↙" key to enter the selected sub-menu, and the "ESC" key to exit the menu interface or menu sub-interface.

3.1 Date/Time

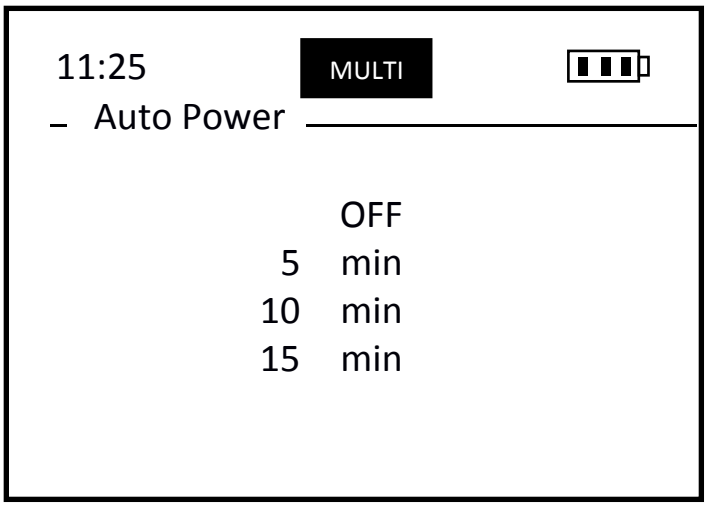


The Date/Time menu sets the date and time of the instrument. Use the ▲ and ▼ keys to adjust the current value. Press "↙" to automatically skip to the next value. After all settings are completed, select Save and press "↙" to save. A prompt "Save Success!" will appear, which means the save is successful.

3.2 System



The System menu can query and set all parameter information, including automatic power off, atmospheric pressure calibration, salinity value setting, probe information, and instrument information. Use "▲▼" keys to select up and down, press "↙" to enter the selected submenu



Auto Power

Four power states can be set:

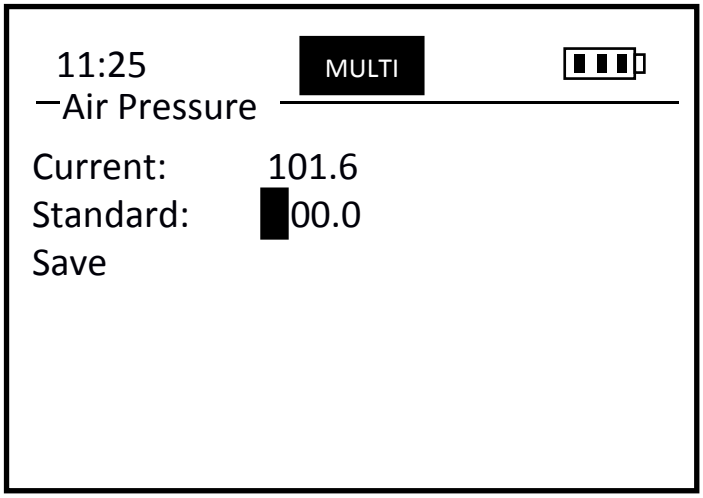
OFF means the power is normally open,

5min means the meter will automatically shut down after 5 minutes of inactivity,

10min means the meter will automatically shut down after 10 minutes of inactivity,

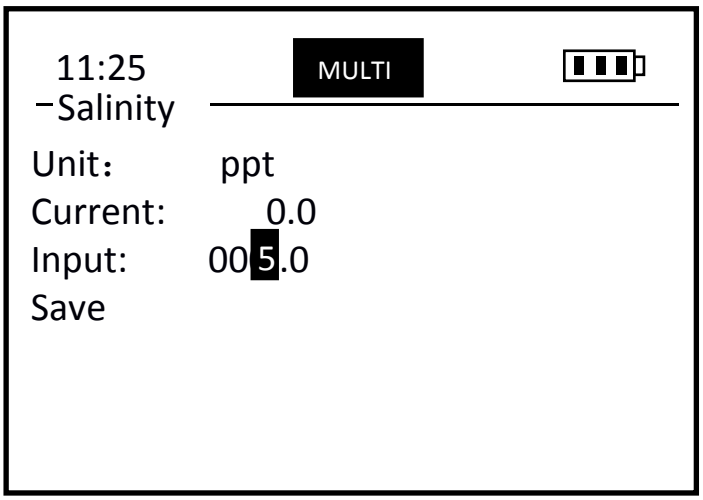
15min means the meter will automatically shut down after 15 minutes of inactivity.

Use the "▲▼" key to select, and the "↙" key to select. This setting will not be saved when the power is off, and it will automatically shut down in 5



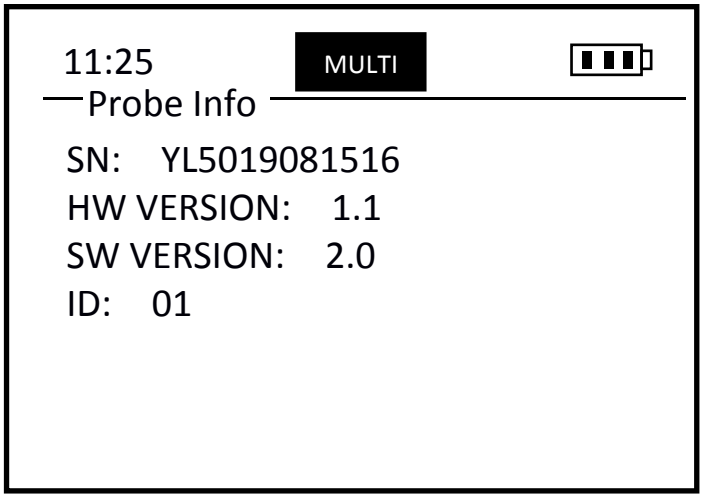
Air Pressure

The atmospheric pressure can be calibrated in kPa, which will affect the dissolved oxygen value. Current represents the currently measured atmospheric pressure value, Standard represents the standard atmospheric pressure to be calibrated to, this value can be adjusted with the ▲ and ▼ keys, press "↙" to automatically skip to the next value, save the value and select Save and press "↙".



Salinity

The salinity of the sample can be set. As the salinity increases, the dissolved oxygen value will decrease, and the meter can compensate for the deviation of the dissolved oxygen value caused by the salinity value. Use the ▲ and ▼ keys to adjust the salinity value, press "↙" to automatically skip to the next value, save the value and select Save and press "↙". This value can be saved when power off, and the default salinity is 0ppt. Usually 0-0.5ppt for fresh water and 35ppt for sea water.



Probe Info

Including 4 probe options, select the reverse display probe to view some information of the probe, including SN, hardware version number, software version number, Modbus ID address.

Meter Info

You can view some information of the instrument, including SN, hardware version number, and software version number.

3.3 Calibration

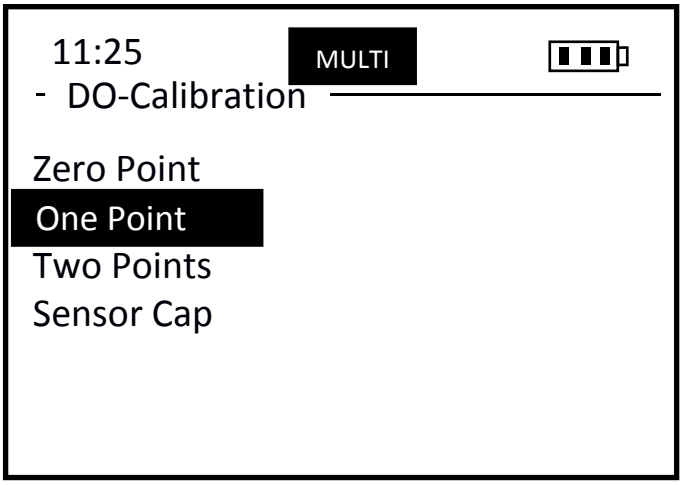
Select a probe in the Menu->Calibration directory to enter the calibration interface. You can also select a probe in the measurement interface and press the "Cal" key to quickly enter the probe's calibration interface.

Attention
Do not unplug the sensor cable during the entire calibration process.

3.3.1 DO Calibration

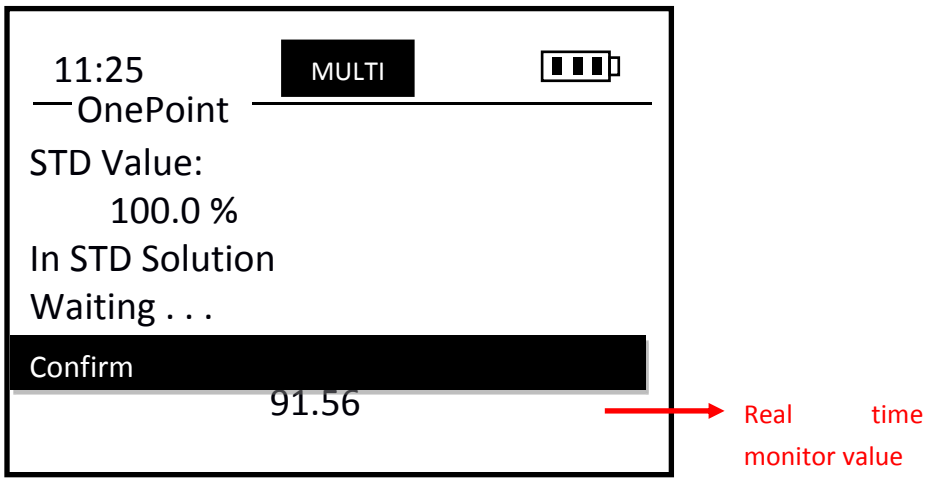
The dissolved oxygen probe supports one-point calibration and two-point calibration. There is no zero point calibration for dissolved oxygen.

Attention
Before calibration, make sure to remove the protective cover of the DO electrode fluorescent cap with a damp sponge on the probe.



One point calibration

- **"STD Value":Enter the target value to be calibrated, one point calibration, it is recommended to set the target value of dissolved oxygen to 100% sat. Press the ▲ and ▼ keys to adjust the value, press "↙" to automatically skip to the next value.**

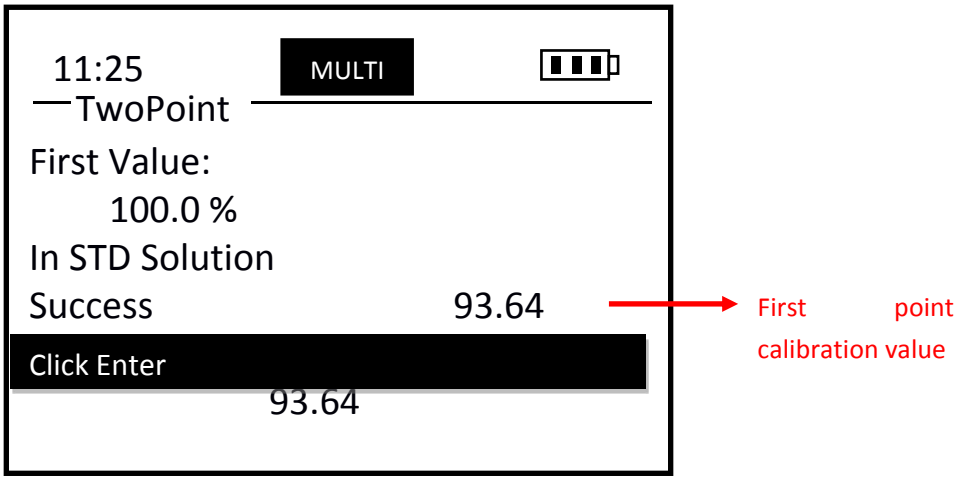


- **"In STD Solution"**: Press "↙" under "Click Enter" to enter the next step "In STD Solution", which means that the dissolved oxygen electrode is placed in the dissolved oxygen environment corresponding to the input value. The bottom of the screen will display the real-time measurement value in %, waiting for the data to become Stable, as shown in the figure above.
- **"Confirm":**After stabilization, press "↙" under "Confirm", the meter calculates the slope, if it prompts "Success", the calibration is successful, if it fails, it will prompt "Fail". After success, press the "↙" key under "Cali Done!" to exit the calibration.

Two points Calibration

- Firstly, enter the first calibration point for calibration, the process is the same as above, after completion, press "↙" under "Click Enter" to enter the second point calibration. As shown below.
- Follow the prompts: "STD Value" -> "In STD Solution" -> "Confirm", and enter the second target value that needs to be calibrated. Put the electrode into the standard solution of the corresponding value, wait for the data to stabilize and press the "↙" key, the meter calculates the zero point and slope. If the calibration is successful, it will prompt “Success”, if it fails, it will prompt “Fail”.

Two points calibration for DO, suggest to choose 100% SAT for first point, 0% SAT for second point.



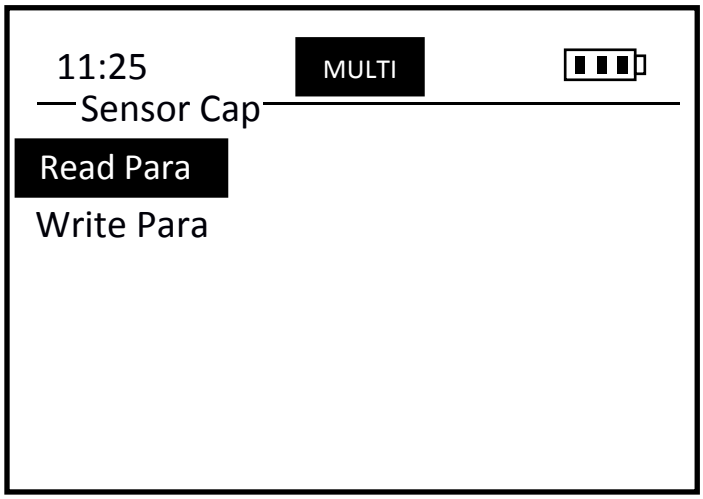
Zero oxygen environment: prepare a beaker, take 200ml tap water, distilled water, or negative ion water into the cup, then slowly add anhydrous sodium sulfite to the beaker, stirring while adding, until the anhydrous sodium sulfite is insoluble and solids appear. When the standard solution is zero oxygen.

Saturated oxygen environment: aerate the water with an aeration pump, and take out the aeration pump after 15 minutes. At this time, the water environment is a saturated oxygen environment.

*If conditions do not allow, it can be considered that the air is saturated with oxygen.

Sensor Cap（ Fluorescent cap parameter）

When replacing the fluorescent cap of a new electrode, you need to input the characteristic parameters of the electrode cap correctly, otherwise the measurement data of the electrode will be inaccurate. There are 8 sets of parameters K0-K7.

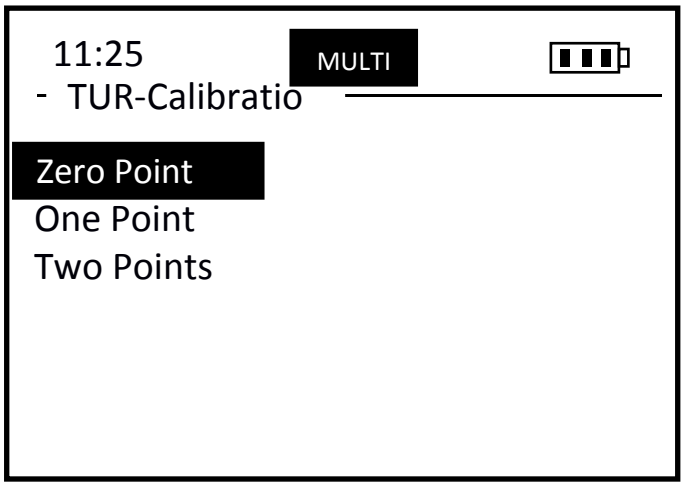


Select Read Para and press the "↙" key to enter the read fluorescent cap parameter interface. At this time, 8 sets of K0-K7 data will appear.

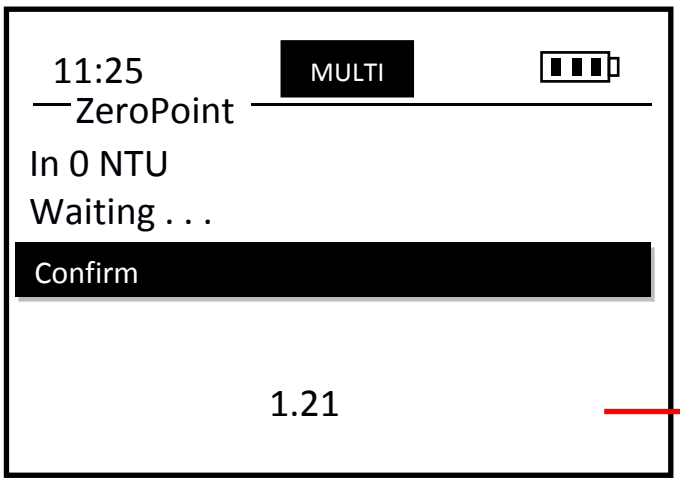
Select Write Para and press the "↙" key to enter the write fluorescent cap parameter interface. At this time, 8 sets of K0-K7 data will appear. Use the ▲ and ▼ keys to adjust each digit value, press "↙" to automatically skip to the next value. After all the updates are completed, select Save and press "↙".

3.3.2 Turbidity Calibration

Turbidity probe supports zero-point calibration, one-point calibration and two-point calibration.



Zero point calibration



- **“In 0 NTU”**:Follow the prompts to put the turbidity electrode into the 0NTU standard solution (distilled water/deionized water can be used instead), the bottom of the screen will display the real-time measurement value in NTU, and wait for the data to stabilize.
- **“Confirm”:**Press "↙" under "Confirm" to complete the calibration. If it prompts "Success", the calibration is successful. If it fails, it will prompt "Fail". After success, press "↙" under "Cali Done!" to exit the calibration.

One point calibration

Follow the prompts: "STD Value" -> "In STD Solution" -> "Confirm", enter the calibration point, put the probe into the turbidity standard solution of the corresponding concentration value, wait for the data to stabilize and press the "↙" key to complete The process of calibration is the same as 3.3.1 one-point calibration. **One-point calibration cannot use zero value for calibration.**

Two points calibration

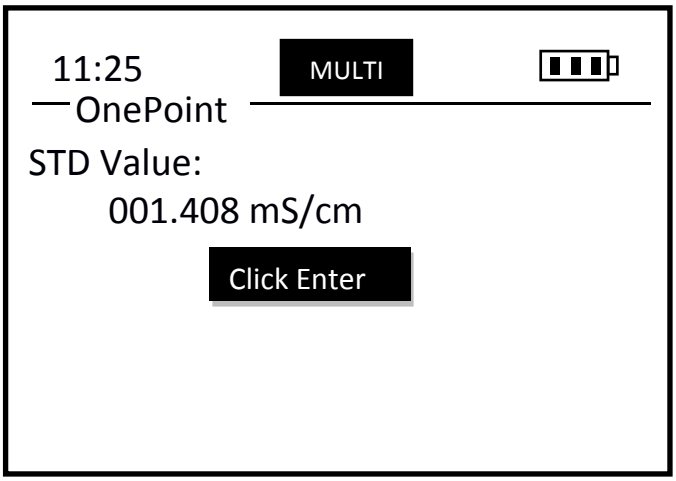
Follow the prompt "STD Value" -> "In STD Solution" -> "Confirm" to enter the first calibration point for calibration, and then press "↙" under "Click Enter" to enter the second point calibration. The process is the same 3.3.1 Two-point calibration.

3.3.3 Conductivity Calibration

The conductivity probe supports one-point calibration and two-point calibration. If it is a low-range probe, it is recommended to use a conductivity standard solution of 1.4083mS/cm for calibration. If it is a high-range probe, it is recommended to use a conductivity standard solution of 12.852mS/cm for calibration.电导电极支持一点校准和两点校准。

One point calibration

Follow the prompts: "STD Value" -> "In STD Solution" -> "Confirm", enter the calibration point, as shown in the figure below. Press "↙" under "Click Enter" to enter the next step "In STD Solution", put the probe into the standard solution of the corresponding value, wait for the data to stabilize, and then press the "↙" key to complete the calibration. The process is the same as 3.3.1. calibration. One-point calibration cannot use zero value for calibration. The real-time measurement value will be displayed at the bottom of the screen in mS/cm.



Two points Calibration

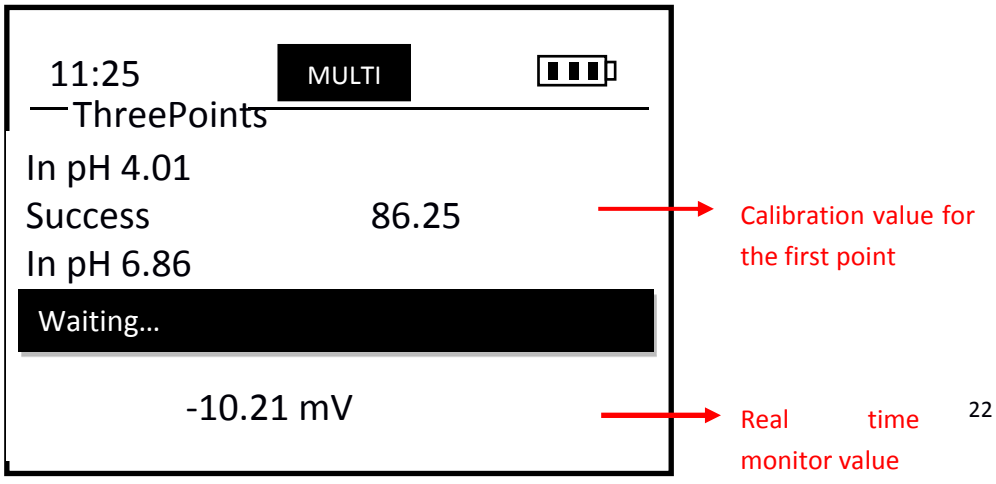
Follow the prompt "STD Value" -> "In STD Solution" -> "Confirm" to enter the first calibration point for calibration, and then press "↙" under "Click Enter" to enter the second point calibration. The process is the same 3.3.1 Two-point calibration.

3.3.4 pH Calibration

The pH electrode supports three-point calibration. And the standard solution of the three calibration points should be fixed 4.01, 6.86 and 9.18.

Three points calibration

After selecting the three-point calibration, press "↙" under "Click Enter" to enter the first calibration point 4.01 of the three-point calibration. After waiting for the data to stabilize, press "↙" under "Waiting..." to enter the second calibration point. Put the probe into the second calibration standard solution 6.86 and wait for it to stabilize, as shown in the figure below. After stabilization, press "↙" under "Waiting..." to enter the third calibration point, put the probe into the third standard solution 9.18, wait for the data to stabilize, press "↙" to complete the calibration, if the calibration is successful, it will display Success, otherwise it displays Fail! .



3.3.5 Salinity Calibration

The salinity electrode supports one-point calibration and two-point calibration.

One point calibration

Follow the prompts: "STD Value:"->"In STD Solution"->"Confirm", enter the calibration point, put the probe into the salinity standard solution of the corresponding value, wait for the data to stabilize, and then press the "↙" key to complete The process of calibration is the same as 3.3.1 one-point calibration. One-point calibration cannot use zero value for calibration. The bottom of the screen will display the real-time measurement value in ppt.

Two points calibration

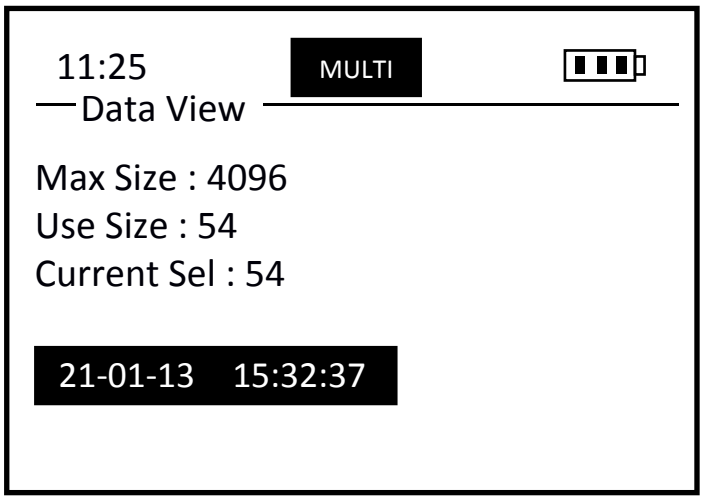
Follow the prompt "STD Value" -> "In STD Solution" -> "Confirm" to enter the first calibration point for calibration, and then press "↙" under "Click Enter" to enter the second point calibration. The process is the same 3.3.1 Two-point calibration.

3.4 Data Log

Data Store

BQ600The meter can record 4096 measurement results. There are two data recording methods. You can press Data Log/Data Store/Store 1 Times to save once. Click **Data Log/Data Store/Store 1 second** Indicates that data is automatically stored, and each group of data is separated by 1 second， "⧗"Appears to indicate the start of recording data, select Data Log/Data Store/Store 1 second again, data recording ends，"⧗"disappear.

Data View



Max Size

Indicates how many pieces of data can be stored in total；

Use Size

Indicates how many pieces of data are currently used；

Current Sel

Indicates which data is currently selected, as shown in the figure below, currently reading is the 54th data information.

The stored data results are named after the storage time. 21-01-13 15:32:37 means that the 54th data was stored at 15:32:37 on January 13, 2021. Use the ▲ and ▼ keys to select other data time, and press the "↙" key to enter and view the specific data results at that time point.

Data Delete

*Choose Yes to clear all the data currently stored, please choose carefully.

Cal/Reset Cal

Attention
You must press "Cal" in the measurement interface to enter the calibration interface

In the measurement interface, select a probe and short press "Cal" to enter the calibration interface of the probe. For details, see section 3.3 above.

Select a probe and long press "Cal" to enter the calibration recovery interface of the probe, select Yes to restore the user calibration parameters of the probe to k=1 and b=0.

Connect to computer

BQ600 The handheld meter comes with a PC software MeterRead, which is used to read the data stored in the meter.

Please open the software, and then connect the provided USB cable to the handheld meter to the USB port of the PC. At this time, the COM PORT of the software can identify the port, then select the download data path, and click Load. The file format is .CSV.

Please open the software, and then connect the provided USB cable to the handheld meter to the USB port of the PC. At this time, the COM PORT of the software can identify the port, then select the download data path, and click Load. The file format is .CSV.

Attention
The instrument must be connected to the computer in the shutdown state, the software will recognize the port

4 Maintenance

4.1 Instrument maintenance

Except occasionally needing to wipe the outer surface of the meter with a damp cloth or replace the battery, the BQ600 meter does not require other maintenance. Please note that the battery compartment cannot be filled with water during normal use and replacement of the battery.

4.2 Probe Maintenance

DO probe

BQ600 The matched optical dissolved oxygen electrode measures the dissolved oxygen content based on the quenching principle of the active fluorescence by a specific substance. It does not consume oxygen during measurement and does not require frequent cleaning (except when used in viscous liquids).

Maintenance Task	Recommended maintenance frequency
Clean probe	Clean every 30 days
Check whether the sensor and fluorescent cap are damaged	Check every 30 days
Replace fluorescent cap	Replace every year
Calibrate probe	Calibrate every 3-6months
Wet and preserve fluorescent membrane	Check the status of the sponge every 30 days and replenish water in time

Maintenance methods:

1) Clean the outer surface of the sensor: clean the outer surface of the sensor with tap water. If there are still debris remaining, wipe it with a moist soft cloth. For some stubborn dirt, add some household detergent to the tap water and use a soft brush to lighten it. Lightly scrub

2) Remove the protective cover on the front of the sensor, and rinse the dirt on the fluorescent membrane of the sensor with clean water; if you need to wipe, please use a moist soft cloth and be careful about the strength and direction of the force, and then screw the protective cover; it is forbidden to scratch with nails or sharp objects If scratches are caused to the fluorescent membrane, the sensor will not work properly!

3) Clean the inner surface of the fluorescent cap: If water vapor or dust penetrates into the fluorescent

cap, the cleaning steps are as follows:

i. Remove the fluorescent cap

ii. Rinse the inner surface of the fluorescent cap with tap water

iii. For dirt containing fat and oil, clean it with warm water with household detergent

iv. Rinse the inner surface of the fluorescent cap with deionized water

i. Use a clean, lint-free cloth to gently dry all surfaces, and place in a dry place to let the water evaporate completely

1) Daily storage of fluorescent cap: The fluorescent film needs to be kept wet, so when storing or not in use, a protective cover with a wet sponge should be placed on the fluorescent cap. Please remove and properly save the protective cover when using it to avoid loss. Note: If the sponge in the protective cover is dry due to lack of water, it can be moistened with deionized water or pure water; if the fluorescent film is kept in a dry state for a long time by improper storage, it will cause inaccurate measurement and greatly shorten the life of the fluorescent film.

2) Check the cable of the probe: the cable should not be tight during normal operation, otherwise there is a risk of breaking the wires inside the cable, causing the sensor to fail to work normally;

3) Check whether the housing of the sensor is damaged due to corrosion or other reasons.

Dissolved oxygen sensor fluorescent cap replacement

1) If the sensor and controller are connected when the fluorescent cap is to be replaced, please disconnect it first;

2） Remove the old fluorescent cap: Hold the probe spindle with one hand, and gently rotate the fluorescent cap counterclockwise with the other hand to completely remove it. Note: No tools can be used in this step.

3）Check whether the O-ring seal on the probe is damaged: If there are any signs of damage, carefully remove the damaged seal ring, and then replace it with a new one. Note: Do not use any tools when removing the damaged sealing ring and replacing it with a new one.

4)Make sure that the O-ring seal installed on the probe is clean: if there is dust or dirt, please wipe it clean with a dust-free cloth or replace the waterproof ring directly according to the previous step.

5)Put on the new fluorescent cap: Hold the probe spindle with one hand, and gently rotate in the clockwise direction with the other hand to tighten the new fluorescent cap (with protective cover). Note: No tools can be used in this step

6）After replacing the new probe cap, you need to set the characteristic parameters to the meter. For specific operations, see 3.3. The specific values of the characteristic parameters are in the package of the new fluorescent electrode cap.

Attention
Please do not touch the fluorescent membrane on the dissolved oxygen sensor with your hands. Avoid directly applying any mechanical stress (pressure, scratches, etc.) to the fluorescent film during the use of the dissolved oxygen sensor

Turbidity probe

Maintenance Task	Recommended maintenance frequency
Clean probe	According to the use environment
Calibrate probe	Regularly perform one or two-point calibration

Maintenance method:

1) Clean the outer surface of the sensor: same as the dissolved oxygen electrode;

2) Measure the outer surface: clean the outer surface of the sensor with tap water. For some stubborn dirt, you can use traditional detergent and soft cloth to clean.

3) Check the cable of the sensor: the same as the dissolved oxygen electrode;

4) Check whether the housing of the sensor is damaged due to corrosion or other reasons

Conductivity/salinity probe

Maintenance Task	**Recommended maintenance frequency**
Clean probe	Clean every 30 days
Calibrate probe	Regularly perform one or two-point calibration

Maintenance method:

1) Clean the outer surface of the sensor: same as the dissolved oxygen probe;

2) Sensor inlet and outlet holes: wipe with a cotton swab or soft cloth. For some stubborn dirt, you can use traditional detergent and soft cloth to clean.

3) Check the cable of the sensor: the same as the dissolved oxygen electrode;

4) Check whether the housing of the sensor is damaged due to corrosion or other reasons

pH Probe

Maintenance Task	Recommended maintenance frequency
Calibrate the probe	3-point calibration every 30 days
Replace pH probe	Please replace on time according to the electrode warranty period and application environment

Maintenance methods:

1) **Clean the outer surface of the sensor:** same as the dissolved oxygen electrode; pay special attention to the electrode bulb to avoid breaking!

2) **Check the cable of the sensor:** the same as the dissolved oxygen electrode;

3) **Sensor storage:** When the sensor is not in use, the black plastic cap should be buckled to check whether the sponge inside is wet, if it is not wet enough, please add 3mol/L potassium chloride solution, and put the electrode with potassium chloride Stored in the solution.

Attention；

The probe contains sensitive optical components and electronic components. Make sure that the probe is not subject to severe mechanical shocks. Sensor damage caused by impact or man-made will not be covered by the warranty. Water entering the sensor due to the replacement of the pH electrode is not covered by the warranty.

5 FAQ

Table 5-1 lists the possible problems of the handheld meter and their solutions. If your problem is not listed or the solution cannot handle your problem, please contact us.

Table 5-1 List of FAQ

Unusual phenomenon	Possible reason	Solution
The handheld meter does not display the measurement result (when the sensor is connected)	The connection between the meter and the cable is wrong	Reconnect the meter and cables
	BQ600 meter's battery without electricity	Directly charge the instrument usb or remove the rechargeable battery to charge
	BQ401 probe without electricity	Replace the battery for the handheld multi-parameter probe
	Cable failure	Contact us
The measured value is too high, too low or the value is continuously unstable	The probe measures whether air bubbles and dirt are attached to the end surface	Check and clear
	Abnormal consumables such as fluorescent cap and pH electrode	Check and replace
	The probe is not calibrated on schedule	Perform a calibration operation
The red light on the top of the BQ401 probe is on	BQ401 Probe without power	Replace the battery for the probe
A flashing "ovf" symbol appears	The salinity probe appears "ovf" in the air	Put the salinity probe into the solution
	Other probes, the probe data is abnormal	Restore user calibration value, if invalid, please contact us