SZ600-A&SZ507-A
Handheld ODO Meter
User Manual

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Preface

Dear customer

Thank you for your instrument purchase. Reading the entire manual before use is highly recommended for operation and maintenance the instrument and out of unnecessary trouble.

Please observe the operating procedures and precautions in this manual.

To make sure the effective after-sales protection provided by the instrument, please do not use any operation or maintenance other than which mentioned in the manual.

Due to non-compliance with the precautions specified in this manual, any fault and loss caused shall not be covered by the warranty, and the manufacturer shall not bear any relevant responsibility. If you have any questions, please contact our after-sales service department or representative.

Carefully unpack the instrument and accessories from the shipping container, and inspect for possible damage during shipping. Check received parts with items on the packing list. If any parts or materials are damaged or missing, please contact our company service or the authorized distributor immediately.

Save all packing materials until you are sure that the instrument functions properly. Any damaged or defective items must be returned in their original packaging materials.

1 Overview

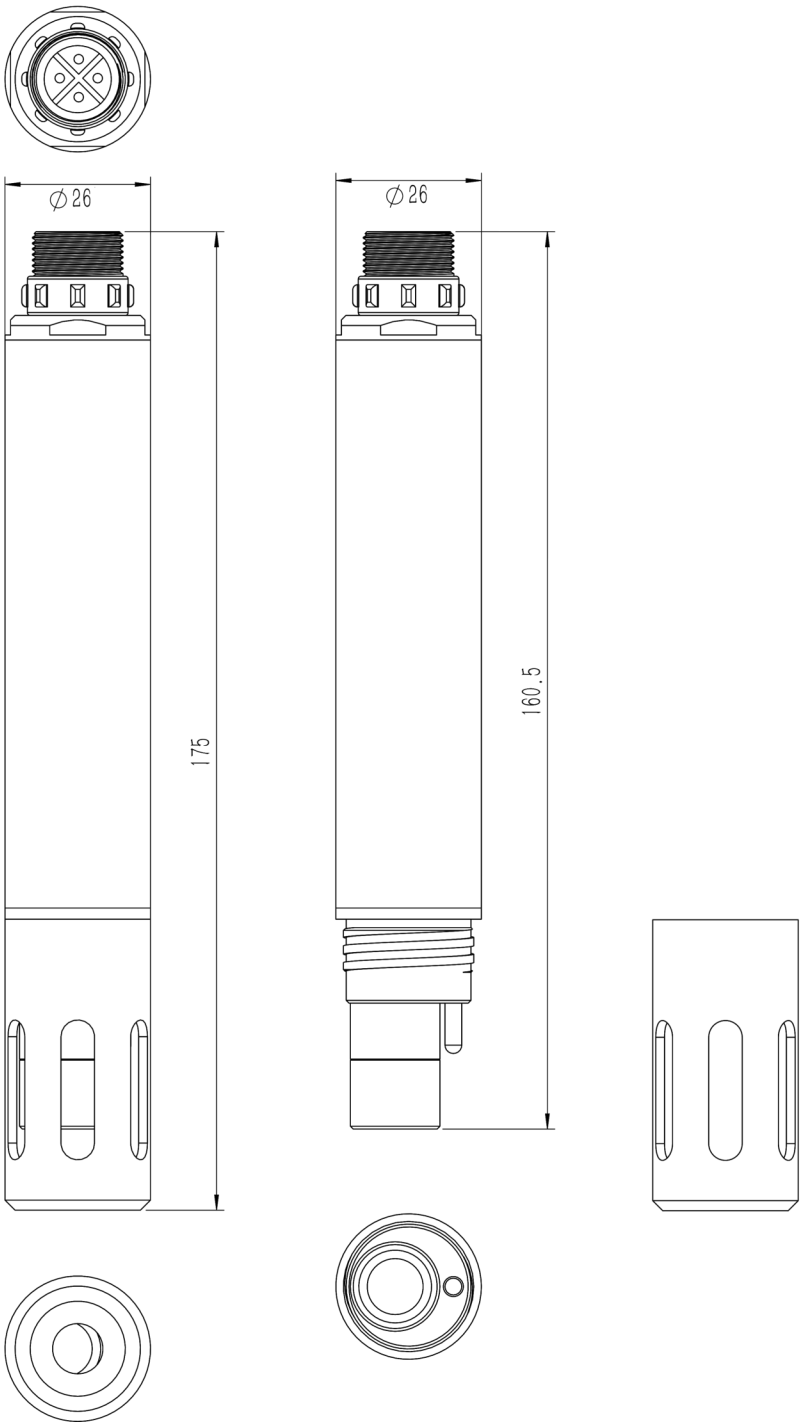
The instrument is a portable device that can automatically recognize our company digital sensors including optical dissolved oxygen, 4-electronic conductivity, turbidity, chlorophyll, BGA, OIW and TSS ,and can measure, display, log. The provides keyboard and backlight with comprehensive functions, simple operation and brief interface. The microprocessor based meter can transmit USB signals and perform sensor calibration easily on a single platform.

The DO sensor adopts the internationally leading fluorescence lifetime technology, which is based on the quenching principle of specific substances to active fluorescence in physics. The remarkable advantage of this fluorescence method in measuring dissolved oxygen is that it does not consume oxygen in the measurement process, so there is no flow rate limit, no need to preheat electrolyte, no need for maintenance and frequent calibration. The response time of optical dissolved oxygen probe is as low as 20 seconds, making the measurement of dissolved oxygen more accurate, more stable, faster and more convenient.

Handheld ODO Meter with automatic temperature and pressure compensation, salinity manual input compensation function; It supports automatic locking of dissolved oxygen detection value and setting of filtering mode. The dissolved oxygen detection has high accuracy and stability, and can be used in unstable conditions of aeration tank, sewage plant and other water bodies with higher effect.

1.1 Introduction




Φ26
Φ26
175
160.5

1.2 Specifications

ODO Sensor	
Sensor Type	Full immersion probe
Range	0-20mg/L or 0-200% air Sat.
Accuracy	±1% or ±0.3mg/L
Response time	20s
Drift	<1% per Year
Temperature sensor	NTC
Working temperature	0-50℃
Temperature accuracy	±0.2℃
IP rating	IP68
Maximum pressure	6bar
Interface	Match handheld meter
Size	Φ26×175mm
Cable length	5m Standard (customizable)
Weight	204g
Material	316L
Handheld Meter	
Size	220 x 96 x 44mm
Weight	460g
Power	Two 18650 rechargeable batteries
Working temperature	0-50℃
Storage temperature	-30~70℃
Display	54.38 x 54.38mm LCD back illuminated
Data storage	Support
Pressure compensation	Built-in， auto compensation in 50~115kPa
IP rating	IP67
Regular Shutoff	Support internal storage, upto 5000 data set

2 Setting-up

2.1 Configuration

Item	Number	Note
Handheld Meter	1	
ODO sensor	1	5m default， optional
USB cable line	1	Micro USB
Wristband	1	
Screwdriver	1	To open the battery compartment

Note

Check the individual parts against the list of components. If anything is missing or damaged, notify after-sales service department immediately

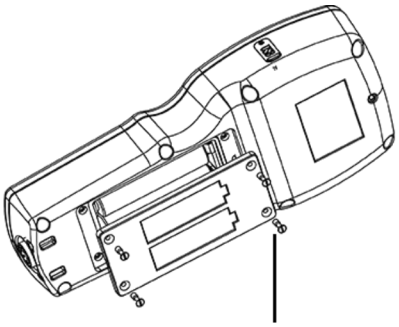
2.2 Installing the batteries

The instrument is designed to operate with two lithium batteries. Please follow the steps below.

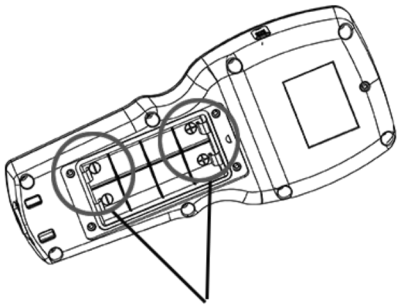
（1） Unscrew the screws on the battery compartment and open it. Note: The screw can't be taken off. That means the battery compartment cannot be opened until the screw can't be turned;

（2） Inspect battery compartment and install two batteries. Please pay attention to battery polarization marks inside the battery compartment, as shown in the figure below.Pay attention to the positive and negative terminals do not install the reverse.

（3）Close the battery compartment. Note that the sealing ring cannot fall off or be uneven. Make sure correct direction of compartment and tighten up the screws.



The screw can't be taken off.
That means the battery compartment
cannot be opened until the screw can't be turned



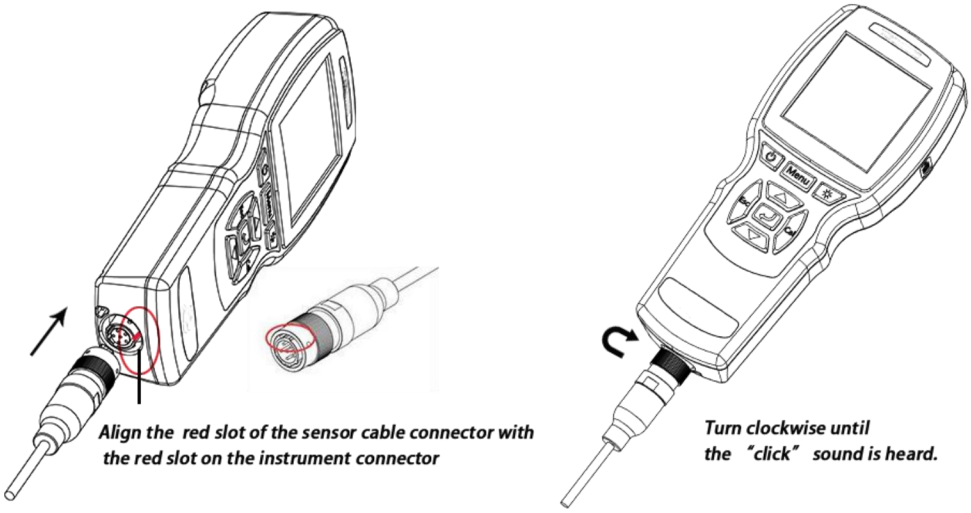
The positive and negative directions of the battery are the same, please install it correctly

2.3 Installing the sensor

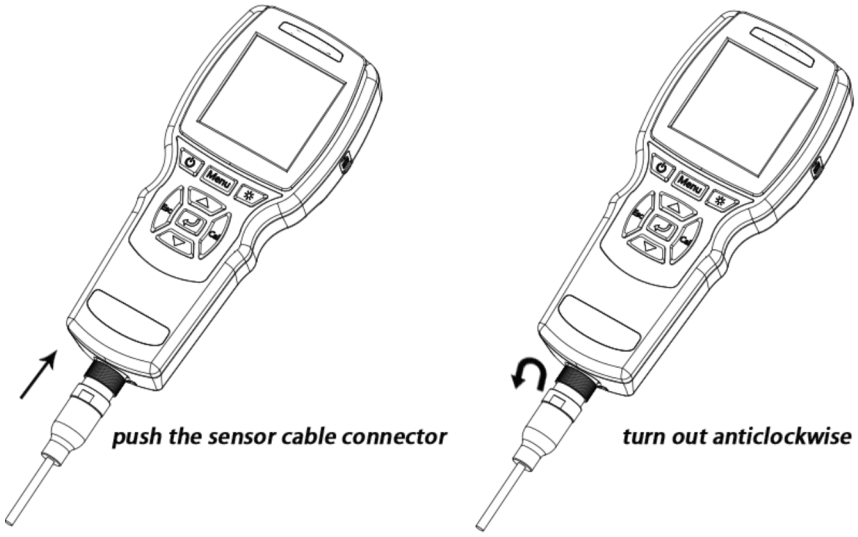
The sensor cable has a red slot on the mini-BNC connector which must align with the connector at the base of the instrument. Then insert gently and turn clockwise until the “click” sound is heard.

When remove the sensor, push the sensor cable connector in and turn out anticlockwise.

Install：

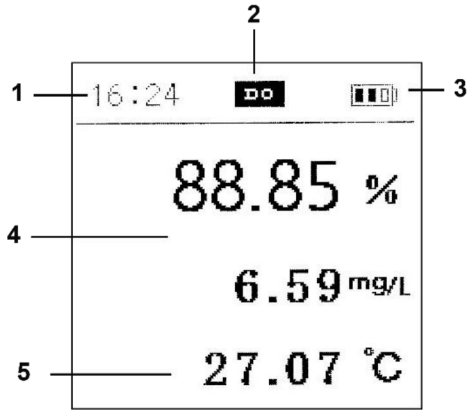


Remove：



3 Operation

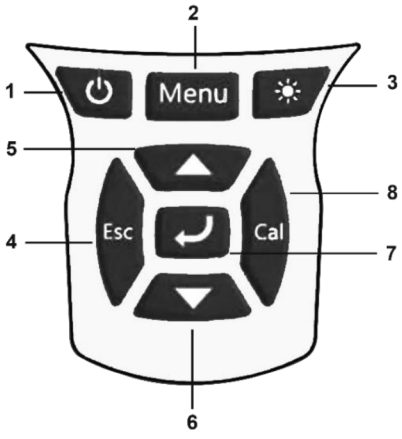
Press key to turn the handheld meter on. When there is no sensor, the measurement interface will display “No Signal!”. If the dissolved oxygen Sensor is connected, the display will show DO values as shown in the figure below.



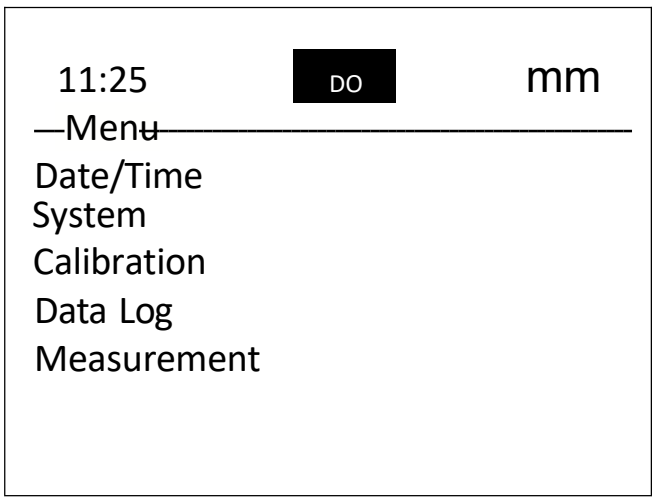
1	Time（ min：sec）24 hour system
2	Sensor Type: DO
3	Battery indicator. If appears, charge the meter using USB cable provided with directly or rechargeable batteries removed from meter.
4	Sensor data： DO values in percentage unit and in mg/L unit.
5	Temperature

Keypad Fouction

Short press：press and hold less than 2sec
Long press：press and hold more than 2sec



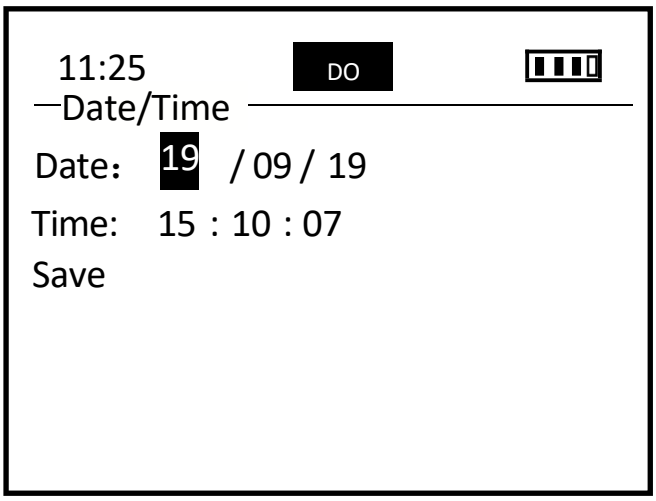
1		Short press	Turn on the handheld meter
		Long press	Turn off the handheld meter
2	Menu	Short press	Switch to Menu interface
3		Short press	Turn the backlight on and off
4	Esc	Short press	Exit settings;Return to the previous interface
5		Short press	Scroll up the menu selection Increase figure
6		Short press	Scroll down the menu selection Decrease figure
7		Short press	Accept a menu selection Accept setting and values
8	Cal	Short press	Switch to Calibration interface
		Long press	Switch to factory Calibration recovery interface
9	+	Short press	Save data once Note: Only in the measurement interface



Menu

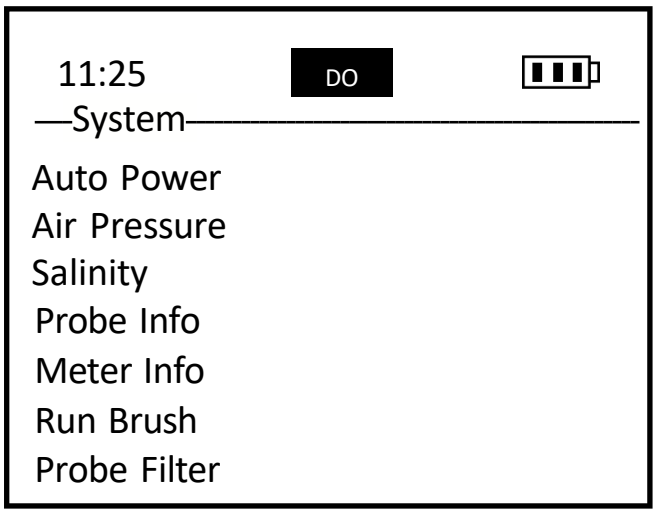
Press the **Menu key** to switch to menu interface. To select a menu item, use the "▲▽" key to highlight the selection and press the "↙" button. To exit a menu or menu item, press the ESC key.

3.1 Menu→ Date/Time



Date/Time menu is where you can setup date and time. Use the ▲or ▽ keys to scroll through the highlight data, and then press the "↙" key to move on to next data. Select **Save** and press the "↙" key to accept desired Data/Time. Then will shows "Save Success!".

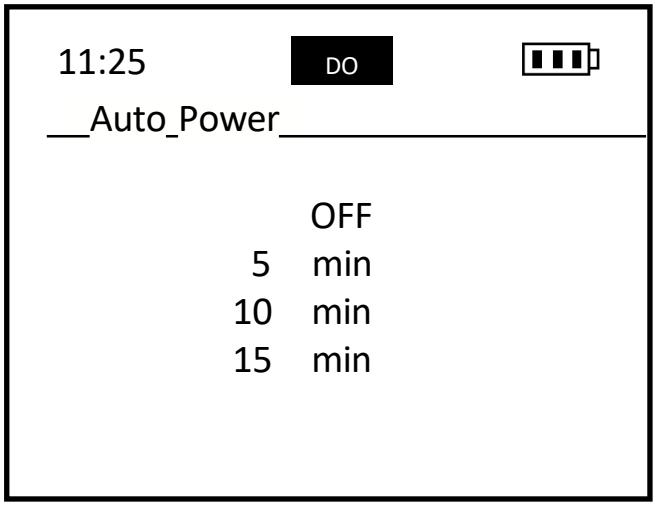
3.2 Menu→System



System menu is where you can enquire and setup all parameters. These include Auto Power, Air Pressure, Salinity, Probe Info, and Meter Info. To switch to a menu item, use the "▲▽" keys to select an option, and the "↙"key to accept.

Checking "Run Brush" will turn on a brush wash. This option is only useful for probes with brushes.

3.2.1 Menu→System→Auto Power



Auto Power

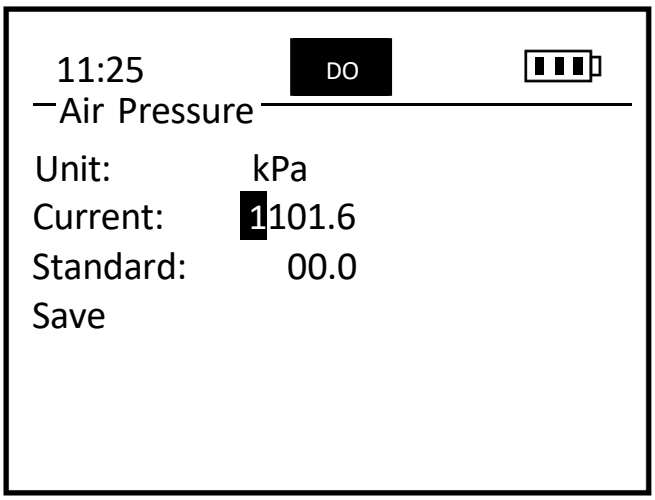
In Auto Power, there are four mode:

OFF indicates the power supply is normally open,

When set to 5 min , 10 min, 15 min, the instrument will shut off after 5 minutes, 10 minutes, 15 minutes of no operation,

Use the "▲▼" keys to select the mode, and the "↙"key to accept. The instrument use 5 minutes by default.

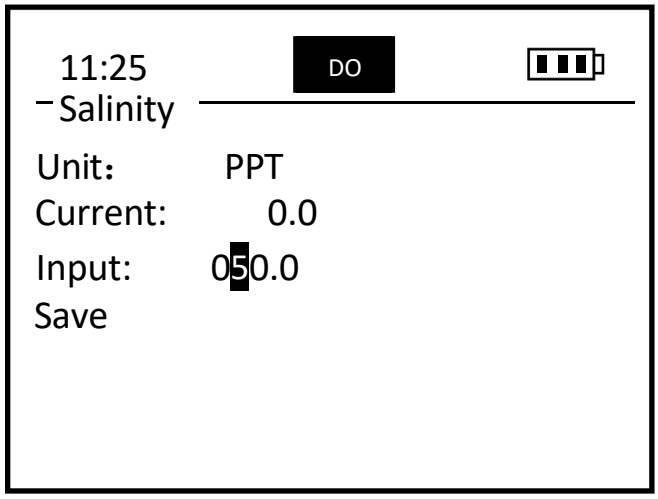
3.2.2 Menu→System→Air Pressure



Air Pressure

This menu can do Air calibration in kPa as it will effect DO value. Current indicates measured air pressure. Standard indicates the desired pressure that to be calibrated. Make adjustments with the ▲or ▼arrow keys and the "↙" key to move on to next value. Select **Save** and press the "↙" key to accept.

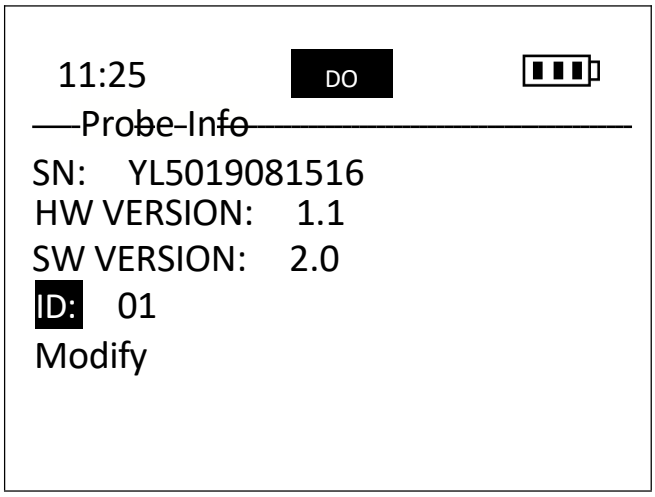
3.2.3 Menu→System→Salinity



Salinity

This menu can setup salinity value. The amount of DO increases as salinity level decreases. The instrument can compensate for the deviation of DO value caused by salinity. Make adjustments with the ▲or ▼keys and then press the "↙" key to turn to next data. Select **Save** and press the "↙" key to accept desired salinity. The default value is 0 ppt. Generally, the fresh water is 0-0.5ppt, and the sea water is 35ppt.

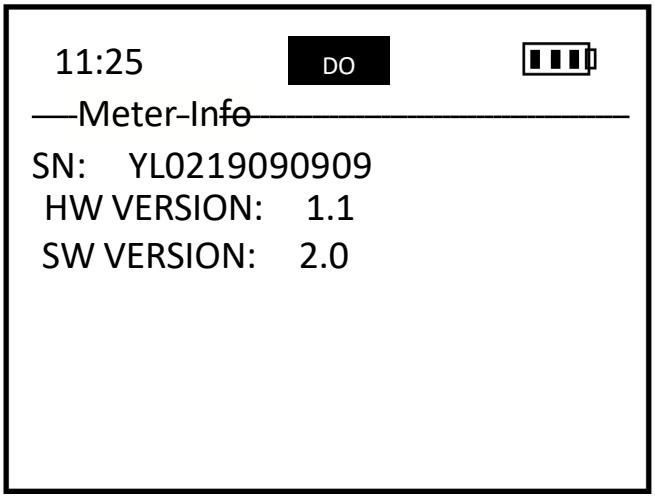
3.2.4 Menu→System→Probe Info



Probe Info

This menu can check information of sensor including SN, HW version, SW version, Modbus ID. Modbus ID can change with the ▲or ▽keys. Select **Modify** and press the "↙" key to accept new ID address.

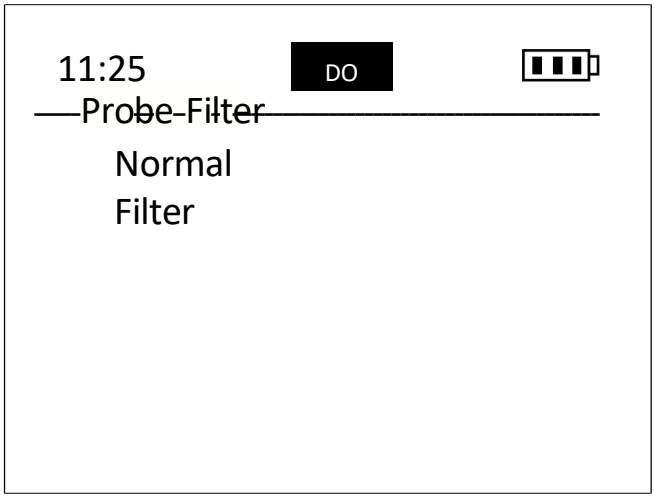
3.2.5 Menu→System→Meter Info



Meter Info

This menu can check information of the instrument including SN, HW version, SW version, grayscale.

3.2.6 Menu→System→Probe Filter



Probe Filter

The filter mode of the probe increases the filtering processing of the data, which can make the data of the probe more stable. It is suitable for some special environments, such as sewage treatment plants, and the sensitivity of the relative data will be appropriately reduced. In normal mode, there is no filtering.

3.3 Menu→Calibration

The instrument supports DO both single-point and two-points user calibration. Single-point DO calibration means "100.0%SAT" calibration which performed in water saturated air or air saturated water. For best results, we strongly recommend to use air saturated water solution. Two-points calibration consist of 100.0%SAT and 0%SAT. There is no Zero calibration here.

0%SAT DO calibration solution: take anhydrous sodium sulfite (Na2SO3) to a beaker, add 200ml of tap water or pure water, and stir until dissolved or even precipitates crystals.

100%SAT DO calibration solution： Aerate the water with an oxygen pump and continue 15 minutes. Then can get air saturated water solution.

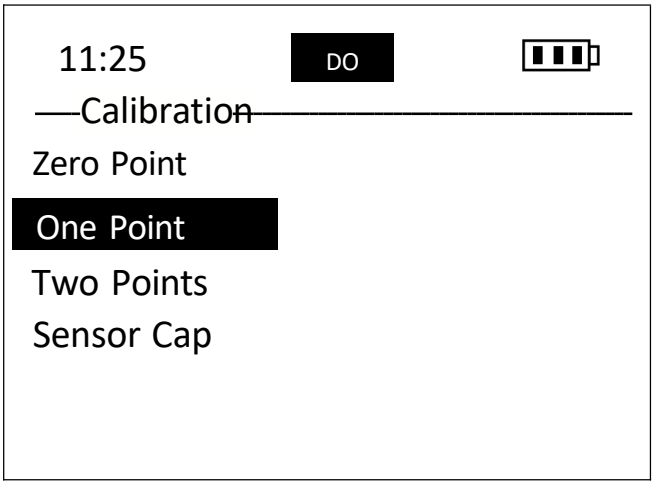
*** The air can be considered as saturated oxygen environment if the condition is not allowed.**

Press and hold the **"Cal"** key can quickly switch to calibration interface.

Note

1. Before calibration, please move protect cap with damped sponge from the sensor cap of DO and make sure the sensor has connected to the meter.

2. The sensor needs to be cleaned with deionized water, especially fluorescent film, but can not use hands or sharp objects to pick, scrape.



3.3.1 Menu→Calibration→One-Point

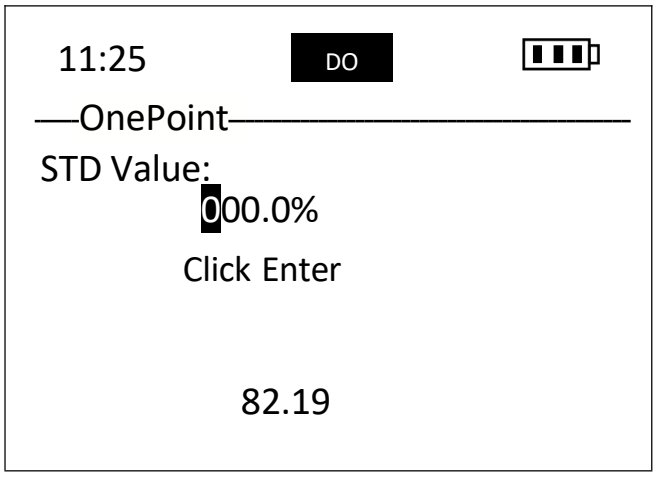
① **STD Value** :Enter the target value to be calibrated. Normally placed in a saturated dissolved oxygen environment, write 100%.

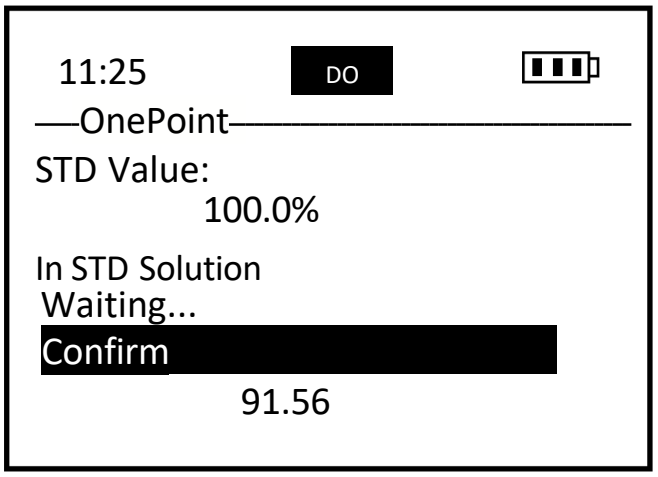
② Press the key ▲ and ▼ to adjust the sync and press the key "↙" to press the next sync

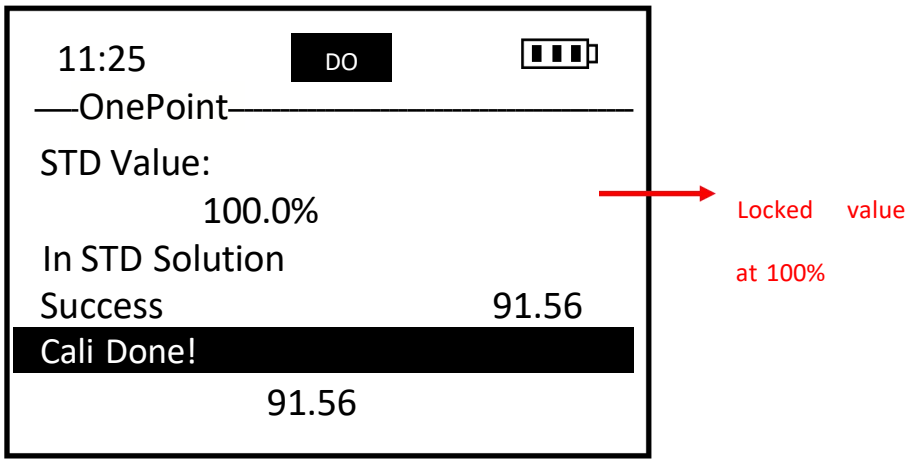
③ **Click Enter:** Select "click enter" press "↙" into the measurement interface, said the dissolved oxygen electrode into the corresponding input worthy of dissolved oxygen in the environment,

the bottom of the screen displays real-time measurements, unit %, waiting for the data tends to be stable, as shown in the above..

④ **Confirm:** When the value at the bottom is stable, select "confirm" and press the " ↙ " to calculate the slope. If the prompt is "success", you will calibrate it successfully; otherwise, the display fails. After success, check the "Cali Done" Press the "↙" to release the alignment.



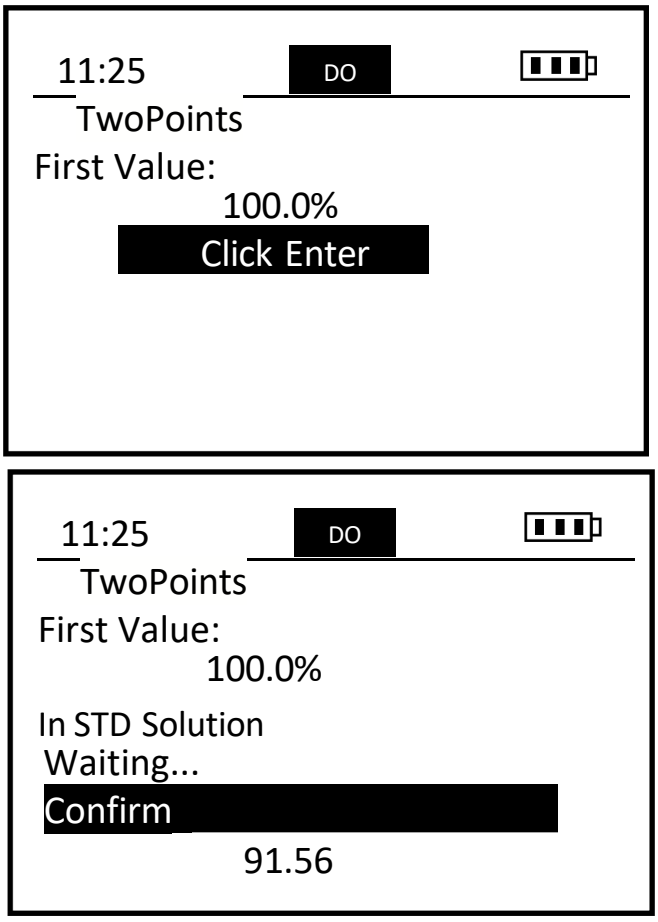




3.3.2 Menu→Calibration→Two-points

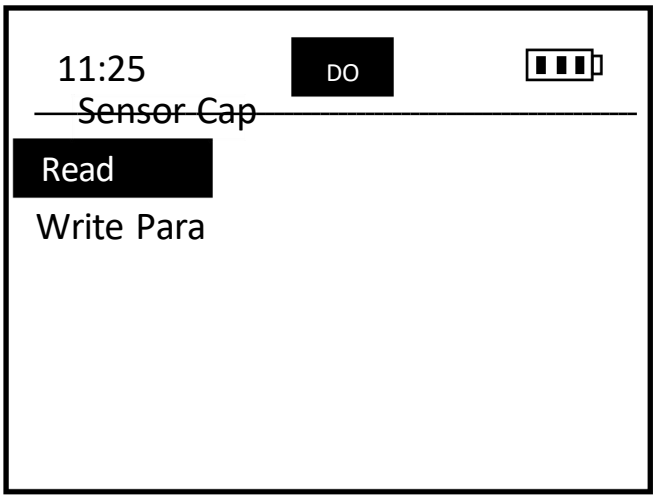
① First, enter the value of the first calibration point for calibration, the process is the same as above. Then select “Click Enter” and press the "↙" to press the second point of alignment. This is shown in the figure below.

② The second calibration point is operated as above



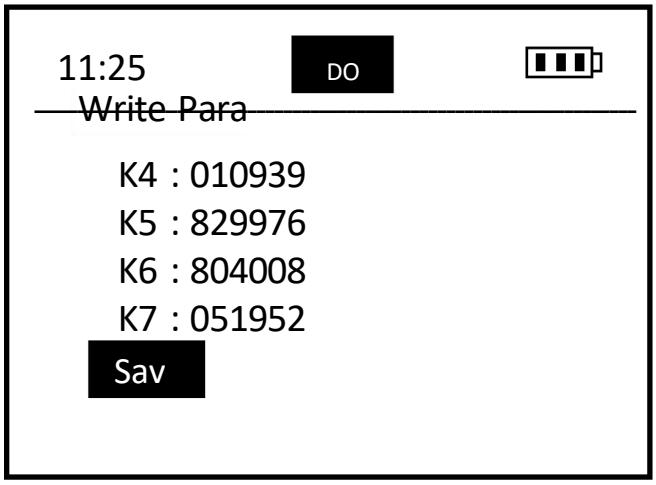
For two-points calibration of DO, it is recommended that the first point be 100% (fully aerated water environment) and the second point be 0% (saturated anhydrous sodium sulfite solution).

3.3.3 Menu→Calibration→Sensor Cap



Sensor Cap

To update the sensor cap, you need to input correct coefficients specific to the sensor cap. There are K0 to K7 total 8 parameters.



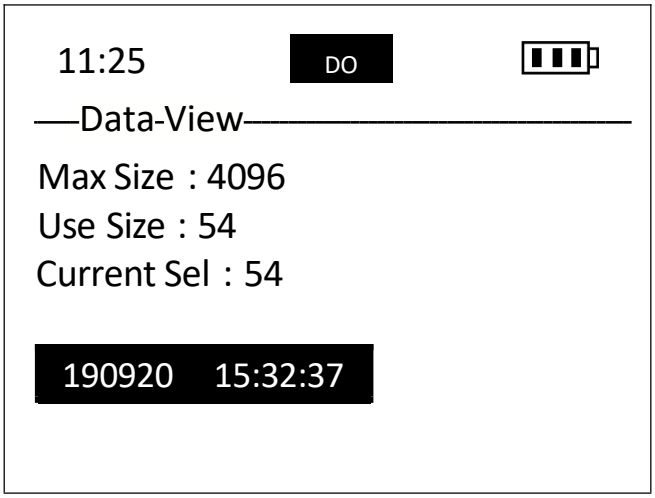
Select **Read Para** and press the “↙” key to switch to read sensor cap parameters interface. These consist of K0-K7 8 parameters. To change the value, highlight the **Write Para** option and press the “↙” key. Make adjustments with the ▲or ▼keys and then press the “↙” key to move on to next data. Select **Save** and press the “↙” key to accept all new coefficients.

3.4 Menu→Data Log

3.4.1 Menu→Data Log→Data Store

The handheld meter has 4096 measurements that can be logged to memory and can be programmed to store measurements in two logging formats. When set to **Data Log/Data Store/Store 1 Times,** the user samples start to be logged a time. When set to **Data Log/Data Store/Store 50 Times,** the instrument will continue logging 50 times with an interval of 2 seconds.

3.4.2 Menu→Data Log→Data View



Max Size

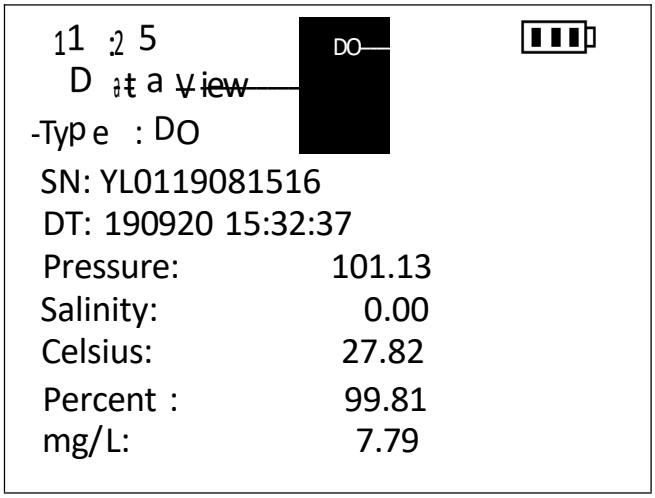
Indicates the numbers of measurements to be logged.

Use Size

Indicates the numbers of measurements have been logged.

Current Sel

Indicates the selected sample item that contains the data to be recalled. As shown in below picture, currently, the sample item 54 is read.



The stored measurements are named after date and time the samples were taken. For example, 190920 15:32:37 means the sample item 54 is stored at 15:32:37 on September 20, 2019. Use the ▲or ▽keys to scroll through the other **Current Sel** and press the "↙" key to view all the measurement parameters.

3.4.3 Menu→Data Log→Data Delete

*Select **Yes** to delete all data. Please choose carefully.

3.5 Cal

Note
Remember in measurement interface where press the **"Cal"** key to switch to calibration interface.

Press the "Cal" key to switch to calibration interface. Please see chapter 3.3 in detail.

Press and hold the "Cal" key to switch to factory Calibration recovery interface where restore k = 1, b =0.

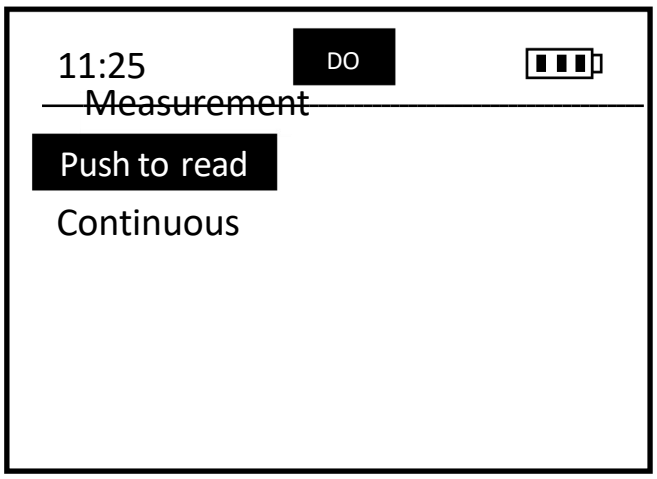
3.6 Connecting to a Computer

The instrument comes with special software called MeterRead, which is designed to provide you access to data memory. The software is stored in the USB shipped with the goods.

Follow the instructions to install the software on your computer and connect the supplied computer interface USB cable to the handheld meter and to a computer USB port. Then the **COM PORT** can identify the port. Select the download data path and click **Load.** The file format is. CSV.

Note
The software cannot recognize the port only when the instrument in shut off state.





Push to read

The data is automatically locked after it becomes stable. To measure again you need to press"↙"

Continuous

The data is always updated and never locked.

4 Maintenance

4.1 Meter Maintenance

The 600-A handheld meter require very little maintenance to keep it performing well. If the instrument case needs cleaning, wipe it off with a soft cloth. Please keep the battery compartment dry during using.

4.2 DO Maintenance

Optical dissolved oxygen sensor is a maintenance free sensor, however to ensure its accuracy specifications, we strongly recommend to perform routine maintenance based on following schedule.

Maintenance	Frequency Recommended
Sensor clean up	Every 30 days
Sensor and DO sensor cap inspection	Every 30 days
DO sensor cap replacement	Every year
Sensor user calibration	Every 3~6 months
Moisturizing DO membrane surface	Every 30 days to Keep DO sensor storage cap wet

4.2.1 Maintenance Schedule

（1）**Clean the sensor case：** Use clean water to wash the sensor case. Then gently wipe off with a lens cleaning tissue that has been moistened. For some stubborn dirt, please use gentle home dish cleaner and a soft brush.

（2） **Clean the sensor cap surface ：** Please move protect cap from the sensor cap, rinse any fouling with clean water. Please gently wipe off with a lens cleaning tissue that has been moistened if necessary. Then install the protect cap. Do not scratch the DO membrane with nails or sharp objects. That will cause DO membrane damage and the sensor will not work permanent!

（3）**Clean the sensor cap internal surface：** If water vapor or dust intrudes into the sensor cap, the cleaning steps are as follows:

i. Carefully remove the sensor cap
ii. Use clean water to wash the sensor cap internal surface
iii. You can use gentle home dish cleaner if necessary
iv. Then Followed with clean water wash
v. Dry up with lens cleaning tissue

（4） **Store DO Sensor Cap ： Keep DO sensor storage cap wet to moisturize DO membrane surface.** Store the sensor cap inside protect cap with a piece of damped sponge. Please take off the protect cap and keep it properly during use. Note: if the sponge is dry and lack of water, deionized water or purified water can be added for wetting; if DO membrane is kept in a dry state for a long time, it will lead to inaccurate measurement and greatly shorten the life of DO membrane.

（5）**Inspect sensor cable：** The cable should not be tightened in use; otherwise there is a risk

of breaking the wire. The sensor will not work normally;

（6）The sensor case is inspected for damage due to corrosion or other reasons.

4.2.2 DO Sensor Cap replacement

（1）Please turn off the power and unplug the sensor from the instrument before perform sensor cap replacement;

（2） Hold the sensor by one hand, and remove the sensor cap from the sensor by rotating the sensor cap counterclockwise using the other hand. DO NOT USE ANY TOOLS.

（3）Inspect the O-ring on the probe carefully. If damaged, replace it. Do not use tools to remove or install o-rings.

（4）Ensure the O-ring installed is clean.

（5）Hold the sensor by one hand, and install the new sensor cap clockwise using the other hand. And dry the inside surface with clean tissue. DO NOT USE ANY TOOLS.

（6）After replaced, set the new characteristic parameters that came with the product to the instrument. Please see chapter 3.3.3 in detail.

Note
Do not touch the DO membrane with hand. Do not apply any mechanical stress directly to the DO membrane (pressure, scratches, etc.)

5 Common Errors and Trouble Shooting

Table 5-1 lists the symptoms, possible causes, and recommended solutions for common problems encountered with the handheld meter. If your symptom is not listed, or if none of the solutions solves your problem, please contact us.

Symptom	Possible Causes	Corrective Action
No data displayed on Meter (if sensors are connected)	Connection Issue	Reconnect sensor to the meter
	No batteries or batteries are low	Charge the meter using USB cable provided with directly or rechargeable batteries removed from meter.
	Cable problem	Contact our company's Customer Service
	Bad DO sensor cap or loose cap	Reinstall sensor cap or replace
Unstable DO value	Dirty sensor cap	Clean sensor cap and agitate the sensor to eliminate air bubbles during measurement.
	Bad sensor cap	Replace sensor cap
	Sensor cap expired	

Table 5-1 Troubleshooting

6 Warranty Description

(1) The warranty period is 1 year.

(2) This quality assurance does not cover the following cases.

① Due to force majeure, natural disasters, social unrest, war (declared or undeclared), terrorism, the War or damage caused by any governmental compulsion.

② damage caused by misuse, negligence, accident or improper application and installation.

③ Freight charges for shipping the goods back to our company.

④ Freight charges for expedited or express shipping of parts or products covered by the warranty.

⑤ Travel to perform warranty repairs locally.

(3) This warranty includes the entire contents of the warranty provided by our company Sensing Technology with respect to its products.

① This warranty constitutes a final, complete and exclusive statement of the terms of the warranty, and no person or The agent is authorized to establish other warranties in the name of our company.

② The remedies of repair, replacement, or return of payment as described above are exceptional cases that do not violate this warranty, and the remedies of replacement or return of payment are for our products themselves. Based on strict liability or other legal theory, our company shall not be liable for any other damage caused by a defective product or by negligent operation, including any subsequent damage that is causally related to these conditions.