Portable Dissolved Oxygen Metet Instruction Manual

Before using the instrument, please read the manual carefully and keep the manual properly so that you can consult it at any time.

Preface

Thank you sincerely for purchasing our company's portable fluorescent dissolved oxygen detector. We are committed to providing you with the highest quality of service. Before use, please carefully read the user manual. If you encounter any problems during use, please contact our after-sales customer service for assistance to ensure the correct usage and maintenance of this product.

This product features a handheld, compact design, making it convenient to carry around, serving as a powerful assistant for scientific research, data analysis, and water quality testing.

Our company is dedicated to the improvement and development of our products, continuously conducting technical upgrades. Please note that any changes to the content of the manual will not be separately notified.

Legal and Copyright Statement

The copyright of this manual belongs to our company. Without the written permission of the copyright owner, no unit or individual may

excerpt, copy, or translate it in any form, and infringement will be prosecuted.

This product complies with the design requirements concerning environmental protection. Installation, use, and disposal of the product should be carried out in accordance with the product manual, relevant contracts, or the requirements of relevant national laws and regulations.

Note: Our company reserves the right to interpret this manual.

Product List

After opening the packaging, please confirm the contents before proceeding with the operation. If you find any discrepancies in models and quantities or physical damage to the appearance, please contact our company.

SN	Item Name	Quantity	Remarks
1	Portable Multi-parameter	1	
	Detector	I	
2	DO Sanaar	1	See specific
	DO Sensor	I	configuration
3	USB Charging Cable 1		
4	5V Power Adapter	1	Lithium Battery
			Version
		1	No. 5 Battery
5	No. 5 Battery Charger	I	Version
6	Rechargeable Batteries *		No. 5 Battery
Ö	4	i Set	Version
7	Screwdriver	1	No. 5 Battery

Packaging List

			Version
8	Portable Carrying Case	1	
9	Instrument Manual	1	
10	Certificate of Conformity	1	

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Chapter 1 Product Overview

The portable fluorescent dissolved oxygen detector includes a handheld controller, dissolved oxygen sensor, portable carrying case, and matching accessories. It has the characteristics of plug and play, convenient operation, and intelligent data storage, and can detect dissolved oxygen indicators. This instrument can be widely used in various occasions such as laboratories, surface water, industrial water, secondary water supply, etc., mainly for on-site emergency detection, data comparison and verification, water quality index measurement and other applications.

The schematic diagram of the product is as follows:



Note: There are two versions of this instrument: the lithium

battery version and the No. 5 battery version. The lithium battery version uses high-capacity lithium batteries as the power source, with a non-removable or no battery cover at the back. The No. 5 battery version uses a high-capacity nickel hydrogen battery or a conventional No. 5 alkaline battery. The battery can be replaced by opening the back cover with a screwdriver.

Chapter 2 Technical Specifications

Instrument specifica	ations	
Display screen	3.3 inch monochrome LCD display	
Dimensions	200mm×101mm×36mm	
Weight	420g	
External	2 alastrada interfação 1 USB port	
interfaces	2 electione interfaces, 1 03b port	
Data storada	Automatic interval saving, automatic lock	
	saving	
Language	Chinese/English	
GPS	Support query and automatic saving	
Degree of	ID67	
protection		
Power source	Lithium battery/No. 5 nickel-metal hydride	
	battery	
Relative humidity	10 \sim 85% RH (non-condensing)	
Operating		
Environment	-5∼50℃	
Temperature		
Transportation	Temperature: -15 \sim 65 $^\circ\!\mathrm{C}$	
and storage	Relative humidity: 5 \sim 85% RH	
conditions	(non-condensing)	

Sensor specifications		
	Measuremen t Principle	Fluorescence quenching method
Discolved	Measuremen	Dissolved oxygen (concentration
Ovvden	t parameters	and saturation), temperature
Oxygen		DO: 0~20mg/L
	Range	Saturation: 0 \sim 200%
		Temperature: 0 \sim 50 $^\circ \!\!\!\!\!\mathrm{C}$

Accuracy	≤±0.3 mg/L
Repeatability	≤±0.3 mg/L
Resolution	0.01 mg/L
Т90	
response	≤60s
time	
Temperature	
compensatio	≤±0.3 mg/L
n accuracy	
Electrode	Stainlage steel DOM
material	Stalliess steel, r Olvi
Size	Φ23×190mm
Line length	Default 1.5 m (customizable)
Waterproof grade	IP68

Chapter 3 Installation Methods

3.1 Instrument and Electrodes

The electrodes of this instrument adopt IP67 waterproof connectors/aviation plugs, which are plug-and-play. Both connectors can be connected. When the instrument panel is facing upwards, as shown in the following figure:



The reference diagram for sensor installation is as follows:



Note:

- When connecting the aviation plugs at positions 1 and 2, please align the red dot on the sensor plug with the corresponding position on the instrument's plug. When you hear a "click" sound, it indicates that the connection is complete.
- To remove the sensor from the instrument, pinch the outer ring lock of the aviation plug (as shown in the red circle in the above figure), and pull it out with force until the connector separates (do not rotate the joint).

Chapter 4 Interface and Key Functions

4.1 Key Operations and Definitions



Figure 4.1 Key Distribution Diagram

> Key Definitions

Table 4.1

Symbol	Key name	Functional Description
		Short press to power on .
Ø	Power key	Press and hold for 3 seconds to shut
		down.
		Enter the menu interface in the
	Manukay	measurement display interface.
	мепи кеу	Return to the first-level menu interface
		under the menu sub-function interface.

(Backlight key	Display backlight on/off.
(5)	Return key	Return to the previous interface or measurement display interface.
	Moveup	Switch to the next measurement interface.
Â	key	a menu function, In part of the interface, this key is used to adjust the value upward.
		Short press to enter the sensor calibration interface in the
۵	Calibration key	measurement display. Long press on the measurement display to enter the sensor initialization
		interface
	Move down	Switch to the next measurement interface. The menu interface moves down to
\bigtriangledown	key	select a menu function, In part of the interface, this key is used

		to adjust the value downward.
	Quartines	Press and hold 2 seconds in the
		measurement display interface to save
		the current data.
	Comirm	Measurement Display Click Auto Lock
	кеу	and Unlock.
		Measurement Display Click Auto Loc and Unlock. Enter the next menu or set parameter in the menu interface.
		in the menu interface.

4.2 Instrument Interface and Operations

When the sensor is not connected, the main interface of this instrument will display "no sensor". When the sensor is successfully connected, the main interface of this instrument will display the current sensor type and real-time measurement data.

> Measurement Display Interface

When connected to a dissolved oxygen (DO) electrode, as shown in the following figure:



Figure 4.2

- a. Indicates time (hour: minute).
- b. Indicates the type of sensor.
- c. Indicates battery level, divided into three levels. When the battery icon is solid m, it indicates sufficient battery power. When it starts blinking , please charge it promptly. When plugged into the USB power source, if the battery icon cycles, it indicates that it is charging.
- d. Numerical lock indicator.
- e. Threshold exceeded alarm indicator.
- f. The measured values and units, when dissolved oxygen (DO) is connected, the measured values from top to bottom are: saturation value, dissolved oxygen value, and temperature.

> Menu Interface

Press the key (I) under the measurement display interface to enter the menu interface, as shown in the figure below:



Explanation of Menu Functions:

Sensor Management: Select sensors (the instrument only displays connected sensors) and perform related settings, calibration, and other functions.

System Settings: Settings for instrument functions.

Historical Data: Storage of electrode measurement data.

4.3 Sensor Management Interface



When the sensor is not connected, the sensor management interface displays "no sensor". When the sensor is successfully connected, the interface will display the current sensor name. Sensor management includes functions such as sensor calibration, parameter settings, and sensor information.

> DO Sensor Function And Calibration

♦ DO Sensor Function Interface

The DO (Dissolved Oxygen) function includes sensor calibration, parameter settings, and sensor information. Sensor calibration includes temperature calibration, one-point calibration, and two-point calibration. Parameter settings include salinity setting, pressure setting, alarm setting, filtering setting, and reading lock function. The sensor information includes SN number, hardware version, software version, ID and other Information.



♦ DO Calibration

Calibration Interface





	20:42 –temperat Current: Standard: Save	20 ure 18.0 018.0	
Calibr	ation		
Yes	No	Fail	

After selecting "Sensor Calibration," enter "Temperature" calibration. You can see the current temperature value. Select the calibration value enter the calibration value setting. Use \bigcirc (or \bigtriangledown) to adjust the calibration value. Press the confirm key \checkmark to confirm the setting. After selecting "Save," choose "Yes" in the confirmation calibration prompt box until the "Operation Successful" window appears.

• One-point Calibration



After entering the calibration interface as shown in the

figure above, place the sensor in a saturated oxygen solution and confirm that the set calibration value is "100%". Select the "Enter Calibration Mode" button to confirm, and the current actual measurement value will appear below. When the measurement value tends to stabilize, select the "Confirm Calibration" button, and a "Confirm Calibration?" dialog box will pop up. Select "Yes" in the dialog box and wait for the instrument interface to display "Calibration Successful". If the calibration fails, the instrument interface will pop up "Operation Failed". Calibration completed, press the button to exit calibration.

Note: One-point calibration for dissolved oxygen is only recommended for calibration in oxygen-saturated solutions. Calibration in air may result in values exceeding the error range due to various factors such as ambient temperature, sensor temperature, humidity, fluorescence film humidity, and air saturation, which is not recommended for customers requiring high accuracy.

Two-point Calibration:



The first point calibration refers to the single point calibration method. After completing the first point calibration, select the menu "Next Point" and press the button to enter the second point (zero point) calibration. At this time, observe the changes in real-time measurement values. When the real-time measurement values tend to stabilize, select the "Confirm Calibration" button and a "Confirm Calibration?" dialog box will pop up. Select "Yes" in the dialog box and wait for the instrument interface to display "Calibration Successful". If the calibration fails, the instrument interface will pop up "Operation Failed". Calibration completed, press the button to exit calibration.

Note: Regarding the two-point calibration function, the first point is saturation oxygen calibration (100% solution), and the second point is zero point calibration (0% solution). If the second point calibration fails multiple times, return to the measurement display interface, press and hold the "Calibration Key" to select "Restore Calibration Coefficients," and then redo the two-point calibration.

The calibration of dissolved oxygen sensors can refer to the National Environmental Protection Standard HJ-925 2017 "Technical Requirements and Testing Methods for Portable Dissolved Oxygen Testers" of the People's Republic of China.

- ♦ Parameter Settings

• Salinity Setting Interface



This setting is mainly used for compensating the dissolved oxygen value. As salinity increases, the dissolved oxygen value decreases. The default salinity value is 0. For example, the conductivity measured at 20°C is 50 mS/cm (about 25 ppt), corresponding to a salt content of approximately 40 g/kg.

Pressure Setting Interface

20:42 DO	
-Air Pressu Unit: Current:	kPa 101.26
Standard: Save	101.26

Set the current pressure value. Press the calibration value button \triangleleft to enter the range setting. Adjust the range value by pressing the \bigtriangleup (or \lhd) button. Confirm the setting by pressing the button \triangleleft . After setting the value, select "Save" to save the parameter.

This setting is mainly used for compensating the dissolved oxygen value. As pressure increases, the dissolved oxygen value also increases. The default pressure value is the current atmospheric pressure.





In a state where the sensor is successfully connected, enable or disable the alarm according to the sensor type.

The alarm threshold value can be set to a low threshold and a high threshold. When the alarm function is enabled and returns to the measurement main interface (with the alarm sound enabled), if the alarm conditions are met (measurement data below the low threshold or exceeding the high threshold), there will be a "beep" sound prompt and a warning sign will flash on the measurement main interface.

Note:When the alarm setting is turned on and both the upper and lower threshold values are set to 0, the alarm function will be automatically turned off. This is to clarify.

• Filtering Settings



Instrument data display and sensor actual measurement data respond in real-time. When the measured value of the water body fluctuates significantly (such as in a sewage aeration tank, etc.), you can enable filtering settings to make the instrument data display smoother.

When filtering settings are enabled, users can set appropriate parameters (2 to 40) according to the actual use environment. A larger value indicates better measurement stability, but slower response speed. After setting, click "Save". If this function is not needed, select "Close" in the filtering settings interface.

Reading Lock



Automatic: The instrument automatically determines when the data is stable and locks it. After entering automatic lock mode, you can select fast, medium, and slow three gears, which represent different locking speeds. After selection, click save.

Note: When this function is enabled and the measured value on the measurement display interface is locked, if the user performs a sensor calibration operation, the current measurement value below the "Confirm Calibration" interface will display the real-time value (non locked state), which is convenient for customers to refer to for calibration. This is explained.

♦ Sensor Information

Sensor information will display sensor versions and other relevant content, as shown in the figure below:



4.4 System Setting Interface



GPS Queries: Query the current latitude and longitude

coordinates.

Auto Shutdown: Set the auto shutdown function.

Auto Save: Set automatic saving of measurement values.

Prompt Tone: Set button and alarm sounds.

Data/Time: Set the date and time of the instrument.

Language: Set the language type to Chinese or English.

Units setup: Set the temperature unit of the instrument.

Instrument Info: Query the software and hardware

version information of the instrument.

Reset: Restore factory default settings.

> GPS Queries Interface



The GPS queries function can be enabled or disabled (default disabled). When this function is enabled, the current latitude and longitude information can be queried when the device is used outdoors. When this function is enabled, the coordinate information will also be saved when measurement data is saved.

> Automatic Shutdown Interface



When the auto shutdown mode is enabled, if the set auto shutdown time is reached and there is no button operation, the instrument will automatically shut down. The auto shutdown mode has intervals of 5 minutes, 10 minutes, and 20 minutes.

Auto Save Interface



Auto save includes interval save and lock save functions. Interval save sets the interval time for the instrument to automatically save data, with a minimum interval time of 1 minute. Lock save automatically saves the measured data when a parameter's measurement value is locked (including auto lock and manual lock).

Note: After setting the interval save function, you need to return to the main interface (measurement display interface for any parameter) to have the function take effect. At this point, timing will start and all parameters will be automatically saved. If you switch to other interfaces such as the settings interface midway, this function will be temporarily turned off. When you return to the main interface, the function will take effect and the timer will be reset.

Prompt Tone Interface



Set the sound status on/off. When this function is enabled, there will be a "beep" sound for button operations. Enabling the alarm sound will produce a "beep-beep" sound when the measured value exceeds the set alarm threshold on the instrument display interface.

> Data/Time Interface



Set the displayed year, month, day, hour, minute, and

second. After setting, select "Save" to save the parameters.

Note: The instrument can also save the set time when it

is turned off. If the time is reset after startup, it may be due to insufficient power of the built-in RTC battery. Please contact the manufacturer promptly.

Language Interface



Set the language type to Chinese or English. After setting, select "Save" to save the selected language type. All display interfaces of the instrument will change to the currently selected language type.

Note: If the default language of the instrument is Chinese, it will revert to Chinese interface after factory reset.

> Unit Setup Interface



This interface can set the temperature unit for all

parameters, with options of ${}^\circ\!\mathrm{C}$ and ${}^\circ\!\mathrm{F}.$

> Instrument Info Interface



Query the current hardware and software version information of the instrument.

Reset Interface



Reset settings. After confirmation, the instrument functions will be restored to the default state at the time of factory shipment.

Note: This factory setting only restores the instrument to the factory state. Electrodes need to be initialized by long-pressing the electrode initialization button in the measurement display interface.

4.5 Historical Data Interface



After entering the historical data interface, first select the

parameter, then proceed to the specific operation interface, including data display and data deletion functions.

Data View Interface

Save the data being measured on the current interface.

Long press the button in the measurement interface to save data.

The data display interface can query historical data, including parameter type, test time, relevant parameters, measured values, and coordinate information.



The data display interface allows you to select the historical data you want to view by pressing the (argin) key, and press the key response to view the detailed data interface. The detailed data interface diagram of dissolved oxygen (DO) is as follows:

20:42 DO
–Data View ———
Type: DO
SN: HF341418051C
DT: 240827 10:03
pressure(kPa):111.20
Salinity(ppt): 10.00
Temp(°C): 25.00
DO(%): 77.68
DO(mg/L): 6.93

Data Delete Interface

Delete all saved historical data under the selected parameter.

Chapter 5 Data Export

The PC software package for this instrument is used to read stored data from the instrument. Please refer to the prompts in the installation package to install the software. Then, connect this instrument to the PC using a Micro USB cable. The software will automatically detect the COM port and select the correct serial port number. Next, choose the save path, click "Save", and the instrument will save the historical data as a (.csv) file to the specified path.

Note: For detailed operating instructions and the software installation package, please download from the following link:

https://d.lohand.com:10001/procedureFile/DataOutputS oftware V5.8.zip

			Chi	nes
Port name:	COM6 USB Serial Port			
Storage path:	C:\Users\123\Documents\DO.csv	Ĵ.	C	1056
			1	
			S	ave

Chapter 6 Instrument Maintenance and Care

6.1 Instrument maintenance and upkeep

When choosing a lithium battery version of the instrument, in order to better maintain the battery and extend its service life, a dry and cool environment should be chosen to store the instrument, avoiding long-term damage to the battery caused by harsh environments such as high temperature and humidity.

When the instrument is low in power, the battery should be charged in a timely manner to prevent the instrument from being affected by insufficient battery power.

When the instrument is not used for a long time, it should be charged at regular intervals (usually recommended every 1-2 months) to maintain the battery's activity and prevent irreversible damage caused by the battery being in a state of low power for a long time.

When the sensor is not in use, it should be cleaned promptly and stored properly in a suitcase.

6.2 Electrode maintenance and upkeep

> Dissolved oxygen sensor

1. Dissolved oxygen sensors do not require complex

maintenance, and the outer surface of the stainless steel electrode is generally wiped clean with a soft cloth. After using the fluorescent film, clean it with clean water and gently wipe it with a damp soft cloth. Do not apply force and avoid using alcohol for cleaning.

2. If the electrode is not used for a long period of time, cover the fluorescent cap with a dust cap and keep the sponge inside moist.

3. The fluorescent cap of the dissolved oxygen sensor is a consumable, and it is recommended to replace it every year.

Chapter 7 Troubleshooting and Solutions

1) Pressing the power button, but the LCD screen does not display

a.Check if the battery has power.

b.Verify if the power button is damaged.

2) No measurement values are displayed

a.Check if there are any breaks in the cables.

b.Ensure that the instrument is securely connected to the electrode connection joint.

3) Abnormal measurement values

a.Check if there are any pollutants or air bubbles on the electrode probe.

b.Verify if the electrode is calibrated periodically according to the instrument.

c.Dissolved oxygen fluorescence caps are consumables with a lifespan of one year under normal usage. It is recommended to replace them regularly.

d.Is there any damage (scratches/cracks/notches, etc.) to the fluorescent film at the dissolved oxygen front-end. If so, it is recommended to recalibrate or contact technical service personnel.

4) Sensor calibration failure

a.Confirm if the calibration solution is prepared correctly.

b.Ensure the calibration steps are performed correctly.

c.Verify if the electrode is reliably connected and working properly.

5) Unable to export instrument stored data

a.Confirm if the PC driver is installed correctly.

b.Check if there are any breaks in the data cable.

After-sale service

The warranty is one year from the date of purchase, and the product is maintained for life. Please keep the warranty card properly.

Note:

The following situations are not within the scope of free maintenance:

1. Artificial damage to the product caused by failure to install or use as required;

2. The product has been disassembled or repaired by personnel not authorized by our company;

3. Product damage caused by other uncontrollable natural forces such as earthquakes, fires, etc;

4. The product has exceeded the warranty period.

Our company is dedicated to serving you. If you have any questions, please contact our technical support department.