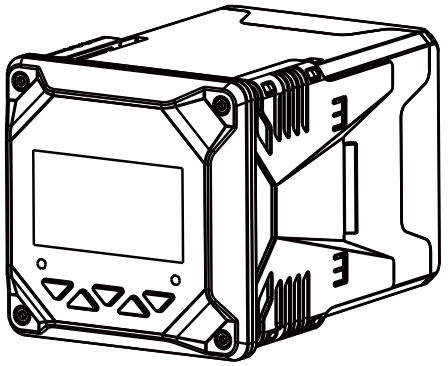
Universal Controller



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Preface

- Thank you for purchasing our product.
- This manual is an instruction manual about various functions, wiring methods, setting methods, operation methods, and troubleshooting methods of the product.
- Please read this manual carefully before operation, use this product correctly to avoid unnecessary losses due to incorrect operation.
- After you finish reading, please keep it in a place where it can be easily accessed at any time for reference during operation.

Note

- The contents of this manual are subject to change without notice due to functional upgrades.
- We strive to be correct in the contents of this manual. If you find any errors, please contact us.
- The contents of this manual are strictly prohibited to be reproduced or copied.
- This product is forbidden to be used in explosion-proof occasions.

Version

U-SUP-MDA-U1/U2-EN2

Safety Precautions

In order to use this product safely, be sure to follow the safety precautions described.

About this manual

- Please submit this manual to the operator for reading.
- Please read the operation manual carefully before applying the instrument. On the precondition of full understanding.
- This manual only describes the functions of the product. The company does not guarantee that the product will be suitable for a particular use by the user.

Precautions for protection, safety and modification of this product

- To ensure safe use of this product and the systems it controls, be sure to follow the instructions and precautions described in this manual during operation. Violation of operating procedures may impair the protection provided by this product. The company does not assume any responsibility for the quality, performance, function and product safety issues arising from the above conditions.
- When installing lightning protection devices for this product and its control system, or designing and installing separate safety protection circuits for this product and its control system, it needs to be implemented by other devices.
- If you need to replace parts of the product, please use the model specifications specified by the company.
- This product is not intended for use in systems that are directly related to personal safety.Such as nuclear power equipment, equipment using radioactivity, railway systems, aviation equipment, marine equipment, aviation equipment and medical equipment.If applied, it is the responsibility of the user to use additional equipment or systems to ensure personal safety.

- Do not modify this product.The following safety signs are used in this manual:


Hazard, if not taken with appropriate precautions, will result in serious personal injury, product damage or major property damage.


Warning:Pay special attention to the important information linked to product or particular part in the operation manual.

- Confirm if the supply voltage is in consistent with the rated voltage before operation.
- Do not use the instrument in a flammable and combustible or steam area.
- To prevent from electric shock, operation mistake, a good grounding protection must be made.
- Thunder prevention engineering facilities must be well managed: the shared grounding network shall be grounded at is-electric level, shielded, wires shall be located rationally, SPD surge protector shall be applied properly.
- Some inner parts may carry high voltage. Do not open the square panel in the front except our company personnel or maintenance personnel acknowledged by our company, to avoid electric shock.
- Cut off electric powers before making any checks, to avoid electric shock.
- Check the condition of the terminal screws regularly. If it is loose, please tighten it before use.
- It is not allowed to disassemble, process, modify or repair the product without authorization, otherwise it may cause abnormal operation, electric shock or fire accident.
- Wipe the product with a dry cotton cloth. Do not use alcohol, benzine or other organic solvents. Prevent all kinds of liquid from splashing on the product. If the product falls into the water, please cut off the power

-
- immediately, otherwise there will be leakage, electric shock or even a fire accident.
- Please check the grounding protection status regularly. Do not operate if you think that the protection measures such as grounding protection and fuses are not perfect.
- Ventilation holes on the product housing must be kept clear to avoid malfunctions due to high temperatures, abnormal operation, shortened life and fire.
- Please strictly follow the instructions in this manual, otherwise the product's protective device may be damaged.

- Do not use the instrument if it is found damaged or deformed at opening of package.
- Prevent dust, wire end, iron fines or other objects from entering the instrument during installation, otherwise, it will cause abnormal movement or failure.
- During operation, to modify configuration, signal output, startup, stop, operation safety shall be fully considered. Operation mistakes may lead to failure and even destruction of the instrument and controlled equipment.
- Each part of the instrument has a certain lifetime, which must be maintained and repaired on a regular basis for long-time use.
- The product shall be scrapped as industrial wastes, to prevent environment pollution.
- When not using this product, be sure to turn off the power switch.
- If you find smoke from the product, smell odor, abnormal noise, etc., please turn off the power switch immediately and contact the company in time.

Disclaimer

- The company does not make any guarantees for the terms outside the scope of this product warranty.
- This company is not responsible for damage to the instrument or loss of parts or unpredictable damage caused directly or indirectly by improper operation of the user.

Package contents

No	Name	Quantity	Remark
1	Controller	1	
2	Butterfly buckle	2	For fixed installation
3	Manual	1	
4	Certificate	1	
5	Standard Accessories Package	1	

After opening the box, please confirm the package contents before starting the operation.If you find that the model and quantity are incorrect or there is physical damage in appearance, please contact us.

Content

Chapter 1 Introduction

1.1 Introduction

This product is a general-purpose controller for water quality, suitable for use with various water quality series digital sensors of our company. It is used to monitor water quality parameters including pH, ORP, conductivity, dissolved oxygen, turbidity, sludge concentration,inductive conductivity, free chlorine, ammonium, nitrate, COD and other water quality parameters. Through RS485 or current transmission output to the monitoring room for record keeping.

1.2 Features

- Universal, can match digital sensors such as pH/ORP/Conductivity/Dissolved oxygen/Turbidity/MLSS/Inductive conductivity/Free chlorine/Ammonium/ Nitrate/COD.
- Isolated transmission output is adopted, which is less affected by interference.
- Using isolated RS485 communication technology.
- With high and low alarm output function.
- With sound and light alarm function.
- With LCD backlight switch control function, improve the adaptability of ambient light.

Chapter 2 Technical parameters

Table 1

Model	MDA-U1	MDA-U2
Measuring range	pH: (0～14) pH ORP: (-2000～2000)mV Dissolved oxygen: (0～40)mg/L Saturation: (0～200)% Conductivity: (0～70)mS/cm Turbidity: (0～4000)NTU MLSS: (0～120000)mg/L Inductive conductivity: (0～2000)mS/cm	pH: (0～14) pH ORP: (-2000～2000)mV Dissolved oxygen: (0～40)mg/L Saturation: (0～200)% Conductivity: (0～70)mS/cm Turbidity: (0～4000)NTU MLSS: (0～120000)mg/L Inductive conductivity: (0～2000)mS/cm Free chlorine: (0~20)mg/L NH_4-N: (0~1000)mg/L NO_3-N: (0~1000)mg/L COD: (0~1500)mg/L
	Note: The actual measurement range refers to the documentation of the connected sensor	
Display	2.8-inch monochrome LCD screen, resolution 128*64	
Dimensions	100mm×100mm×150mm	
Hole Size	92.5mm×92.5mm	
Monitoring parameters	pH/ORP/Conductivity/dissolved oxygen/turbidity/MLSS/ Inductive conductivity/Free chlorine/NH_4-N/NO_3-N/COD	
Measurement error forsensor inputs	Refer to documentation of the connected sensor	
Repeatability	Refer to documentation of the connected sensor	
Current output	Isolation type, (4～20)mA can set the corresponding parameter measurement range, load capacity 500Ω, output accuracy ±0.2%FS	

RS485 output	Isolated, Modbus-RTU communication protocol
Alarm	Normally open and normally closed, 2 channels, capacity AC250V/3A
Distribution output	12V/125mA
Relative humidity	10% ~ 85% (no condensation)
Input power	AC: (100～240)VAC
	DC: 24VDC (optional)
Power consumption	≤6W
Cable entries	M12*1.5 suitable gland *1 M16*1.5 suitable gland *2
Operating temperature	(0 ~ 60)℃
Storage conditions	Temperature: (-15 ~ 65)℃
	Relative humidity: (5 ~ 95)% (no condensation)
	Altitude: <2000m
Ingress protection	IP54 or IP65

Chapter 3 Structure and pimensions

3.1 Dimensions

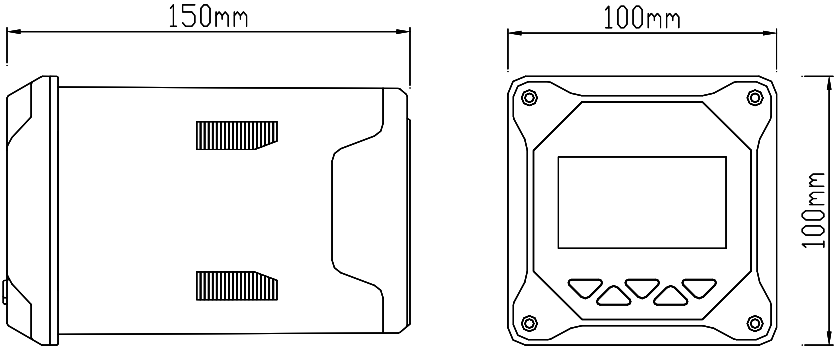


Fig.1 Product dimensions (Unit: mm)

3.2 Weight

Product Weight: 0.65kg.

Chapter 4 Installation

4.1 Instrument installation

The installation place and installation method of this product are explained. Please read this part when installing.

Installation Precautions

- This product is a tray-mounted type.
- Please install it indoors, away from wind, rain and direct sunlight.
- In order to prevent the internal temperature of this product from rising, please install it in a well-ventilated place.
- Please do not tilt left and right when installing this product, try to install it horizontally (can be tilted back <30°).

Avoid the following places when installing

- Places directly exposed to sunlight and near hot appliances.
- Places where the ambient temperature exceeds 60° C during operation.
- Places where the ambient humidity exceeds 85% during work.
- Near the source of electromagnetic generation.
- Places with strong mechanical vibration.
- Places where the temperature changes greatly and condensation is easy.
- Places with a lot of oil smoke, steam, moisture, dust and corrosive gasesInsert the meter into the mounting hole and fasten the butterfly buckle, as shown in Figure 3:

4.2 Installation methods

Install a 92.5 * 92.5 mounting hole on the instrument cabinet or mounting panel, The thickness of the installation panel is 1.5mm~13mm.

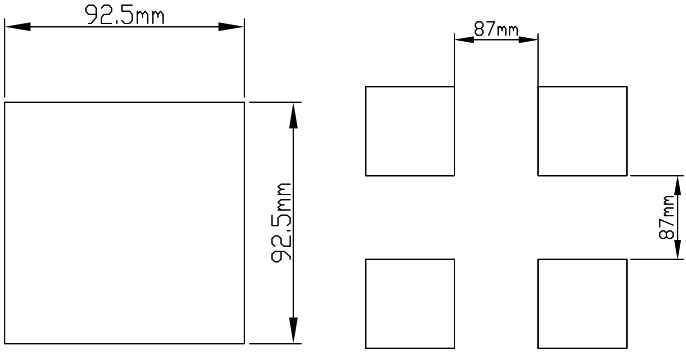


Fig.2 Panel mounting hole size and minimum distance between instrument cabinet square holes

The instrument into the mounting hole and then buckle on the Snap, as shown below:

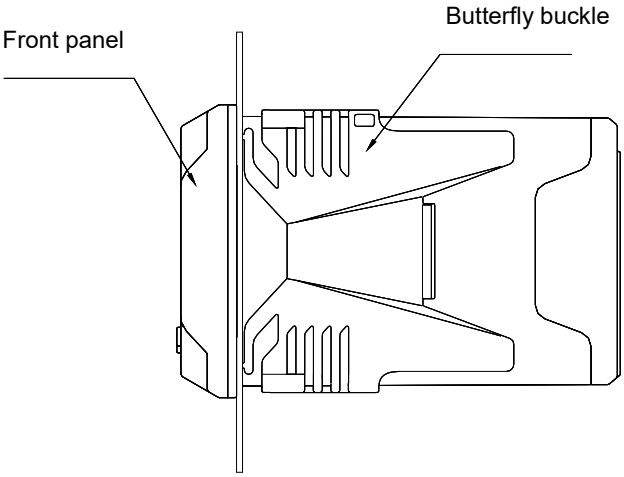


Fig.3 Schematic diagram of meter installation

4.3 Wiring

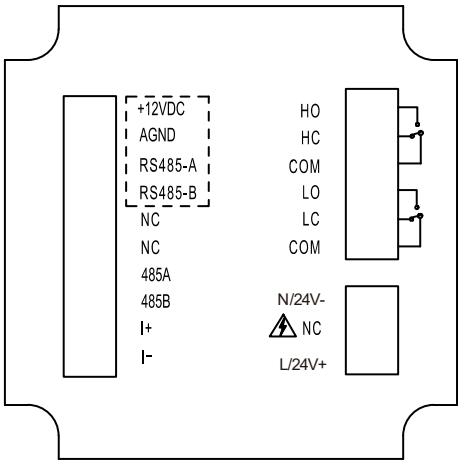


Fig.4 Wiring diagram

Port definition

- +12VDC: 12V positive power supply
- AGND: 12V power supply negative pole
- RS485-A: sensor RS485 communication terminal A
- RS485-B: sensor RS485 communication terminal B
- NC: empty
- 485A: RS485 communication terminal A
- 485B: RS485 communication terminal B
- I+: (4~20)mA output terminal positive
- I-: (4~20)mA output terminal negative
- HO: High alarm normally open relay
- HC: High alarm normally closed relay
- COM: relay common terminal
- LO: Low alarm normally open relay
- LC: Low alarm normally closed relay

- COM: relay common terminal
- L: 220VAC power port L
- NC: Empty
- N: 220VAC power port N
- 24V+: 24VDC power supply positive
- 24V-: 24VDC power supply negative

Notice

- To prevent electric shock, please confirm that the meter is not powered on before connecting the signal cable.
- To prevent fire, please use double insulated wire.
- Please do not place live products close to the signal terminals, which may cause malfunction.

Chapter 5 Key operation

5.1 Key distribution

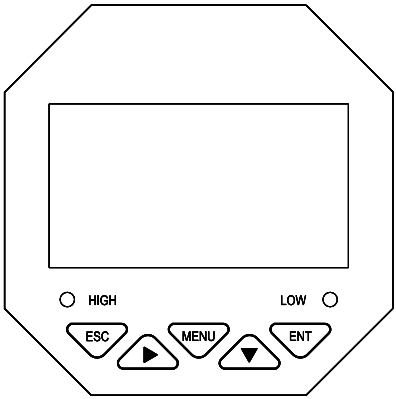


Fig.5 Button distribution diagram

5.2 Button Definition

Table 2

Identifier	Key Name	Function Description
ESC	Escape key	View related alarm status under "Monitoring Interface" Return to the upper layer between the relevant upper and lower layers of the interface under the "menu interface"
▶	Right shift	Modified bits of the cycle selection parameter
MENU	Menu	Enter the menu under "Monitoring Interface" Exit menu under "Menu interface"
▼	Downshift	Select the relevant menu under "Menu interface" Modify the relevant value in the setting state
ENT	Enter	Enter the submenu under "Menu interface" or confirm the modification

Chapter 6 Instrument interface and operation

6.1 Sensor search interface

When the meter is powered on, it will automatically match some sensors. If the matching is successful, it will automatically enter the meter monitoring interface. If the match is not successful, enter the sensor type selection interface.

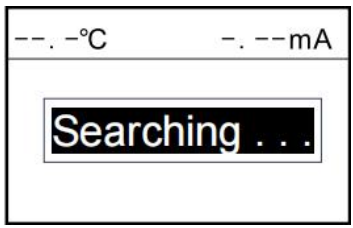


Fig.6

6.2 Sensor type selection interface

pH/ORP: Optional digital sensor model pH-8001/ pH-8002.

Turbidity: optional digital sensor model PTU-8010/PTU-8011.

PSS: optional digital sensor model PSS-9010/PSS-9011.

Dissolved Oxygen: Optional digital sensor model DO-7010/DO-7012/DO-7013/ DO-7017//DO-7018/DO-7019.

Conductivity: optional digital sensor model TDS-8001/TDS-8002.

Inductive conductivity: optional digital sensor model ADE3500

NH_4-N: optional digital sensor model ADI3000

NO_3-N: optional digital sensor model ADI5000

COD: optional digital sensor model ADS2000

6.3 Monitoring interface

The interface displays "Sensor not connected", indicating that the connection between the meter and the sensor is faulty. It is necessary to check whether the meter wiring and electrode type selection are correct. If the sensor type is incorrectly selected, long press to re-enter the sensor type selection interface.

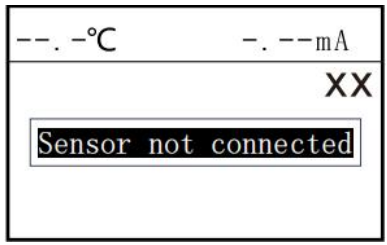


Fig.7

Use MENU to enter the password verification interface, enter the password to enter the main menu interface.

Use ESC to enter the alarm query interface to query the current alarm setting information.

Note: XX automatically switches the measurement parameter type according to the selected sensor.

Monitoring interface:

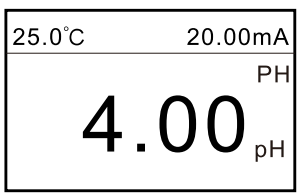


Fig.8 pH monitoring interface

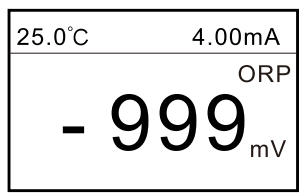


Fig.9 ORP monitoring interface

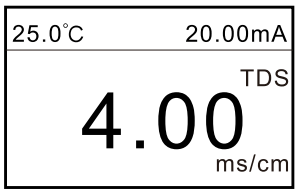


Fig.10 Conductivity monitoring interface

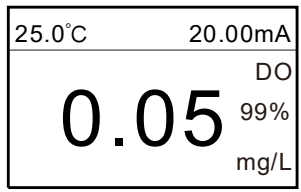


Fig.11 DO monitoring interface

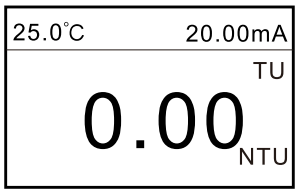


Fig.12 TU monitoring interface

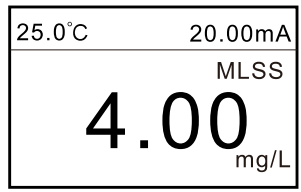


Fig.13 MLSS monitoring interface

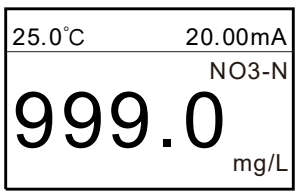


Fig.14 NO_3-N monitoring interface

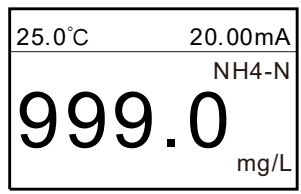


Fig.15 NH_4-N monitoring interface

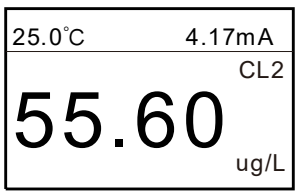


Fig.16 Free chlorine monitoring interface

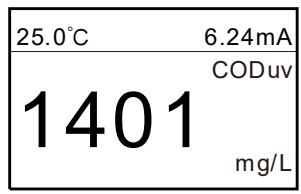


Fig.17 COD monitoring interface

Note: If the instrument is not operated for 3 minutes, it will automatically jump to the monitoring interface.

6.4 Alarm inquiry interface

Push [ESC] to enter alarm inquiry interface, to inquire the current warning configuration information

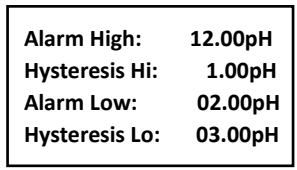


Fig.10 Alarm inquiry

6.5 Password verification interface

After entering the password, use it to enter the main menu interface.

The initial password is "0000", you can use the password modification function to modify the password.

If you forget your password, please contact our company.

Fig.18 Password verification interface

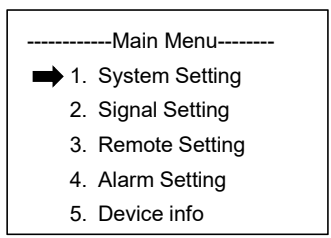
System Settings: Language,Buzzer,Backlight,Change Password and Factory Setting

Signal Settings: Sensor parameters, Calibration, Revision and other function settings.

Remote setting: Communication Settings, Electrorheological send

Alarm setting: parameter setting of high alarm and low alarm.

Information inquiry: current version information query.



Chapter 7 Configuration settings

7.1 System settings

Language: Set the type of language, Chinese and English can be set.

Buzzer: Set the buzzer switch when alarming.

Backlight: Set the switch of LCD backlight.

Password reset: Change the password and log in with the new password.

Recall default: Restore factory settings.

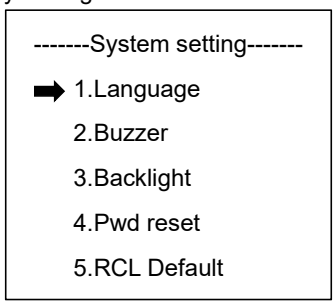


Fig.19

7.2 Signal settings

7.2.1 pH signal settings

7.2.1.1 Online calibration:

① Wash the sensor with distilled water, wipe off the water stains, and then put it in the calibration solution;

②Select the calibration point according to the calibration solution. The corresponding values of the NIST calibration points from small to large are 4.00 pH, 6.86 pH and 9.18 pH respectively (the corresponding values from small to large in USA are 4.01 pH, 7.00 pH and 10.01 pH respectively). After entering the calibration interface, Wait for a while, and after the measured value is stable, use the ENT to complete the calibration.

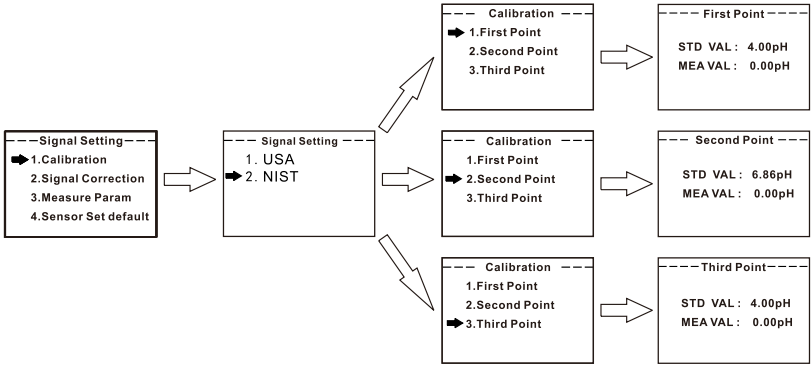


Fig.20 pH online calibration

7.2.1.2 Signal correction:

The measured pH value can be corrected.

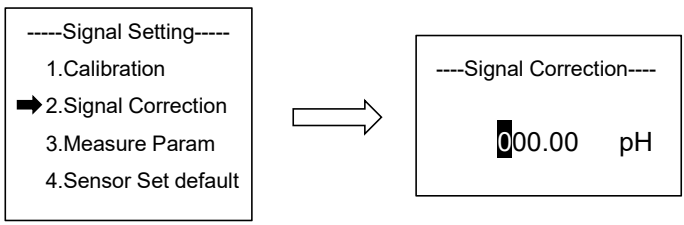


Fig.21 pH correction

7.2.1.3 Measurement parameter:

Select the sensor to measure the primary parameter pH or ORP.

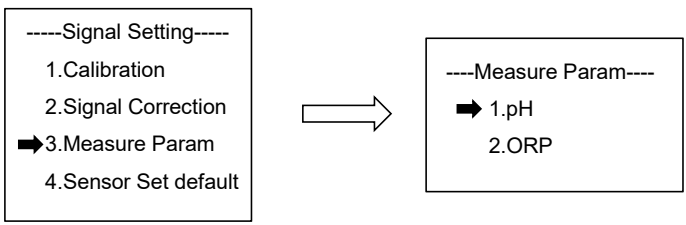


Fig.22 Measurement parameter

7.2.1.4 Sensor Set default：

Restore sensor to factory default values

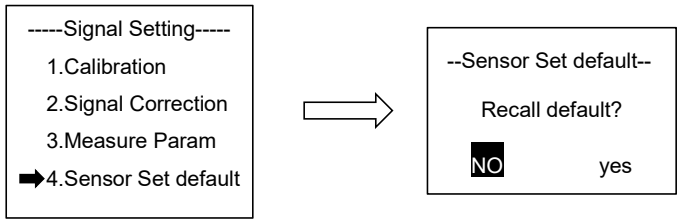


Fig.23 Sensor set default

7.2.2 ORP signal settings

7.2.2.1 Online calibration:

After entering the online calibration interface, enter the standard solution value, put the sensor into the standard solution, wait for a while, and use the ENT to complete the calibration after the measured value is stable. Before calibration, the sensor needs to be washed with distilled water and wiped dry. After soaking in water, put it in the calibration solution for calibration.

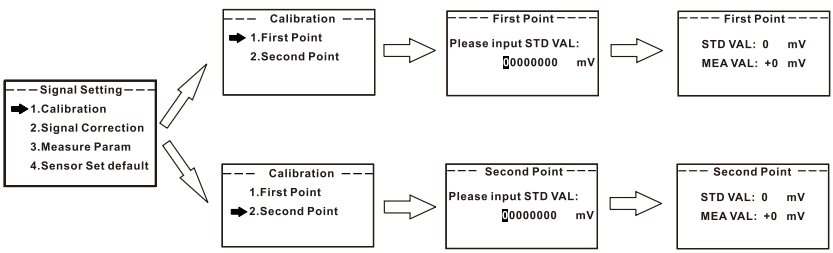


Fig.24 pH online calibration

7.2.2.2 ORP signal correction：

The measured ORP value can be corrected.

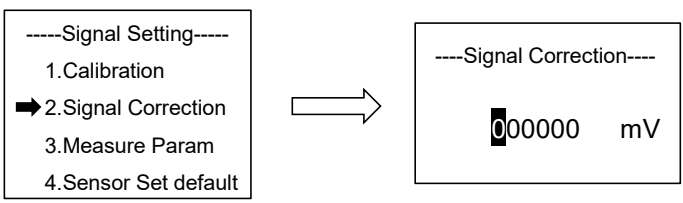


Fig.25 ORP correction

7.2.3 Turbidity signal settings

7.2.3.1 Signal Correction:

The measured turbidity value can be corrected.

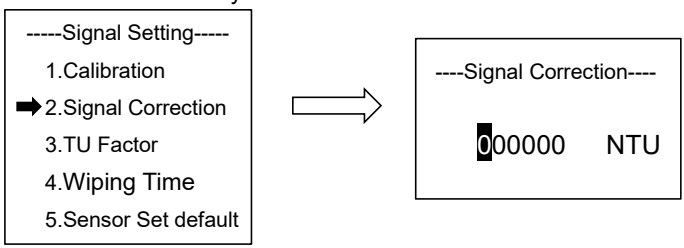


Fig.26 Turbidity correction

7.2.3.2 Turbidity factor:

Parameter settings for turbidity factor.

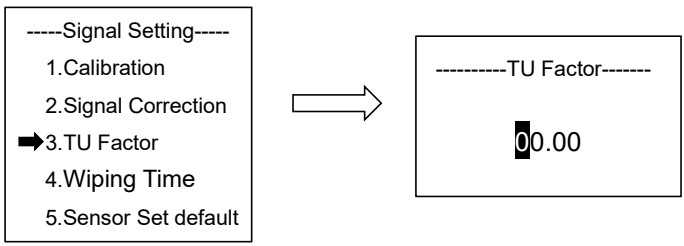


Fig.27 Turbidity factor

7.2.3.3 Wiping Time:

Set the sensor wipe time interval (1min, 5min, 15min, 30min, 1h, 4h, 12h, 1d, 3d, 7d).

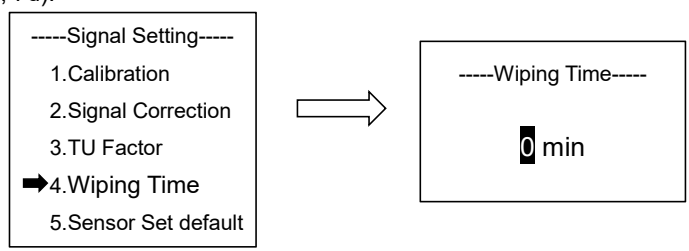


Fig.28 Wiping Time

7.2.4 Sludge concentration signal settings

7.2.4.1 Online calibration:

Calibrate the sensor. The sludge concentration sensor has been calibrated before leaving the factory. If you need to calibrate yourself, you can follow the steps below. Sludge concentration calibration requires the use of standard solutions. The specific steps are as follows:

In the signal setting, set the sludge concentration factor to 1, enter the first point calibration interface of sludge concentration and wipe the sensor probe;

Put the probe into the first point of standard solution (usually pure water is used as the first point), input the standard value of the first point of standard solution and

click, ENT after the measured value data is stable, click to ENT complete the first point calibration;

Take the probe out of the first standard solution, rinse with clean water, and dry the sensor.

Put the probe into the second-point standard solution, input the standard value of the second-point standard solution, and click. ENT After the measured value data is stable, click to ENT complete the second-point calibration.

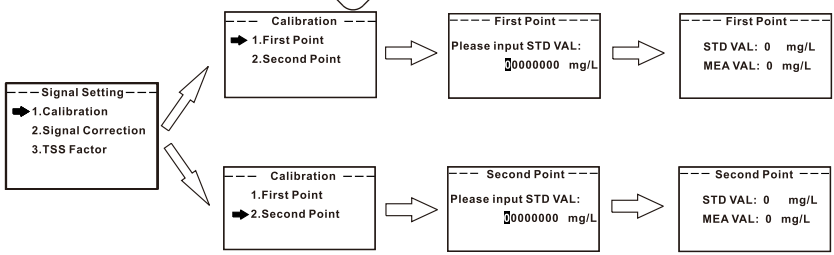


Fig.29 PSS Online calibration

Multi-point calibration:

For sludge concentration sensors that do not support online calibration, the multi-point calibration method can be used for calibration. The specific steps are as follows:

(1) Prepare several standard solutions for calibration at multiple points;

(2) Place the probe into the first standard solution, record the first standard solution value and the actual measurement value;

(3) Remove the probe from the first standard solution, rinse it with clean water, and wipe the sensor dry;

(4) Repeat steps 2 and 3 to record the standard values and actual measured values of all standard solutions;

(5) Enter the standard solution values and corresponding measurement values for each point in sequence according to the interface prompts to complete the calibration.

Example:

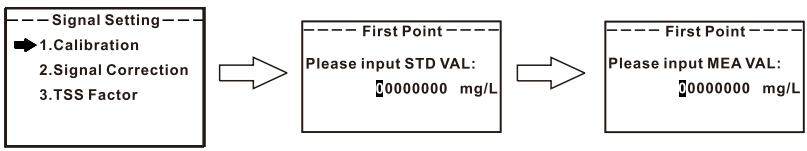


Fig.30 PSS Multi-point calibration

7.2.4.2 Signal correction:

The measured sludge concentration value can be corrected.

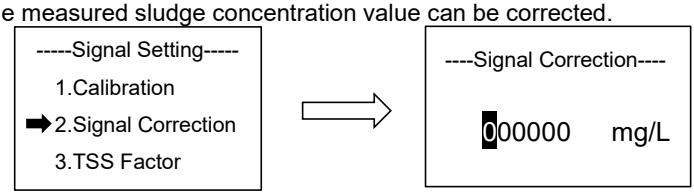


Fig.31 PSS signal correction

7.2.4.3 Sludge concentration factor:

Parameter setting of sludge concentration factor.

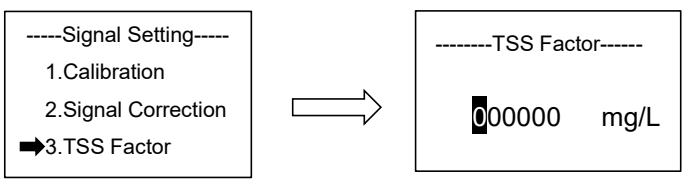


Fig.32 TSS Factor

7.2.4.4 Wiping Time

Set the sensor wipe time interval (1min, 5min, 15min, 30min, 1h, 4h, 12h, 1d, 3d, 7d).

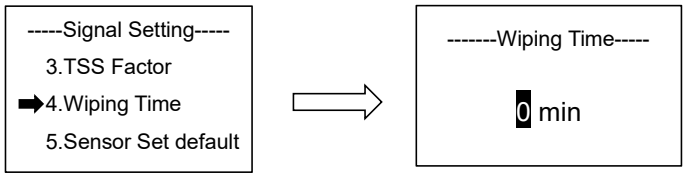


Fig.33 Wiping Time

7.2.5 Dissolved oxygen signal settings

7.2.5.1 Online calibration:

Zero oxygen and air calibration can be selected. The first point of the calibration point corresponds to zero oxygen calibration, which can be calibrated in anhydrous sodium sulfite solution (configured with deionized water), and the second point corresponds to air calibration, which can be in air or saturated air and water To calibrate, after entering the calibration interface, you need to wait for a while, and after the measured value is stable, use to complete the calibration.

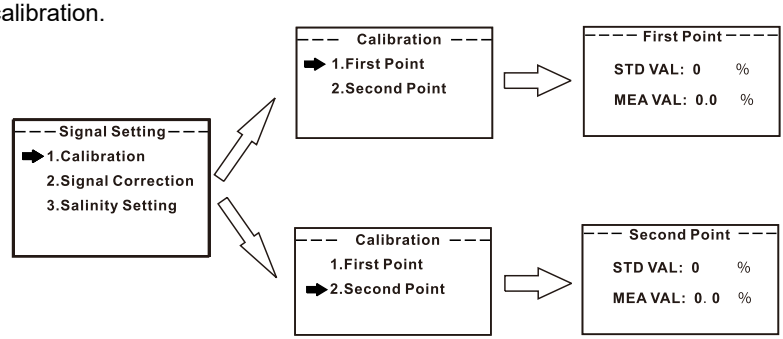


Fig.34 Dissolved oxygen online calibration

7.2.5.2 Signal correction:

The measured dissolved oxygen value can be corrected.

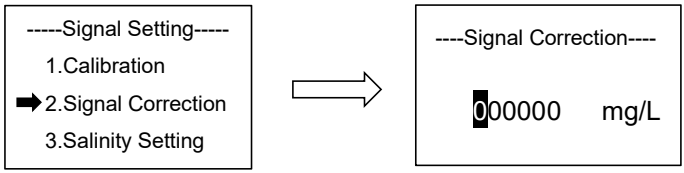


Fig.35 Dissolved oxygen correction

7.2.5.3 Salinity setting:

Sets the salinity value of the current solution. Range:0.0ppt~40.0ppt,the default value is 0.00ppt.

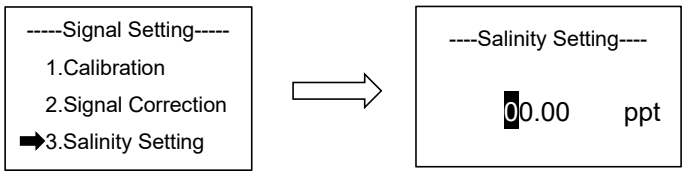


Fig.36 Salinity setting

7.2.5.4 Pressure setting:

Sets the barometric pressure value at the current altitude. The default is 1standard atmosphere(760mmHg).

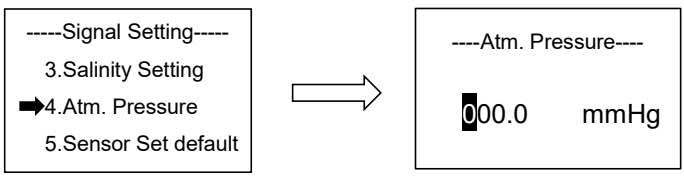


Fig.37 Pressure setting

7.2.6 Conductivity signal settings

7.2.6.1 Online calibration:

You can perform single-point calibration of any standard solution, enter the conductivity calibration input interface, and enter the calibration solution value to be calibrated (common standard solutions are 147.0μS/cm, 1413μS/cm and 12.88mS/cm, the actual can be calibrated according to on-site standards)，Press

to ENT enter the conductivity calibration interface, and then put the connected electrode into the standard solution. After the reading is stable, press the ENT calibration button.

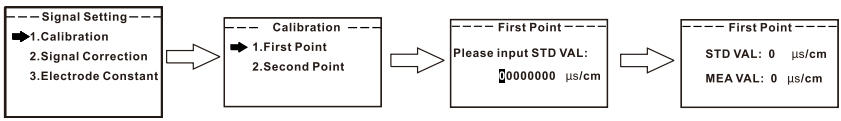


Fig.38 Conductivity signal online calibration

7.2.6.2 Signal correction:

The measured conductivity value can be corrected.

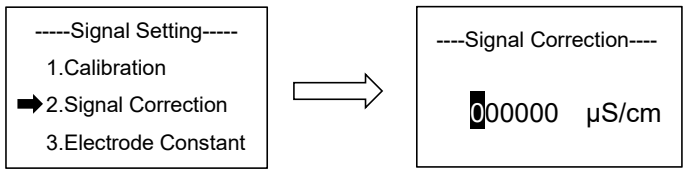


Fig.39 Conductivity correction

7.2.6.3 Electrode constant:

Set the electrode constant, usually set to 0.01, 0.1, 1.0, 10.0.

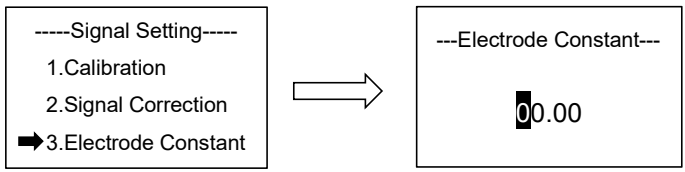


Fig.40 Electrode constant

7.2.6.4 Temperature compensation coefficient:

Set the temperature compensation coefficient of the solution, the default is 2.00%.

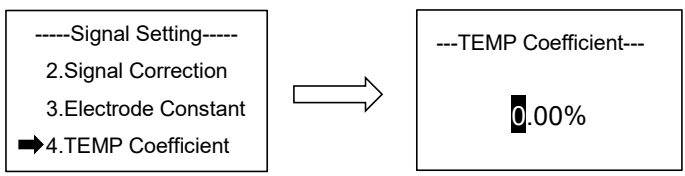


Fig.41 Temperature compensation coefficient

7.2.6.5 TDS coefficient:

Set the conversion factor for conductivity and total dissolved solids.

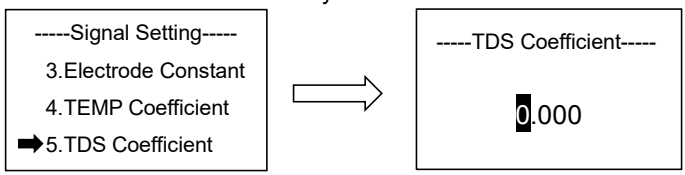


Fig.42 TDS coefficient

7.2.6.6 Measurement parameter:

Select the sensor to measure the main parameter.

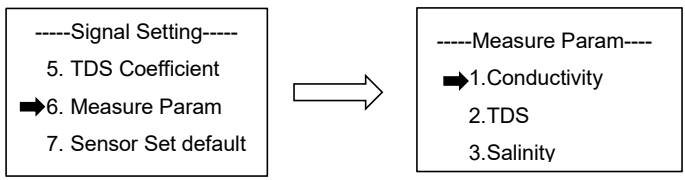


Fig.43 Measurement parameter

7.2.7 Ion signal settings (ammonium, nitrate and other ions)

7.2.7.1 Online calibration:

Ion signal calibration requires the use of standard solution. The specific steps are as follows:

(1)Put the probe into the first point of standard solution , input the standard value of the first point of standard solution and click ENT ,after the measured value data is stable, click to ENT complete the first point calibration;

(2)Take the probe out of the first standard solution, rinse with clean water, and dry the sensor.

(3)Put the probe into the second point of standard solution , input the standard value of the second point of standard solution and click ENT ,after the measured value data is stable, click to ENT complete the second point calibration;

(4)Take the probe out of the first standard solution, rinse with clean water, and dry the sensor.

(5)Put the probe into the third point of standard solution , input the standard value

of the third point of standard solution and click ENT ,after the measured value data is stable, click to ENT complete the second point calibration;

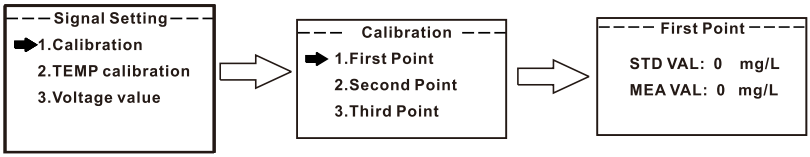


Fig.44 Ion signal calibration

7.2.7.2 Temperature calibration:

Enter the current standard temperature value for calibration.

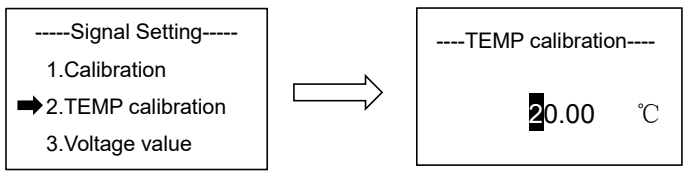


Fig.45 Temperature calibration

7.2.7.3 Voltage value:

Displays the current measured voltage value.

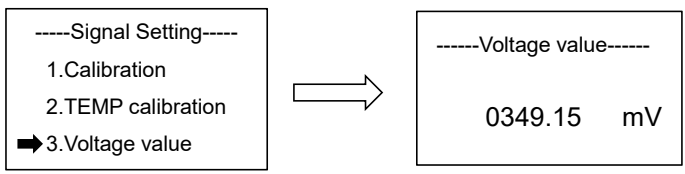


Fig.46 Voltage value

7.2.7.4 Measurement unit:

Set ion measurement unit, mg/L,pX or pH can be set.

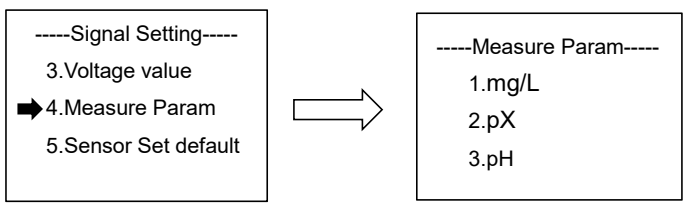


Fig.47 Ion measurement unit

7.2.8 COD signal settings

7.2.8.1 Online calibration:

COD calibration requires the use of standard solution. The specific steps are as follows:

(1)Put the probe into the first point of standard solution , input the standard value of the first point of standard solution and click ENT ,after the measured value data is stable, click to ENT complete the first point calibration;

(2)Take the probe out of the first standard solution, rinse with clean water, and dry the sensor.

(3)Put the probe into the second point of standard solution , input the standard value of the second point of standard solution and click ENT ,after the measured value data is stable, click to ENT complete the second point calibration;

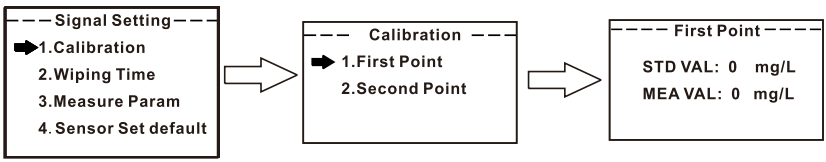


Fig.48 COD online calibration

7.2.8.2 Online calibration:

Set the sensor wipe time interval (1min, 5min, 15min, 30min, 1h, 4h, 12h, 1d, 3d, 7d).

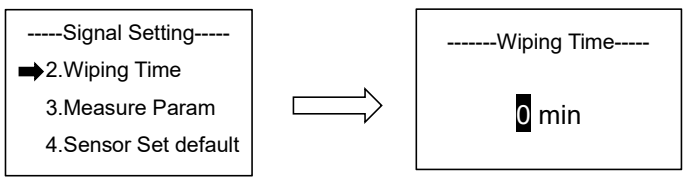


Fig.49 Wiping Time

7.2.8.3 Measurement parameter:

Select the sensor to measure the main parameter.

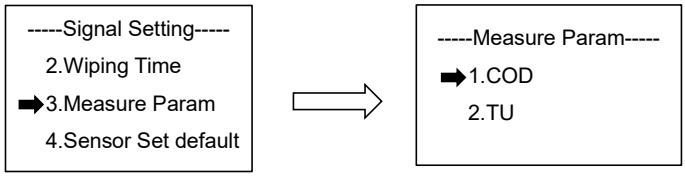


Fig.50 Measurement parameter

7.2.9 Free chlorine signal settings

7.2.9.1 Online calibration:

Free chlorine calibration requires the use of standard solution. The specific steps are as follows:

(1)Put the probe into the first point of standard solution , input the standard value of the first point of standard solution and click ENT ,after the measured value data is stable, click to ENT complete the first point calibration;

(2)Take the probe out of the first standard solution, rinse with clean water, and dry the sensor.

(3)Put the probe into the second point of standard solution , input the standard value of the second point of standard solution and click ENT ,after the measured value data is stable, click to ENT complete the second point calibration;

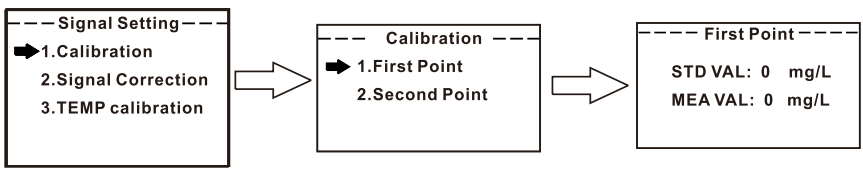


Fig.51 Free chlorine signal calibration

7.2.9.2 Signal Correction:

The measured free chlorine value can be corrected.

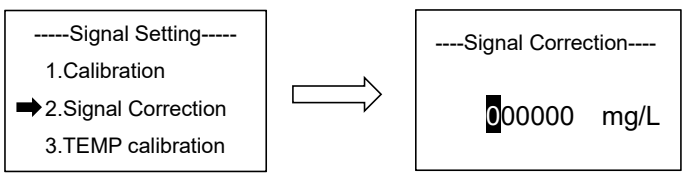


Fig.52 Signal correction

7.2.9.3 Temperature calibration:

Enter the current standard temperature value for calibration.

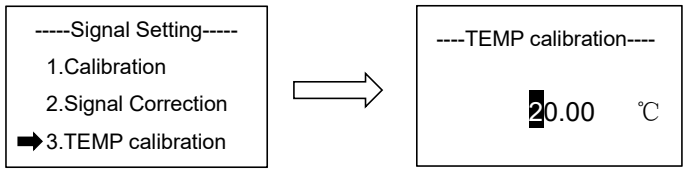


Fig.53 Temperature calibration

7.2.9.4 Sensor sensitivity:

Display the measurement sensitivity of the current residual chlorine electrode.

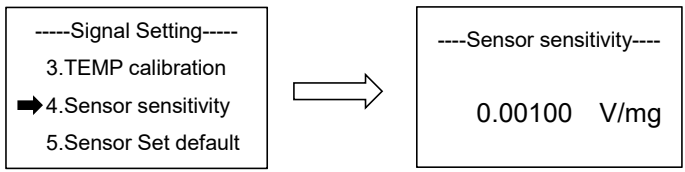


Fig.54 Sensor sensitivity

7.3 Remote settings

7.3.1 Communication settings

Set the address, baud rate and parity bit of 485 communication.

▶ : Select address digits, baud rate, check digit

▼ : Optional. Address range (1~254), optional baud rate (2400, 4800, 9600, 19200, 57600), optional check bit (no check, odd check, even check)

ENT : save setting parameters

MENU : Back to monitoring interface

ESC : Return to the remote transmission setting interface

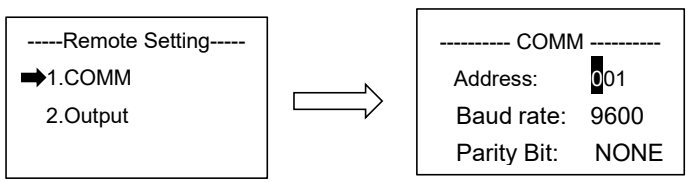


Fig.55 Communication setting

7.3.2 Output settings

The engineering value corresponding to 4mA and the engineering value corresponding to 20mA of (4~20) mA output can be set.

▶ : select the number of digits to set the parameter data

▼ : change data size

ENT : Jump to 20mA parameter setting, save the setting parameters

MENU : Return to the monitoring interface

ESC : Return to 4mA parameter setting, return to remote transmission setting interface

Note: The unit xx and the data size are automatically switched according to the selected sensor.

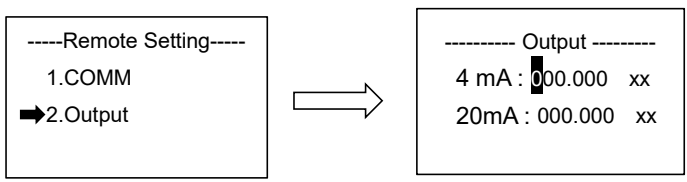


Fig.56 Output setting

7.4 Alarm settings

7.4.1 High value settings

Set the alarm value and hysteresis difference of the high alarm relay. When (measured value > alarm value), the normally open contact of the high alarm relay is closed, and the normally closed contact is disconnected. When (measured value < alarm value - hysteresis) , the normally open contact of the high report relay is disconnected, and the normally closed contact is closed.

▶ : Select to set parameter data digits

▼ : Change data size

ENT : Jump to hysteresis parameter setting, save the setting parameters

MENU : Back to monitoring interface

ESC : Return to the alarm value parameter setting, return to the alarm setting interface

Note: The unit xx and the data size are automatically switched according to the selected sensor.

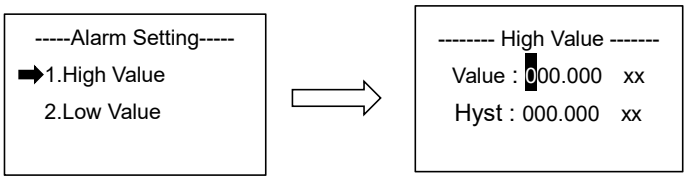


Fig.57 High value setting

7.4.2 Low value setting

Set the alarm value and hysteresis value of the low alarm relay. When (measured value < alarm value), the normally open contact of the low alarm relay is closed, and the normally closed contact is disconnected. When (measured value > alarm value + hysteresis) When the low alarm relay normally open contact is disconnected, the normally closed contact is closed


.： Select to set parameter data digits


： Change data size

： Jump to hysteresis parameter setting, save the setting parameters

： Back to monitoring interface

： Return to the alarm value parameter setting, return to the alarm setting interface

Note: The unit xx and the data size are automatically switched according to the selected sensor.

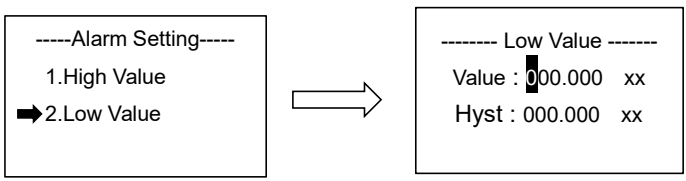


Fig.58 Low value setting

7.5 Device information

Version Information:

Query Firmware and Bios version.

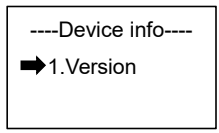


Fig.59 Device information

Chapter 8 Communication protocol

This product provides standard RS485 serial communication interface and adopts standard Modbus-RTU communication protocol.

- **Register address**

The communication data and register addresses are shown in Table 3:

Table 3 Communication data and register address

Address	Data Type	Function Code	Description	Access Rights
0x1100	short	0x03/0x06	Slave address: 1-254	W/R
0x1101	short	0x03/0x06	Baud rate: 0=2400, 1=4800, 2= 9600 (default), 3 = 19200, 4 = 57600	W/R
0x1102	short	0x03/0x06	Check digit: 0=N81(default),1=O81,2=E81 N: No parity E: Even parity O: odd parity 8: 8 data bits	W/R
0x2000	short	0x03	High byte: data version, low byte: device type Data version: 0x01 Device Type: 0x04	R
0x2001	short	0x03	The type of access sensor determines the meaning of measurement values 1, 2, and 3. Please refer to Table 4 for details.	R
0x2002	float	0x03	Temperature value Unit: °C	R
0x2004	float	0x03	Measured value 1, look up table 4	R
0x2006	float	0x03	Measured value 2, look up table 4	R
0x2008	float	0x03	Measured value 3, look up table 4	R

Address	Data Type	Function Code	Description	Access Rights
0x2103	short	0x03	High Alarm Relay Status	R
0x2104	short	0x03	0: Disconnect 1: Pull in	R
Note: The above register data transmission adopts big endian mode, the high byte is first, and the byte order of the floating point type is 4321				

Table 4 Sensor Type Correspondence Table

Sensor type	Data	Measurement value 1, 2, 3 meaning
pH	0x0001	Measured value 1 is pH value, unit: pH Measured value 2 is meaningless, value is 0 Measured value 3 is meaningless, value is 0
ORP	0x0002	Measured value 1 is the ORP value, unit: mV Measured value 2 is meaningless, value is 0 Measured value 3 is meaningless, value is 0
EC	0x0003	Measured value 1 is the conductivity value, unit: mS/cm Measured value 2 is the conductivity value, unit: μS/cm Measured value 3 is meaningless, value is 0
TDS	0x0004	Measured value 1 is TDS value, unit: ppm Measured value 2 is meaningless, value is 0 Measured value 3 is meaningless, value is 0
Salinity	0x0005	Measurement value 1 is the salinity value, unit: ppt Measured value 2 is meaningless, value is 0 Measured value 3 is meaningless, value is 0
Dissolved oxygen	0x0006	Measured value 1 is the dissolved oxygen value, unit: mg/L Measured value 2 is the dissolved oxygen

Sensor type	Data	Measurement value 1, 2, 3 meaning
		saturation, unit: % Measured value 3 is meaningless, value is 0
Turbidity	0x0007	Measured value 1 is the turbidity value, unit: NTU Measured value 2 is meaningless, value is 0 Measured value 3 is meaningless, value is 0
PSS/MLSS	0x0008	Measured value 1 is the sludge concentration value, unit: mg/L Measured value 2 is meaningless, value is 0 Measured value 3 is meaningless, value is 0
Free chlorine	0x0009	Measured value 1 is the free chlorine value, unit: mg/L Measured value 2 is meaningless, value is 0 Measured value 3 is meaningless, value is 0
Ammonium	0x000A	Measured value 1 is the free chlorine value, unit: mg/L Measured value 2 is meaningless, value is 0 Measured value 3 is meaningless, value is 0
Nitrate	0x000B	Measured value 1 is the nitrate value, unit: mg/L Measured value 2 is meaningless, value is 0 Measured value 3 is meaningless, value is 0
COD	0x000C	Measured value 1 is the COD value, unit: mg/L Measured value 2 is meaningless, value is 0 Measured value 3 is meaningless, value is 0

Communication case

(1) Query address 0x00 (stand-alone mode)

The device address is unknown, you can use the address 0x00 to send the 03 command

Device address	Function code	Start address	Number of registers	CRC
0x00	0x03	0x1100	0x0001	0x80E7

Data reply: device address is 0x01

Device address	Function code	return byte	Return data	CRC
0x01	0x03	0x02	0x0001	0x7984

Explanation: The current device table address is found to be 0x01

(2) Query real-time data

Device address	Function code	Start address	Number of registers	CRC
0x01	0x03	0x2001	0x0009	0xDFCC

Data reply: device address is 0x01

Device address	Function code	Return byte	Return data	CRC
0x01	0x03	0x12	0x0001(PH sensor) 0x41C80000(25℃) 0x40E00000(7pH) 0x00000000(No meaning) 0x00000000(No meaning)	0xCDD8

Chapter 9 Failure analysis and removal

Question 1: No display on the controller?

Answer: Make sure that the power supply wiring is correct and the power supply can supply power normally.

Question 2: The controller display numbers jump up and down?

A: Check whether there are any interference devices such as inverters around, and pay attention to stay away from these interference devices or take shielding measures.

Q3: The controller cannot be calibrated?

Answer: The standard solution is not prepared correctly or the electrode is damaged.

Question 4: The display area of the screen is that the sensor is not connected?

A: Confirm whether the sensor is disconnected.

Q5: Wrong sensor selection?

A: You can press and hold to re-enter 

the sensor selection interface and select the correct sensor.

Chapter 10 Warranty and After-sale Service

We promise to the customer that the hardware accessories provided during the supply of the instrument have no defects in material and manufacturing process. From the date of the purchase, if the user's notice of such defects is received during the warranty period, the company will unconditionally maintain or replace the defective products without charge, and all non customized products are guaranteed to be returned and replaced within 7 days.

Disclaimers:

- During the warranty period, product faults caused by the following reasons are not in the scope of Three Guarantees service
- Product faults caused by improper use by customers.
- Product faults caused by disassembling, repairing and refitting the product.