

# ***MC-HC***

## ***Meter controller***



***User Manual V1.1***  
**2025.06 Edition**

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## Document

Edition number	Revision date	Version	Note
V1.0	March 13, 2025	V01B1	● New user manual
V1.1	June 9, 2025	V01B1	Update installation information

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# 1 Specifications

Specification	Details
Product description	Meter controller, connected to the sensor to display measured values and upload data
Display	5-inch color LCD screen with touch function
Dimensions (W×H×D)	184 × 97 × 40 mm
Weight	0.65 kg
Output voltage	DC 12 V
Battery capacity	6600 mAh
Protection class	IP65
Mounting	Handheld
Operating temperature	Charging: 10-45 °C (50 - 113 °F) Using: -20-60 °C (-4 - 140 °F)
Storage temperature	-10-45 °C (14- 113 °F)
Data storage	32 GB
Interface	5-pole plug connector
Wireless Communication	WiFi (HTTP, MQTT protocol), Bluetooth, 4G (user optional)
Location	GPS
Warranty	One year

In no event will the manufacturer be liable for direct, indirect, special, incidental or consequential damages resulting from any defect or omission in this manual. The manufacturer reserves the right to make changes in this manual and the products it describes at any time, without notice or obligation.



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## 2 General information

### 2.1 Safety information




Please read this entire manual before unpacking, setting up or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment. Make sure that the protection provided by this equipment is not impaired. Do not use or install this equipment in any manner other than that specified in this manual.

#### 2.1.1 Use of hazard information

 <b>DANGER</b>
Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury.
 <b>WARNING</b>
Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.
<b>NOTICE</b>
Indicates a situation which, if not avoided, may cause damage to the instrument. Information that requires special emphasis.

#### 2.1.2 Precautionary labels

Read all labels and tags attached to the instrument. Personal injury or damage to the instrument could occur if not observed. A symbol on the instrument is referenced in the manual with a precautionary statement.

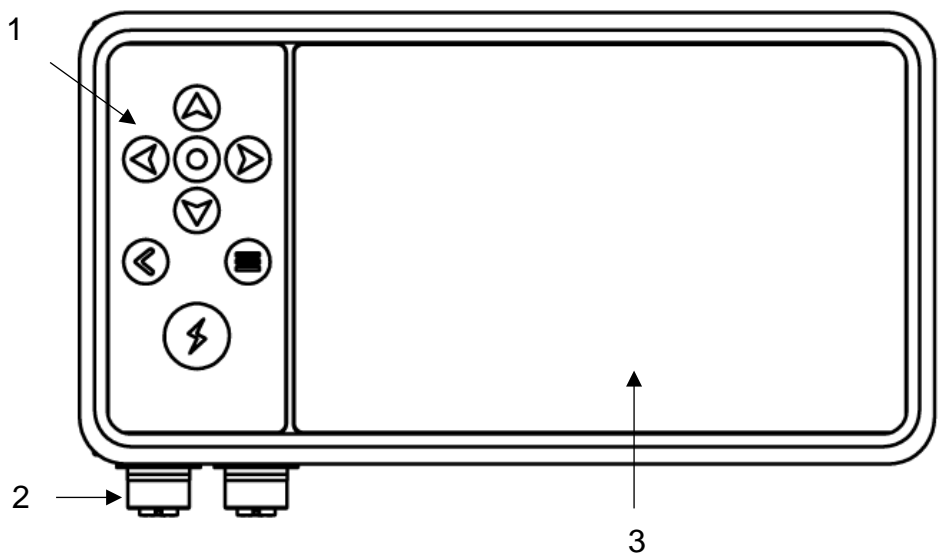
	This symbol, if noted on the instrument, references the instruction manual for operation and/or safety information.
	This symbol indicates that a risk of electrical shock and/or electrocution exists.
	This symbol indicates the connection location of protective earth.

Note: This series of products are mainly used in industrial environments, indoor use, which will cause potential electromagnetic interference to the environment. This series of products meets the relevant requirements of the standards EN 61326-1: 2013 and EN 61326-2-3: 2013.

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## 2.2 Product overview

MC-HC meter controller is a handheld meter developed by our company, with 4G, WiFi, Bluetooth wireless data transmission, the device is adapted to all of our sensors and slave devices, support for standard ModbusRTU communication devices.

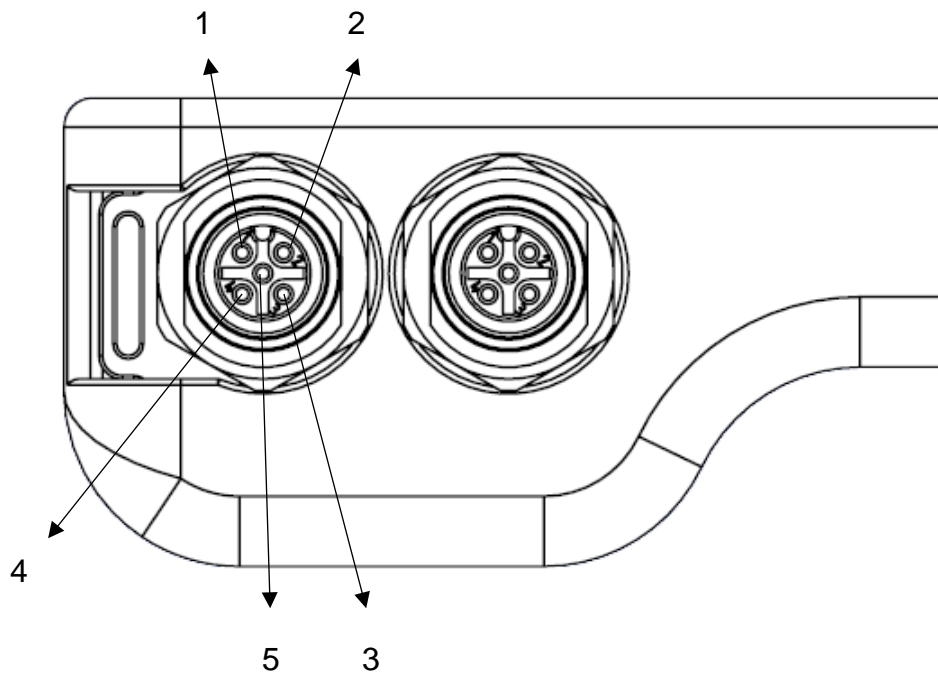


1	Buttons	2	5-pole plug connector
3	Display		

---

## 2.3 Interface definition

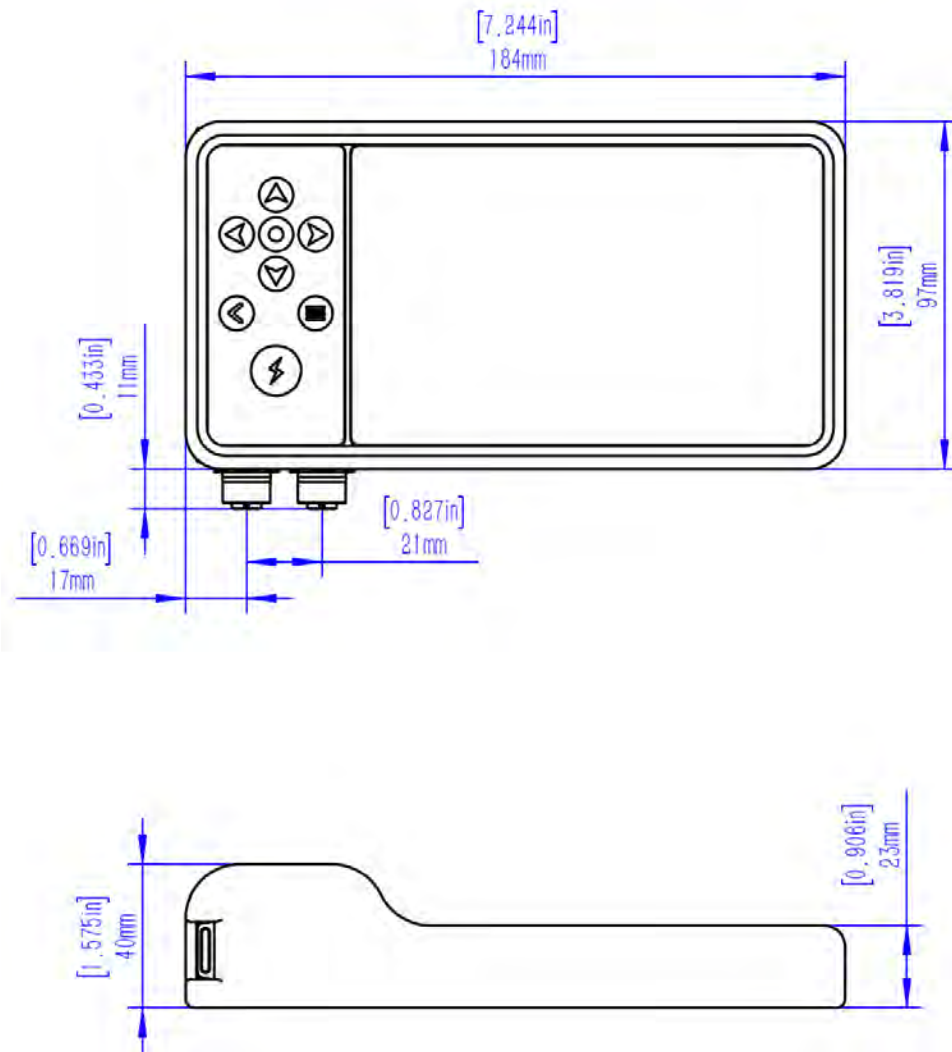
The meter controller only supports 5-pole plug connector connection, sensors with other connectors should be adapted according to the definition before prior to connection to the meter controller.



1	DC output power supply positive	2	RS485B
3	RS485A	4	0 VDC
5	DC input power supply positive		

---

## 2.4 Dimensions

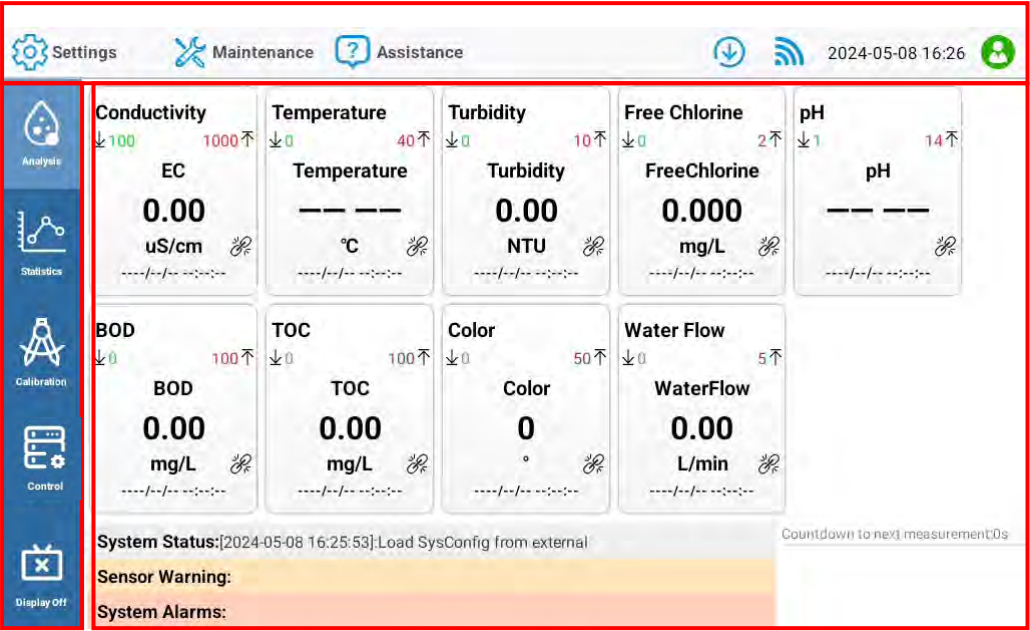


### 3 Quick access

<b>NOTICE</b>
The display is a touch screen, so touch it lightly to operate.
<b>NOTICE</b>
The interface guide images in the text are only examples, please refer to the actual user interface received.

#### 3.1 Introduction to the interface

The interface consists of three main blocks: the menu bar, the navigation bar, and the display area.



Note: Changing parameter settings requires the appropriate rights

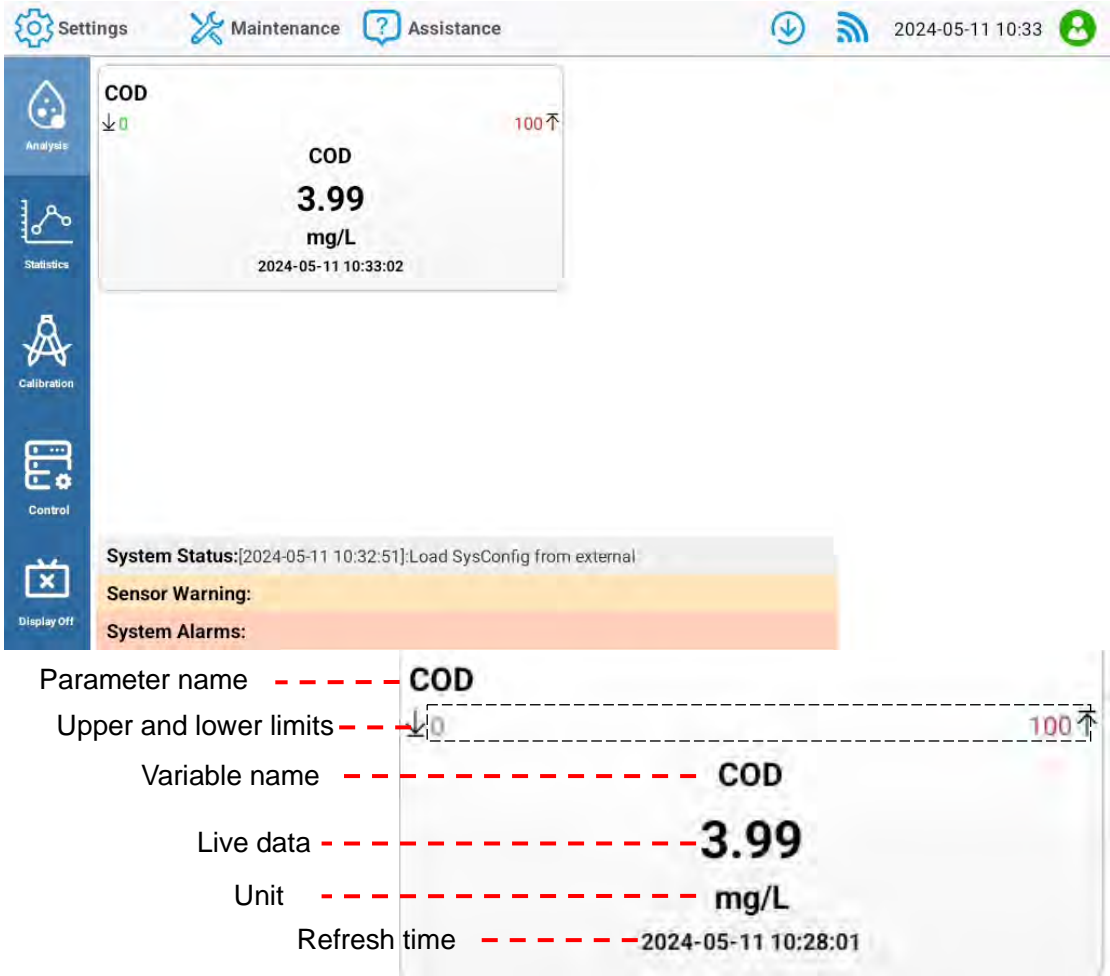
Engineer: can check data, maintenance, calibration and other operations,  
initial password: 123456

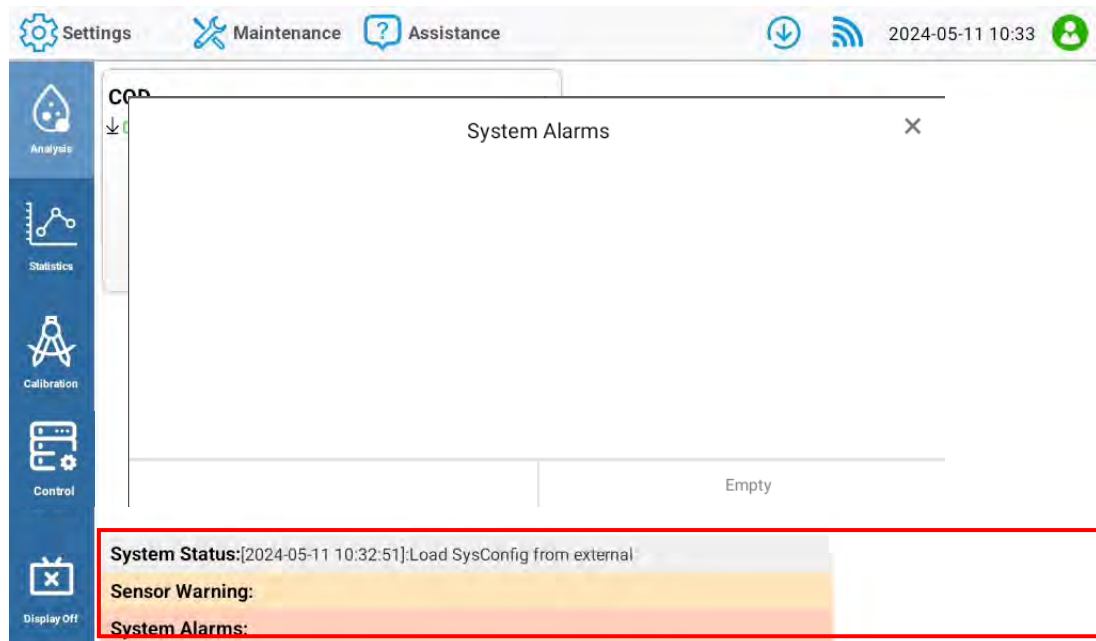
Administrator: has all modification rights, initial password: 12345678

### 3.2 Analysis page

The Analysis page displays real-time data for each of the device's parameters. The page is composed of the data displayed by each sensor access screen. Each panel represents a parameter value and the display consists of the parameter name, real-time value, unit and update time.

The Analysis page display consists of the configurations in 3.6.1.2 [Analysis page management](#).





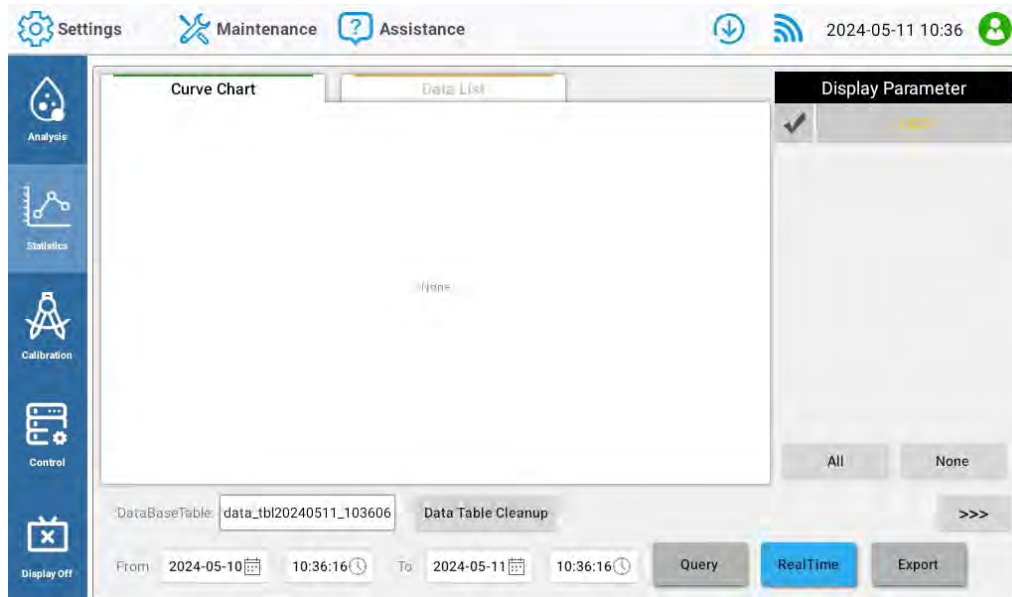
The bottom section is the status display area, which contains three sections: System Status, Sensor Warning, and System Alarm.

Click on the appropriate area to view the status record.

<b>System Status</b>	Load SysConfig from internal Load SysConfig from external Engineer login successful Admin login successful
<b>Sensor Warning</b>	Parameter failed to read Probe value is too high Probe value is too low
<b>System Alarm</b>	Liquid leak alarm Lua Result Type Error: [Lua Script] Lua Error: [Lua Script] The storage space is less than 200MB

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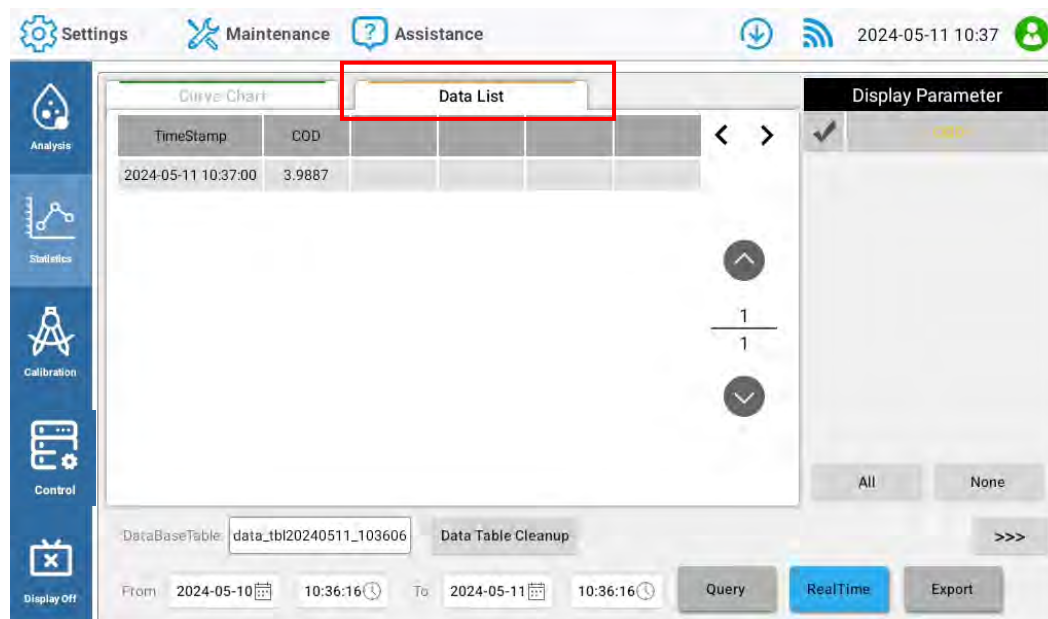
### 3.3 Statistics page



This page displays graphs and charts of the various data curves, making it easy for users to view data trends.

- Click on the "<<<" button on the right side to open the list of legends, click on a legend to show and hide the corresponding curve.
- Click on the "All" button to select all panel data and the "Select None" button to cancel all.
- Click on the "Query" button to display historical data for a specified period.
- Click on the "RealTime" button to display the most recent day's data and refresh it regularly.
- Click on the "Data Table Cleanup" button to clear the historical data.
- Click on the 'Export' button to export historical data for a specified period of time.

The content of the Statistics page consists of the configurations in 3.6.1.4 [Statistics page management](#).



Click on the data list to view specific data records.

### 3.4 Calibration page

Equipment selection	Parameter selection	Calibration
Multi-Parameter Sensor	Turbidity	Turbidity: 0.000
EC	BOD	Raw value: 0.000
pH	Color	Slope: 1.000
fCl	TOC	Zero: 0.000
		Submit

**Technical Tips**

The Calibration Page is the device control and calibration page that is set up according to the sensor calibration instructions, and the calibration data is stored in the sensor.

The contents of the calibration page consist of the configurations in 3.6.1.5 [Calibration page management](#).

### 3.5 Control page

Parameter	Value	Unit
ProVerSN	4145	
DevSN	4	
SoftwareSN	435	
ModbusID	7	
BaudRate	9600	
M_PeriodT	500	ms
WorkTemp	25.000	°C
TempCoef	0.000	
SVsON Ts	18733	sec

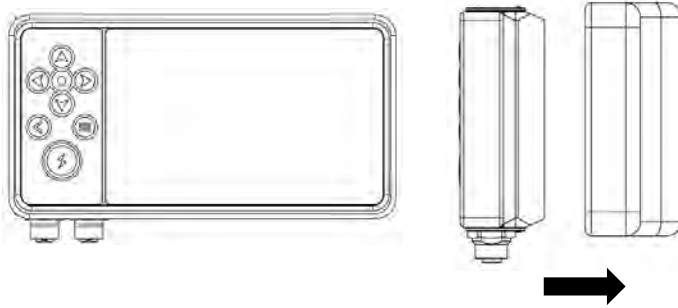
Operations such as sensor range switching and cleaning brush control can be set.

The contents of the Control page consist of the configurations in 3.6.1.6

[Controlr page management.](#)

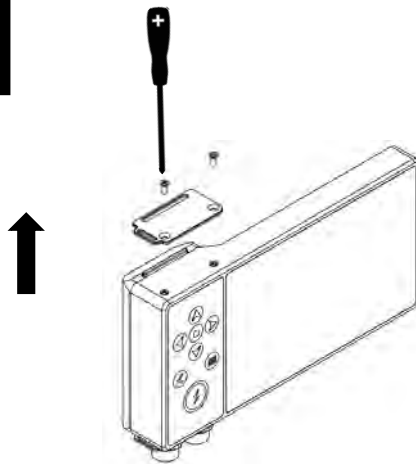
### 3.6 Install battery

1



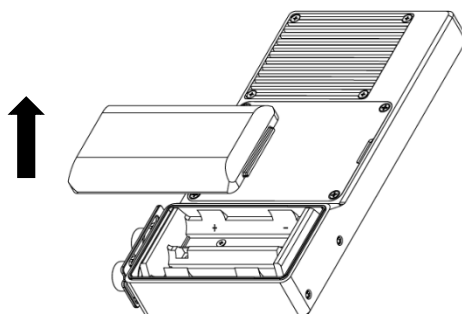
Remove the rubber protective cover

2



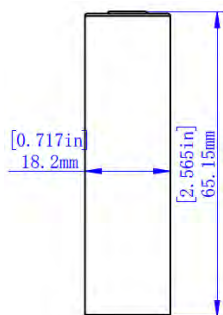
Remove the battery cover panel.

3



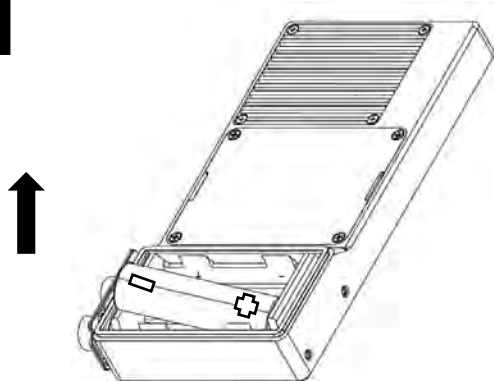
Remove the battery cover

4



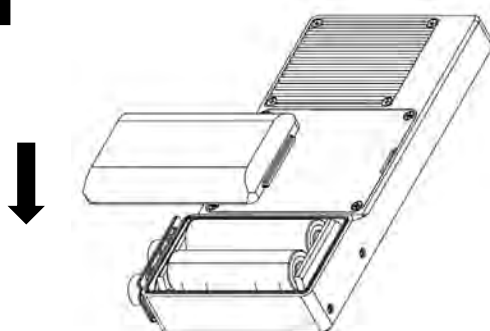
The battery is a model 18650 flat-top lithium battery

5



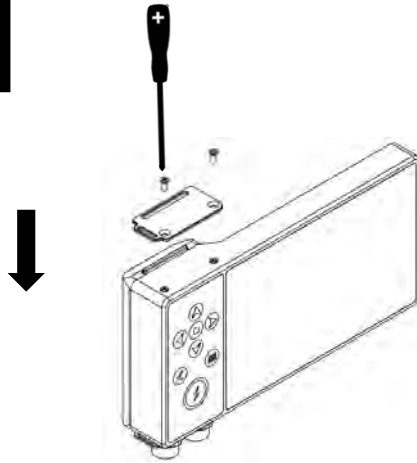
To install the battery, press the positive terminal into the battery holder and then gently press the negative terminal.

6



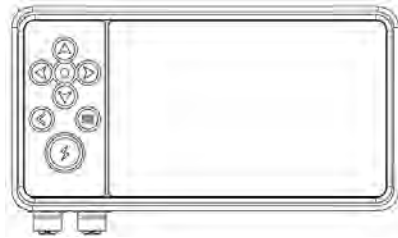
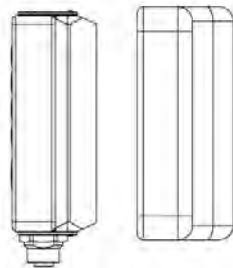
Install the battery cover

7



Install the battery cover panel.

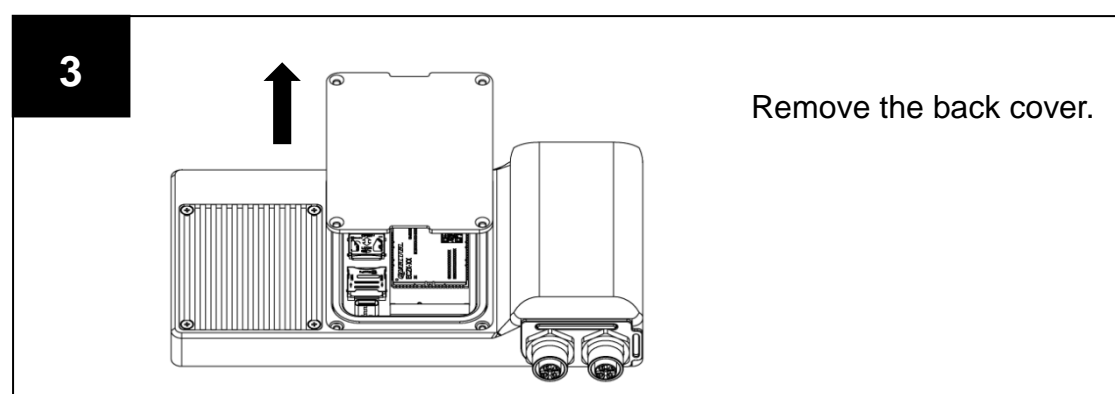
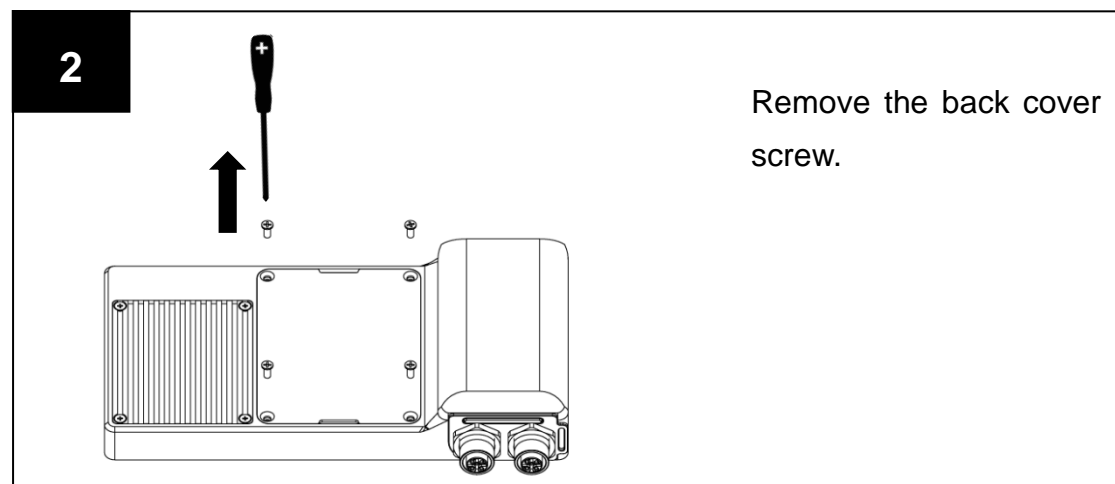
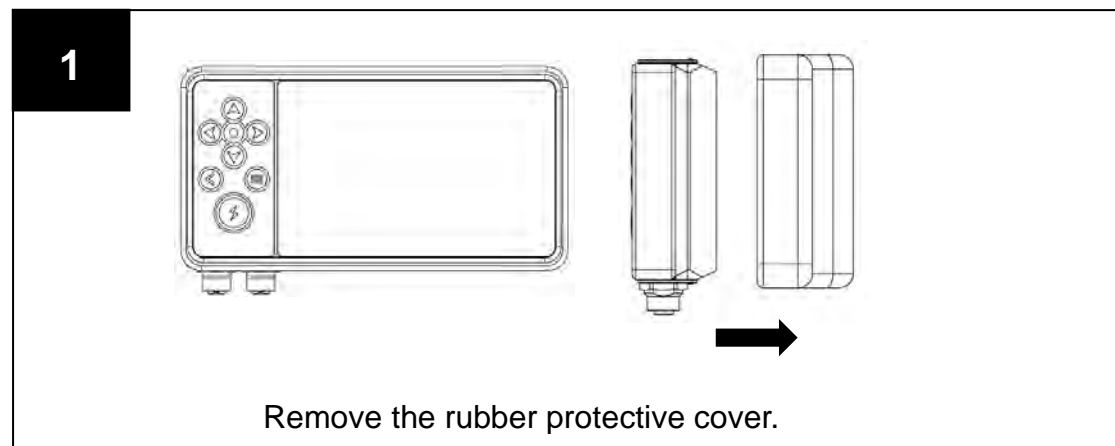
8



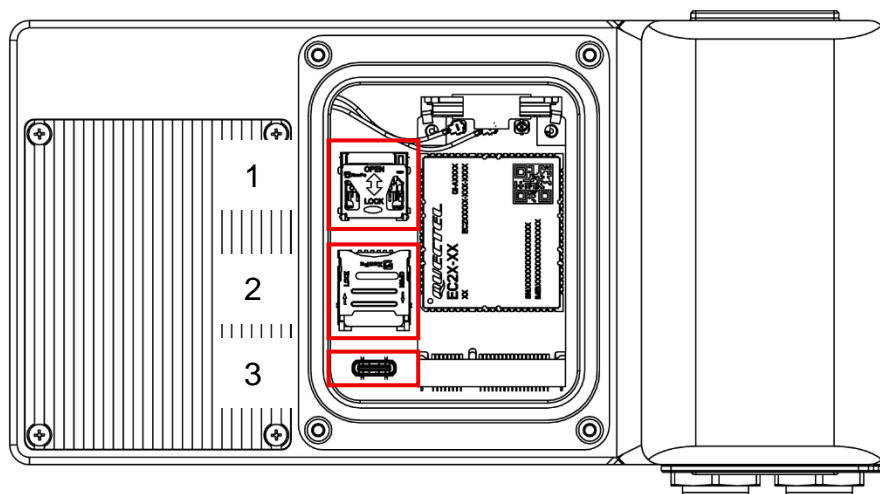
Install the rubber protective cover

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### 3.7 Install a memory card or IoT card

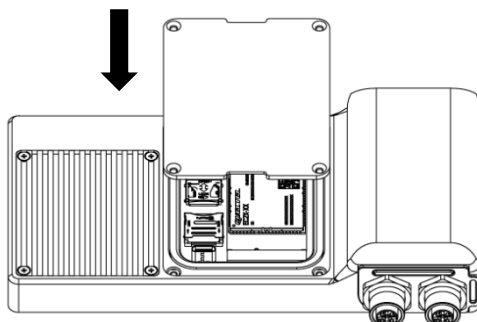


4



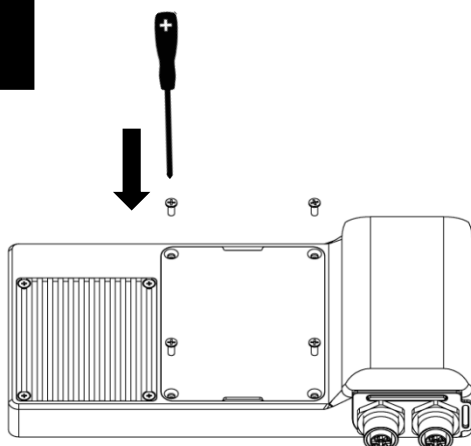
- 1: Memory card slot
- 2: IoT card slot
- 3: Type-C port

5



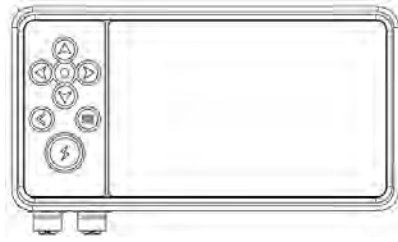
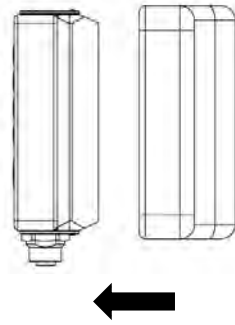
Install the back cover.

6



Install the back cover screws.

7



Install the rubber protective cover

---

## 4 MC-HC UI introduction

### NOTICE

The interface guide images in the text are only examples, please refer to the actual user interface received.

### 4.1 Start

This device is a Modbus protocol universal transmitter, in addition to supporting SPS series sensors, it also supports the connection of other Modbus slaves, which are configured by the user.

The configuration in the manual is only an example, the device is generally shipped with the appropriate configuration added by default, which is adapted to the sensors purchased by the user.

#### 4.1.1 Framework

The register map list and CMD for each Modbus device run according to the set parameters. The input page, chart page, output page, and calibration page are bound to the device's registers for displaying register values, changing register values, and executing CMD.

- 1) Device Management:
  - a) Device: modbus slave
    - i. Register map table: execution by function code
      1. Register: store the corresponding register data of the device
    - ii. CMD: execution by CMD type
- 2) Display Page:
  - a) Analysis page: real-time display of device data
  - b) Statistics page: record device data and display it in a graph
- 3) Control Page:
  - a) Calibration page: calibration of the measured value for the slave
  - b) Parameter page: manually read or write registers or execute CMD

#### 4.1.2 Data binding sources

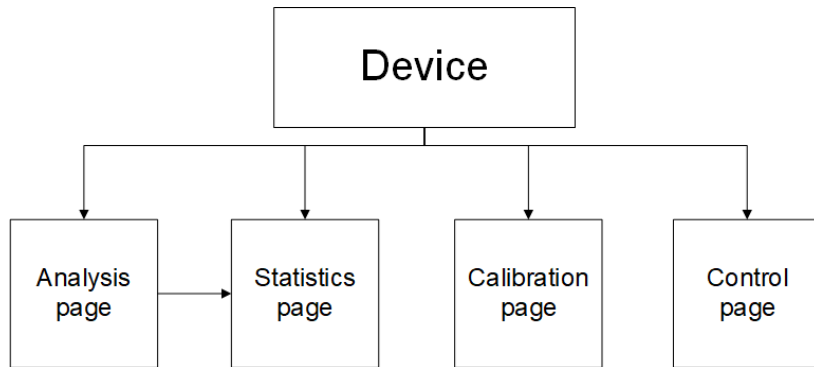
Data binding source for the analysis page: Device.

Data binding source for calibration page: Analysis page or device.

Data binding source for statistics page: Analysis page or device.

Data binding source for parameter page: Analysis page or device.

**Note: Changing the object name or deleting the object may invalidate the data binding, so please modify the corresponding data binding.**



### 4.1.3 Model and trigger

In this device, both the model and the trigger use the Lua scripting language, the difference is that the returned value of the model is a numeric value, and the returned value of the trigger is a boolean value.

The script's execution entry is the main function, for example:

```
function main ()  
--<body>  
end
```

#### 4.1.3.1 Referencing register data

The internal function `com.getDevV("register path")` is needed.

Register path: "device name/RegMapList/register map list name/register name".

To return COD register as an example.:

```
function main ()  
    return com.getDevV ("Sensor_COD /RegMapList/WQP/COD_KHP")  
end
```

#### 4.1.3.2 Referencing input page panel data

The internal function `com.getPanelV ("panel path")` is required.

Panel path:

When the panel is in the top level: the panel name.

When the panel is in a group: "group name/.../panel name"

```
function main ()  
    return com.getPanelV ("COD")  
end
```

### 4.1.4 Configuration process

- 1) Add devices, register table, registers and CMD in Device manager.
- 2) Add panel in analysis page (need to bind to the register).


- 
- 3) Add group, calibration, calibration members in calibration page (need to bind to the register or analysis page).
  - 4) Add data cell statistics page (need to bind to the register or analysis page).
  - 5) Control page to add device control or read analysis page (need to bind to the register or analysis page).

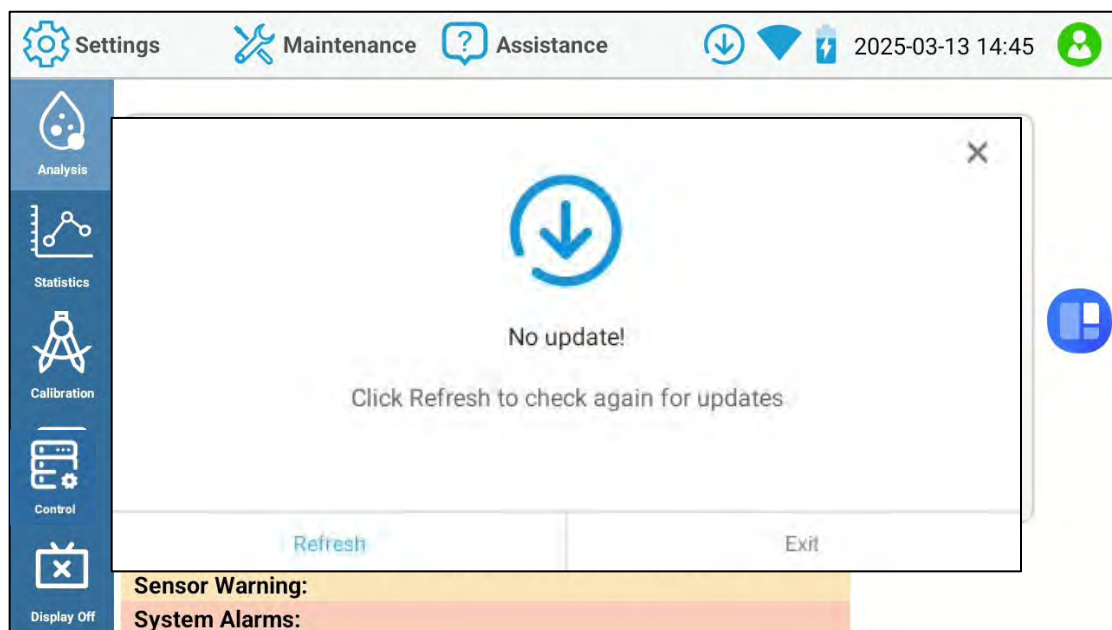
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## 4.2 Menu bar




## 4.3 Online update

When the icon  in the status bar blinks, it means there is a new update, click the icon to view the update information.




## 4.4 WiFi



Click the icon  in the status bar to open the WiFi settings screen.

If the icon  turns gray, the current network is abnormal.

Note: Internet environment is required for software update and time synchronization.

## 4.5 Battery level


 This icon represents the battery balance, when the battery level is too low, please charge it in time


The  icon and the button icon  flashing indicate that the battery is charging

## 4.6 User login

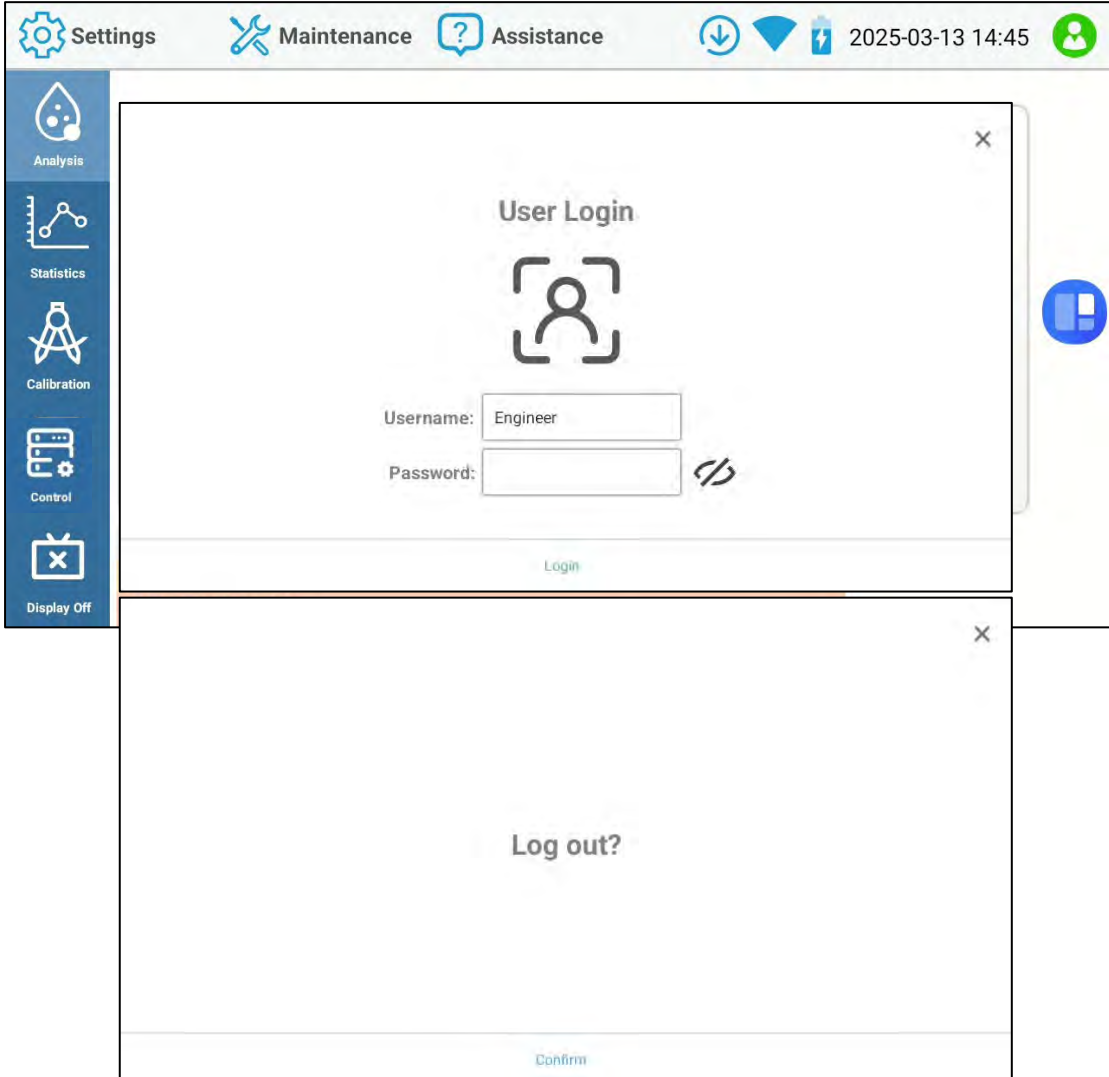
Click on the status bar icon  to log in as an **Engineer** or **Admin**.

The **Engineer** is responsible for the maintenance and calibration of the sensor.

The default password is 123456 and the icon  changes to blue after logging in.

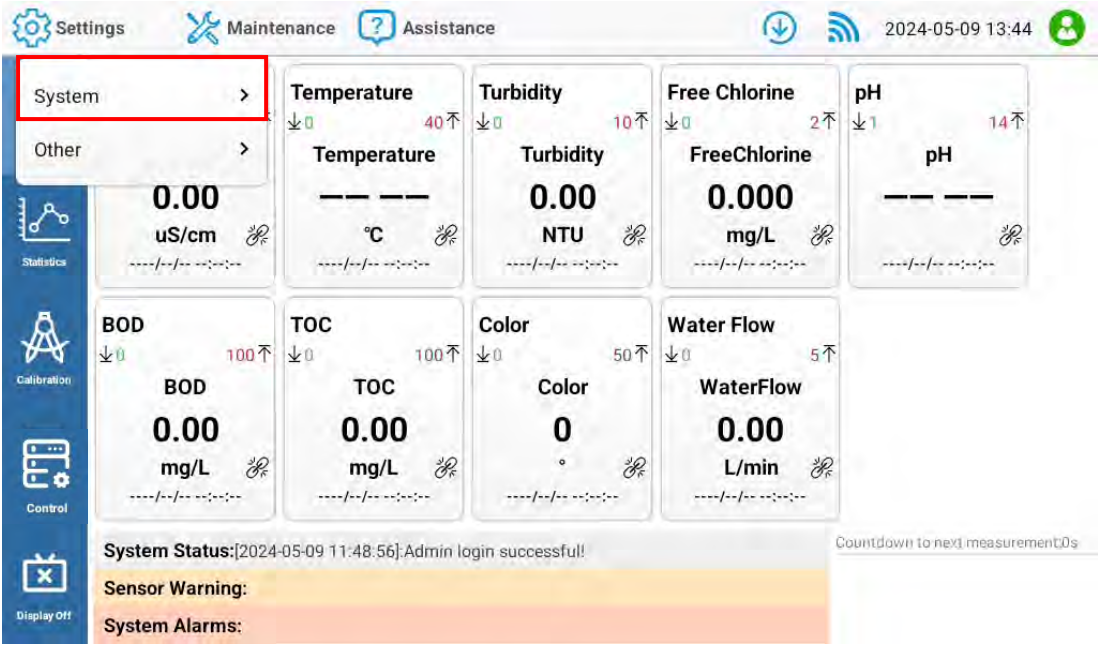
The **Admin** has higher privileges and can edit the layout configuration. The password is 12345678 by default and the icon  changes to green after logging in.

Once you have logged in, you can log out by clicking on the icon again.

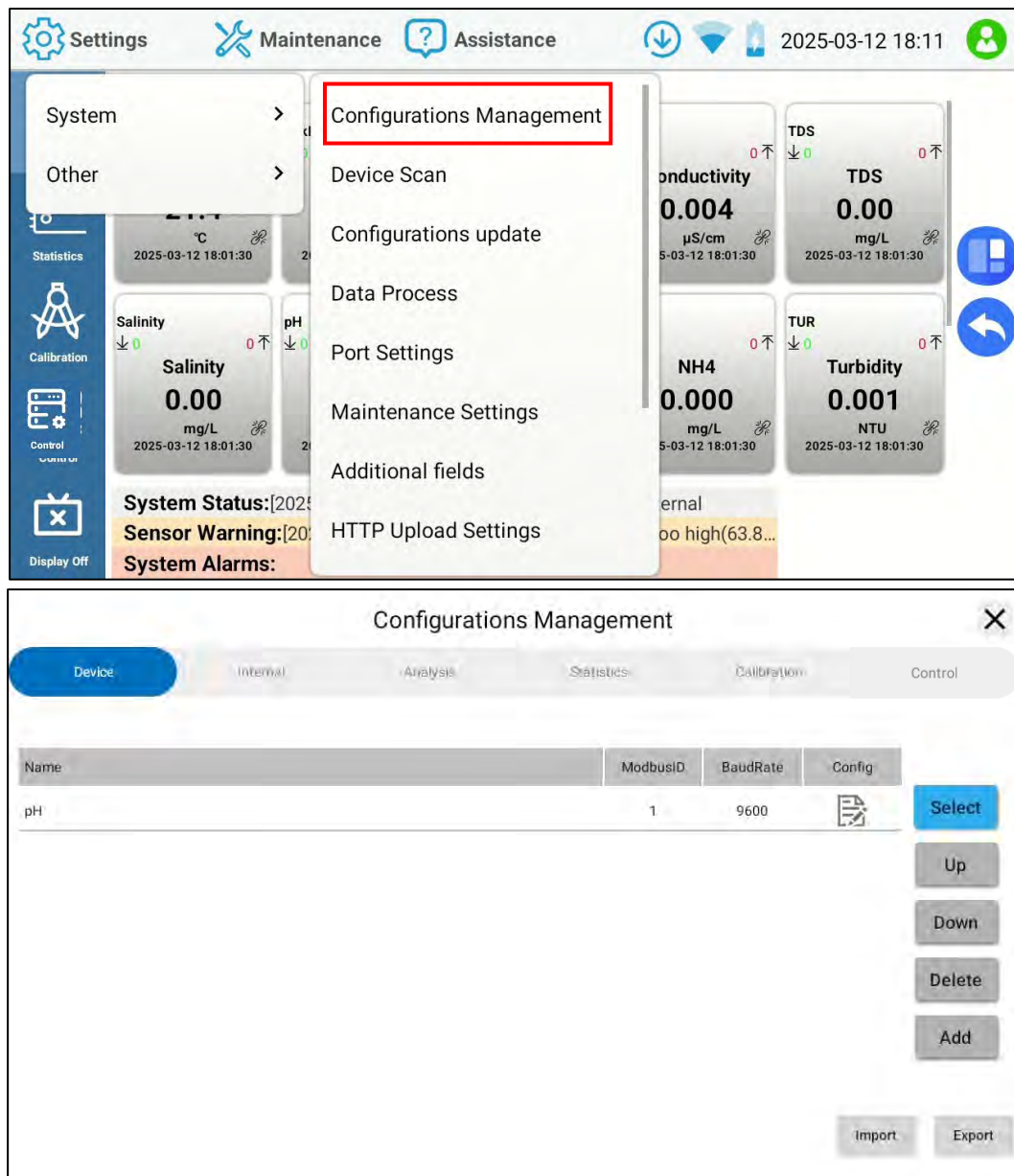


The screenshot shows a web application interface with a top navigation bar and a left sidebar. The top bar includes links for Settings, Maintenance, and Assistance, along with system status icons (download, Wi-Fi, battery) and a timestamp of 2025-03-13 14:45. A green user icon is in the top right corner. The left sidebar contains icons for Analysis, Statistics, Calibration, Control, and Display Off. Two modal windows are open. The top window, titled 'User Login', contains a user icon, a 'Username' field with the value 'Engineer', a 'Password' field, and a 'Login' button. The bottom window, titled 'Log out?', contains a 'Confirm' button.

# 4.7 System settings

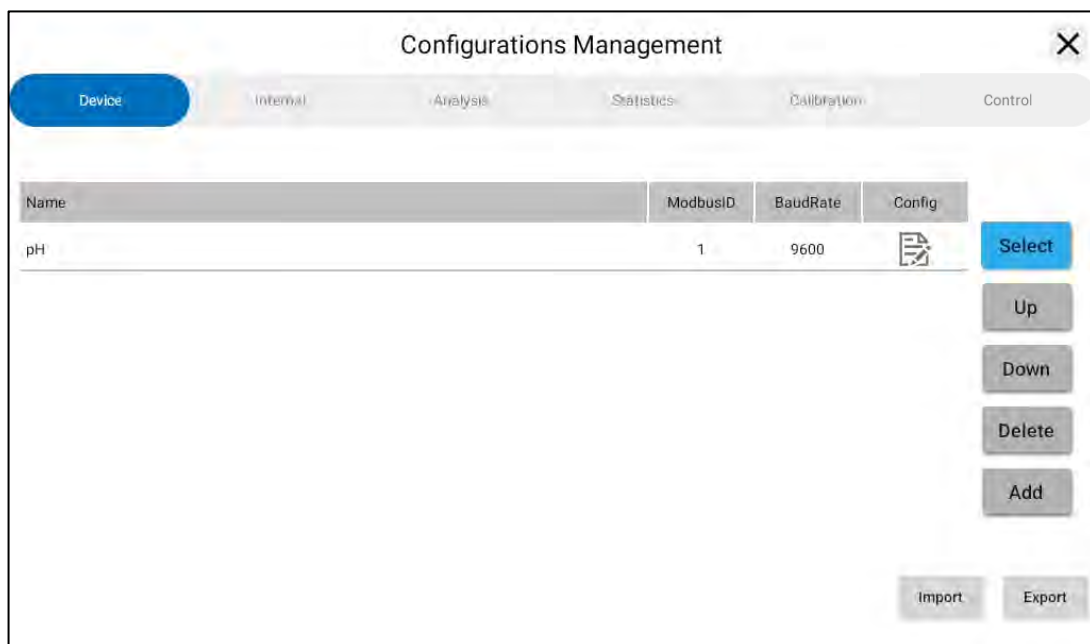


## 4.7.1 Configurations management




Configuration management allows you to configure devices, analysis pages, statistics pages, calibration pages, and control pages.

#### 4.7.1.1 Add device



The 'Configurations Management' window features a tabbed interface with 'Device' selected. It contains a table with columns: Name, ModbusID, BaudRate, and Config. A single row is visible with 'pH' as the name, '1' as the ModbusID, and '9600' as the BaudRate. To the right of the table are buttons for 'Select', 'Up', 'Down', 'Delete', and 'Add'. At the bottom right are 'Import' and 'Export' buttons.

Name	ModbusID	BaudRate	Config
pH	1	9600	

Select mode: Click Select to enter the selection mode, which allows you to move or delete the devices edited on the left.

Up: Moves the selected device configuration up.

Down: Moves the selected device configuration down.

Delete: Deletes the selected device.

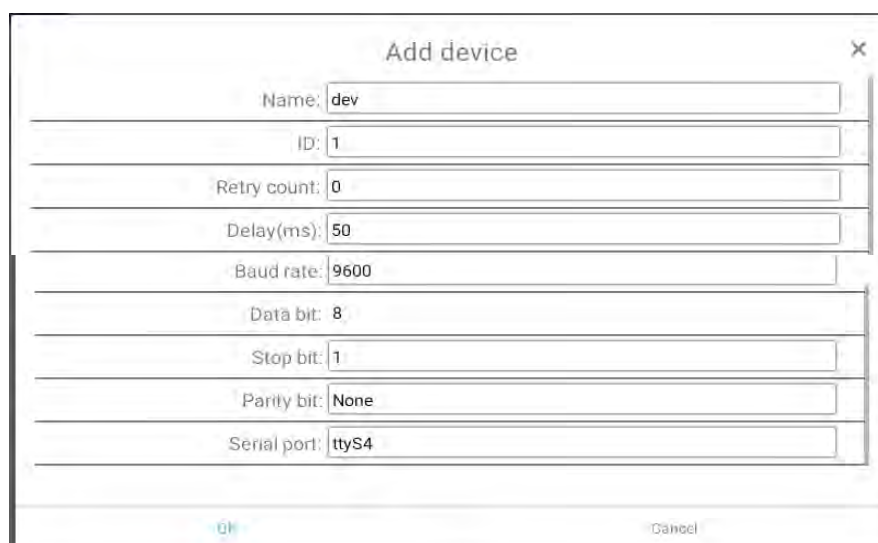
Add: Add a new device configuration.

Import: Imports a previously written device configuration.

Export: Exports the currently written device configuration.

: Edit device information or register.

#### Add device



The 'Add device' dialog box contains the following fields:

- Name: dev
- ID: 1
- Retry count: 0
- Delay(ms): 50
- Baud rate: 9600
- Data bit: 8
- Stop bit: 1
- Parity bit: None
- Serial port: ttyS4

Buttons at the bottom: OK, Cancel.

Name: Device name, not repeatable.  
 ID: Device ID, not repeatable.  
 Retry count: The number of times the device fails to communicate and attempts to reconnect.  
 Delay (ms): Communication delay of the device.  
 Baud rate: Device baud rate.  
 Data bit: 8.  
 Stop bit: 1 or 2.  
 Parity bit: None, Odd, Even.  
 Serial port: None (Unassigned ports), ttyS4 (Primary port), ttyS9 (Expansion module port). See 3.2 [Internal board interface](#) for port definitions.

## Add register

The screenshot shows the 'Configurations Management' window with the 'Device' tab selected. Below the tabs, there's a 'RegMap' tab and a 'CMD' tab. A table lists the register configuration:

Name	Enable	Fun	Address	Config	Select
regMap	<input checked="" type="checkbox"/>	0x03	0		

Below the table, the 'Add register table' dialog is open, showing the following fields:

- Name: regMap
- Interval(ms): 10000
- Protocol Type: Modbus RTU
- FunCode: 0x03
- Start address: 0
- Timeout(ms): 200
- Loop Enable: ☒
- Filter(Lua):
- Trigger Mode: Hold
- Trigger Enable: ☒
- Trigger delay(s): 5

The 'Add' button is highlighted in red.

Name: register table name, not repeatable.  
 Interval(ms): register read/write interval.  
 Protocol type: Modbus RTU, Custom.  
 FunCode: 0x01, 0x02, 0x03, 0x04, 0x05, 0x06, 0x0F, 0x10, Inner.  
 Starting address: register starting address, query the sensor user manual register table.

Timeout(ms): Register read timeout duration, after the timeout the device display offline.

Loop Enable: Whether the registers are read or written at the interval set above.

Trigger (Lua): Script editor.

Trigger Mode: Hold, Rising edge, Falling edge.

Trigger Enable: Script trigger enable switch.

Trigger delay: Trigger execution delay.

Configurations Management

Device Internal Analysis Statistics Calibration Control

dev/regMap/

Address	Name	Type	Format	Value	Config
0	reg	Float	CDAB	0	

Select

Add register

Name: reg1

Data type: Float

Data format: CDAB

Value: 0

Zero: 0

Slope: 1

OK Cancel

Add

Import Export

Name: Register name, not repeatable.

Data type: Uint16, Uint32, Int16, Int32, Float, BIT32, BOOL.

Data format: Select different data format according to the device register list

Value: Read or write value.

Zero: Parameter offset, default 0.

Slope: Parameter slope, default 1.

### Add CMD

Configurations Management

Device Internal Analysis Statistics Calibration Parameters

dev/

RegMap	CMD	Enable	CMDType	Config	Select
Name					

Add

Import Export

---

The screenshot shows a dialog box titled "Add cmd" with a close button (X) in the top right corner. The dialog contains the following fields and controls:

- Name: cmd
- Command type: TypicalCMD
- Protocol parsing type: None
- Timeout(ms): 200
- Interval(ms): 10000
- Loop Enable: ☐
- Trigger(Lua):
- Trigger Mode: Hold
- Trigger Enable: ☒
- Trigger delay(s): 5
- Start address: 0
- Symbol: 0
- Var: 0
- Bytes: -

At the bottom of the dialog are two buttons: "OK" and "Cancel".

Name: Register name, not repeatable.

Command Type: TypicalCMD, CustomCMD.

Protocol parsing type: None, SAC.

Timeout(ms): Register read timeout, after the timeout, the device will show offline.

Interval(ms): Loop command execution interval.

Loop Enable: Switches for looping through command.

Trigger(Lua): Script editor.

Trigger Mode: Hold, Rising Edge, Falling Edge.

Trigger Enable: Script trigger enable switch.

Trigger delay(s): Delay for trigger execution.

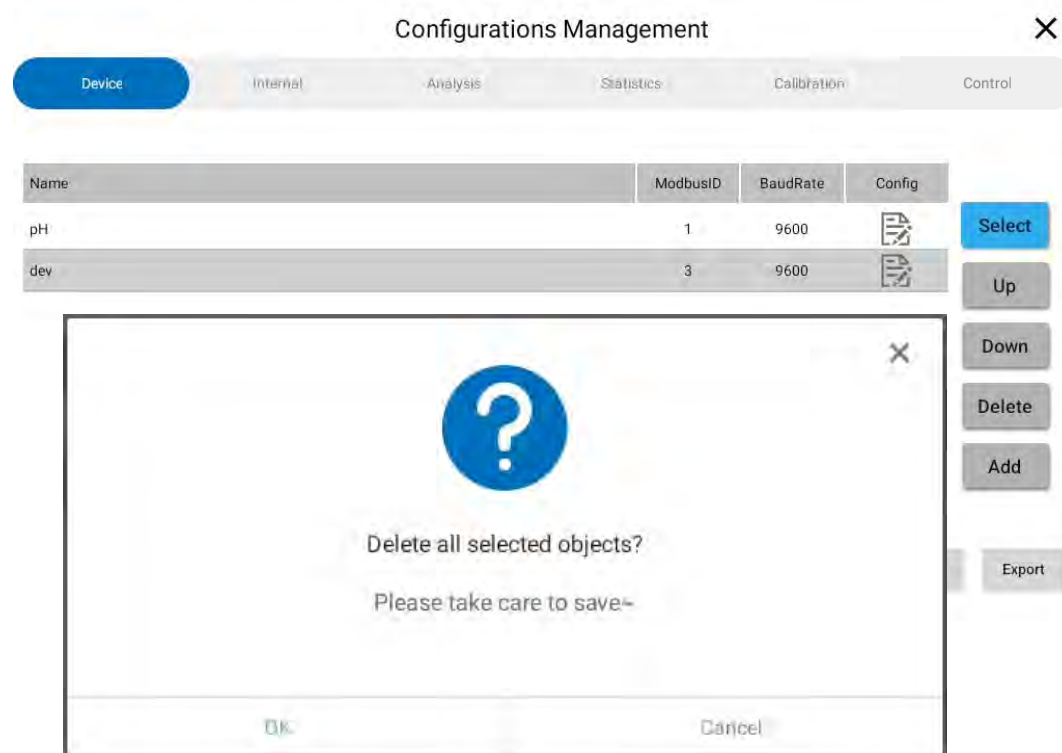
Start address: Start address of command register, query device command register table.

Symbol: Command value high 8-bit, query device command register table.

Var: Command value low 8-bit, query device command register table.

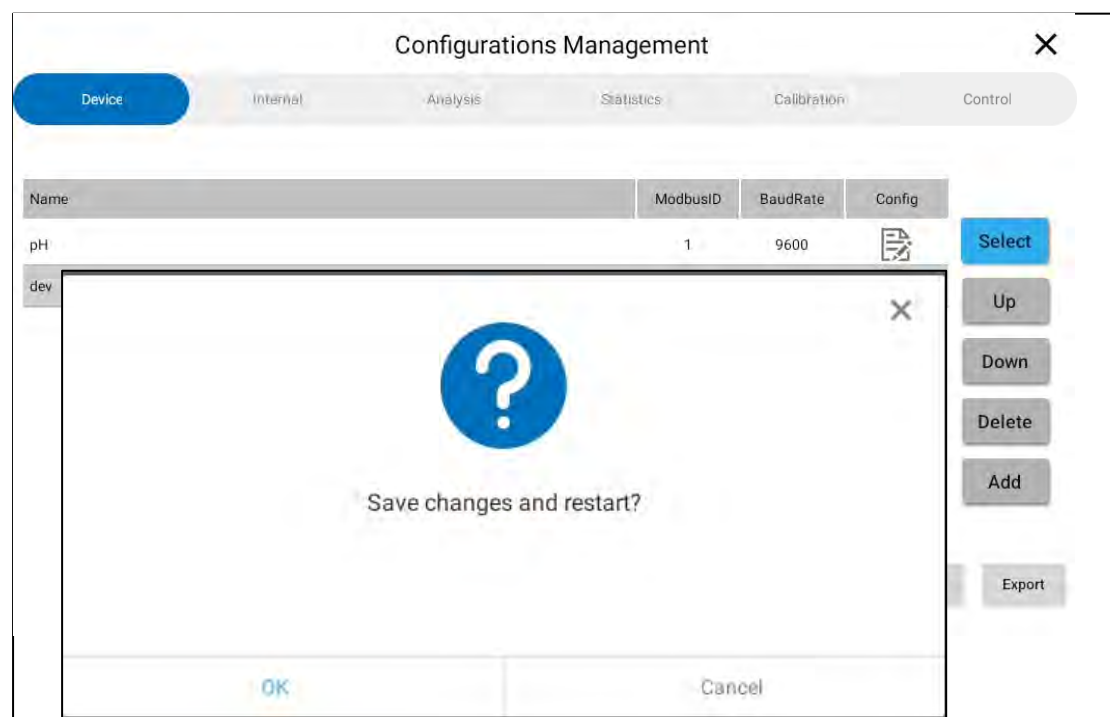
Bytes: Custom send bytes (CustomCMD can only be executed).

## Delete device



If there are devices or registers to be deleted, click Select, select the device to be deleted, and click Delete.

## Save configuration



When the configuration is complete and you exit Configuration Management, you will be prompted to save the changes, click OK to save the configuration.

#### 4.7.1.2 Analysis page management

Add group (if you don't need group, you can skip this step.)

The screenshot shows the 'Configurations Management' window with the 'Analysis' tab selected. Below the tabs is a table with columns: Name, Type, Note, Unit, Config, and a 'Select' button. The table contains one row with 'pH' in the Name column and 'Panel' in the Type column. To the right of the table are buttons: 'Up', 'Down', 'Delete', 'Add', 'Import', and 'Export'. A red box highlights the 'Add group' option in the 'Add Item' dialog box. Below the dialog box is the 'Add group' form with fields for 'Key' (set to 'group'), 'Name', 'Mark', and a 'Default save' toggle switch (set to 'on').

Configurations Management

Device Internal Analysis Statistics Calibration Control

Panel Tips

Name	Type	Note	Unit	Config	Select
pH	Panel		pH		

Up Down Delete Add Import Export

Add Item

Add panel >>

Add group >>

Add group

Key: group

Name:

Mark:

Default save: ☒

OK Cancel

Click Add and select Add group.

Key: Variable name, meter controller upload name, cannot be repeated.

Name: Name of the group, cannot be repeated.

Note: Note.

Default save: Database storage statistics switch, on by default.

## Add panel

The screenshot shows the 'Configurations Management' window with a top navigation bar containing tabs: Device, Internal, Analysis (selected), Statistics, Calibration, and Control. Below the navigation bar is a breadcrumb trail: /group. A table with columns 'Name', 'Type', 'Note', 'Unit', and 'Config' is visible. A 'Select' button is next to the table. A red box highlights the 'Add panel' option in the table. To the right of the table are buttons: Up, Down, Delete, Add, Import, and Export. The 'Add panel' dialog box is open, showing fields for: Key (panel), Name, Unit, Decimal Digits (0), Data binding, Data Type (Auto), Upper limit (0), Low limit (0), Zero (0), Slope (1), Default save (checked), and Model.

Click Add and select Add Panel.

Key: Variable name, meter controller upload name, cannot be repeated.

Name: Parameter name, cannot be repeated.

Unit: The unit of the parameter.

Fractional Digits: The exact number of decimal digits for the parameter.

Data binding: Select the parameter register in the instrument configuration.

Upper Limit: Set the upper limit of the parameter register alarms.

Lower Limit: Set the lower limit of the parameter register alarms. If the upper and lower values are not equal, the device will automatically add the parameter's status register.

Zero: Parameter offset, default 0.

Slope: Parameter slope, default 1.

Default save: Database storage statistics switch, on by default.

Model: Parameter display script editing (default none).

### Add tip

The screenshot shows the 'Configurations Management' window with a tabbed interface. The 'Analysis' tab is selected. Below the tabs is a table with columns: Name, Type, Note, Unit, Config, and a 'Select' button. The 'Add Item' dialog box is open, showing fields for Key (panel), Name, Unit, Decimal Digits (0), Data binding, Slope (1), and Model. The dialog has 'OK' and 'Cancel' buttons at the bottom. To the right of the dialog are buttons for 'Up', 'Down', 'Delete', 'Add', 'Import', and 'Export'.

Key: Variable name, meter controller upload name, cannot be repeated.

Name: Parameter name, cannot be repeated.

Unit: Unit.

Fractional Digits: The exact number of decimal digits for the parameter.

Data Binding: Binding parameters.

Slope: parameter slope.

Zero: parameter offset.

Note: Note information.

Model: Parameter display script editor (default none).

### 4.7.1.3 Internal management

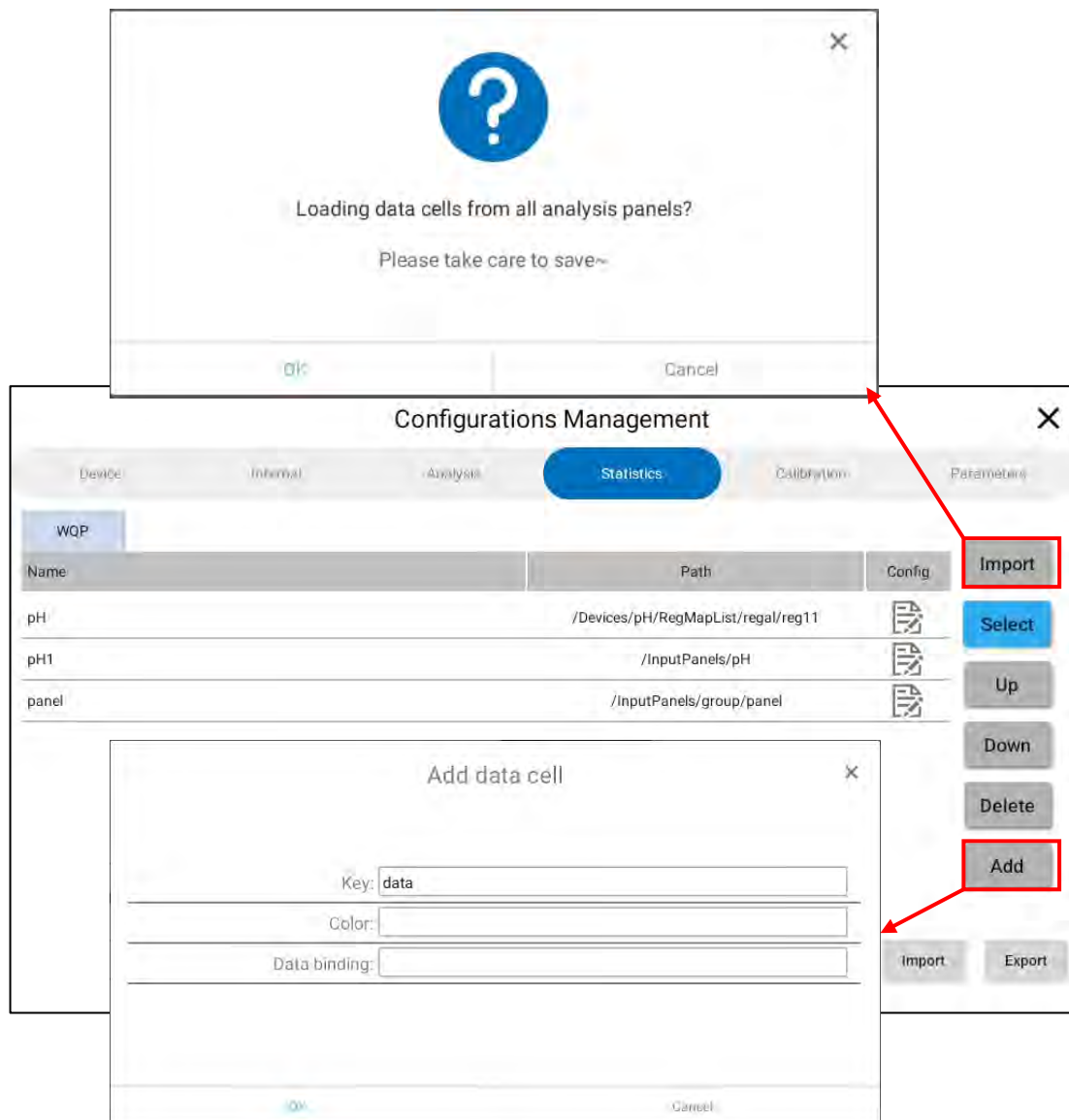
The screenshot displays the 'Configurations Management' interface. At the top, there's a title bar with a close button (X). Below it, a horizontal menu contains tabs: 'Device', 'Internal' (selected), 'Analysis', 'Statistics', 'Calibration', and 'Control'. Under the 'Internal' tab, there's a sub-menu with 'IO' and 'Internal Var' (selected). Below this, a table header shows 'Name', 'Value', and 'Config'. A modal window titled 'Add Internal Variable' is open, featuring three input fields: 'Name' (with 'var' entered), 'Note' (empty), and 'Value' (with '0' entered). To the right of the modal are three buttons: 'Select', 'Add', and 'Export'. The modal itself has 'OK' and 'Cancel' buttons at the bottom.

Name: Parameter name, not repeatable.

Note: Remark.

Value: Value.

#### 4.7.1.4 Statistics page management



1. Click Import in the upper right corner to quickly add the parameters of the bound analysis page.
2. Click Add to add the parameters to be displayed in the statistics page.

Name: The name of the parameter, cannot be repeated.

Color: You can specify the color of the parameter curve, and the system automatically assigns the color if it is not selected. For example: FF0055 -> R: 0xFF G: 00 B: 55

Data Binding: The data source to which the parameter is bound.

**Note:** Only if the statistics page is not configured in any way and the device configuration is completed to close the device management, the system will automatically load the parameter items that are stored by default in the analysis page.

### 4.7.1.5 Calibration page management

#### Add device group

Configurations Management

Device Internal Analysis Statistics Calibration Control

Typical

Name	Mark	Config	Select
pH			

Add group

Name: pH

Mark:

Add Cancel Import Export

Name: Device name, not repeatable.

Mark: Remarks.

#### Add parameter group

Configurations Management

Device Internal Analysis Statistics Calibration Control

← /pH

Typical

Name	Type	Mark	Config	Select
pH actual water sample calibration	Typical	mark		
pH standard solution calibration	Typical	mark		

Edit panel

Name: pH standard solution calibration

Type: Typical

Mark: mark

Technical Tips: tips

Fractional Digits: 0

Data binding:

OK Cancel Up Down Delete Add Export

Name: Panel name, not repeatable.

Type: Typical, One-point, Two-point, Slope & Zero.

Marker: Remarks information.

Technical Tips: Note message.

Fractional digits: Fractional digits.

Data binding: Data source binding (only linear and slope offsets need to be used).

### Add calibration sub-option

The screenshot shows the 'Configurations Management' dialog with the 'Calibration' tab selected. Below the tab bar, there is a breadcrumb path: '/pH/pH standard solution calibration'. A table lists calibration items:

Name	Type	Value	Config
Sig_mV	Numeric	0.000	
Sig_mV[1]	Input box	0.000	

Below the table is an 'Add' button. An 'Edit Element' sub-dialog is open, showing fields for:

- Name: TEMP
- Value: 16.4
- Decimal Digits: 1
- Display type: Numeric
- Trigger record: ☐
- Model: (empty)

The sub-dialog has 'OK' and 'Cancel' buttons at the bottom. To the right of the sub-dialog are 'Add' and 'Export' buttons.

Click Add to edit the group members.

Name: Parameter name, not repeatable.

Value: When the display type is button, the target value will be sent after clicking.

Decimal digits: Number of decimal digits to display.

Display type: Numeric, Input box, Button, Switch, Block button.

Trigger record: The device generates a calibration record when it is turned on.

Model: Script editing.

Data Binding: Bind to a data source.

---

#### 4.7.1.6 Control page management

##### Add group

The screenshot shows a 'Configurations Management' dialog box with a close button (X) in the top right corner. Below the title bar is a horizontal menu with tabs: 'Device', 'Internal', 'Analysis', 'Statistics', 'Calibration', and 'Control'. The 'Control' tab is selected and highlighted in blue. Below the tabs is a table with three columns: 'Name', 'Mark', and 'Config'. The 'Name' column is currently empty. To the right of the table is a vertical toolbar with buttons: 'Select' (blue), 'Up', 'Down', 'Delete', 'Add', 'Import', and 'Export'. An 'Add Parameter' sub-dialog box is open in the foreground, featuring a title bar with a close button (X). It contains two input fields: 'Name:' with the text 'para' and 'Mark:'. At the bottom of the sub-dialog are 'OK' and 'Cancel' buttons.

Name: Parameter name.

Marker: Remarks information.

## Add subitem of parameter

The screenshot shows the 'Configurations Management' window with a tabbed interface. The 'Control' tab is active. Below the tabs is a table with columns: Name, Type, Value, Subitem, and Config. The table contains one row with the name 'item', type 'Numeric', value '0', and subitem 'Invalid'. To the right of the table is a 'Select' button. Overlaid on this is a dialog box titled 'Add Subitem Of Parameter'. The dialog box contains the following fields: Name (text box with 'item'), Value (text box with '0'), Max (text box with '0'), Min (text box with '0'), Re-execution delay(s) (text box with '0'), Re-execution value (text box with '0'), Decimal Digits (text box with '0'), Display type (text box with 'Numeric'), Unit (text box), Model (text box), Run Script (text box), and Data binding (text box with '/Devices/1031\_00004/RegMapList/BaselInfo/ProVerSN'). To the right of the dialog box are buttons for 'Add', 'Import', and 'Export'. At the bottom of the dialog box are 'OK' and 'Cancel' buttons.

Name: Parameter name, not repeatable.

Value: If the display type is a button, the target value is sent when clicked.

Max: The upper limit of the set value when the function is to read or write the value.

Min: Lower limit of the set value when this function reads or writes the value.

Re-execution delay(s): Re-execute the delay.

Re-execution value: Value sent on re-execution.

Fractional Digits: This function displays the number of decimal places for numeric values.

Display type: Numeric, Input box, Button, Switch, Block button.

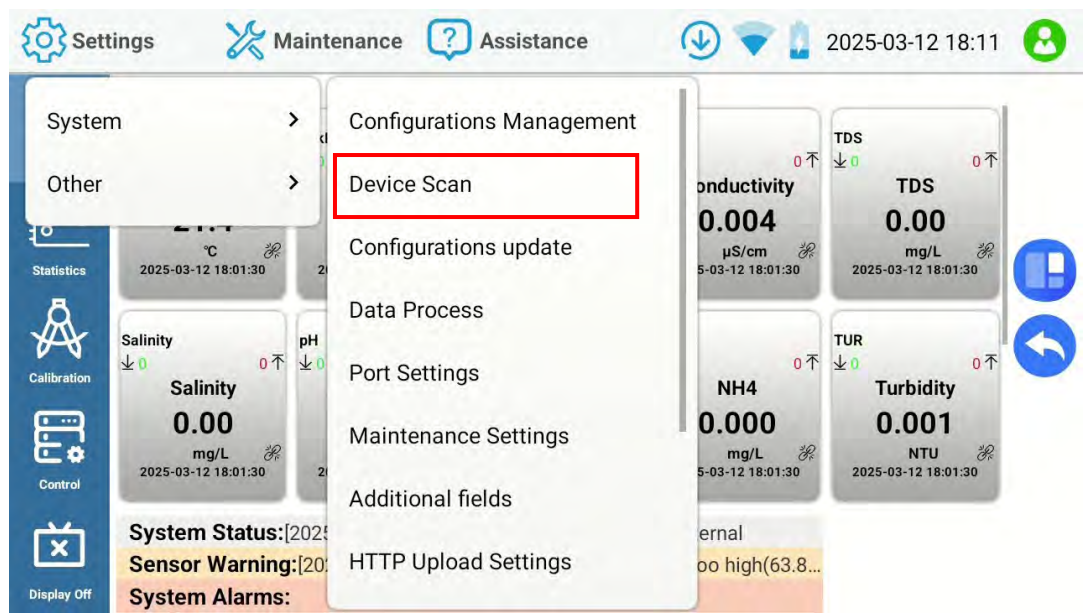
Unit: Parameter unit.

Model: Processing the raw data.

Run Script: If the parameter object is of type button and the data binding is empty, clicking on the button will execute the Lua script.

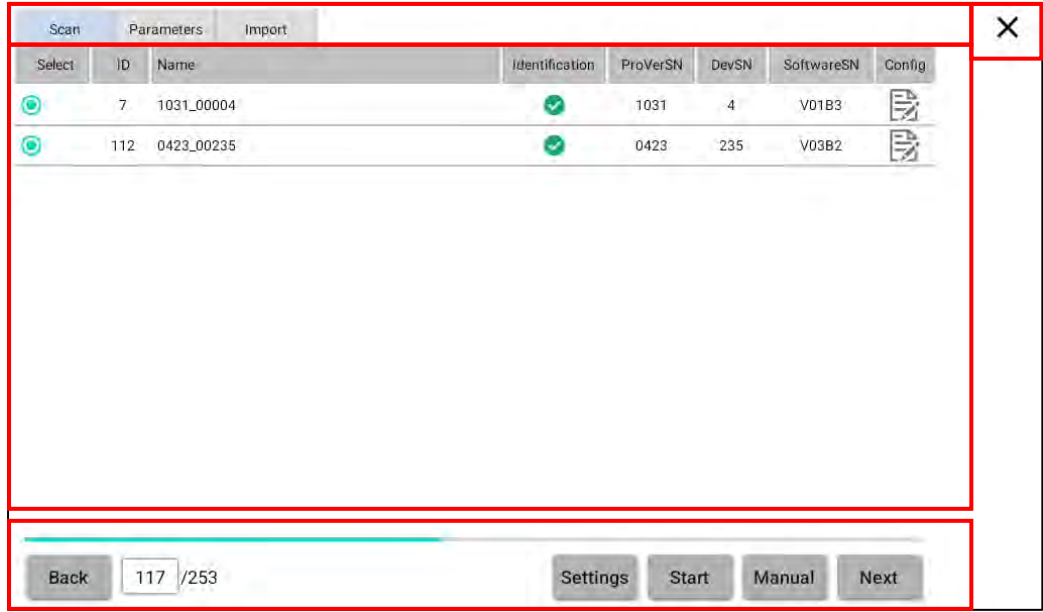
Data binding: Binding data sources.

### 4.7.2 Device Scan






If you already have one of our range of sensors or slave devices connected to a transmitter, you can quickly configure our products by clicking here.

#### Scanning device



This bar shows the progress of the configuration, and Exit button

Select	ID	Name	Identification	ProVerSN	DevSN	SoftwareSN	Config
<input checked="" type="checkbox"/>	7	1031_00004	<input checked="" type="checkbox"/>	1031	4	V01B3	
<input checked="" type="checkbox"/>	112	0423_00235	<input checked="" type="checkbox"/>	0423	235	V03B2	

This is the device table; you can change the device name by clicking the  icon on the right side.

Back
117 / 253
Settings
Start
Manual
Next

This is the control bar.

**Back:** Return to previous step.

**Settings:** Select serial port, baud rate, stop bit, data bit.

Note: Before scanning the device, you must select the correct serial port, baud rate (9600, 19200, 38400, 115200), stop bits (1,2), data bits (only 8 supported), parity bits (None, Odd, Even), please refer to the user manual of the sensor to obtain the appropriate information.

**Start:** Start scanning devices.

**Manual:** Manually add devices.

**Next:** Go to the next step.

Scan
Parameters
1031\_00004
0423\_00235
Import
×

Next you can adjust the parameter information for each device.  
Examples include variable name, display name, units, etc.

Back
Next


Click Next to go to the next step.



The screenshot shows a window titled 'Parameters' with tabs for 'Scan', 'Parameters', '1031\_00004', '0423\_00235', and 'Import'. The 'Parameters' tab is active, displaying a table with the following data:

Index	Enable	Name	Key	Unit	Decimal Digits	Upper limit	Low limit	Config
0	<input checked="" type="checkbox"/>	Temperature	TEMP	°C	1	60	0	
1	<input checked="" type="checkbox"/>	Ammonia	NH3-N	mg/L	1	2000	0	

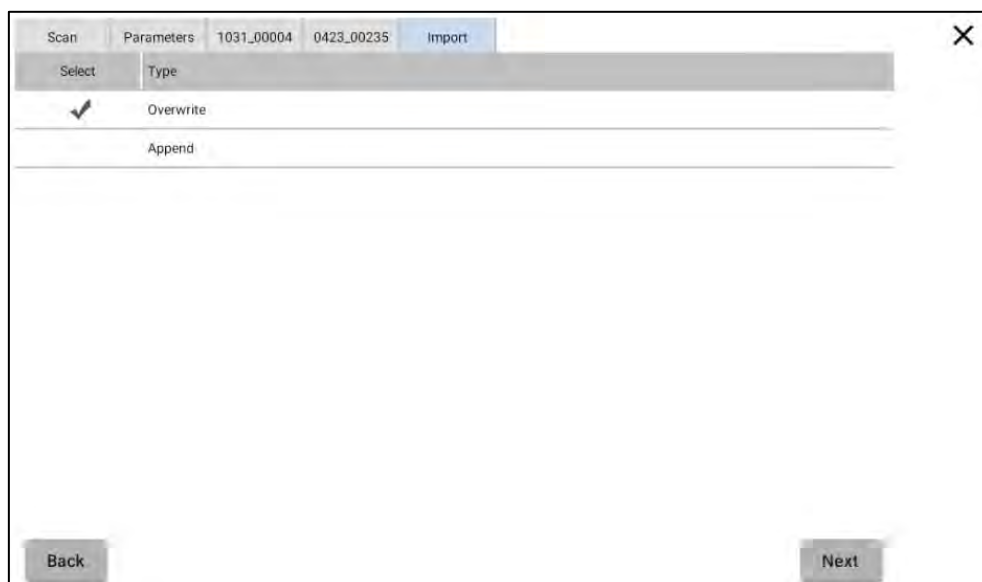
Below the table are buttons for 'Select' and 'Add'. At the bottom are 'Back' and 'Next' buttons.

Here is the parameter table, click the  icon on the right side to edit the parameter name, keyword, read enable, unit, decimal place, upper and lower warning limits.

**Select:** Parameters can be deleted by clicking on the select

**Add:** Add new parameter

If more than one device is scanned click Next to edit the parameters of the next device

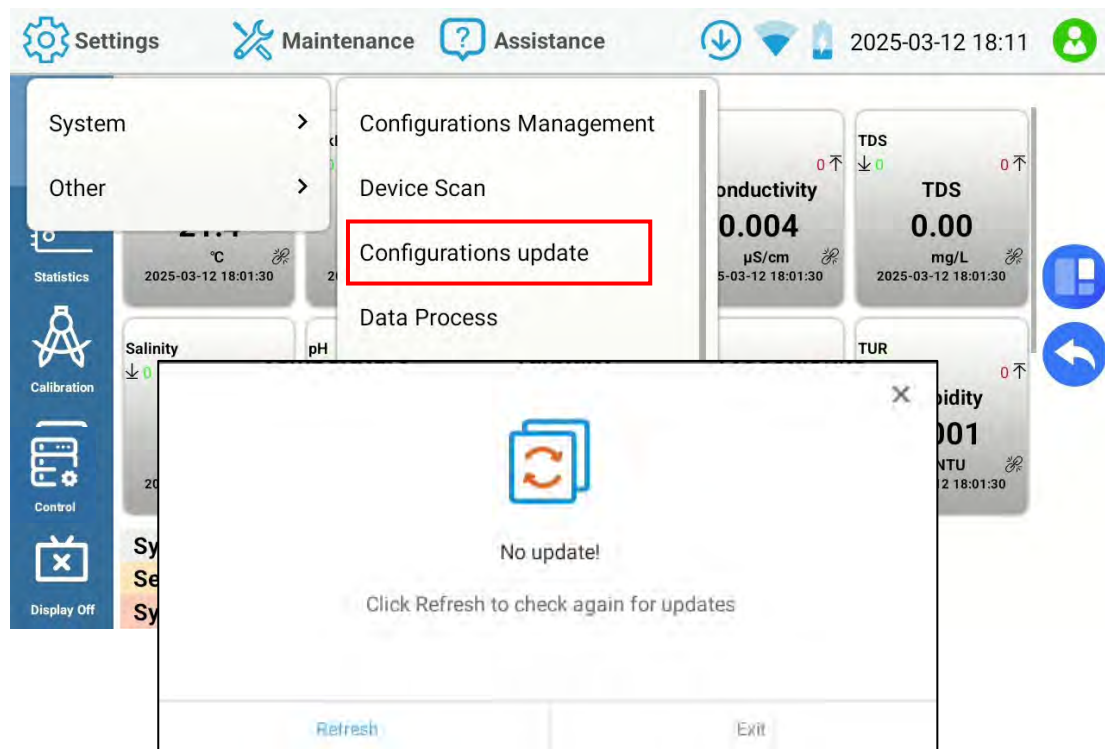


The screenshot shows the 'Import' tab selected in the 'Parameters' window. It displays a 'Select' dropdown menu with 'Type' as the selected option. Below the dropdown are two radio button options: 'Overwrite' (selected) and 'Append'. At the bottom are 'Back' and 'Next' buttons.

**Overwrite:** Overwrite all current configurations and write new ones.

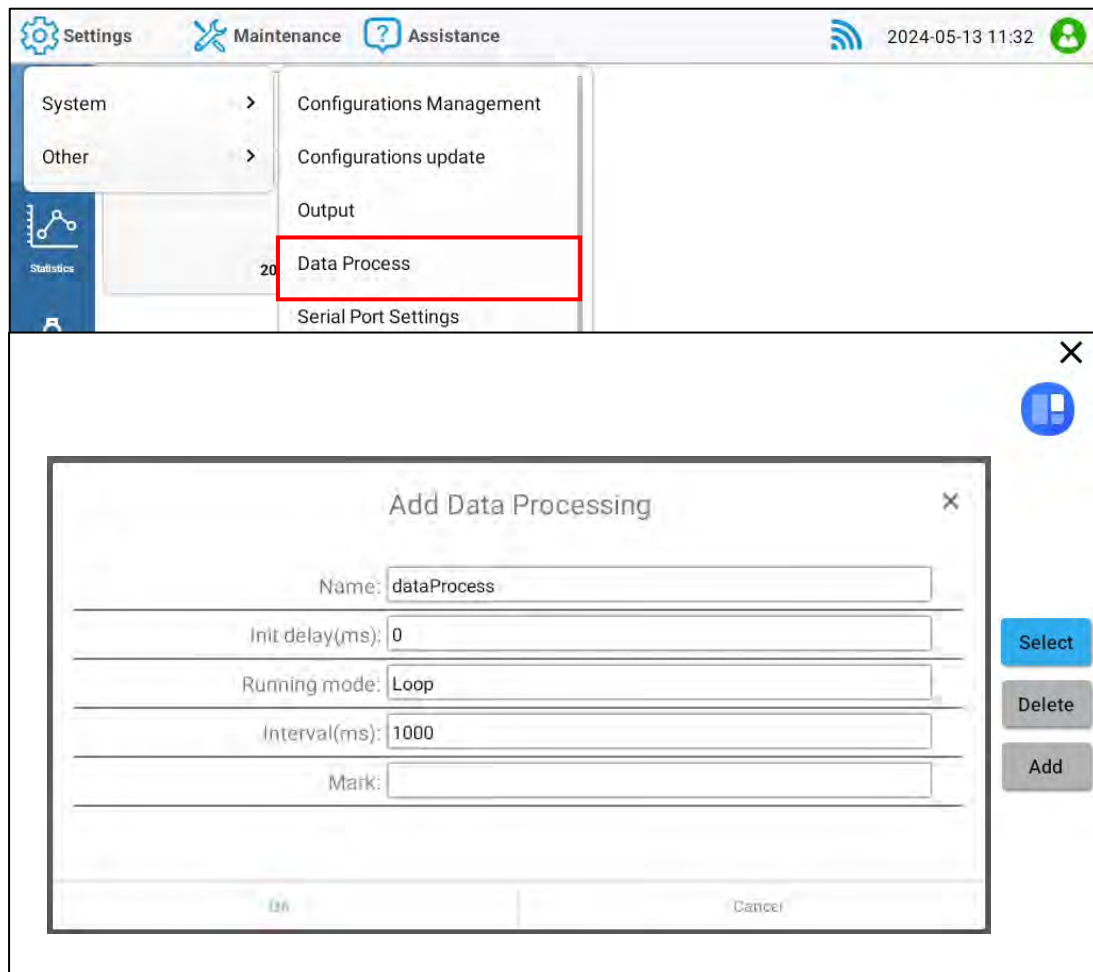
**Append:** Adding a new configuration to the back of an existing configuration. After clicking Next the device will reboot and finish loading the configuration.

### 4.7.3 Configurations update



Click this setting to retrieve the device's configuration information from the network.

## 4.7.4 Data process



Data processing is a data processing unit with multiple inputs and outputs, and the processing logic is a custom Lua script.

Name: Name of the parameter, not repeatable.

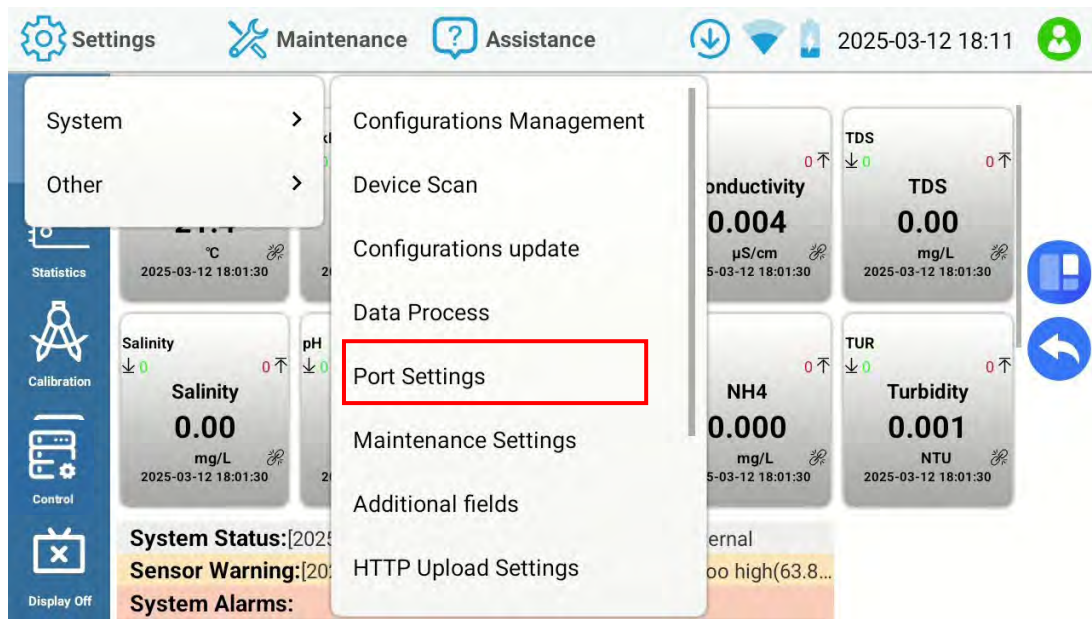
Init delay(ms): Script start delay.

Run mode: Loop, Once.

Interval(ms): interval between loop executions.

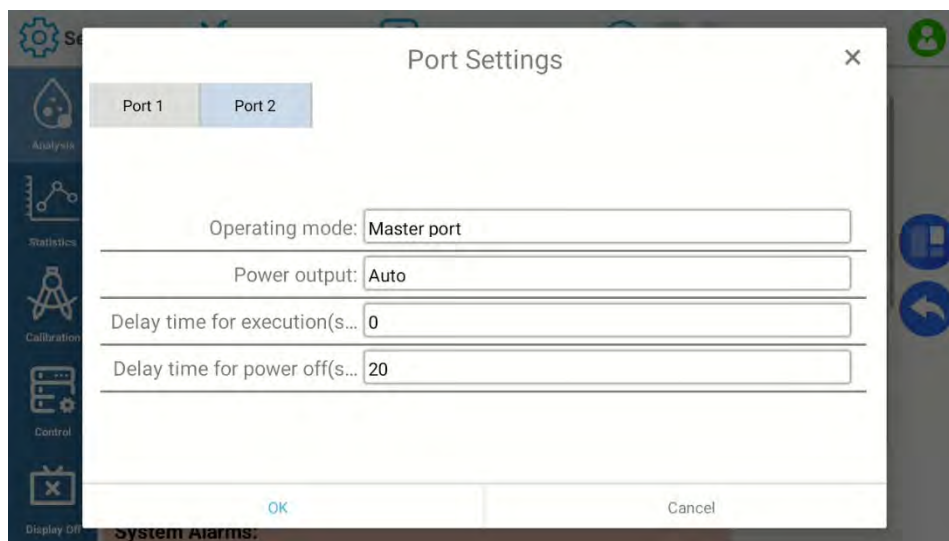
Marker: Remarks information.

## 4.7.5 Port setting



You can set up Port 1 and Port 2, change port properties, and switch the port to read sensors or act as a slave port.

### 4.7.5.1 Master port



Operating mode: Master port, Slave port

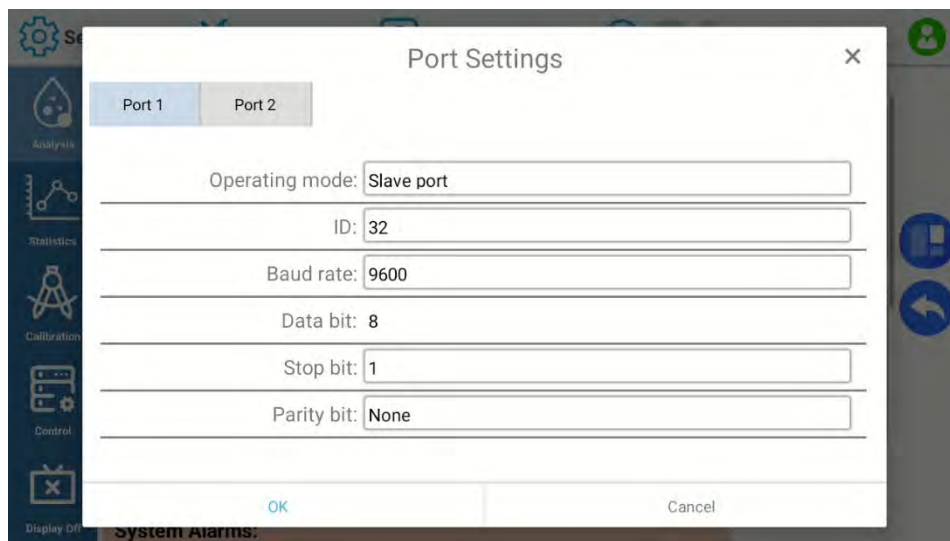
Power output: Auto, Normally open, Normally off.

Delay time for execution: Device parameter reading delay, unit: s

Delay time for power off: Port power off delay, unit: s

---

#### 4.7.5.2 Slave port



Operating mode: Master port, Slave port

ID: ID of the transmitter as a slave, default 32

Enable: Enable button for whether the handheld meter transmitter is acting as a slave or not

Serial port: ttyS3, ttyS4, ttyS9

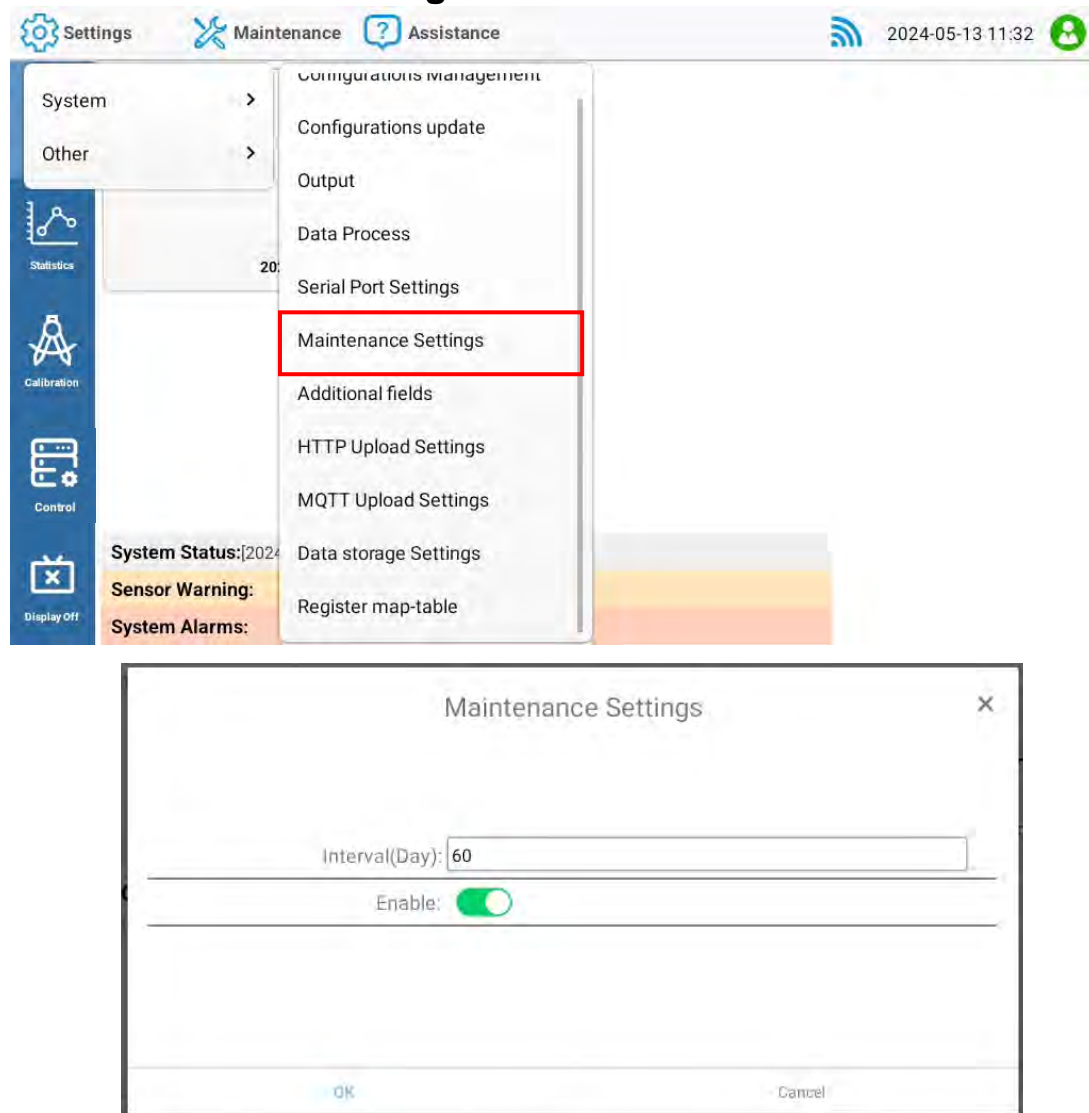
Baud rate: Baud rate of transmitter, 9600, 19200, 38400, 115200. Default 9600

Data bits: 8

Stop bit: 1 or 2. Default 1

Parity bit: None, Odd, Even, Default None.

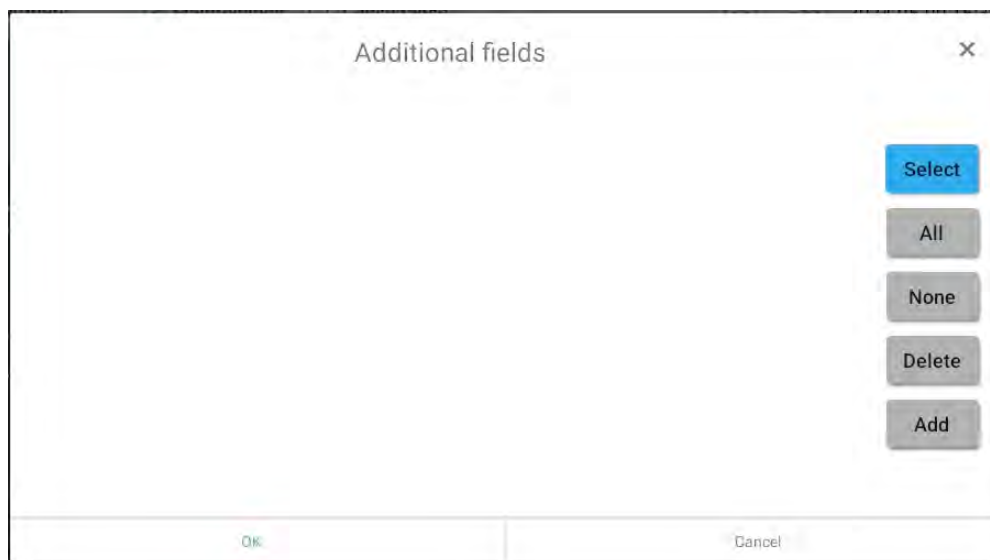
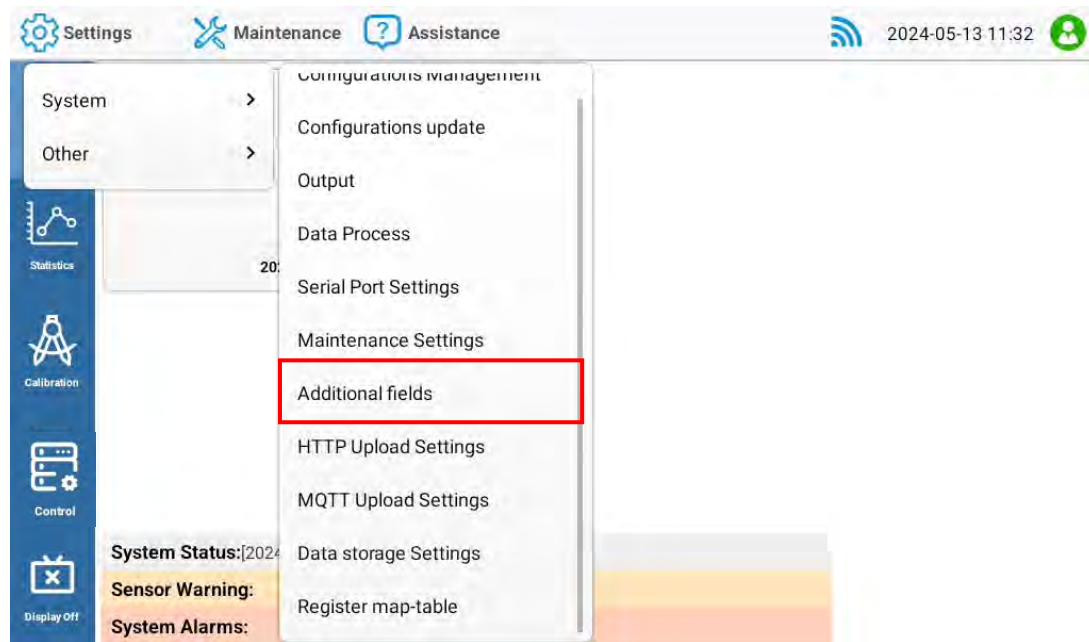
## 4.7.6 Maintenance settings



Interval(Day): Setting up maintenance intervals.

Enable: Maintenance tips on or off switches.

### 4.7.7 Additional fields



Key: Field name.

Value: Field content.

Select: Enter panel edit mode.

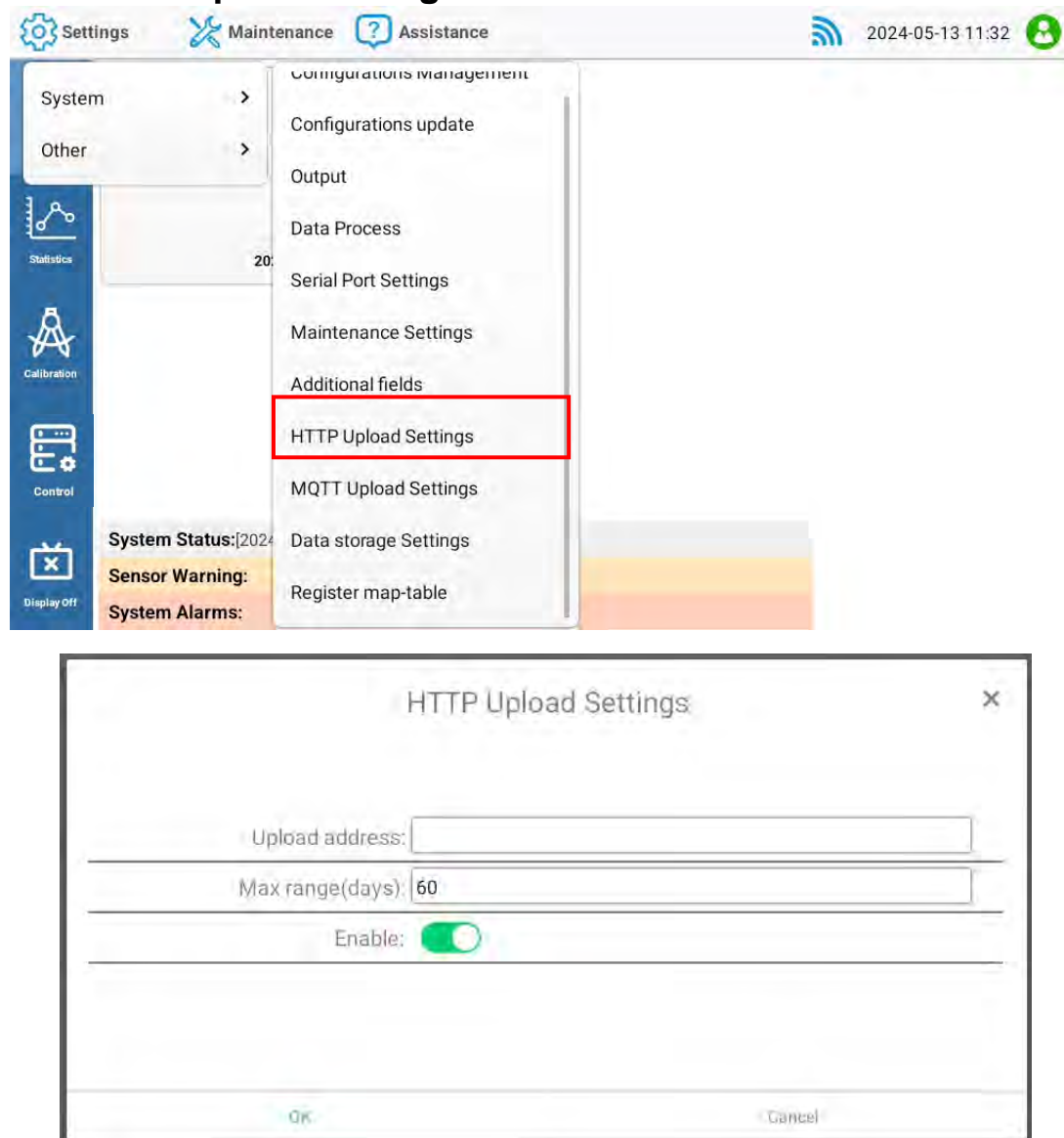
All: Select all.

None: Not choose any of them.

Delete: Delete the selected field.

Add: Adding fields.

## 4.7.8 HTTP upload settings

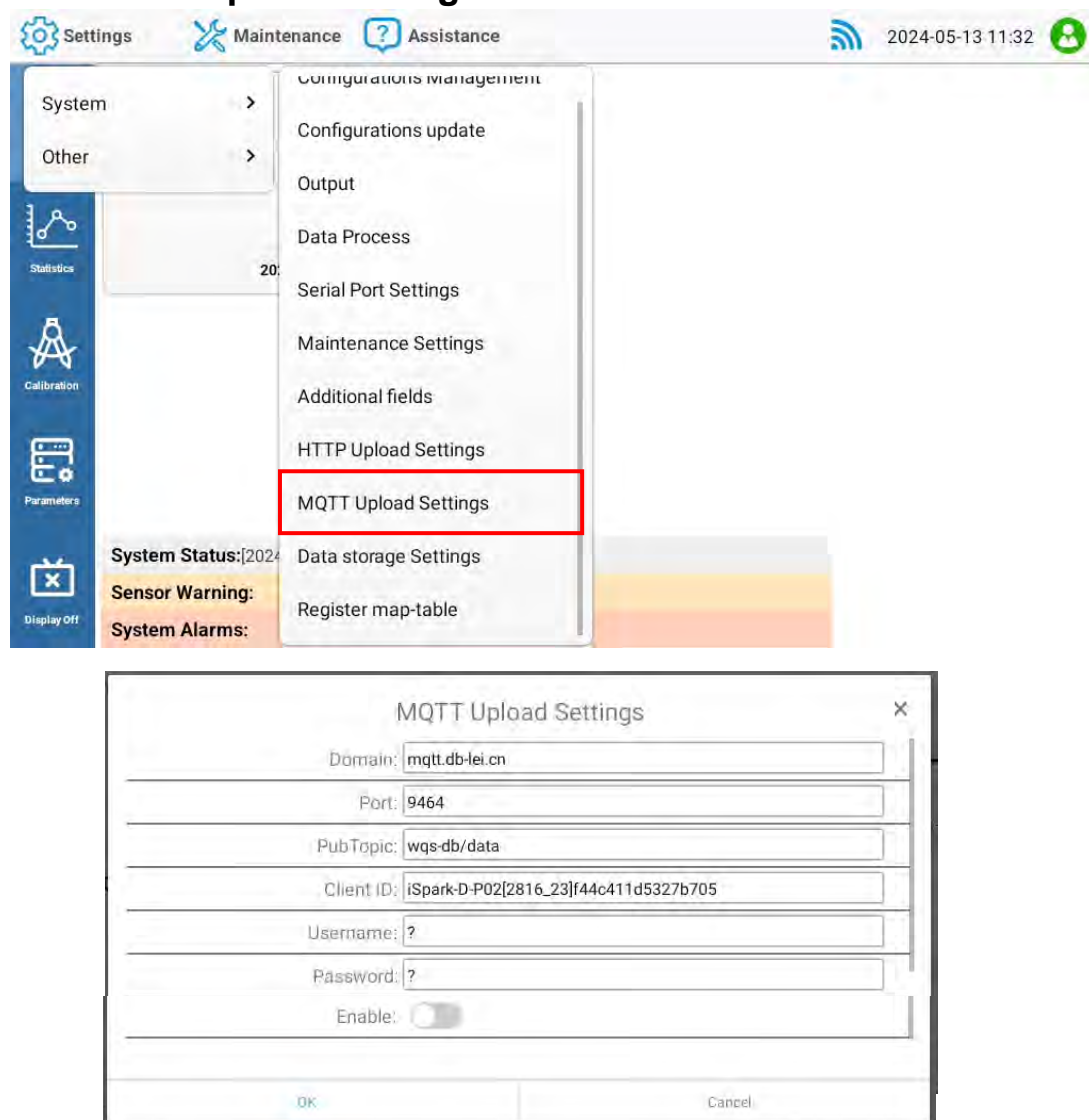


Upload address: Http access address with port information.

Max range(days): If the data upload fails and the data is uploaded normally again, the device will send the data within the number of days set on the data storage card. The maximum setting is 365 days.

Enable: HTTP data upload function switch.

## 4.7.9 MQTT upload settings



Domain: Mqtt server domain name or IP address.

Port: Server port, range 0-65535.

Pub Topic: The target topic for uploading data, if empty, no upload.

Client ID: ClientID used to connect to the MQTT server, automatically generated by default.

Username: Mqtt user name.

Password: Mqtt user password.

Enable: MQTT upload function switch.

### 4.7.9.1 MQTT message format description

Message content is in standard JSON format, in the root node, containing fixed key-value pairs:

---

***Upload time field:***

"Timestamp": 1640966400

***Device category number field:***

"ProVerSN": 1

***Device serial number field:***

"DevSN": 1

***The Panel Information list field:***

"SubDevs": [array]。

If the transmitter's analysis page is configured with COD, TUR, and TOC panels whose data names are COD, TUR, and TOC, respectively, the following key/value pairs are also included in the message:

***Analysis page panel 1:***

"COD": 0.000

***Analysis page panel 2:***

"TUR": 0.000

***Analysis page panel 3:***

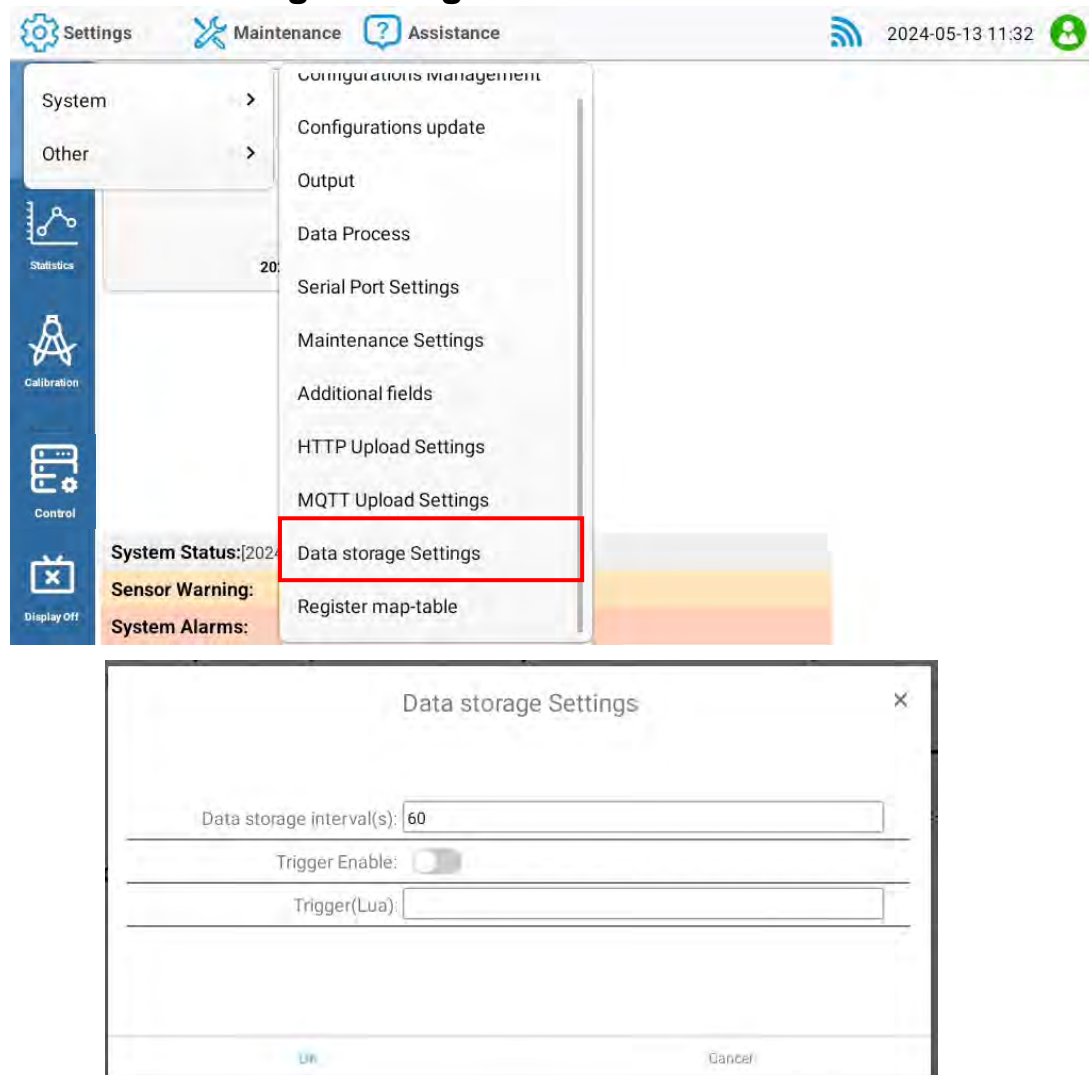
" TOC": 0.000

Additionally, if there are custom key-value pairs in the additional fields, they are also added to the JSON root node.

***Example message:***

```
{  
  "Timestamp":1645084458,  
  "ProVerSN":1,  
  "DevSN":1,  
  "COD":17.234,  
  "TUR":2.234,  
  "TOC":6.234,  
}
```

#### 4.7.10 Data storage settings



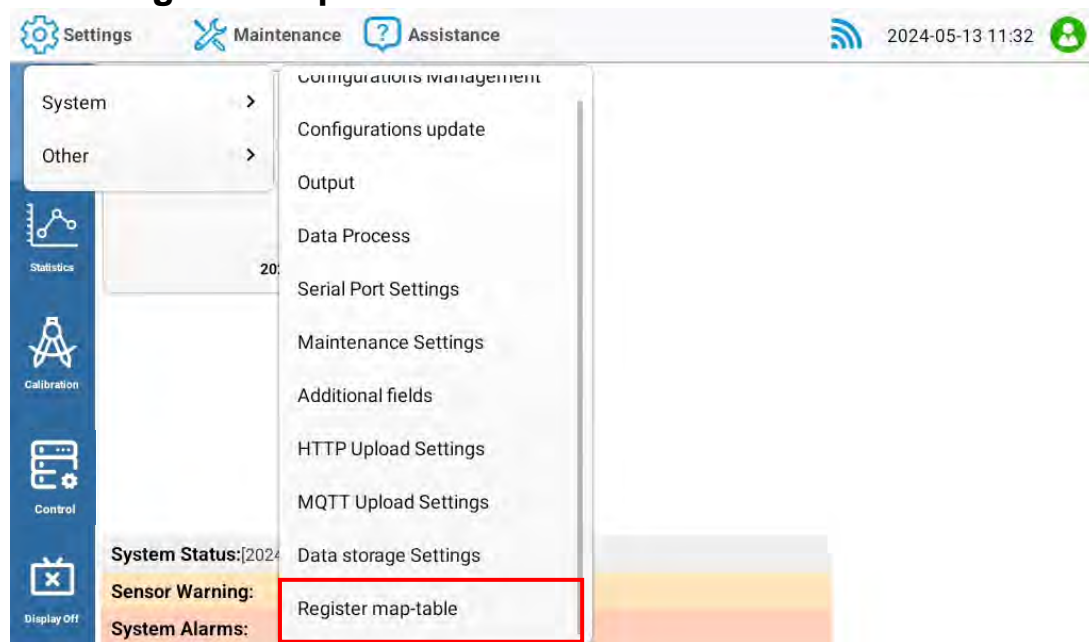
Data storage interval(s): Data storage interval in the statistics page, unit s.

Default 60s.

Tigger Enable: Script trigger on or off switch.

Tigger(Lua): Lua script.

## 4.7.11 Register map-table



Name	Address	PLC_Address	Type
pH	36864	49001	FloatCDAB
Temp	36866	49003	FloatCDAB

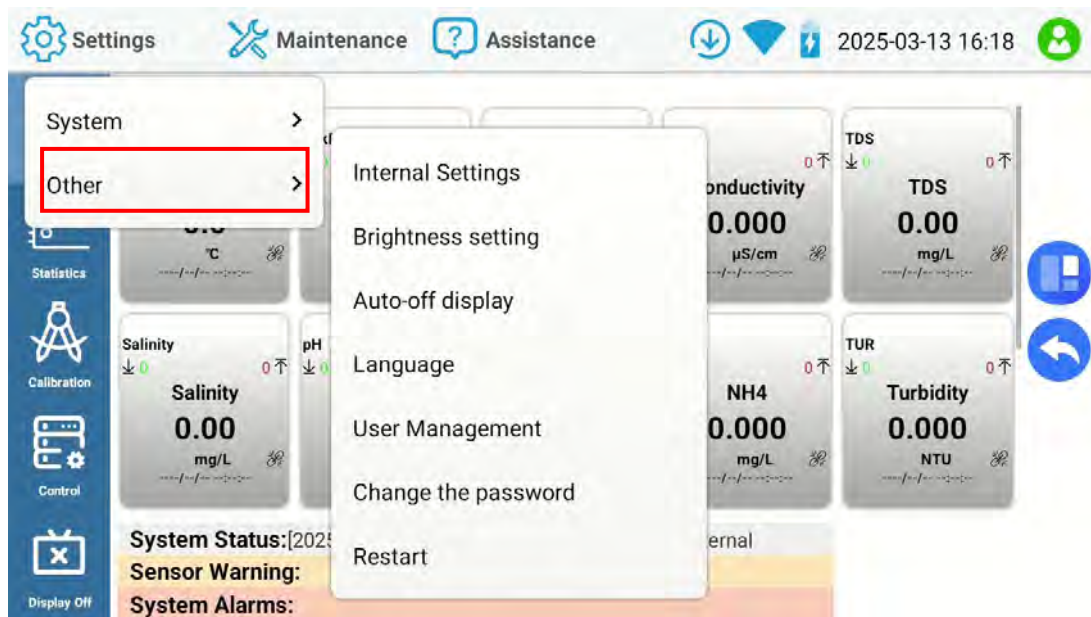
Name	Address	PLC_Address	Type
pH/Status	1024	41025	Int16AB
Temp/Status	1025	41026	Int16AB

This device can be used as a slave for other devices to read the data of this device. The panel order of the analysis page corresponds to the register address, and you can view the register address and format of the specific parameter according to the data mapping table.

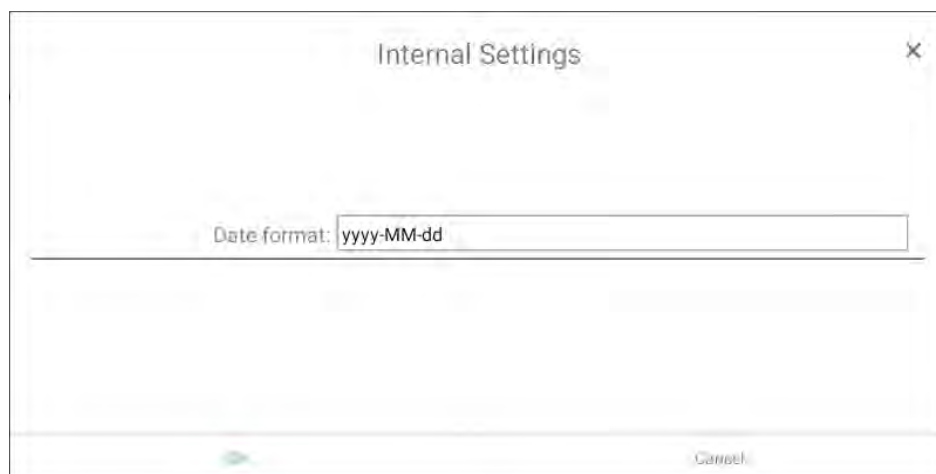
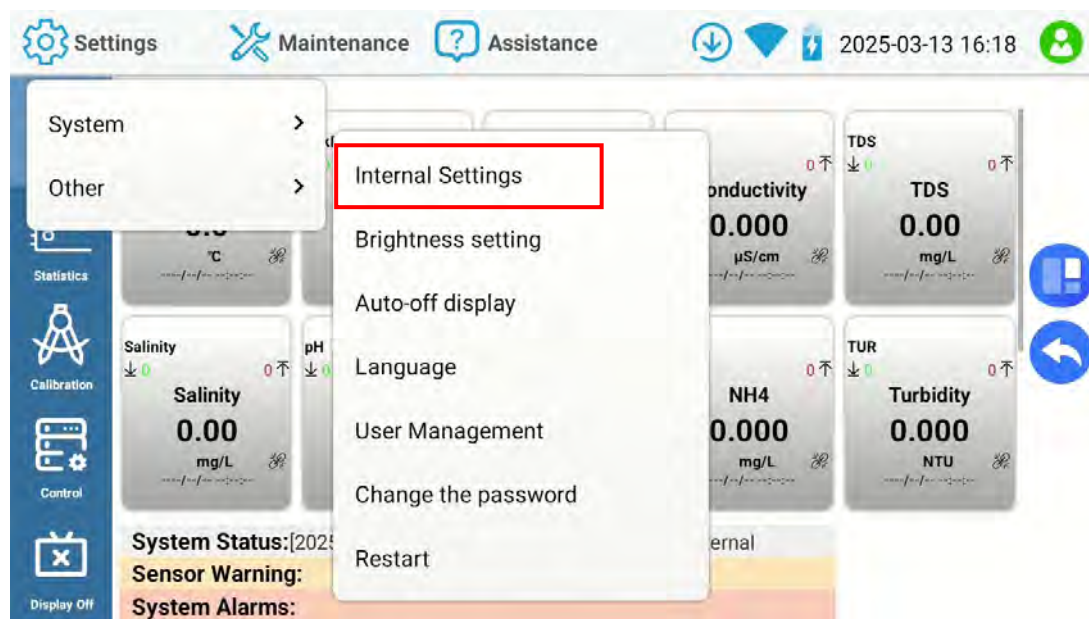
The status register is generated automatically only when the Analysis page panel is added with different upper and lower limits set. Refer to Section 7.6.1.2 Analysis page management for analysis page settings.

Code	Instruction
0	Parameters are normal
1	Upper limit exceeded
-1	Lower limit exceeded
-100	Device disconnected

## 4.8 Other

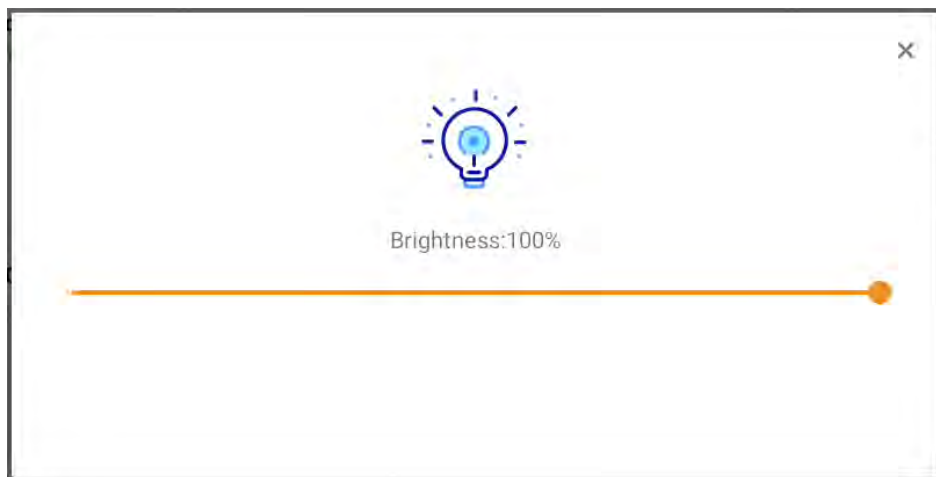
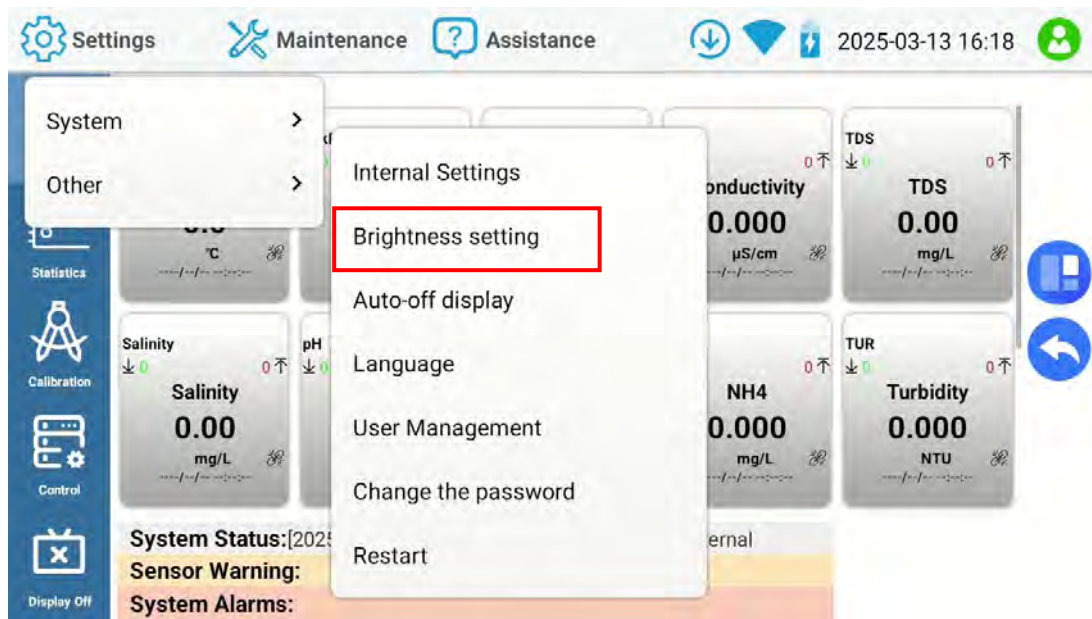


## 4.8.1 Internal settings



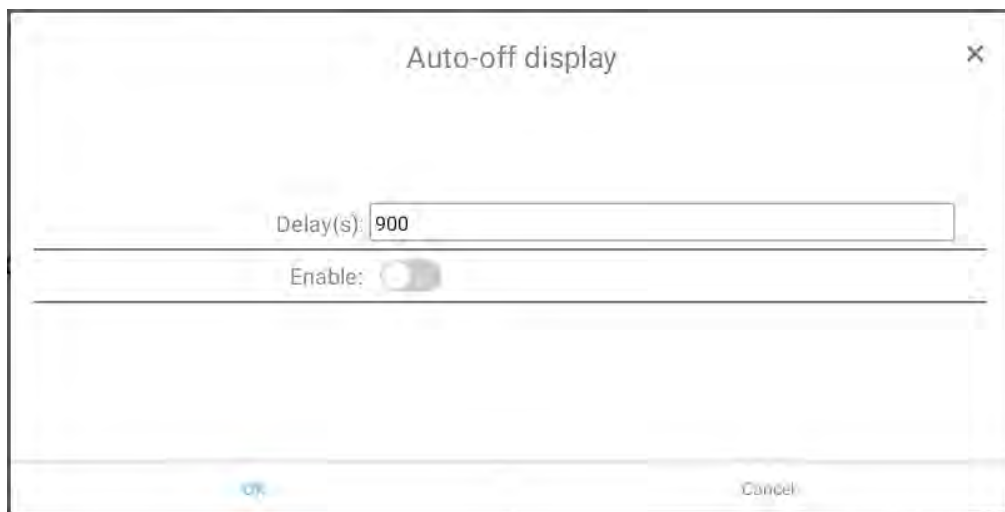
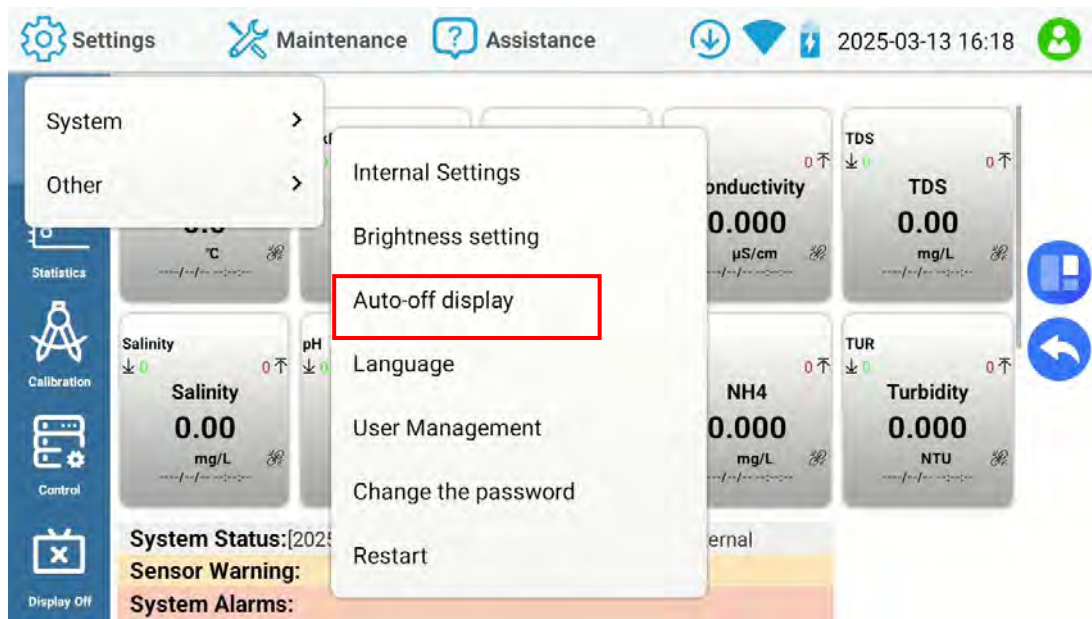
Adjustment of date format: yyyy-MM-dd, MM-dd-yyyy, dd-MM-yyyy.

## 4.8.2 Brightness setting



Brightness setting adjusts the screen brightness.

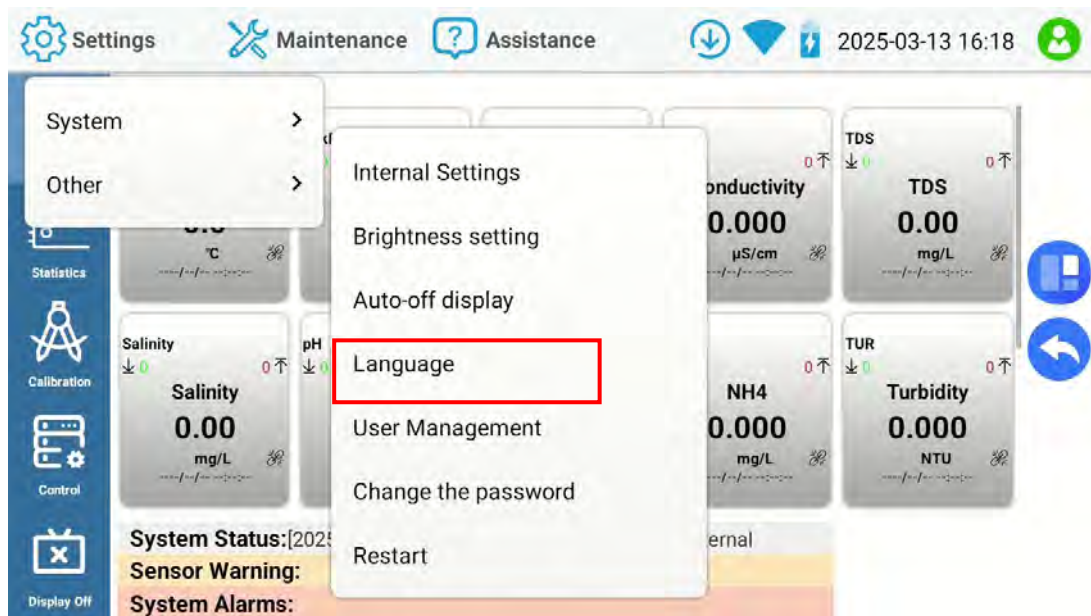
### 4.8.3 Auto-off display



Delay(s): automatically rests the screen after no operation.

Enable: automatically enable or disable enable.

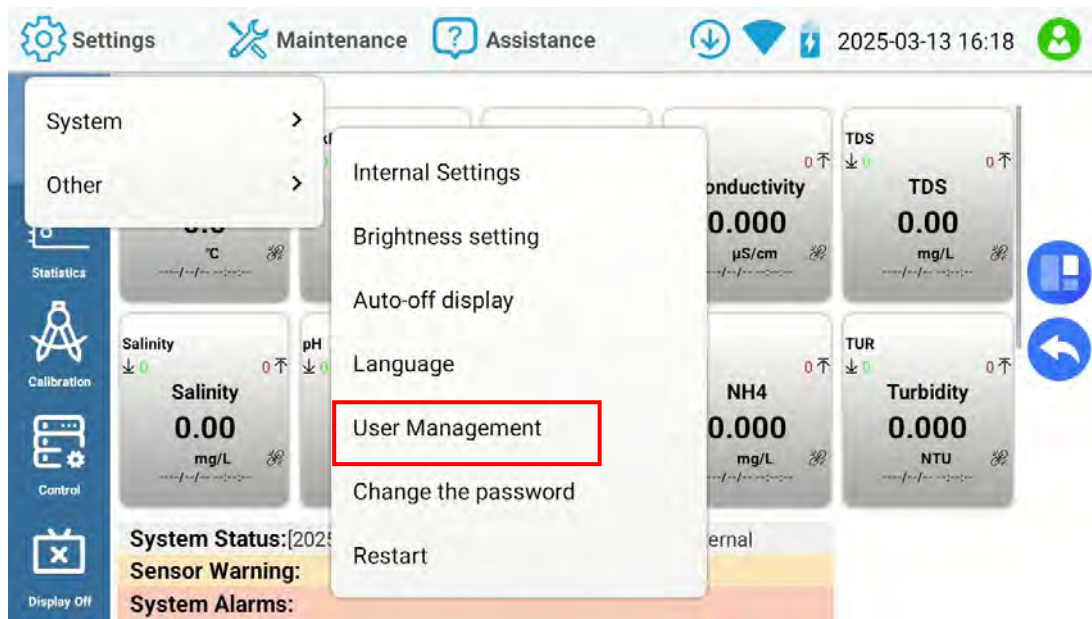
## 4.8.4 Language



English, Chinese, French, Russian are currently supported.

*Note: The language of the custom section of the page layout is governed by the text in the configuration manager.*

## 4.8.5 User management



Use this function to assign sub-accounts, only administrator privileges can use this function.

Key: Sub-account name

Value: Password of the sub-account

Select: Enter panel editing mode

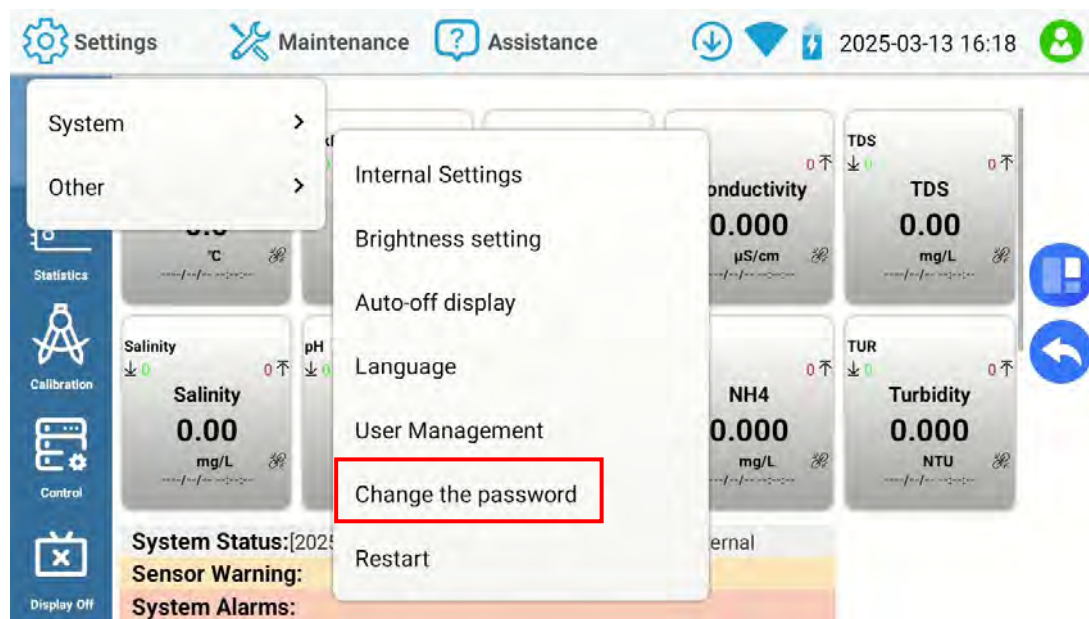
All: Select all

None: None of the selected fields

Delete: Delete the selected fields

Add: Add field

## 4.8.6 Changing your password

A screenshot of a 'Change the password' dialog box. It has a title bar with a close button (X). The form contains four input fields: 'Username' (pre-filled with 'Engineer'), 'Current Password', 'New Password', and 'Confirm Password'. There is a toggle switch for 'Show/Hide' passwords. At the bottom, there are 'OK' and 'Cancel' buttons.

Note: This function is only available to administrators.

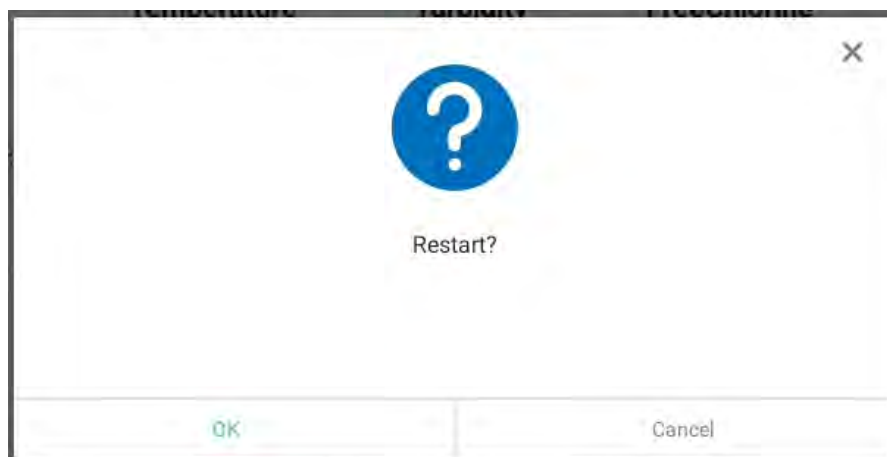
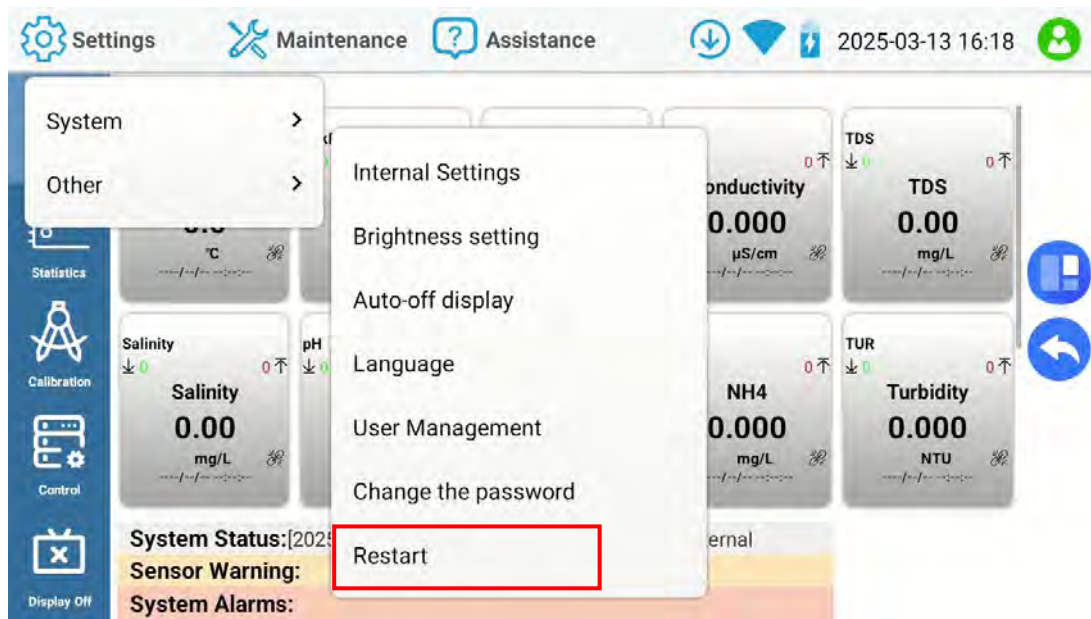
Username: the account that needs to change the password, only the engineer and administrator accounts.

Current password: the current account password, engineer default: 123456; administrator default: 12345678.

New password: the password to be changed.

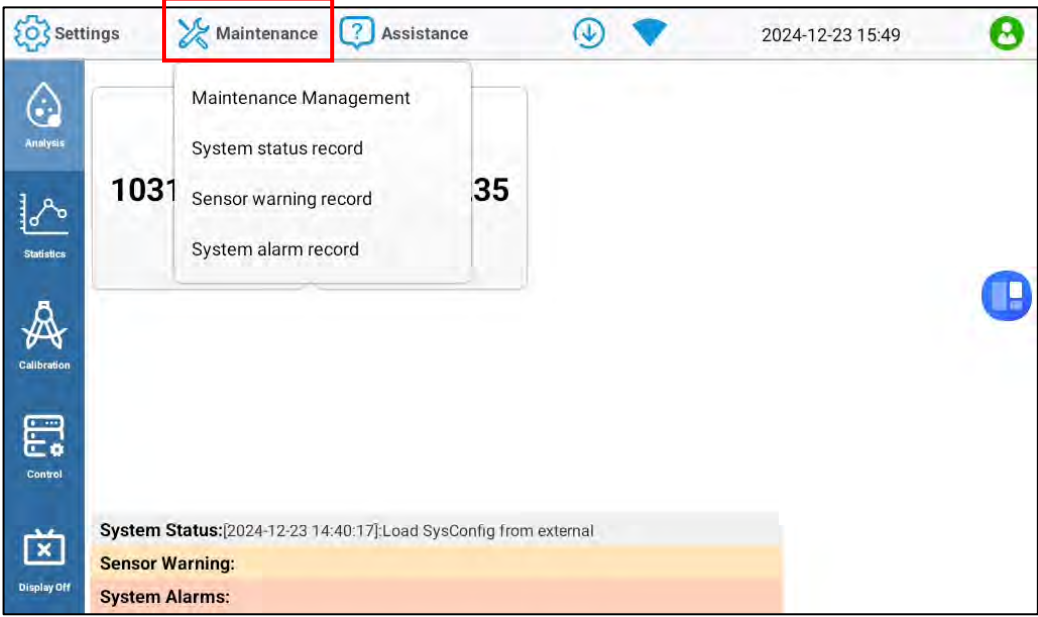
Confirm password: Re-enter the password to be changed.

## 4.8.7 Restart

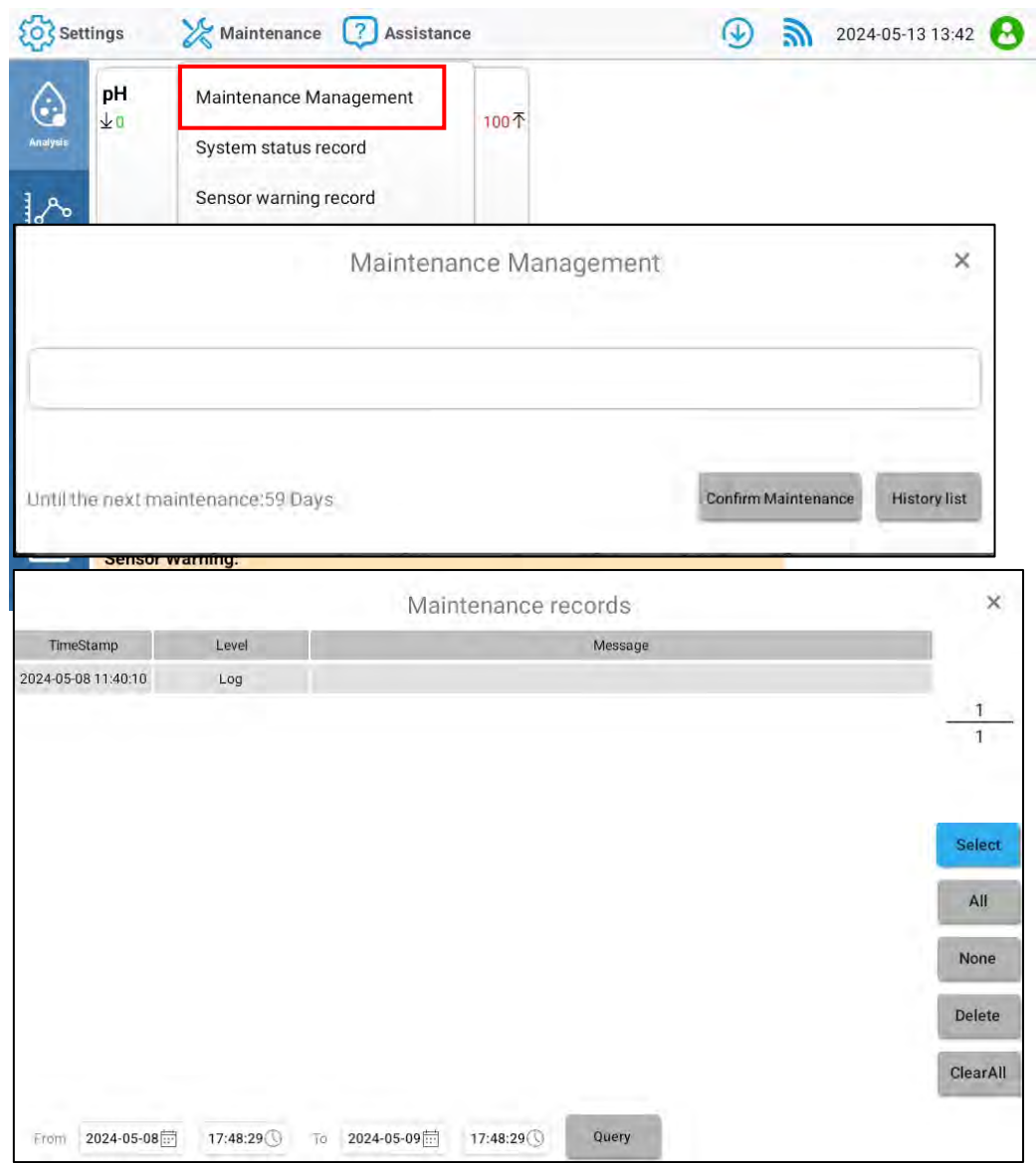


Restart the device.

# 4.9 Maintenance

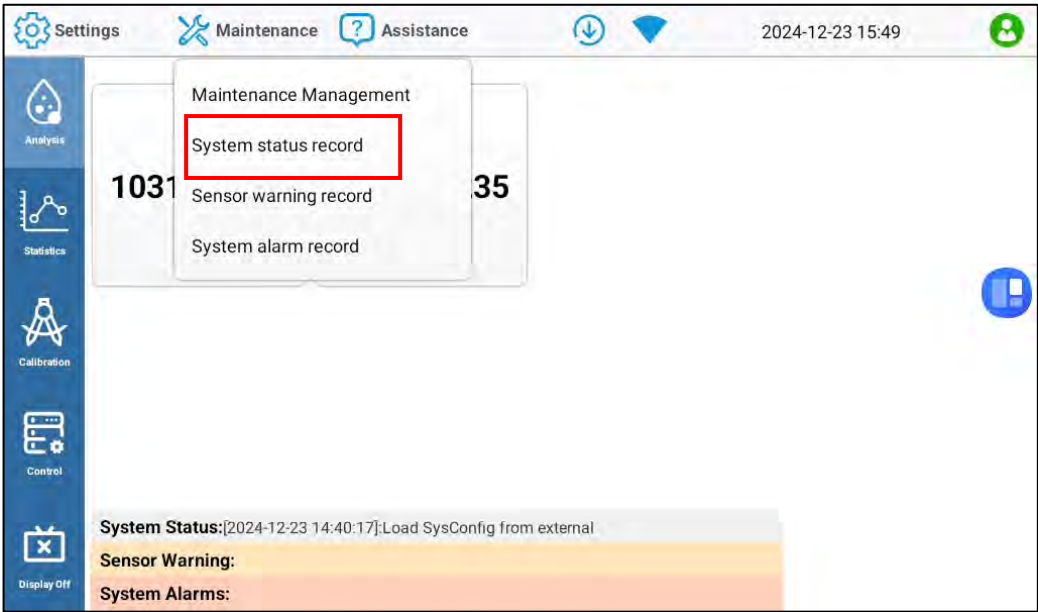


### 4.9.1 Maintenance Management



During the maintenance, you can write the corresponding maintenance log in the input field. After clicking Confirm Maintenance, the device records and saves the maintenance log, and you can view or delete the maintenance log in the history list.

### 4.9.2 System status record



System status record

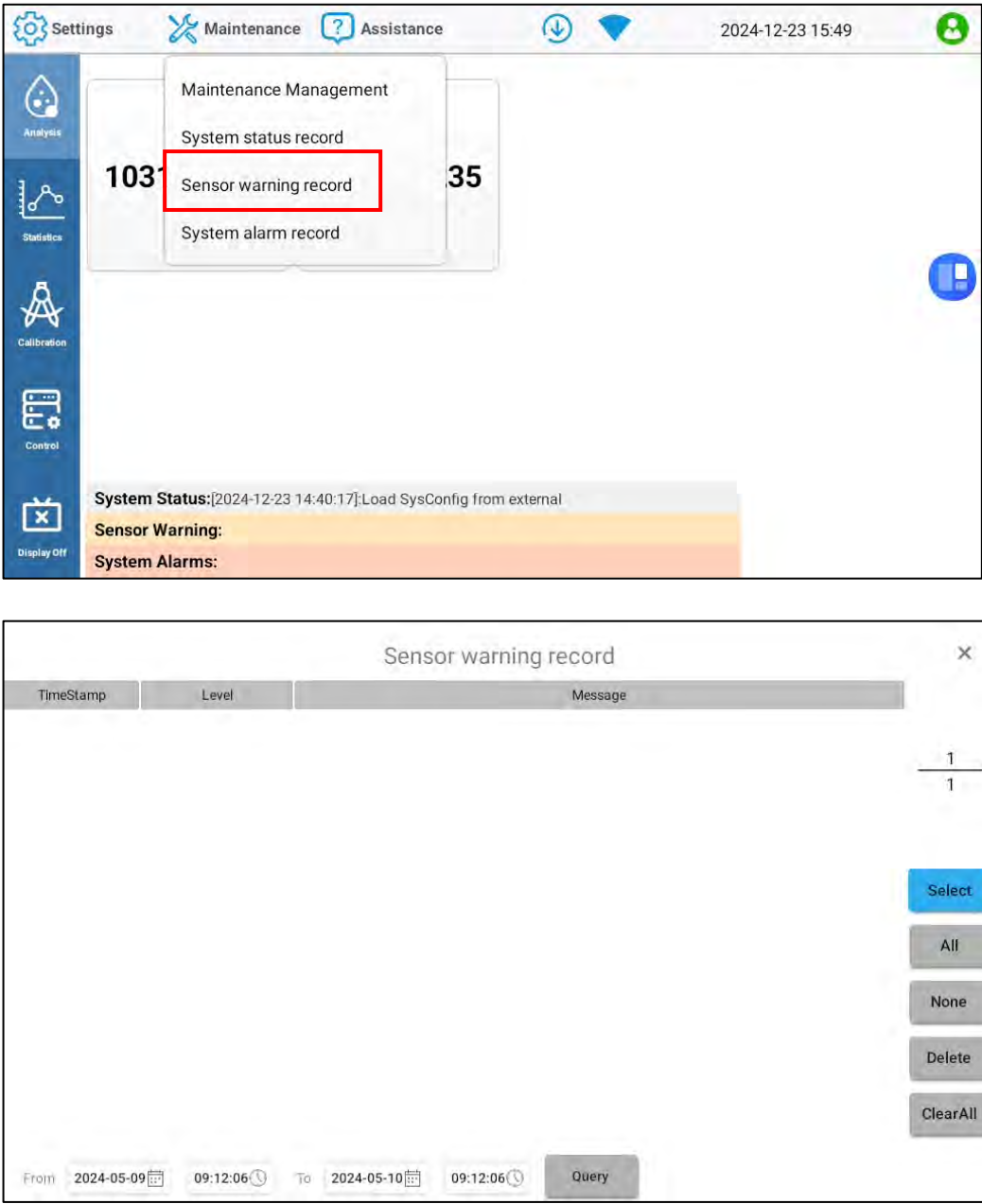
TimeStamp	Level	Message
2024-05-09 11:48:56	Log	Admin login successful!
2024-05-09 11:43:28	Log	Engineer login successful!
2024-05-09 11:40:33	Log	Admin login successful!
2024-05-09 11:40:21	Log	Engineer login successful!
2024-05-09 11:40:09	Log	Admin login successful!
2024-05-08 16:25:53	Log	Load SysConfig from external
2024-05-08 16:22:53	Log	Load SysConfig from external
2024-05-08 16:22:09	Log	Load SysConfig from external
2024-05-08 16:15:01	Log	SuperAdmin login successful!
2024-05-08 16:14:09	Log	Load SysConfig from external

From: 2024-05-08 17:53:56 To: 2024-05-09 17:53:56 Query

Select All None Delete ClearAll

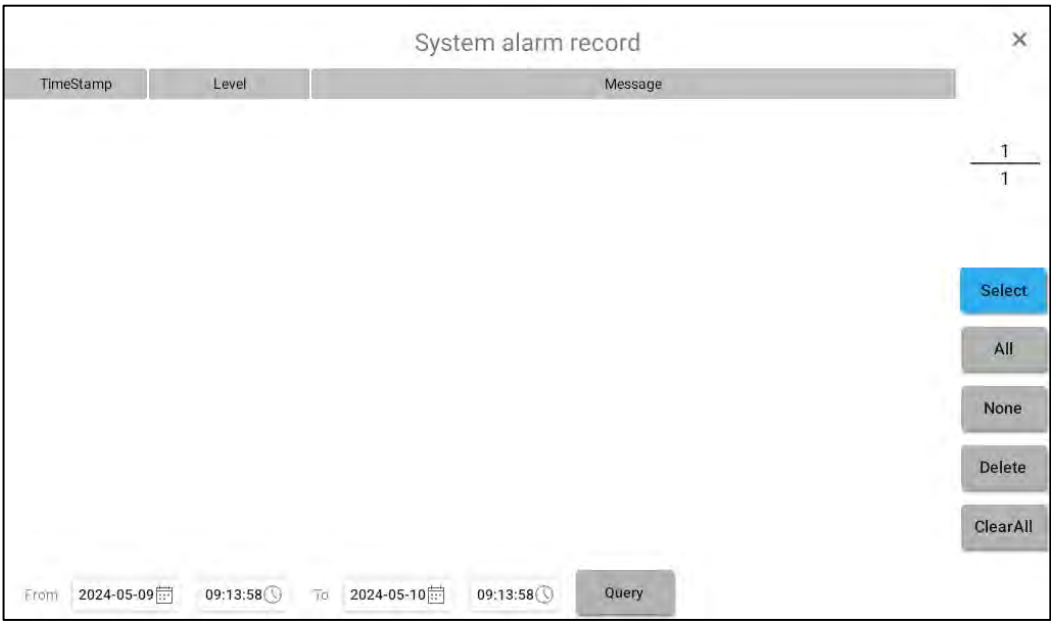
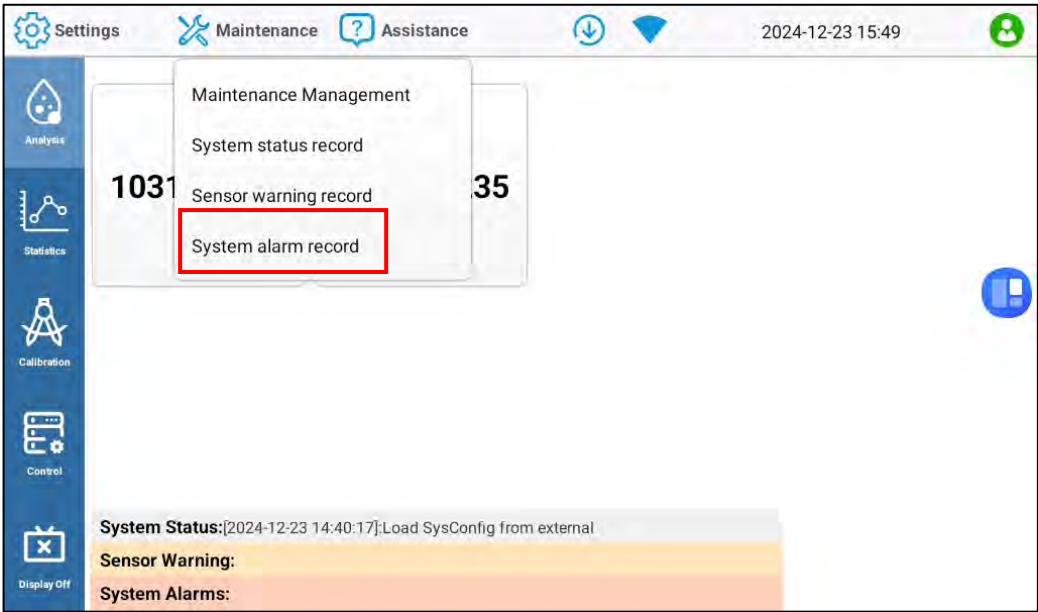
This function allows you to retrieve and clear the historical system status, the device stores the system status of the last week.

### 4.9.3 Sensor warning record



Historical sensor alerts can be viewed and cleared in this function, and the unit will store the most recent year's sensor alerts.

### 4.9.4 System alarm record

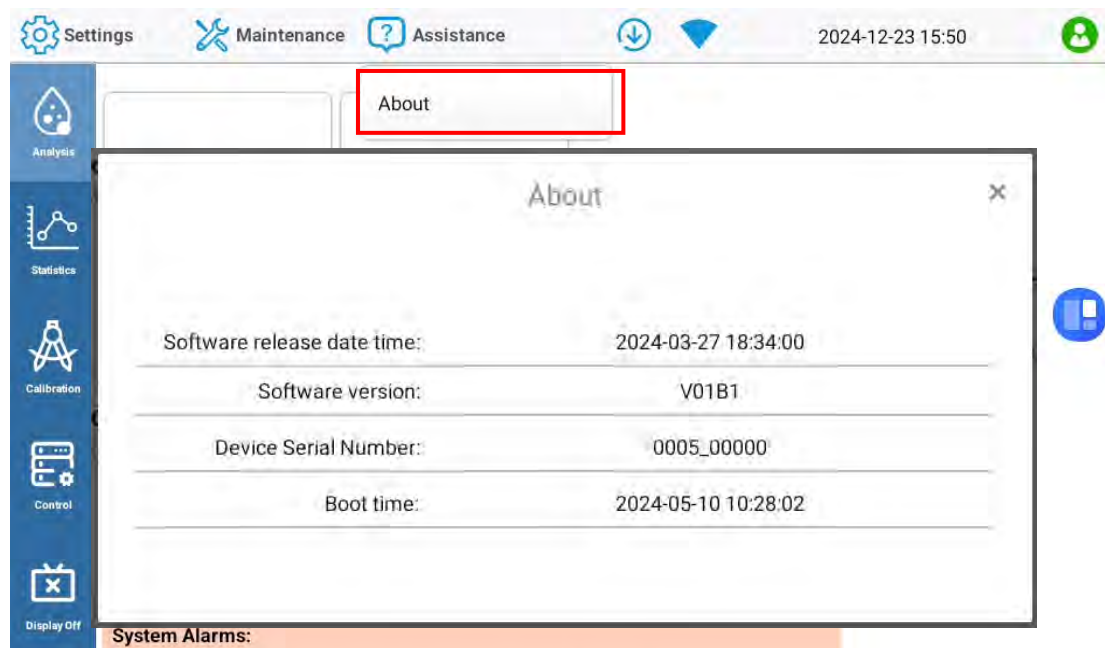


Historical system alarms can be viewed and cleared in this function, and the unit stores the most recent year's system alarms.

---

## 4.10 Assistance

### 4.10.1 About



Software release date time: The current software release date.

Software version: The current software version number.

Device serial number: Device version number and device serial number.

Boot time: The time at which the device was started, which can be used to determine the time of this run.

---

## 5 MC-HC register table

Register Type: Holding registers (4x).

Supported Function Codes: 0x03/0x06/0x10/0x0F.

### 5.1 Basic register table

Register name	Address	W/R	Data type	Explanation	Note
ProVerSN	0x8000	R	U16	Product Model version number	0x0001
DevSN	0x8001	R	U16	Product Serial No	[1-65535]
ModbusID	0x8002	W/R	U16	Modbus RTU communication address	[0-253]
COM_BaudRate	0x8003	W/R	U32 (CDAB)	RS485 Serial communication baud rate	4800 9600 115200
	0x8004				

### 5.2 Panel register table (example)

MC-HC support PLC address access, 0x9000 corresponds to 49001 address, and other addresses are accessed by offset;

The following table is only an example, please refer to the actual user configuration.

Register name	Address	PLC Address	W/R	Data type	Explanation
COD (example)	0x9000	49001	R	Float32 (CDAB)	User Defined Panel 1
	0x9001	49002			
TUR (exmaple)	0x9002	49003	R	Float32 (CDAB)	User Defined Panel 2
	0x9003	49004			

### 5.3 MC-HC command table (Development based on Modbus RTU 0x0F instruction)

CMD	Addr.	Instruction code	Data type	CMD code. High 8bit	Cmd code. Low 8bit	Explanation	return
Restart	0x0000	0x0F	U16	0x10	0x01	Restart	None
SaveF	0x0000	0x0F	U16	0x11	0x01	Save parameters	Standard Modbus

## 6 Maintenance

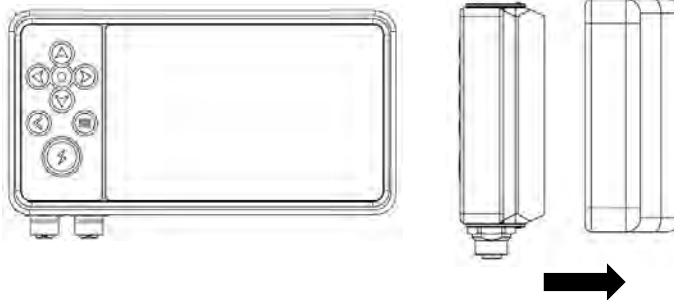
### ⚠ WARNING



*Only qualified personnel must conduct the tasks described in this section of the document.*

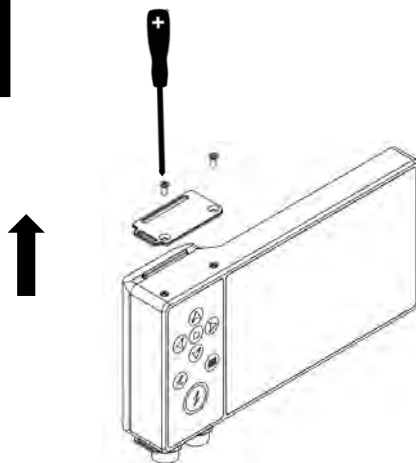
### 6.1 Replace the battery

1



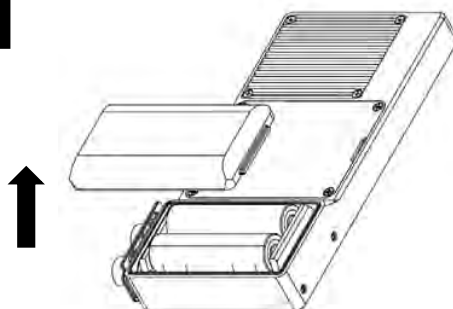
Remove the rubber protective cover

2



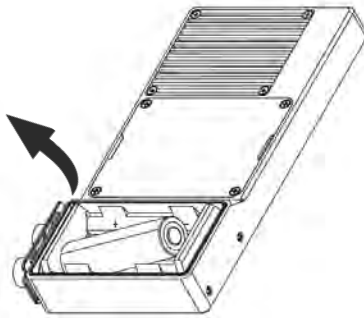
Remove the battery cover panel.

3



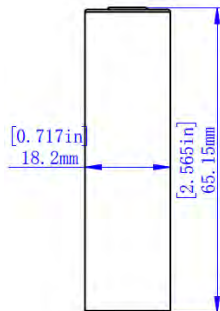
Remove the battery cover

4



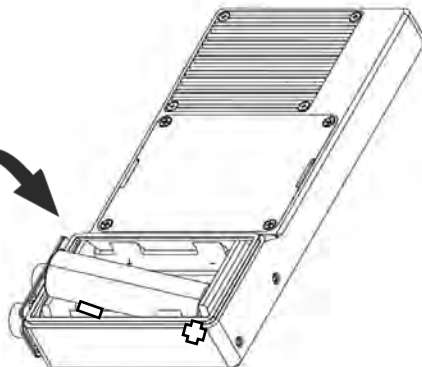
When removing the battery, remove the positive electrode first, then the negative electrode

5



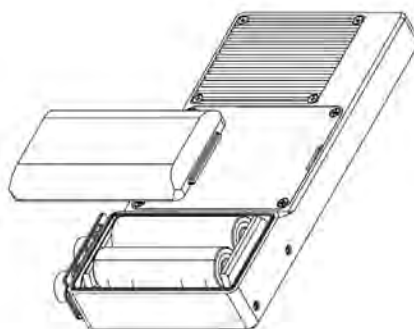
The battery is a model 18650 flat-top lithium battery

6

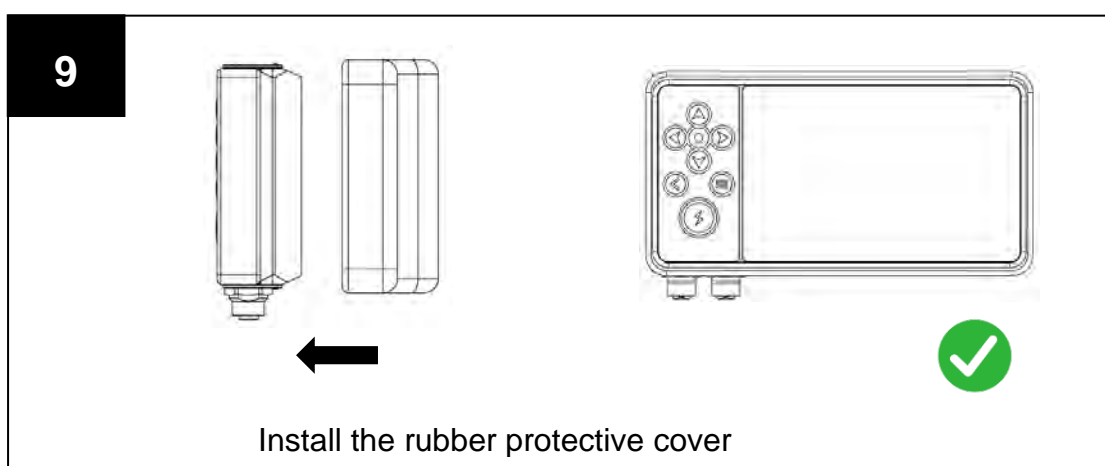
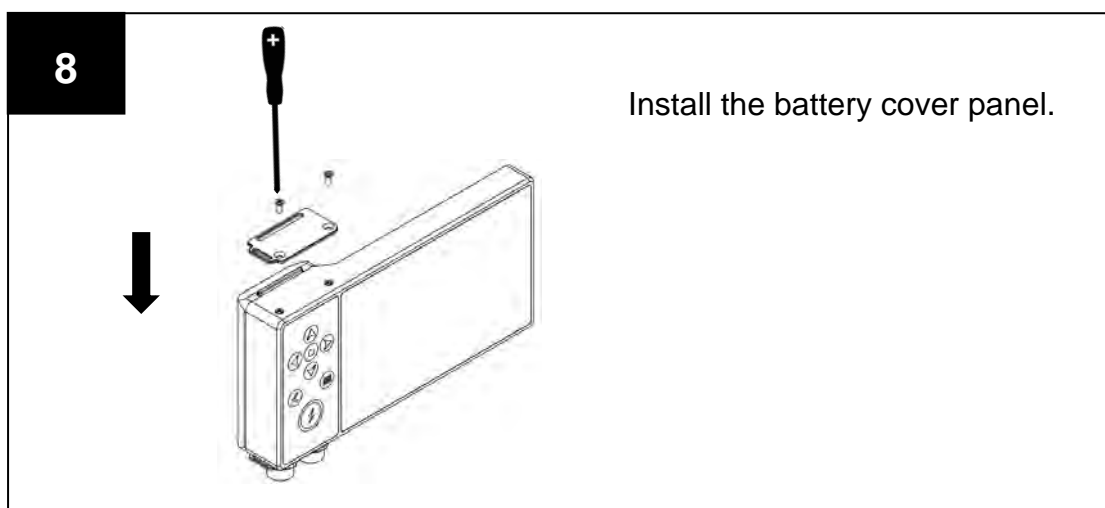


To install the battery, press the positive terminal into the battery holder and then gently press the negative terminal.

7



Install the battery cover



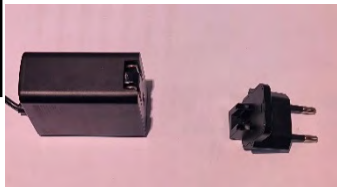
## 6.2 Charge your device

### WARNING



*Please use the dedicated charger provided by our company when charging; other models of chargers may cause damage to the device.*

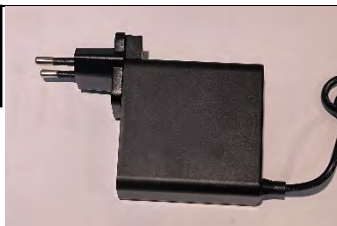
1



Prepare the charger and plug.

Please note that plug types vary depending on the region. Our company will provide the appropriate plug. Please inform us of the type of socket you have before making your purchase.

2



Align the slot at the back of the plug with the transformer interface, then slide the plug in.

3





Power input: 100 – 240 VAC, 50/60 Hz  
Power output: 18 V, 2.5 A, 45 W

4





After aligning the positioning hole, insert any port to charge the device.

The  icon and the button icon  flashing indicate that the battery is charging

---

## 7 Troubleshooting

 <b>WARNING</b>	
	HanMCE faults and alarms in strict accordance with the manual. If you cannot solve them, please contact a technician.

Symptom	Possible Cause	Solution
Unable to connect to WiFi	Password error	Reconnect to WiFi and enter the correct password
	WiFi switch is not turned on.	Please enter the Wi-Fi setting interface and manually turn on the WiFi switch
Unable to connect to default WiFi	Wait less than 3 minutes after power on.	Please wait for 3 minutes at least
	Not connected after 3 minutes.	Please contact technical support
Unable to connect to the internet	Connect to customer-provided WiFi.	Please check the network status of the customer-provided WiFi.
	4G antenna is not installed.	Please install the 4G antenna
	No 4G card inserted or no signal.	Please replace the 4G card or contact technical support
Data export failure	SD card or USB flash drive not accessed	Check if SD card or USB flash drive is inserted
	Insufficient space remaining on SD or USB flash drive	Check the remaining space on the SD card or USB flash drive
Unable to upload data	No network connection	Check network settings
	Error upload parameter configuration	Check the configured parameters