Pyxis

UC-80-PLUS with 2x ST-723 Sensors
User Manual

Pyxis Lab Inc.

July 2025

Related Statements

The manufacturer shall not be liable for direct, indirect, special, incidental or consequential damages resulting from any deficiency or omission in this manual. The manufacturer reserves the right to make changes to this manual and the products described in it at any time without notice or liability. Revised versions can be found on the manufacturer's website.

Safety Information

Please read this manual completely before unpacking, installing and operating this equipment. In particular, pay attention to all dangers, warnings and precautions, otherwise, it may cause serious personal injury to the operator or damage to the equipment.

Use of Danger Information

⚠ Danger
Indicates a potentially or urgent dangerous situation that, if not avoided, will cause death or serious injury.

⚠ Warning
Indicates a potentially or very dangerous situation that, if not avoided, may cause serious personal injury or death.

⚠ Warning
Indicates a potentially dangerous situation that may cause a certain degree of personal injury.

Attention
Indicates conditions that if not avoided, will cause damage to the instrument. This is information that needs special emphasis.

Warning Label

Please read all labels and marks attached to the instrument. Failure to follow the instructions on these safety labels may result in personal injury or damage to the instrument.

⚠	If this symbol appears in the instrument, it means refer to the operation and/or safety information in the instruction manual.
⚡	If there is this mark on the instrument housing or insulator, it means there is a risk of electric shock or death from electric shock.
	Static electricity can damage the delicate internal electronic components, resulting in reduced performance or eventual failure of the instrument.
	Electrical equipment marked with this symbol cannot be disposed of through the European public waste system after August 12, 2005. In order to comply with European regional and national regulations (EU Directive 2002 / 98 / EC), European electrical equipment users must now return abandoned or expired equipment to the manufacturer for disposal without any cost.

Table of Contents

Pyxis

1. Specifications

Items	UC-80-PLUS
P/N	72875 – Custom
Display	7-inch LCD Color Industrial Capacitive Touch Screen
Storage Capacity	Built-In 4GB of Ram for Storing up to 1-Million Data/Event Records
Power Requirement	96-260VAC / 50-60 Hz; 3A Fuse; 60 W
Input	RS-485 Modbus - RTU
Output	2 x 4-20 mA / RS-485 Modbus - RTU / Modbus TCP
USB	1 x USB host, for data downloading and screen upgrade
Internet	RJ-45 socket, Modbus-TCP
Panel Operational Temperature	40 – 113°F (4-45 °C)
Storage Temperature	Instrument: -4 – 131°F (-20 – 55°C) / Sensors 32 – 122°F (0 – 50°C)
Rating	IP-65 Panel-Display
Regulation	CE / RoHS
Relative Humidity	20% - 90% (No Condensation)
Altitude	<6,561 feet (<2,000 Meter)
Approximate Product Weight	~ 5 kg

Item	ST-723
P/N	53106
Conductivity Range	0 - 15,000.0 µS/cm
Conductivity Precision	±10% µS/cm or ± 3.5% FS, whichever is greater
4-20mA Range fo Temp	32 - 392 °F (0 - 200 °C)
Temperature Method	PT-100
Cell Constant (K)	0.3
Power Supply	22 – 26V DC, Power Consumption 2W
Dimension (L x W x H)	Length 8.46 inch (298 mm), body diameter 1.32 Inch (47mm)
Installation	¾-inch NPT
Body Material	304 Stainless Steel
Weight	1290 g (2.84 lbs.)
Operational Pressure	≤2.0 MPa（300psi）@199°C
Operating Temperature	41 - 392 °F (5 - 200 °C)
Storage Temperature	-4 - 392 °F (-20 - 200 °C)
Outputs	8Pin - Isolated 4 – 20 mA Analog Output & Isolated RS-485 Digital Output
Electrode Material	HASTELLOY
Rating	IP67, Fully Dustproof & Waterproof
Regulation	CE, RoHS, UKCA Marked
Cables Provided	8-Pin Bulkhead 4.9 ft (1.5 m) / 8-Pin Flying Lead 4.9 ft (1.5 m) (Extension Cables Sold Separately)

NOTE - Pyxis Lab is consistently updating technologies, as such, specifications may change without notice. Contact info@pyxis-lab.com for details or www.pyxis-lab.com .

2. Dimension and Mounting

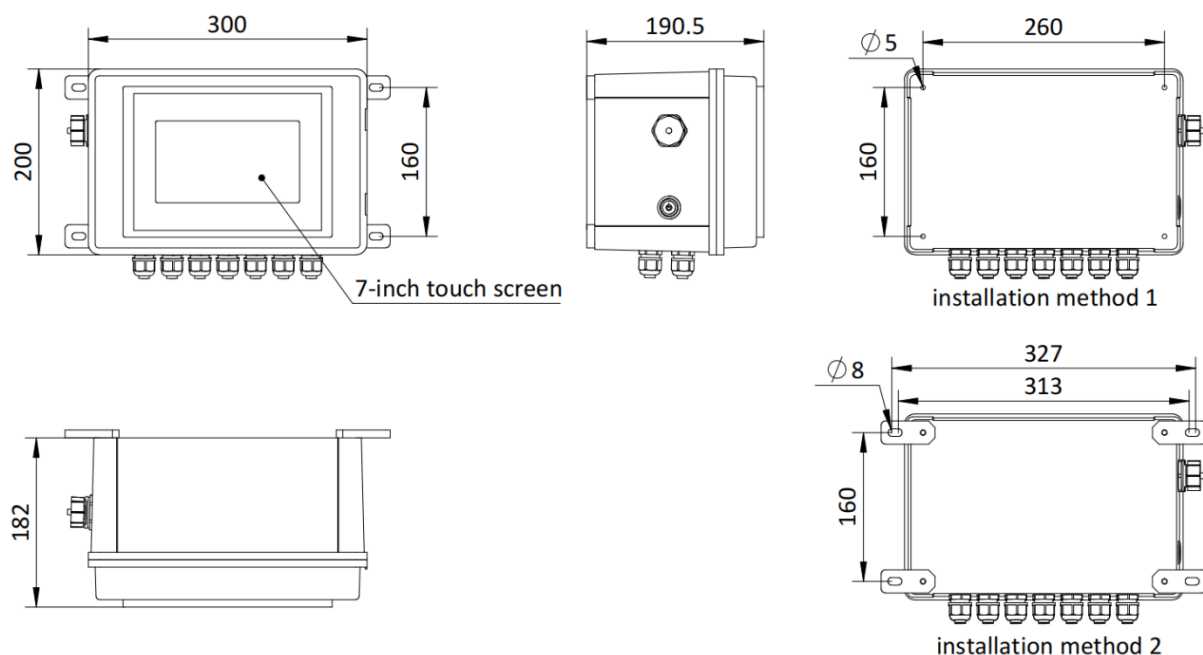## 2.1. UC-80-PLUS Display & Data Logging Terminal (mm)
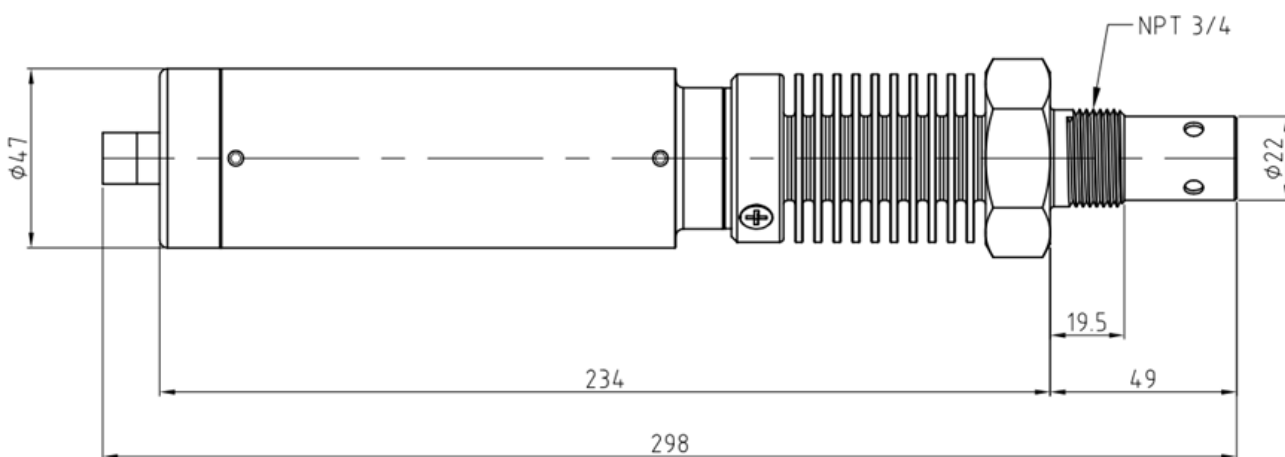

Figure. 1 - UC-80PLUS

2.2. ST-723 Sensor (mm)

Figure. 2 - ST-723

3. Analyzer Installation

3.1. Installation Requirements

Power Supply: 96-260VAC / 50-60 Hz; 60 W

3.2. Terminal Wiring

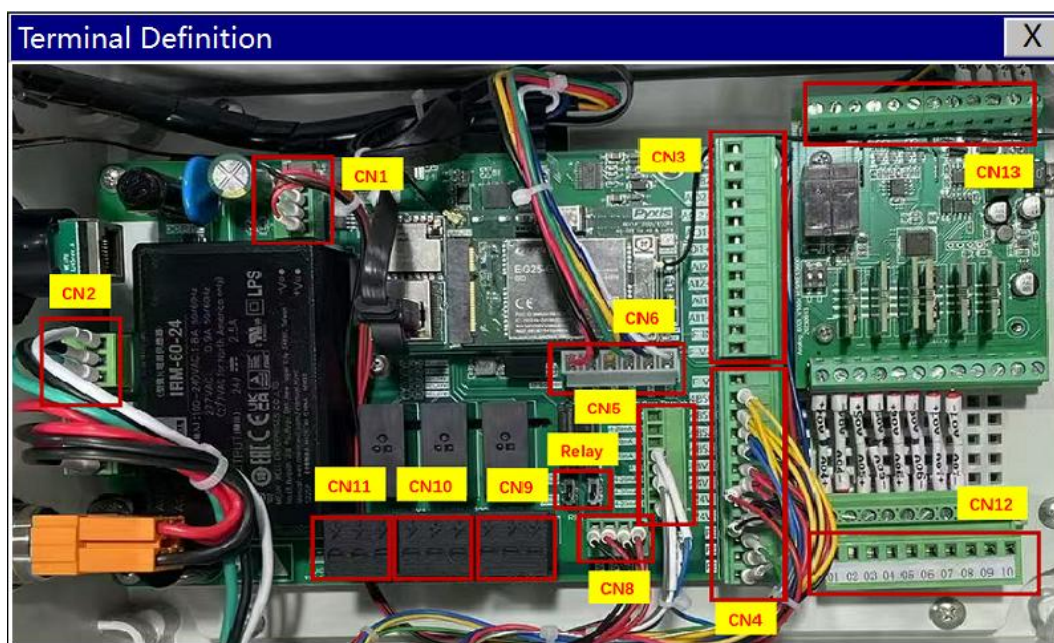After the installation of the equipment, you need to connect the site power to the **CN2** equipment terminal block:



Figure. 3 - Terminal Layout Diagram

CN1	Terminal Number	Definition
	0V	/
	V2	/
	0V	/
	V1	/

CN2	Terminal Number	Definition
	N	AC110~220V 50/60Hz : N
	L	AC110~220V 50/60Hz : L
	PE	PE

CN3	Terminal Number	Definition
	A2	DCS:485A
	B2	DCS:485B
	AO2-	4-20mA- DCS:Conductivity-2
	AO2+	4-20mA+ DCS:Conductivity-2
	AO1-	4-20mA- DCS:Conductivity-1
	AO1+	4-20mA+ DCS:Conductivity-1
	AI2-	/
	AI2+	/
	AI1-	/
	AI1+	/
	F_IN	/
	F_V+	/

CN4	Terminal Number	Definition
	F_V-	/
	485B	B(ST-723)(ST-723)
	485B	B(AI Module)
	485A	A(ST-723)(ST-723)
	485A	A(AI Module)
	24V+	24V+(ST-723)(ST-723)
	24V+	24V+(AI Module)
	24V-	24V-(ST-723)(ST-723)
	24V-	24V-(AI Module)
	PE	PE(ST-723)(ST-723)
	PE	/
	PE	/

CN5	Terminal Number	Definition
	4-20mA-	/
	4-20mA Out#1	/
	4-20mA Out#2	/
	4-20mA Out#3	/
	4-20mA-	/
	4-20mA IN#1	/
	4-20mA IN#2	/
	4-20mA IN#3	/

CN8	Terminal Number	Definition
	24V-	/
	24V+#1	/
	24V-	/
	24V+#2	/

CN9	Terminal Number	Definition
	AC_L#3	/
	AC_N#3	/
	PE	/

CN10	Terminal Number	Definition
	AC_L#2	/
	AC_N#2	/
	PE	/

CN11	Terminal Number	Definition
	AC_L#1	/
	AC_N#1	/
	PE	/

CN12	Terminal Number	Definition
	XT1	4-20mA+ DCS:Reserve
	XT2	4-20mA- DCS:Reserve
	XT3	4-20mA+ DCS:Reserve
	XT4	4-20mA- DCS:Reserve
	XT5	4-20mA+ DCS:Reserve
	XT6	4-20mA- DCS:Reserve
	XT7	/
	XT8	/
	XT9	/
	XT10	/

CN13	Terminal Number	Definition
	+24V	24V+(CN4)
	GND	24V-(CN4)
	485A	485A(CN4)
	485B	485B(CN4)
	AI1+	/
	AI1-	/
	AI2+	/
	AI2-	/
	Y0	/
	COM	/
	Y1	/
	COM	/

Relay		ACTIVE OUTPUT	PASSIVE OUTPUT
	SW1 SW2 PASSIVE OUTPUT ACTIVE OUTPUT		

Figure. 4 - Terminal Wiring Diagram

Warning The process of electrical connection to contact the 220V single-phase power supply, should be operated by personnel with an electrician's license. Failure to operate according to the electrical code of practice may result in electric shock injury or even death.

4. Touch Screen Operation

4.1. Main Screen

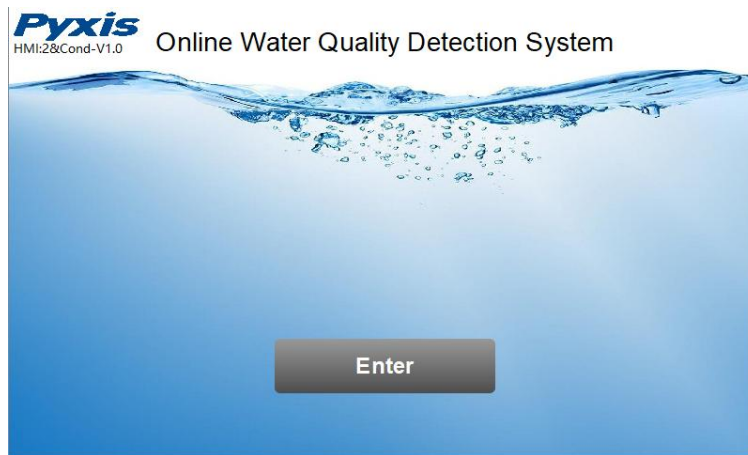After the system is powered on an initial screen allows the user to log into the system.

Figure. 5 - Main Screen

4.2. User Login

After powering on the system, log in with the user name and password to be able to change system settings. Click the "User Login" button, select the user "pyxis", enter the password: "**888888**" in the user password field. A new user can be added via "User Management" in interface of the menu.
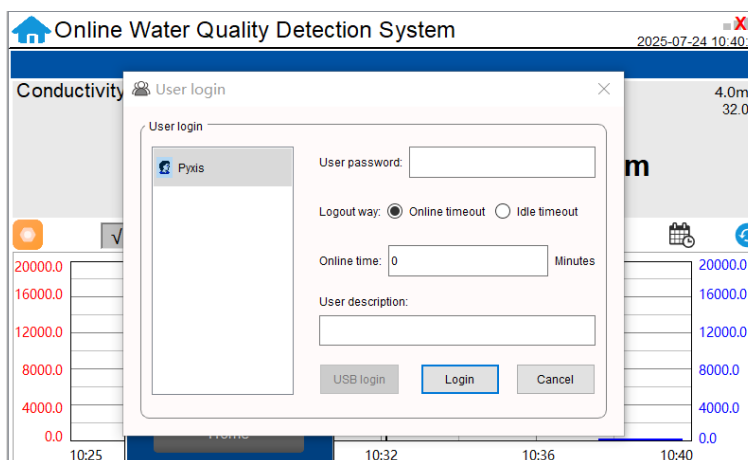

Figure. 6 - User Login Screen

If you do not need a password, or want to change the user, you can enter the system and "Manage" in the "User Management" screen of the menu.

4.3.　Real-Time Monitoring

Click the "Enter System" button on the main interface to enter the real-time monitoring screen of the system.
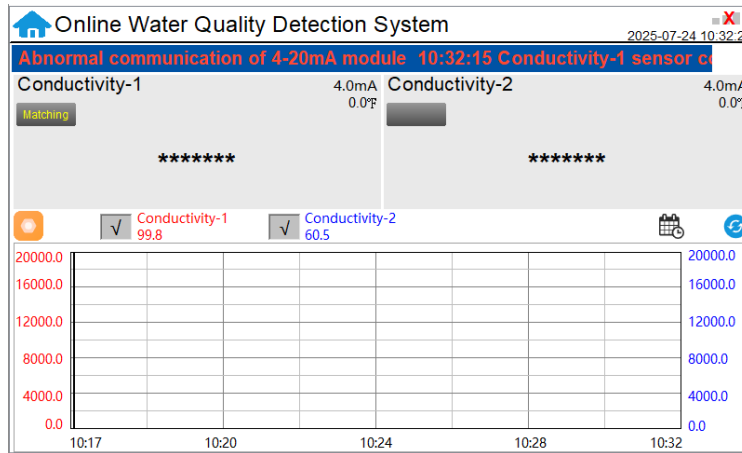
Figure. 7 - Real-time monitoring screen

Connect a ST-723 conductivity sensor to the controller and click the "Matching" button. After confirming that the sensor is correctly connected to the controller, click the confirm button. Then the interface will jump to display "Matching in progress" until the matching is successful.

IMPORTANT NOTE *The sensors must be connected individually to the controller in sequence for matching because from the factory they share the same modbus register address.The "Matching" process will individually assing a new modbus register to each ST-723 sensor as it is connected and matched.*
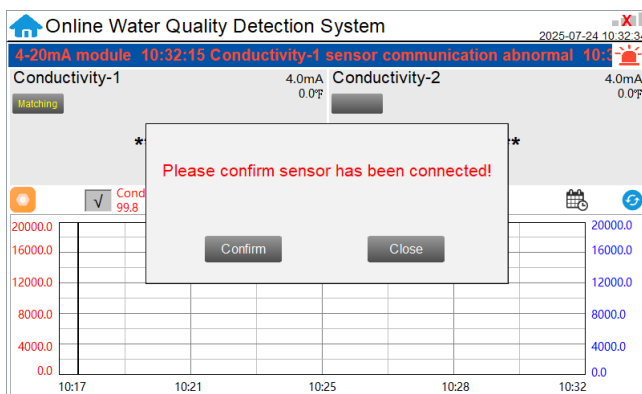
Figure. 8 - Matching confirmation
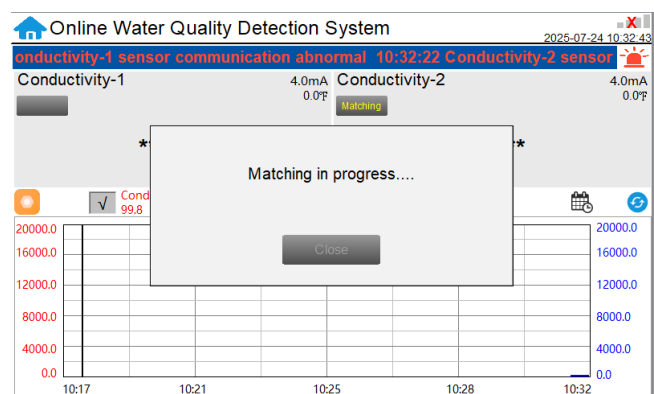
Figure. 9 - Matching in progress

If the interface shows a matching timeout, please check whether the sensor is properly connected to the controller or whether the sensor register address is correct.
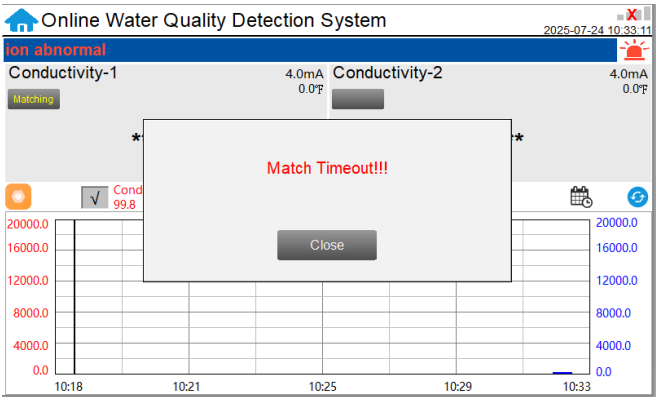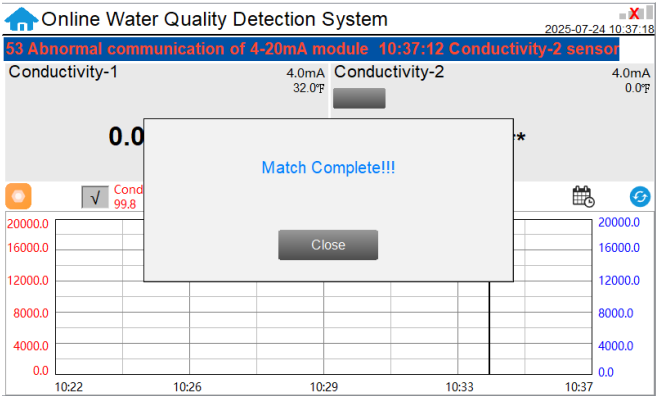

Figure. 10 - Match Timeout

Figure. 11 - Match Complete

After the sensor is successfully matched, the data detected by the Pyxis sensors will be displayed in real-time.
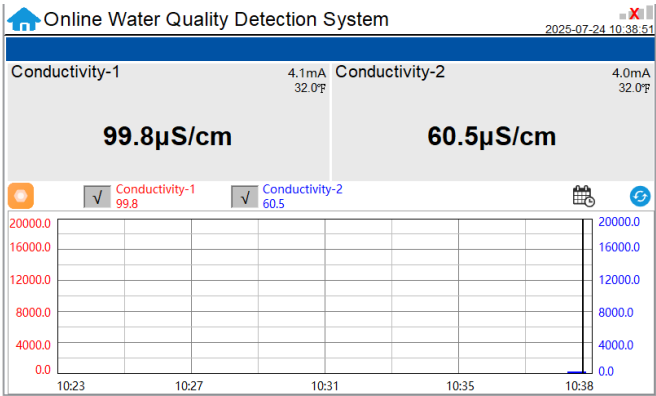

Figure. 12 - Real-time monitoring screen

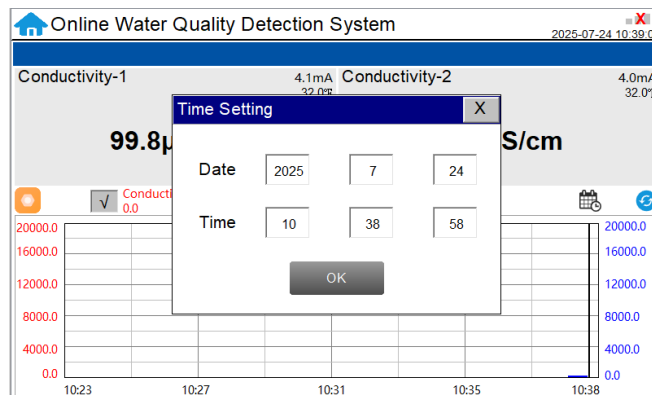Click on the time <u>in the upper right corner</u>, the screen pops up the time setting window.

Figure. 13   - Time Setting

Click the refresh icon in the middle right corner, the icon turns blue and the real-time curve stops refreshing. Click again to restore it. The real-time curve interface will only display the parameters of the selected sensors.
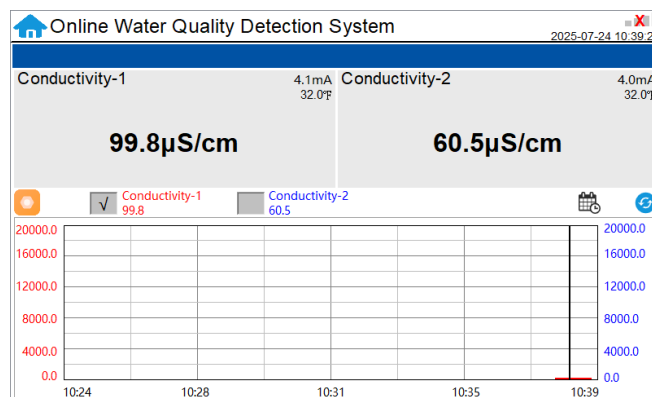
Figure. 14 - Real-time Curve

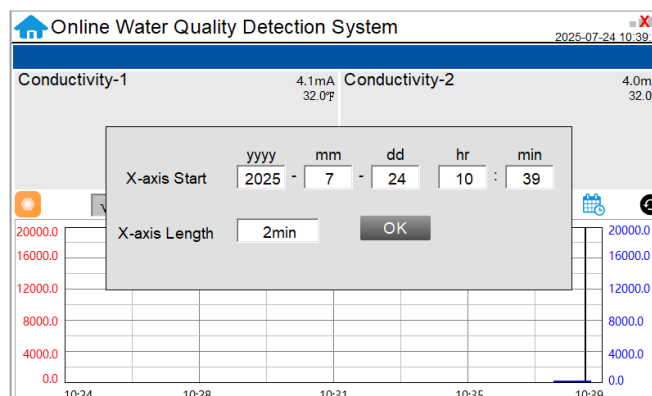By clicking the calendar icon in the middle right corner, users can set the parameters of the X-axis.

Figure. 15   - X-axis Range

By clicking the orange icon in the middle left corner, the user can set the parameters of the Y-axis.
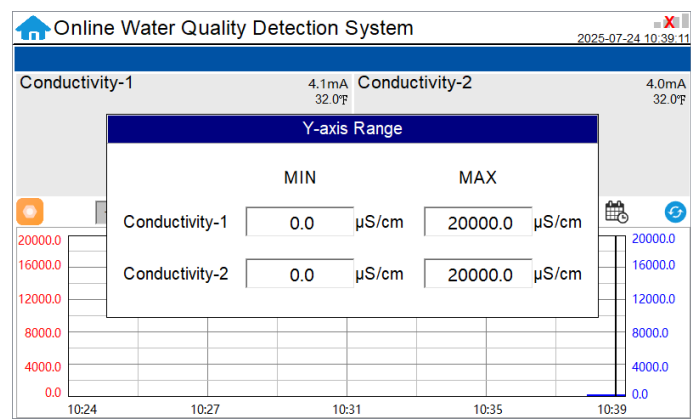

Figure. 16 - Y-axis Range

4.4.　Menu Bar

Click the button in the upper left corner of the screen to enter the system's menu interface, where the user can select to enter the desired operation interface.
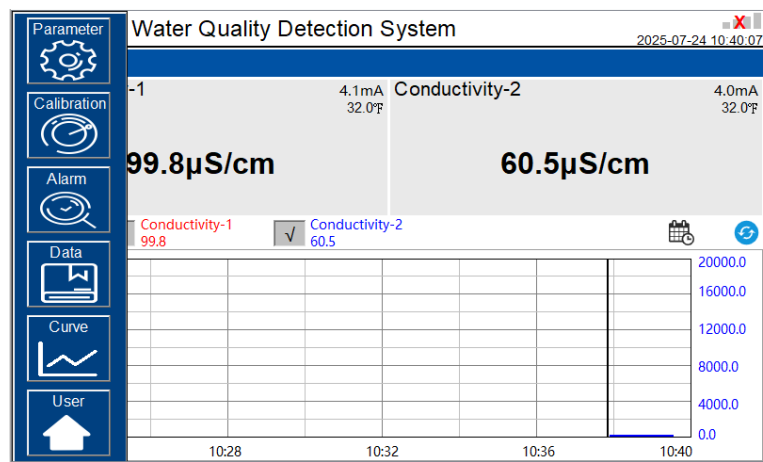

Figure. 17 - Menu Bar

4.5. Configurable Parameters

Click the **"Parameter"** button in the menu bar. Here you can select a list of options to include enter **Alarm Parameters** / **User Definition** / **Information Service** / **4-20mA Output** and **Comm Setup**.
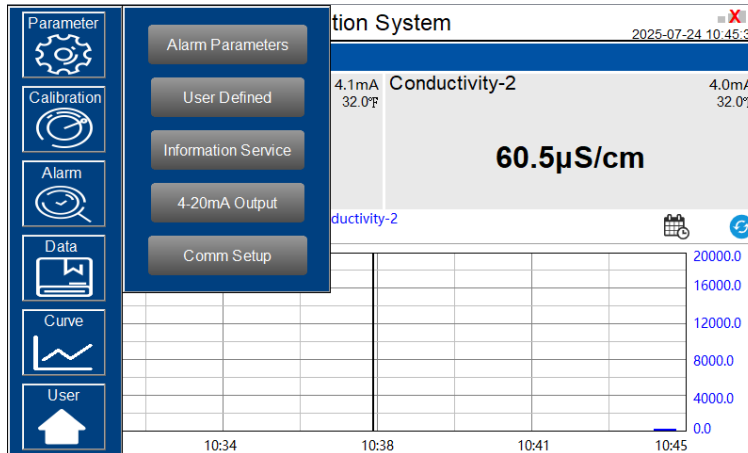

Figure. 18 - Parameter

4.5.1. Alarm Parameters Setting

Users can set the upper and lower alarm limits. Click "Alarm Parameters" to enter the alarm parameter settings. When the measured sensor value is lower than the set lower limit (the XX lower limit alarm) or when the measured value is higher than the set upper limit (the XX upper limit alarm), the corresponding sensor alarm will be displayed on the real-time monitoring screen. The user can also choose to turn the alarm display on or off at the top right of the corresponding parameter list.
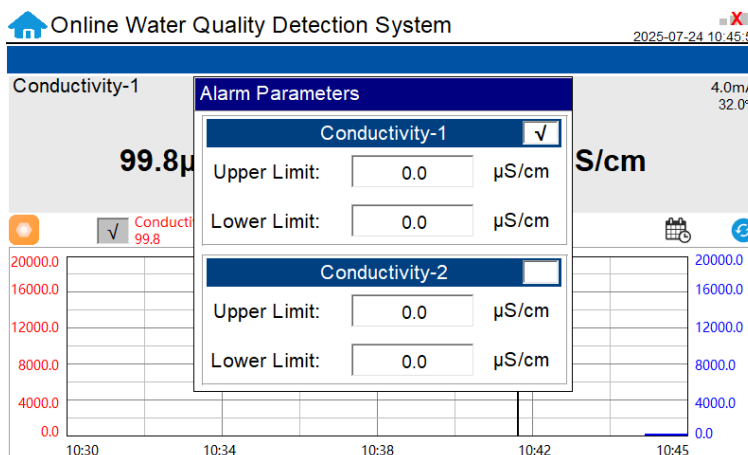

Figure. 19 - Alarm Parameter Setting

4.5.2. User Definition

Click the **"User Defined"** button in the menu bar. Here you can select a list of options to include enter **Name Definition** and **Unit Switching**.
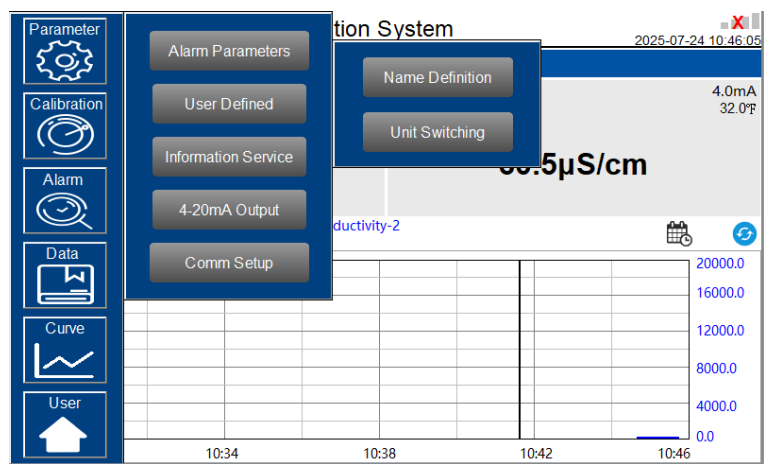

Figure. 20 - User Definition

Name Definition

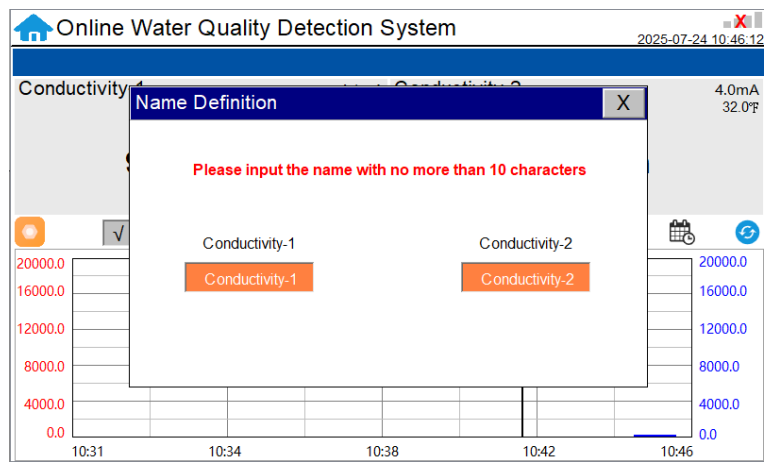Click the orange dialog box to customize the sensor name.

Figure. 21 - Name Definition

Unit of Measure Switching

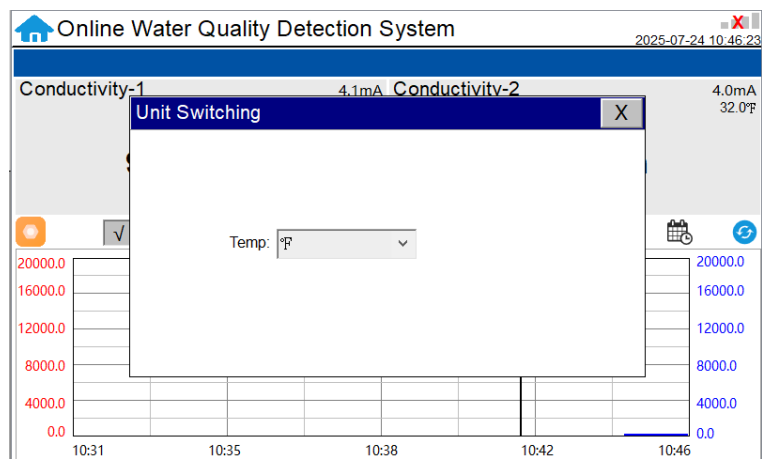Users can change the unit of temperature and flow rate in **"Unit Switching"**.

Figure. 22 – Unit Switching

4.5.3.   Information Service

Clicking on **"Information Service "** opens a sub-menu for **Diagnostic Parameters** , **IO Monitoring** , **Terminal Definition** and **IoT info**.
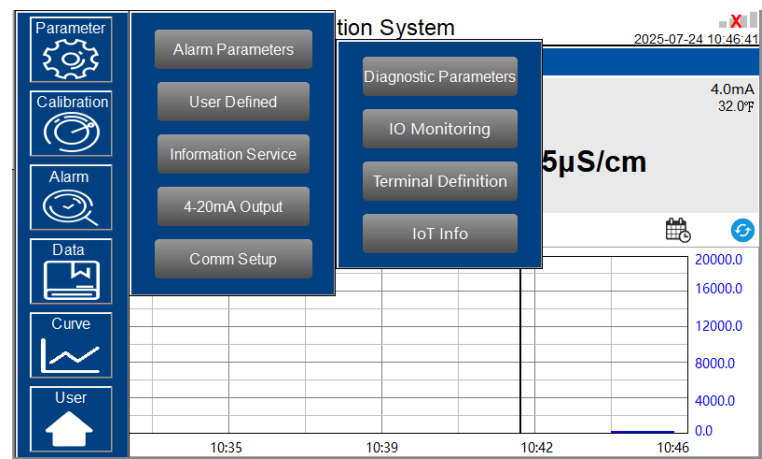

Figure. 23 - Information Service

Diagnostic Parameters

Click "Diagnosis Parameters" to the diagnosis page. In the diagnosis page, the raw data measured by the probe is displayed. To help troubleshooting possible issues with the probe, please save an image of this data when the probe is placed in a clean water (tap water or deionized water), in a standard, and in the sample that the probe is intended for.
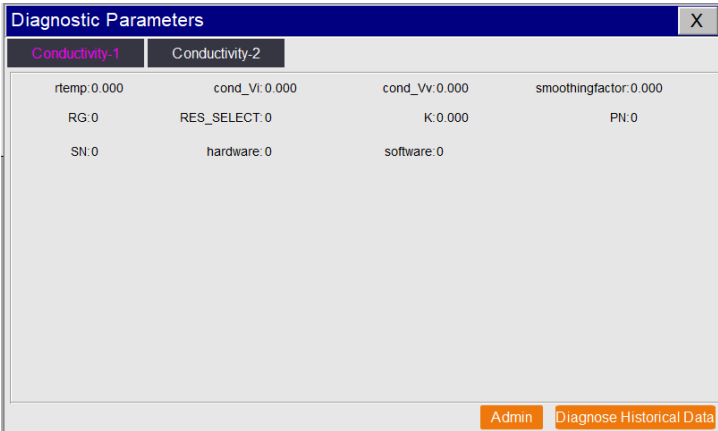

Figure. 24 - Diagnostic Parameters

Click on **"Diagnostic History Data"** in the lower right corner to access to view previous diagnostic parameters. Data can also be exported and made available for support from the Pyxis Lab Service Department.
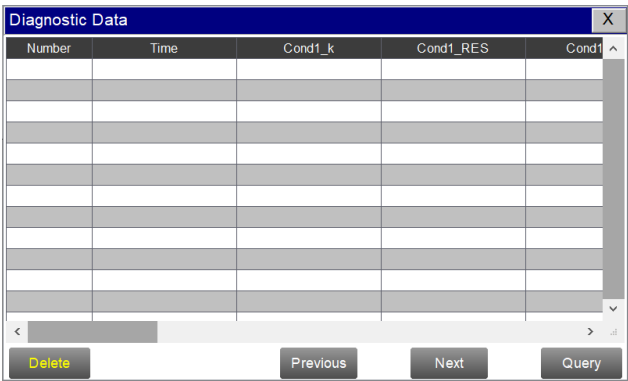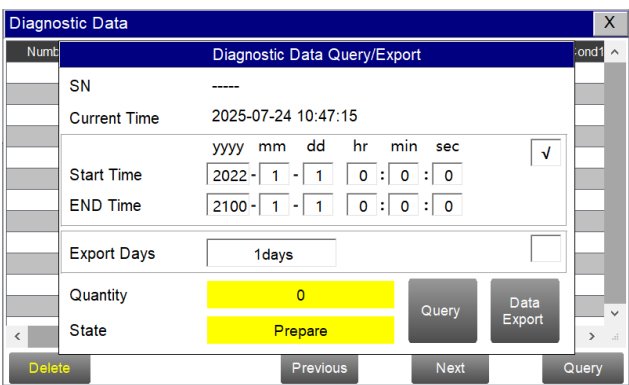

Figure. 25 - Diagnostic History Data

Figure. 26 - Diagnostic History Data Query

IO Monitoring

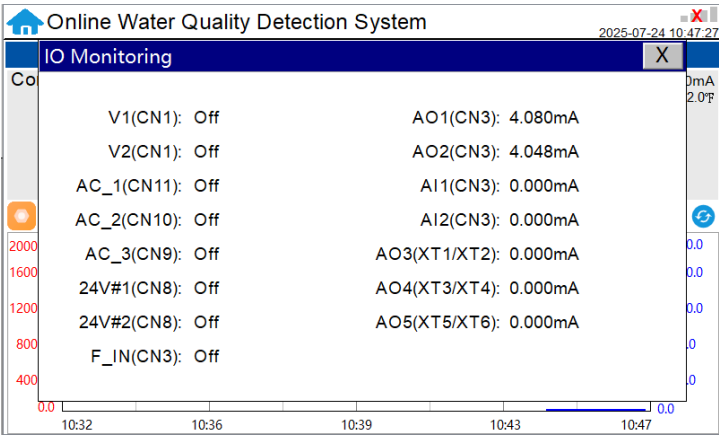This interface enables users to monitor the operational status associated with the IO ports.

Figure. 27 - IO Monitoring

The corresponding table of names and parameters is presented below.

Name	Parameter
AO1	Conductivity-1
AO2	Conductivity-2

Terminal Definition

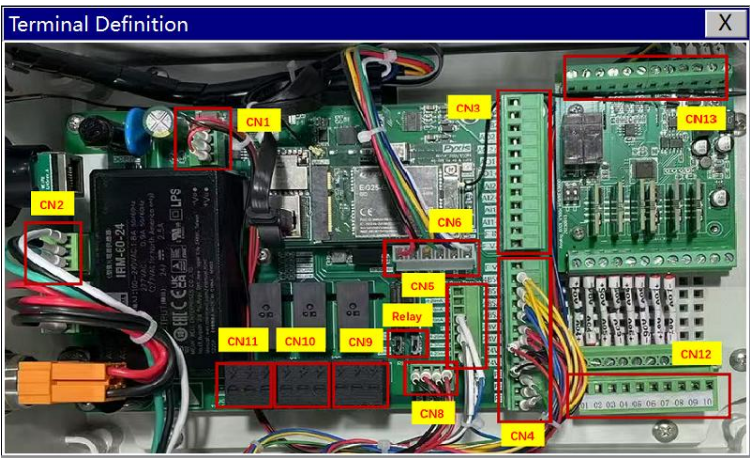This interface shows the terminal definitions of the terminal block.

Figure. 28 - Terminal Definition

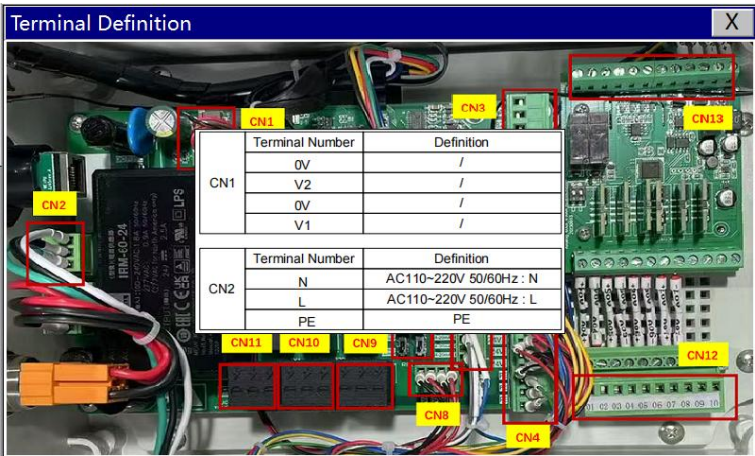Clicking on the corresponding position can display the table defined by the corresponding terminal block.

Figure. 29 - Terminal Definition Detail Diagram

Internet of Things (IoT) Information

This interface displays information related to the 4G gateway and the status of the connection. *NOTE* *For activation of the global SIM Card within the 4G gateway, please contact service@pyxis-lab.com with the serial # of the UC-80-PLUS. An annual enrollment and data fee applies.*
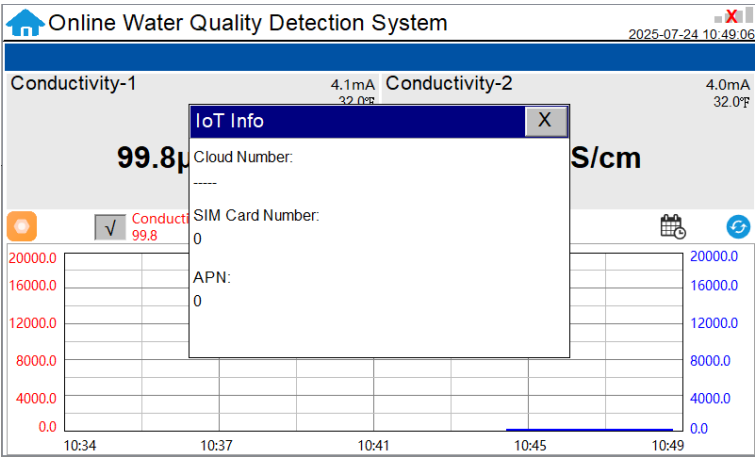

Figure. 30 - IoT Info

4.5.4. 4-20mA Output

Click "4-20mA Output " to enter the 4-20mA output parameter setting interface. The 4mA and 20mA output values should corresponds to the lower and upper limits of the sensor range. *NOTE* *The closer the value is set to the measurement value the more accurate the data. It is recommended to set according to the range of the sensor.*
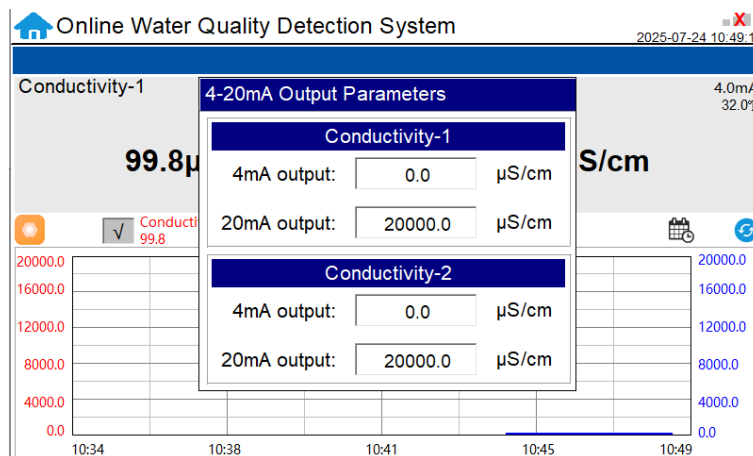

Figure. 31 - 4-20mA Output Setting

4.5.5. Modbus Comm Setup

Clicking on **"Comm Setup "** opens a sub-menu for **Modbus RTU** , **Modbus TCP**.
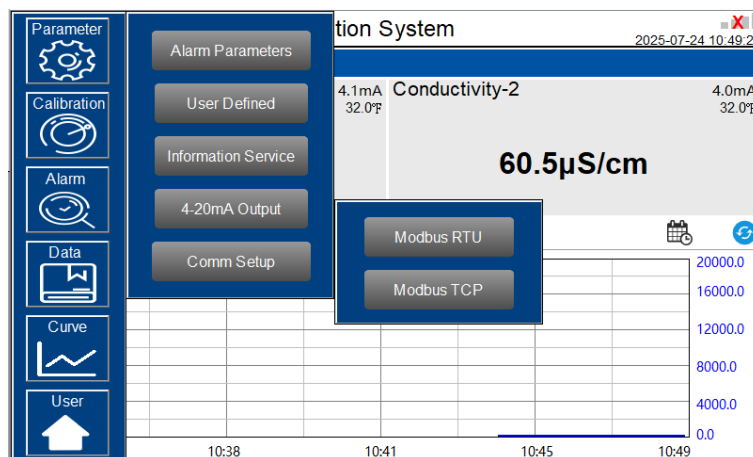

Figure. 32 - Comm Setup Setting

Modbus RTU and Modbus TCP

Communication parameters generally do not need to be changed. If the communication station number and other parameters need to be changed on site, they can be changed on this interface.
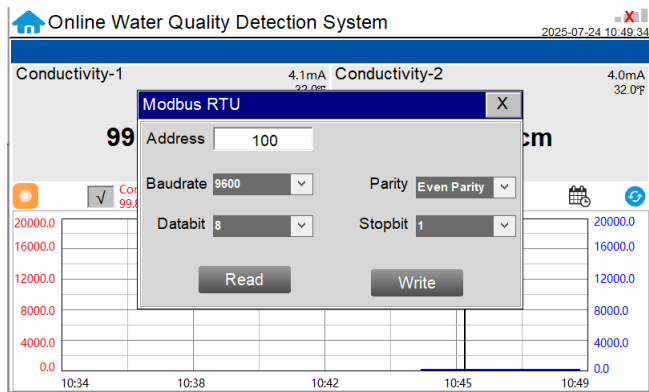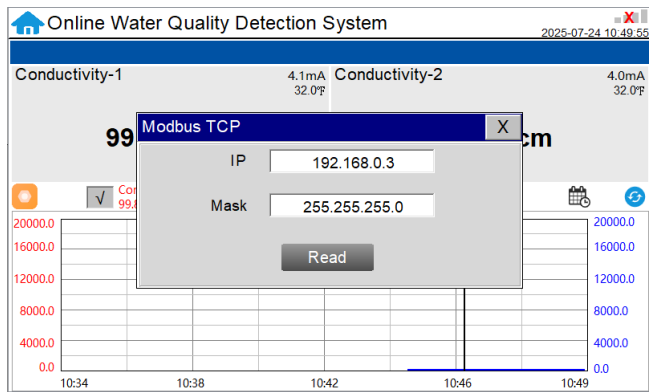

Figure. 33 - Modbus RTU

Figure. 34 - Modbus TCP

4.6.   Calibration

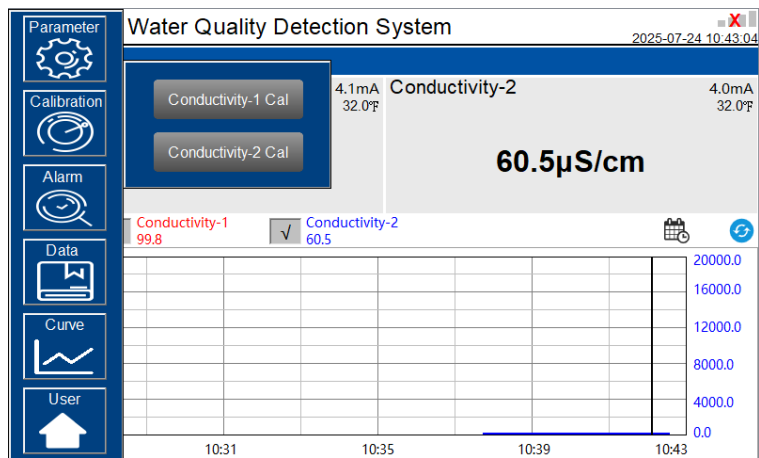Click on the "Calibration" button in the menu bar and select the sensor to be calibrated.

Figure. 35 - Sensor Calibration

4.6.1.   Conductivity Calibration

The calibration procedure is the same for both conductivity sensors. The user should select the corresponding sensor for calibration.

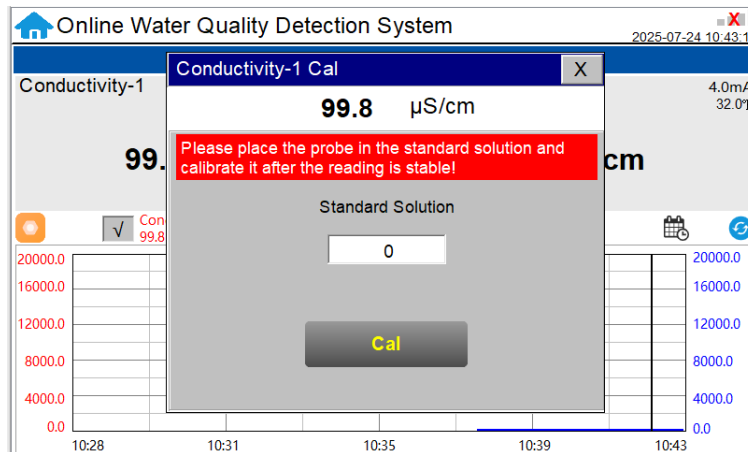Figure. 36 - Conductivity Calibration

The conductivity sensor only needs to be calibrated once, put the sensor into the standard solution with known standard solution value, enter the standard solution value in the interface, then click calibration, wait for the calibration completion prompt to pop up, which means the calibration is successful.
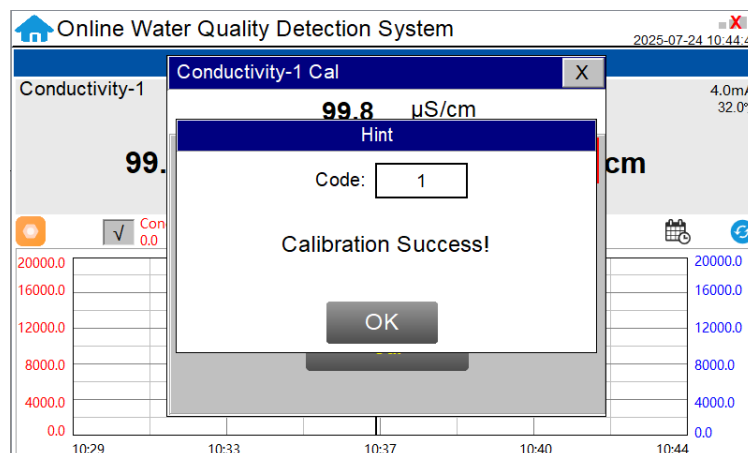

Figure. 37 - Conductivity Calibration Success

4.7.   Alarm

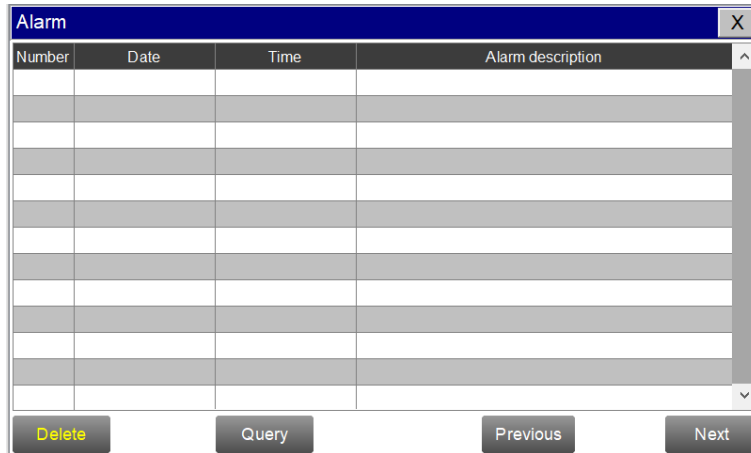Click the "Alarm" button on the main screen to enter the alarm view screen.

Figure. 38 - Alarm View

In this screen users can browse all logged alarms. Drag the right scroll bar up and down to view the history of alarms. Click "Previous" and "Next" to advance to the next page. Click "Query" then enter the alarm number in the pop-up box to query that alarm.
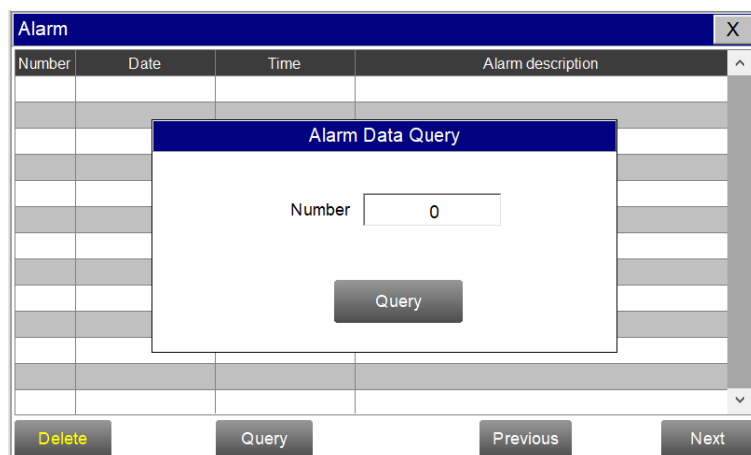

Figure. 39 - Alarm Data Query Screen

The Delete button in the lower left corner will delete all alarm records. After clicking delete, you must exit the screen and reenter before the historical data within the data report will be cleared.

4.8.　Data

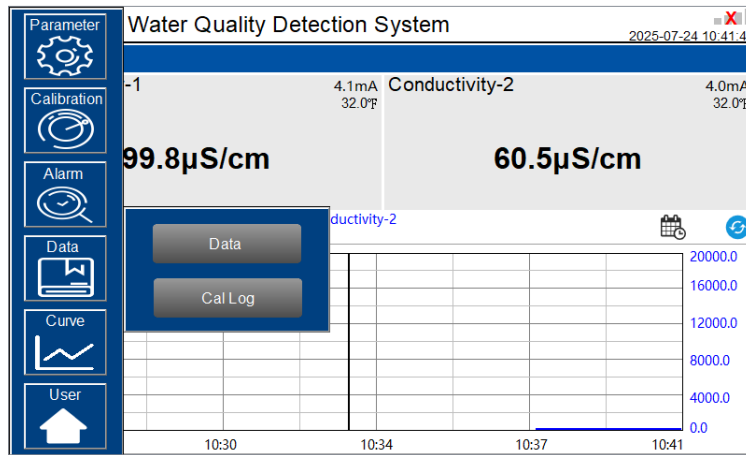Click on **"Data"** to view historical data and calibration logs.

Figure. 40 - Data

4.8.1.　Historical Data

Click the "Data" button in the menu bar to enter the data report interface.

Figure. 41 - Historical Data Screen

In the data report, the user can view the stored data of all parameters. The system records sensor readings every 4 seconds by default but this can be edited by the user if desired. Drag the scroll bar on the right to slide up or down or click "Previous" and "Next" to view historical data records. The data record can save up to 100,000 data entries. New data will overwrite the previously saved data after recording 100,000 data entries. The user can click the "Periodicity" button to change the data recording time interval.

Figure. 42 - Data Storage Cycle Time Setting

Figure. 43 - History Data Deletion Screen

Click "Delete" in the lower left corner. After entering the retention time, click the "Delete" button to clear all historical data within the retention time range.

Click the "Query"button in the lower right corner, enter the start time and end time and then click the "Query" button. *NOTE* *that the start time and end time must be filled in exactly and completely according to the system time format.*

Figure. 44 - Historical Data Query and Export Screen

Insert a clean(no saved files) FAT-32 Format USB disk behind the display screen and enter the time range of the data to be exported in the query area. Click on the "Data Export" to download the data to the USB disk. The data quantity will be shown as a positive number if data export is successful. If the data export was not successful, please check whether the time format is correct.

4.8.2. Calibration Log

The calibration log can be viewed in the calibration log interface, and when the export operation is performed, the diagnostic parameters, historical data, and calibration log will be exported simultaneously.
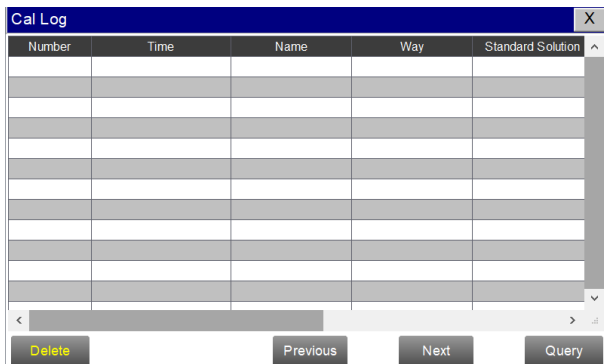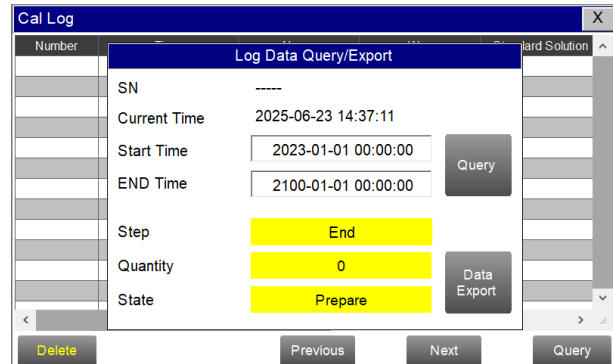

Figure. 45 - Calibration Log

Figure. 46 - Calibration Log Query/Export

4.9. Curve

Click the "Curve" button in the menu bar to enter the trend curve interface. You can click the buttons below the X-axis to browse and view the values in a different time range. Click on Y-axis Range to change the minimum and maximum Y-axis values for a proper range.
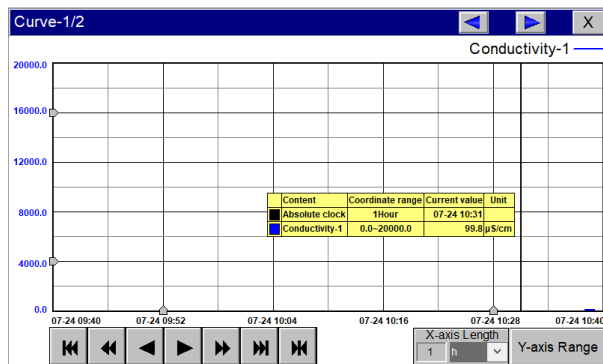
Figure. 47 - History Curve Screen
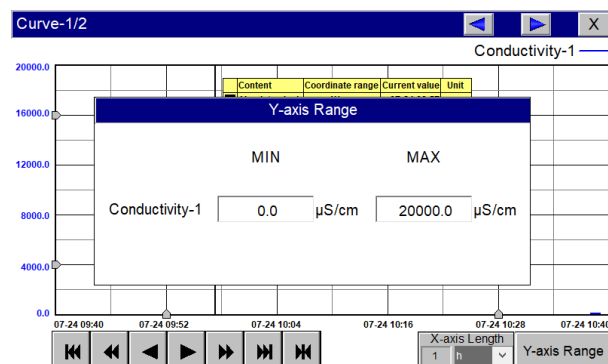
Figure. 48 - Y-axis Range Setting

The curve will scroll back (to the left of the X-axis) one page

The curve will scroll back (to the left of the X-axis) half the page of the curve

The curve will scroll backward (to the left of the X-axis) to a position where the main line is drawn

The curve will scroll forward (to the right of the X-axis) to a position where the main line is drawn

The curve will scroll forward (to the right of the X-axis) half the page of the curve

The curve will scroll forward (to the right of the X-axis) one page

A dialog box will pop up to reset the starting time of the curve

Figure. 49 - Button Function Review

4.10. User

Click the "**User** " button on the menu bar and then you can select "**Login**", "**Logout**" and "**Manage**" operations.
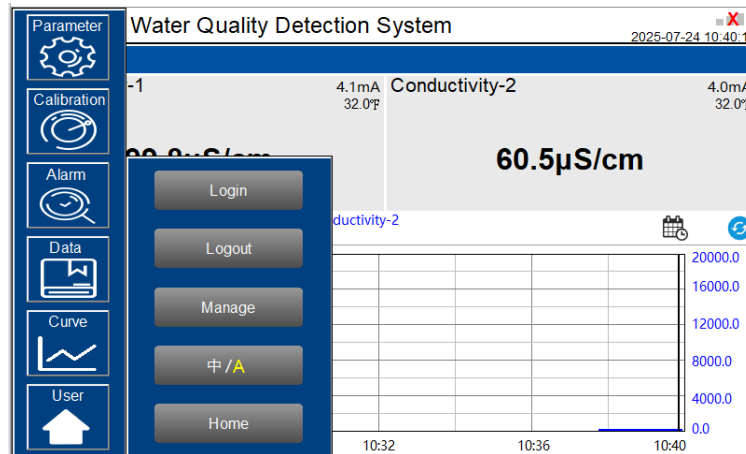

Figure. 50 - User Management

Logout enables the user to log out of the logged-in state and only view the real-time readings, but cannot perform operations such as parameter settings. Click "Manage" to enter the user management interface, where you can add users, change passwords and other operations. Users can set their own user name and password and select the user group they belong to. Only users in the administrator group can set parameters such as calibration.
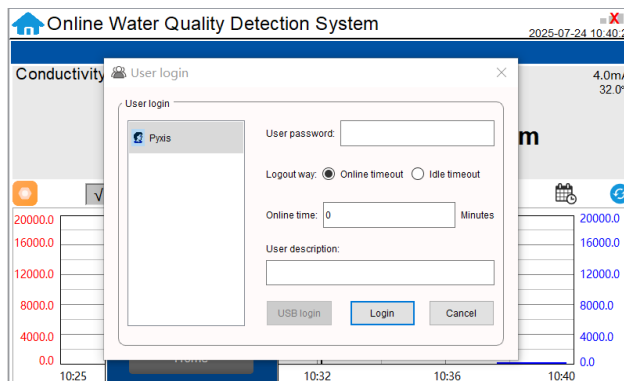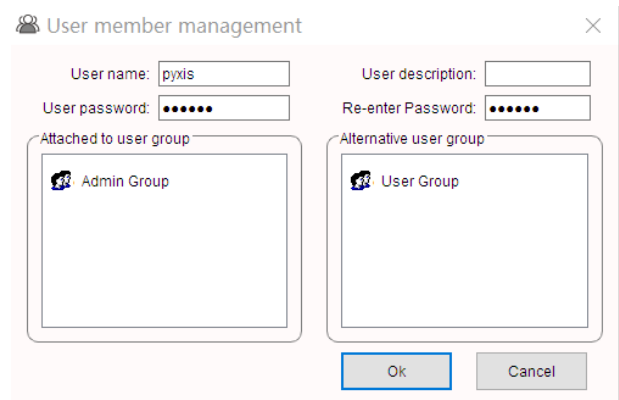

Figure. 51 - User Management Screen

Figure. 52 - Modifying the User Screen

ModifyPassword: Select the user you want to change, then click Modify User button, enter the user's own password in the User Password column and Confirm Password column, and click Confirm to modify successfully. *NOTE* *If you do not want to set the password, you can delete the password and save it.*

5. Modbus Register Table & Analyzer Maintenance

5.1. Modbus Correspondence Address

Number	Definition	Address	Format	Mode	Unit	Note
1	Conductivity_1	1	float	read only	μS/cm	Data format ABCD
2	Conductivity_2	3	float	read only	μS/cm	
3	Temp_Cond1	5	float	read only	°C/°F	
4	Temp_Cond2	7	float	read only	°C/°F	
5	Conductivity_1 upper limit alarm	9	uint	read only		0: Normal 1: Alarm
6	Conductivity_1 lower limit alarm	10	uint	read only		
7	Conductivity_2 upper limit alarm	11	uint	read only		
8	Conductivity_2 lower limit alarm	12	uint	read only		
9	Conductivity_1 sensor communication is abnormal	13	uint	read only		
10	Conductivity_2 sensor communication is abnormal	14	uint	read only		
11	The analog module communication is abnormal	15	uint	read only		
12	The relay module communication is abnormal	16	uint	read only		
13	The control output module communication is abnormal	17	uint	read only		
14	The analog module communication is abnormal_2	18	uint	read only		
15	The digital Input Acquisition Module communication is abnormal	19	uint	read only		
Communication protocol: standard Modbus-RTU						
Communication parameters: baud rate -9600, data bit -8, stop bit -1, parity bit - even						
Station number: 100						
Communication protocol: standard Modbus-TCP						
Communication parameters: IP: 192.168.0.3 (can be set); port: 502						
Station number: 1						

Table 1 - Correspondence Address

6. Contact Pyxis Lab

21242 Spell Circle
Tomball, TX. 77375
service@pyxis-lab.com for technical service and support
order@pyxis-lab.com for order and pricing inquires
1-866-203-8397 Phone USA for all needs
Office Hours 7AM – 5PM Central Time USA