Pyxis®

UC-100A Display & Data Logging Terminal

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CUSTOM MANUAL

General Information

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. Revised editions are found on the manufacturer's website.

Safety Information

Please read this entire manual before unpacking, setting up or operating this equipment. Pay attention to all danger, warning and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.

To 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.

Use of Hazard Information

 **DANGER**
Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING**
Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION**
Indicates a potentially hazardous situation that may result in minor or moderate injury.

NOTICE
Indicates a situation which, if not avoided, may cause damage to the instrument. Information that requires special emphasis.

	This symbol, if noted on the instrument, refers to the instruction manual for operation and/or safety information.
	This symbol, when noted on a product enclosure or barrier, indicates that a risk of electrical shock and/or electrocution exists.
	Delicate internal electronic components can be damaged by static electricity, resulting in degraded performance or eventual failure.
	Electrical equipment marked with this symbol may not be disposed of in European public disposal systems after 12 August of 2005. In conformity with European local and national regulations (EU Directive 2002/98/EC), European electrical equipment users must now return old or end-of-life equipment to the Producer for disposal at no charge to the user.

Catalog

1. Specifications

Items	LT-737B
Part Number	53224
Turbidity Range	0.001–5.000
Accuracy Using FR-100	±0.005 NTU or ±1%
Accuracy Using FT-100	±0.01 NTU or ±1%
Resolution Using FR-100	±0.001 NTU or ±0.5%
Resolution Using FT-100	±0.002 NTU or ±1%
Light Source (LED)	850 nm
Compliance	ISO-7027
Calibration	Pyxis Solid State Calibration Kit for Repeatable Liquid-Less Calibration, Pyxis Formazin Standards & Dry Secondary Zero Standard for Field Cal = 0.01 Repeatability, Pyxis Lab Factory Ultra-Pure Calibration Services = 0.001 Repeatability
Calibration Stability	<0.01 NTU/year drift
Outputs	4–20mA Analog Output, RS-485 Digital Output with Modbus protoco
Power Supply	22–26 VDC, 1.5 W
Dimension (L × Dia)	7.4 × 1.44 inch (189 × 36 mm)
Material	304 Stainless Steel
Operational Temperature	33.8–131°F (1–50 °C)
Enclosure Rating	IP67
Regulation	CE

Items	ST-730
P/N	53201
ORP Range	0-100NTU
Measuring accuracy	±0.5NTU or ±2%fs takes the largest
Resolution	±0.1NTU
Operating voltage	22-26 VDC, power ~1W
Signal output	4-20mA analog output /RS-485 digital output
Working pressure	≤6.9Bar (100psi)
Operating temperature	0~50℃(32~104℉)
Storage temperature	-20~60℃(-4~140℉)
Probe material	CPVC; Detection channel: optical quartz tube
Probe size	L172.7mm×Ø36.6mm
Probe weight	170g (0.37lbs)
Mounting method	3/4 "by tee mounting kit, socket or NPT thread connection
Protection level	IP67
Product certification	CE, RoHS
Warranty period	1 year

Item	UC-100A
P/N	43054
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
USB	1 x USB host, for data downloading and screen upgrade
Internet	RJ-45 socket, Modbus-TCP
Rating	IP-65 Panel-Display
Relative Humidity	20% - 90% (No Condensation)
Altitude	<6,561 feet (<2,000 Meter)
Dimensions (HxWxD)	(UC-100A) 280H x 380W x 200D mm
Weight	UC-100A ~ 5 kg

2. UC-100A Installation and Connection

2.1. UC-100A Installation requirements

Power supply: 100~240V AC 50/60Hz all the way;

Equipment installation: on-site wall-mounted installation of monitoring device;flatness of wall surface is less than 0.5cm/m^2;

Equipment weight: 5kg, fixed by expansion screws on the wall;

At least 0.5m operation space is reserved around the equipment installation;

3G/4G network signal: The 3G/4G network signal in the equipment installation area is normal, and the mobile phone on site can receive calls and surf the Internet normally.

2.2. UC-100A & Inline Sensor Equipment installation

It is recommended that the UC-100A be installed on a solid wall for easy installation and maintenance. Punch holes and prepare expansion screws before installation.The dimensions given may vary slightly depending on the location of the installation.

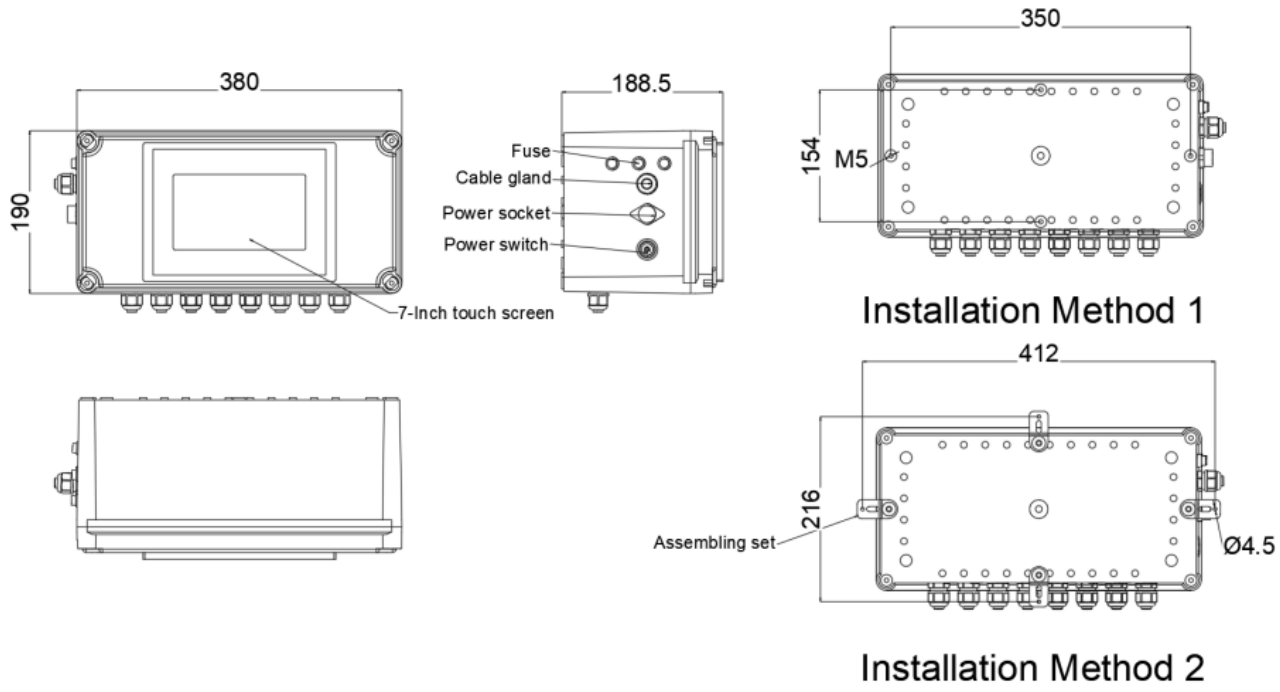


Figure. 1 UC-100A Installation Dimensions

2.3. UC-100A Electrical Connection

Users of online detection analyzer equipment only need to plug the power plug into a power socket of 100~240V AC 50/60Hz, and they can operate normally. The enlarged drawing can be seen in the attachment.

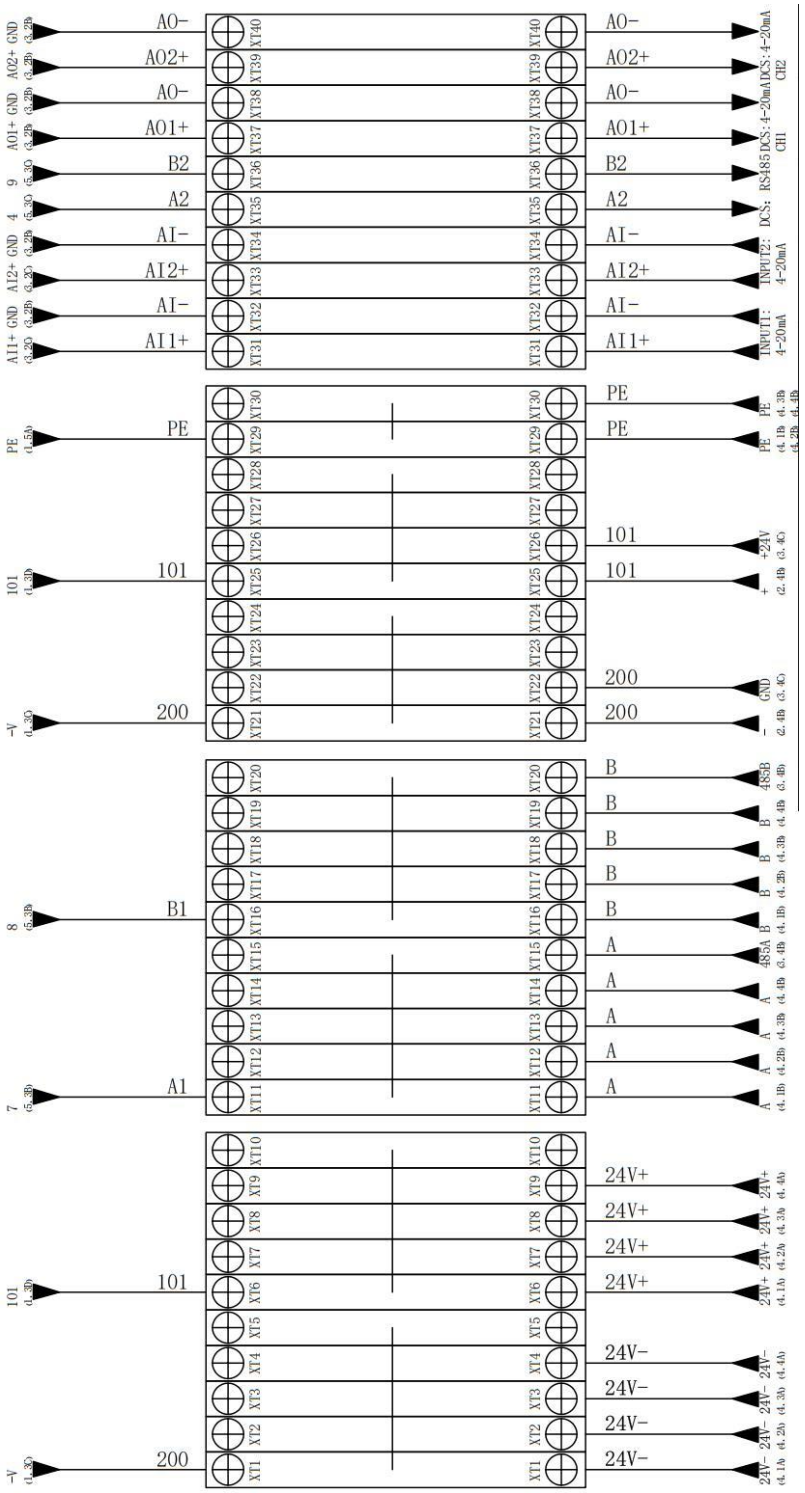


Figure. 2 UC-100A Terminal Board

3. UC-100A Touch Screen Operation

3.1. Initial screen

After the system is powered on, the screen will open the initial screen, where the user can select the user to log in or enter the system.

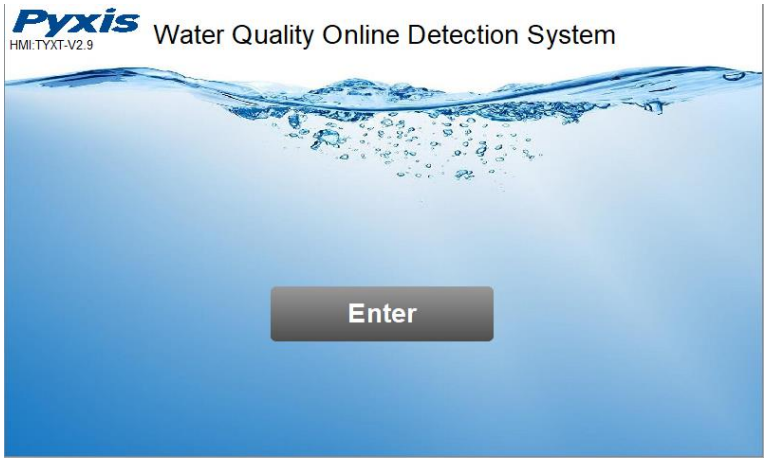


Figure. 3 Main Interface

3.2. User Login

After booting, the user needs to log in with the user name and password, otherwise they can only view the reading on the main interface, and cannot perform instrument parameter setting and calibration. Click the "User Login" button, a prompt box pops up: select the user **"pyxis"**, enter the password: **"888888"** in the user password field.

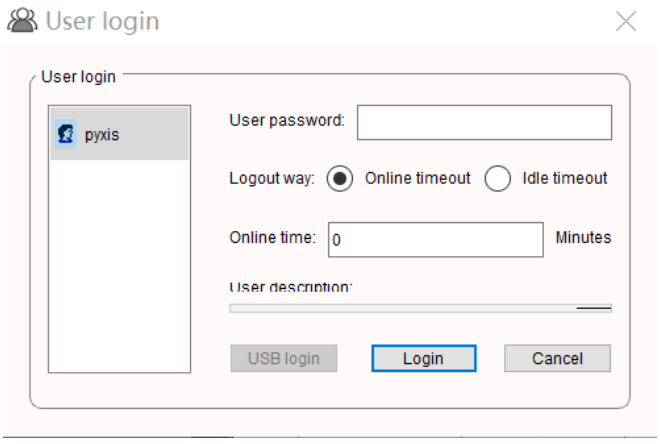


Figure. 4 User Login Interface

If you don't need a password or want to change the user, you can enter the system and perform **"Management"** in the **"User Management"** interface of the menu.

3.3. Real-time Monitorin

Click the **"Enter System"** button on the main interface to enter the real-time monitoring screen of the system, where the data detected by the sensor will be displayed in real time.

The default turbidity is LT-737B and turbidity-2 is ST-730.

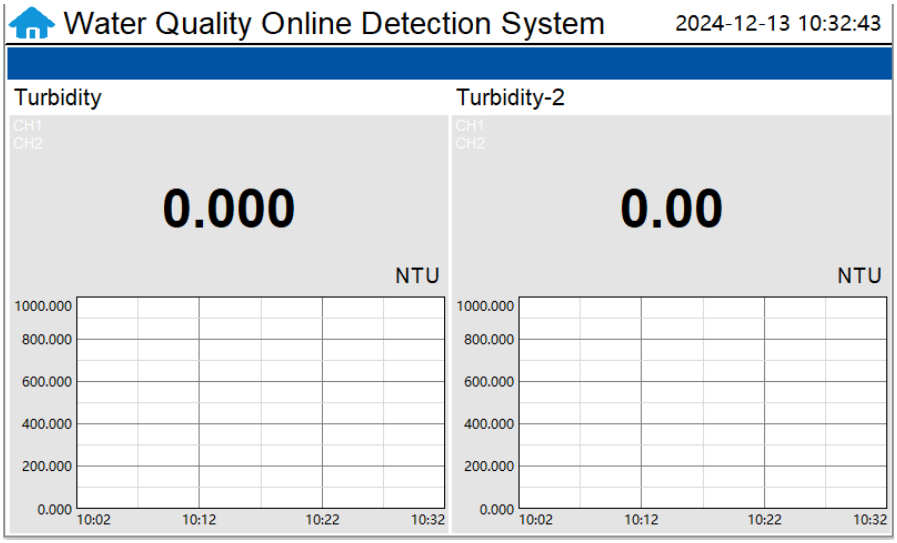


Figure. 5 Real-time Monitoring Screen

3.4. Menu Bar

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

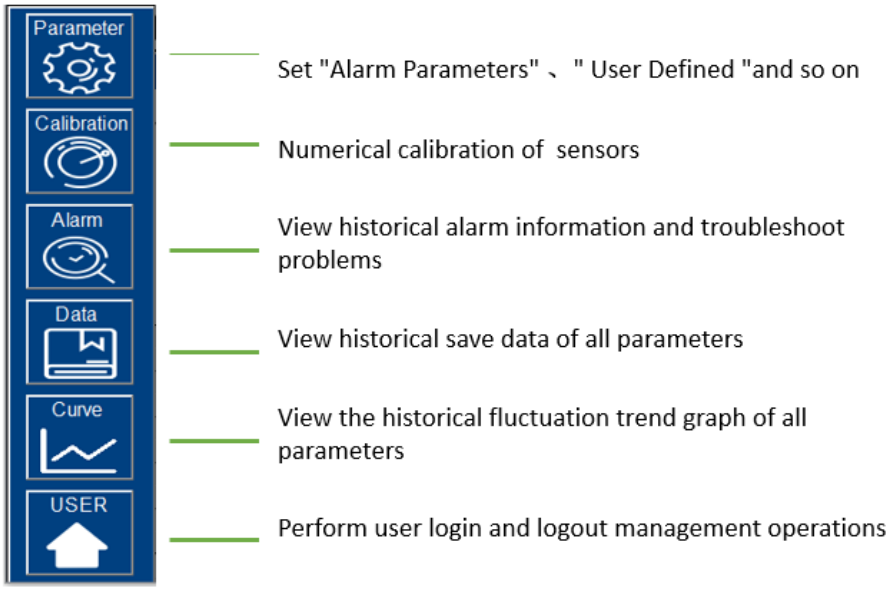


Figure. 6 Menu Bar

3.5. Parameter Setting

Click the **"Parameter"** button in the menu bar, you can choose to enter the **"Alarm Parameters"** and **“4-20mA Output”** setting interface:

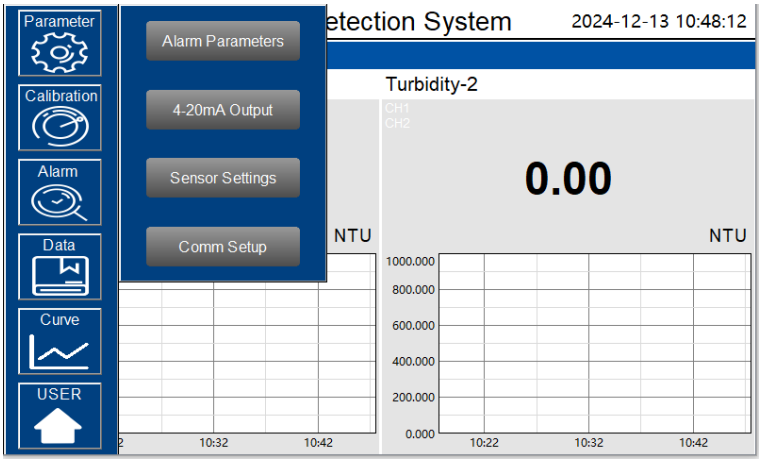


Figure. 7 Parameter Settings

3.5.1. Alarm Parameters

When the online user has the right to operate the instrument, the upper and lower limits of alarm can be set. Click **"Alarm Parameters"** to enter the interface of setting alarm parameters. When the measured value is lower than the set lower limit, the "**** lower limit alarm" of the corresponding sensor will be displayed in the real-time monitoring screen; when the measured value is higher than th e set upper limit, the "**** upper limit alarm" of the corresponding sensor will be displayed in the real-time monitoring screen. Users can also choose to turn on or off the alarm display function at the top of the corresponding parameter.

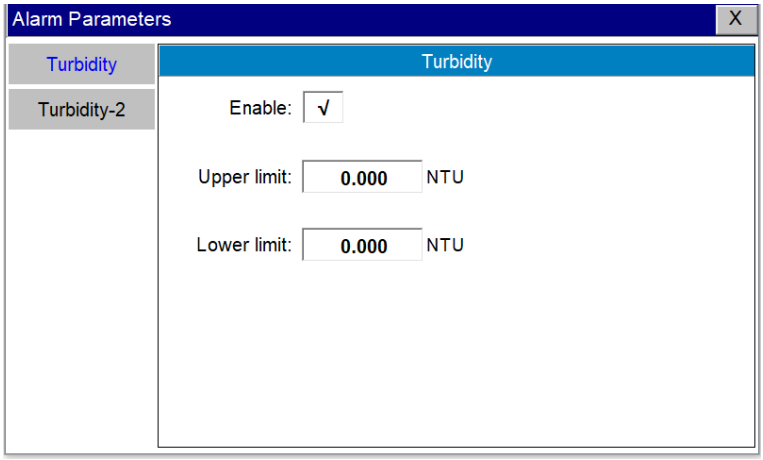


Figure. 8 Alarm Parameter Settings

3.5.2. 4-20mA parameter

Click "4-20mA parameter" to enter the 4-20mA parameter setting interface. The 4mA output value corresponds to the lower limit of the sensor range value, and the 20mA output value corresponds to the upper limit of the range value. The closer the value setting is to the measured value, the more accurate it is recommended to set according to the sensor range.

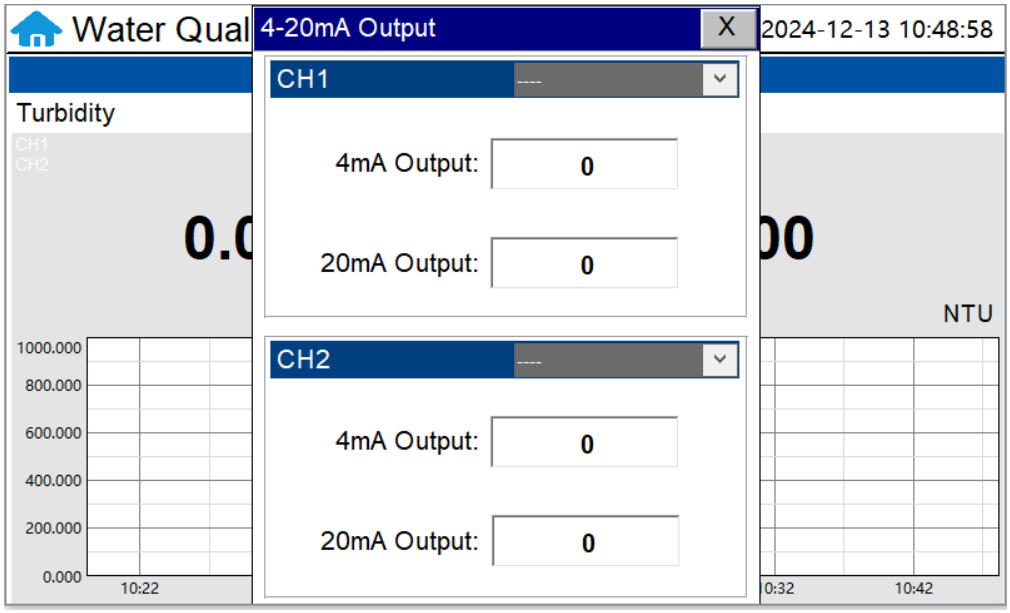


Figure. 9 4-20mA setting

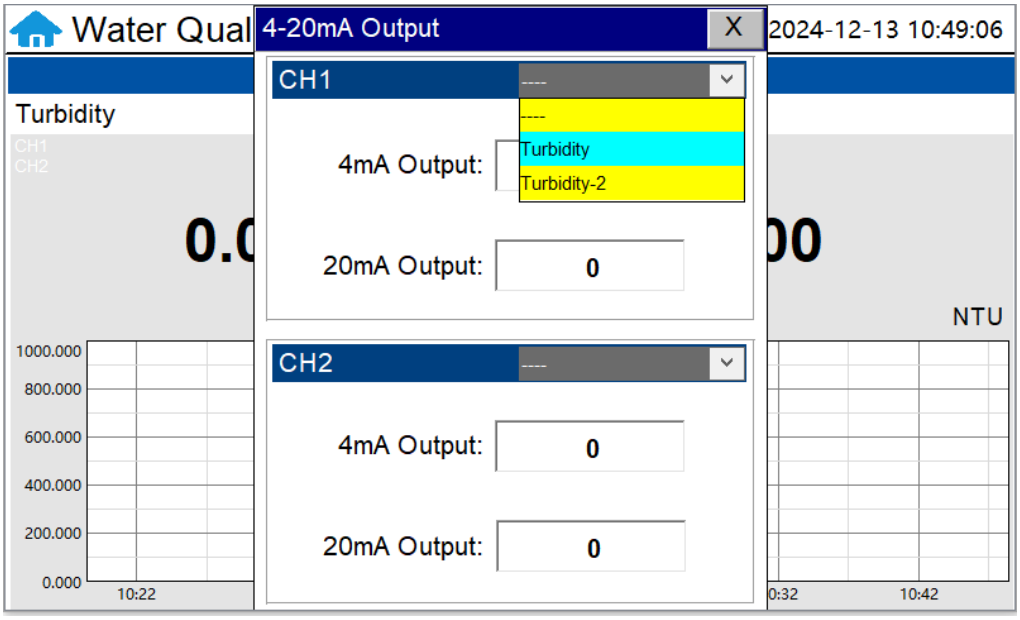


Figure. 10 4-20mA setting CH

3.5.3. Sensor Seettings

The Sensor Seettings screen allows you to select the sensor you want to configure, which is already set to LT-737B and ST-730 at the factory.

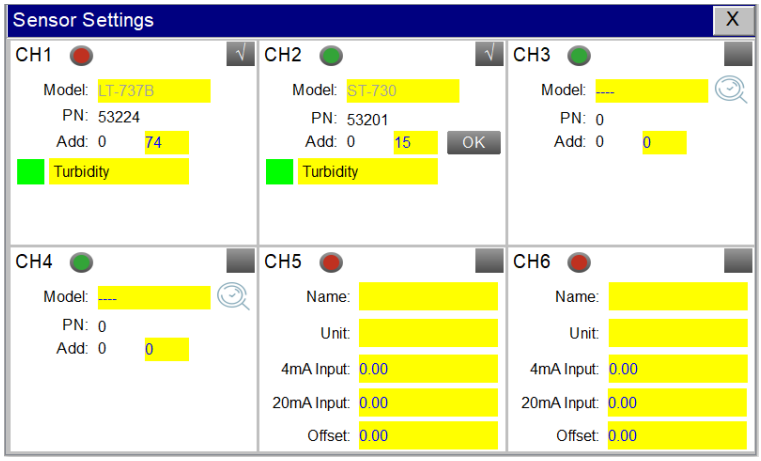


Figure. 11 Diagnostic Parameters

3.5.4. Communication (Modbus) Setup

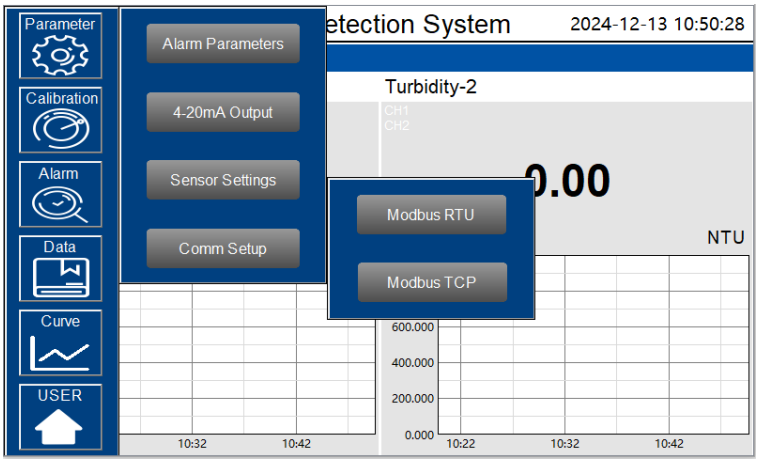


Figure. 12 Communication Setup for Modbus

The Modbus 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.

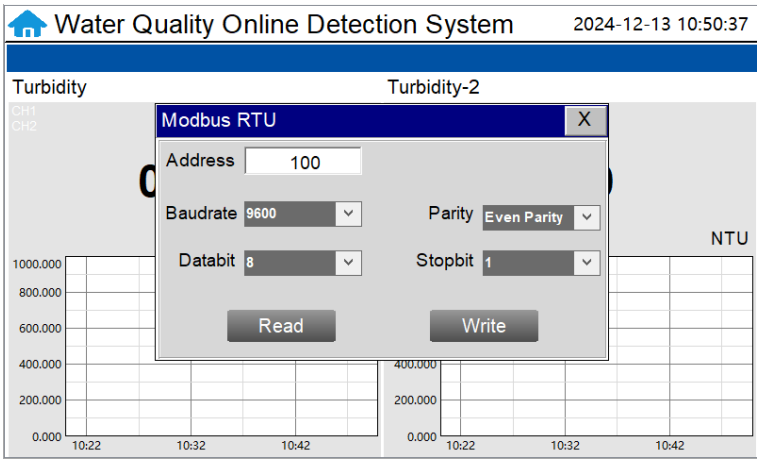


Figure. 13 Modbus RTU

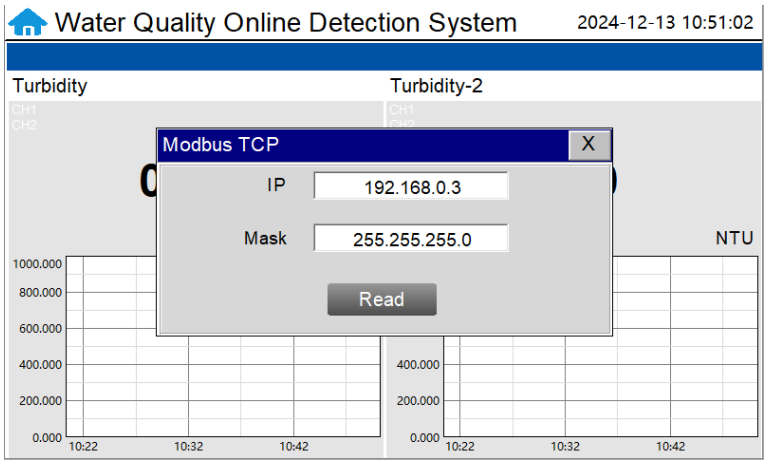


Figure. 14 Modbus TCP

3.6. Calibration

Click the **"Calibration"** button in the menu bar, and then select Calibration.

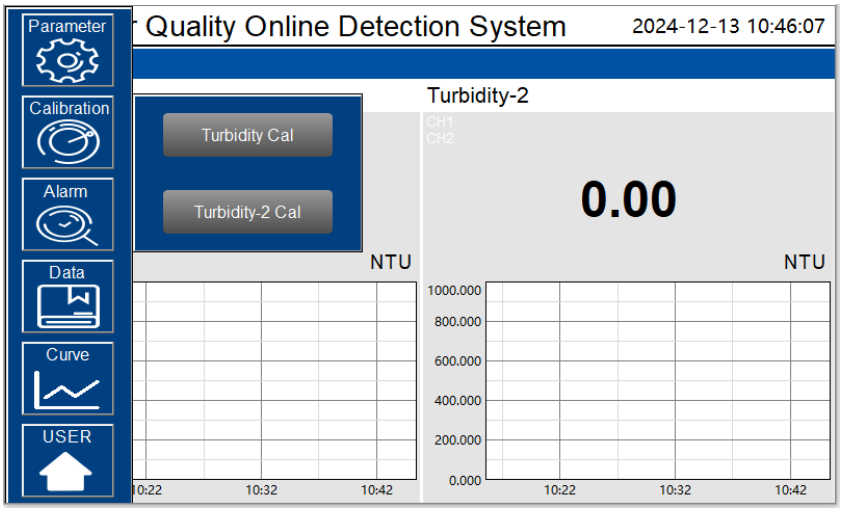


Figure. 15 Parameter Calibration

3.6.1. Turbidity Calibration using the L-CAL Portable Turbidity Calibration Kit-LT-737B

The LT-737B Ultra Low Turbidity Sensor is rigorously calibrated at the Pyxis Lab factory. If the sensor is kept clean, the user will not need to calibrate the sensor for one year of operation. However, the user may calibrate the sensor as desired.

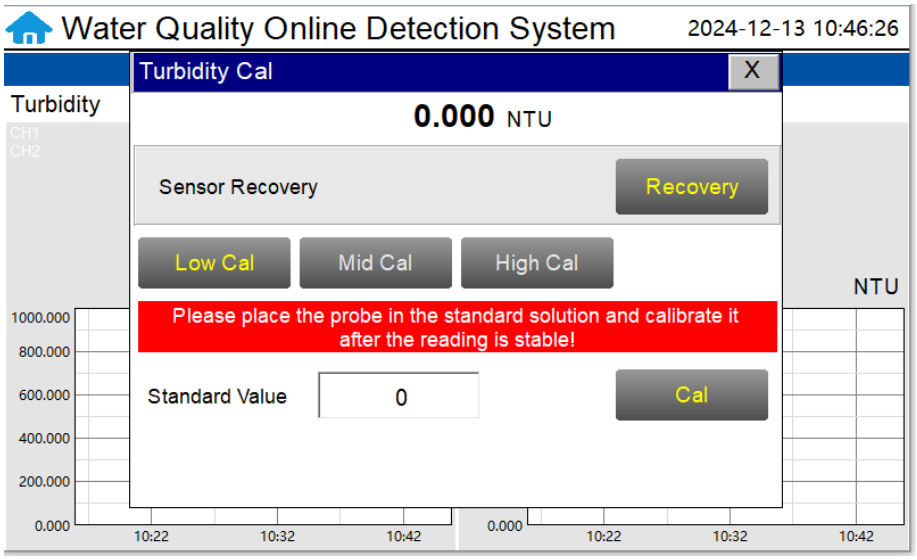


Figure. 16 - Turbidity Calibration Screen

Low-Range Calibration Procedure DI Water in the Pyxis L-CAL Portable Turbidity Calibration Kit:

Isolate the panel and drain the piping and inline Tee assemblies. Remove the LT-737B sensor from the flow tee. Triple rinse the LT-737B sensor surface, the flow tee internals and the L-CAL Portable Turbidity Calibration Kit (P/N 53247) vessel with Deionized water. Insert the cleaned LT-737B turbidity sensor into the L-CAL calibration vessel and positon the L-CAL vessel vertically. Remove the top cap and fill the L-CAL vessel with 500mL of bubble free deionized water. After the displayed turbidity data is stable, enter "0.05" for the low-range calibration value and click on "Low Range Calibration", a dialog box will pop up to confirm whether to perform this operation. Click "OK", if the calibration is successful, the dialog box will show "Calibration successful". ***NOTE*** Because there is no global standard for zero turbidity in the industry, Pyxis recommends 0.05 NTU as a target for Low-Point Calibration while using Bubble-Free DI Water.

Mid-Range Calibration using the L-CAL Portable Turbidity Calibration Kit:

After the low range calibration has been completed, rinse the L-CAL vessel with Deionized water and refill with 500mL of known turbidity standard solution between 1 NTU and 2 NTU for mid-range calibration. After the displayed data is stable, enter the medium turbidity standard solution value and click on "Mid Range Calibration", a dialog box will pop up to confirm whether to perform this operation. Click "OK", if the calibration is successful, the dialog box will show "Calibration successful".

High-Range Calibration using the L-CAL Portable Turbidity Calibration Kit:

If a high-range calibration is not required, the user does not need to perform a high-range calibration of the LT-737B series sensor. If a high calibration is required, proceed by rinsing the L-CAL vessel with deionized water and refill with known turbidity standard solution between 3 NTU and 5 NTU for high-range calibration. After the displayed data is stable, enter the high turbidity standard solution value and click on "High Range Calibration", a dialog box will pop up to confirm whether to perform this operation. Click "OK", if the calibration is successful, the dialog box will show "Calibration successful".

Troubleshooting Calibration Failed Messages

If you receive a “Calibration Fails” message during the calibration steps above, the following items should be checked:

1) Ensure your source of Deionized water is not contaminated with turbidity
2) Ensure your turbidity calibration standard solutions have not been contaminated
3) Esnure the LT-737B sensor distillate end is not contaminated with debris or other substances
4) Ensure the flow reservoir is not contaminated or circulation blocked by debris or other materials.

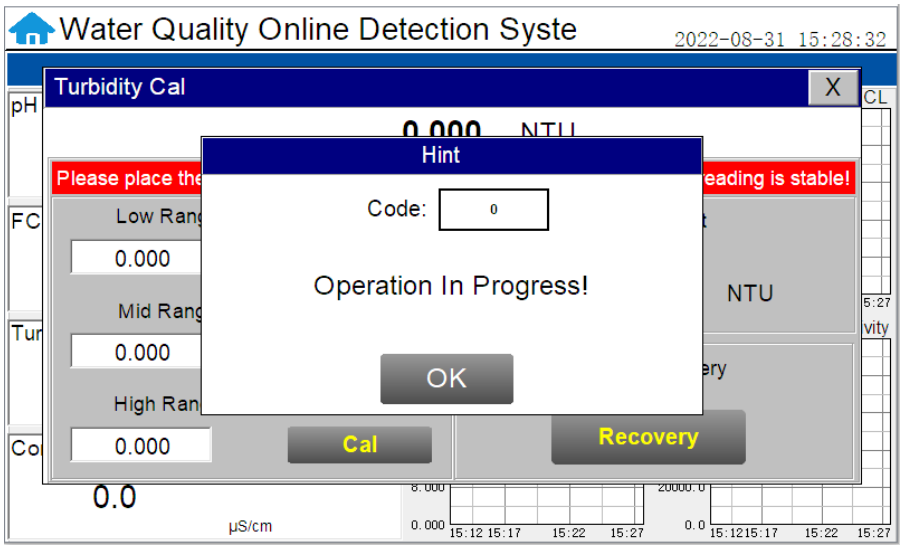


Figure. 17 - Awaiting execution Screen of Turbidity Calibration

LT-737B Calibration using L-CAL Portable Turbidity Calibration Kit

As an alternative to using the flow reservoir for LT-737B sensor calibration, Pyxis Lab has developed a portable and reusable liquid-state turbidity calibration kit for rapid calibration of the all LT-73X Series inline ultra-low turbidity sensors. The L-CAL calibration kit allows users to calibrate all LT-73X Series ultra-low turbidity sensors using smaller volumes of Formazin turbidity calibration standards providing an affordable and reusable solution for long term sensor reliability. The unique design of the L-CAL liquid calibration kit allows the LT-73X sensor to be easily inserted and calibrated with the sensor in a horizontal position, allowing air bubbles to be evacuated through the integrated air-vent line ensuring superior accuracy of the sensor calibration. The L-CAL has an easy to remove lid allowing users to fill and empty the calibration kit with DI water for vessel/sensor cleaning and Formazin calibration standards for sensor calibration.

L-CAL Liquid Turbidity Calibration Kit (P/N 53247)

Turbidity Calibration Principals & Considerations

The precision, resolution and the low detection limit of the LT-73X Series sensors are not affected by the calibration method, regardless of using certified Formazin standards and the L-CAL kit. The calibration only affects the turbidity sensor accuracy. The nature of turbidity measurement makes an absolute turbidity value not easily obtainable for any sensor manufacturer although proper standards and methods are followed. For example, turbidity values greater than 1.0 NTU measured on real-world samples with different sensors, even from the single manufacturer, could differ significantly. For ultra-low turbidity (less than 0.3 NTU) measurement using the same methods (ISO-7027 or EPA-180.1), it is likely that the values from different sensors can agree within 0.05 NTU. As such, the user should choose a calibration method and remain with the same calibration method for consistency.

L-CAL Specifications

Item	**L-CAL Portable Liquid Formazin Calibration Kit**
P/N	53247
Sensor Name	LT-737B
Calibration	**Recommended Calibration Standard Solution Range**
Low-Range (0.05NTU Recommended for Calibration)	Bubble Free DI Water or Sample <0.1 NTU
Mid-Range	1 – 2 NTU
High-Range	3– 5 NTU

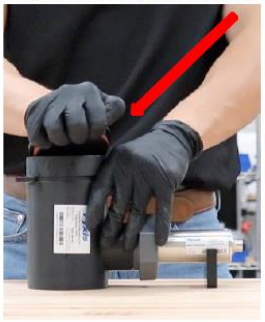
L-CAL Portable Liquid Formazin Calibration Kit Use Method

After removing the LT-73X sensor, gently wipe off the flat distal end with a soft cloth to ensure it is clean. The LT-73X Sensor should then be calibrated using the L-CAL portable liquid calibration kit using the following steps, and wirelessly calibrated via the uPyxis Mobile or Desktop APP. Please refer to LT-73X Series Operation Manual for details.

Insert LT-73X Sensor

Tighten Sensor Nut

Position Vertically and Remove Lid



Preclean by adding DI-Water (200mL)

Insert Lid

Gently Shake Then Empty Contents

Add Calibration Standard (500mL)

Insert Lid and Remove Air Bubble Vent Line Cap

FOLLOW CALIBRATION STEPS

NOTE *Sensor Brace Included with L-CAL Kit for Stability*

WATCH PROCEDURE VIDEO https://www.youtube.com/watch?v=1MuJM5Q5VB4

3.6.2. Turbidity Calibration -ST-730

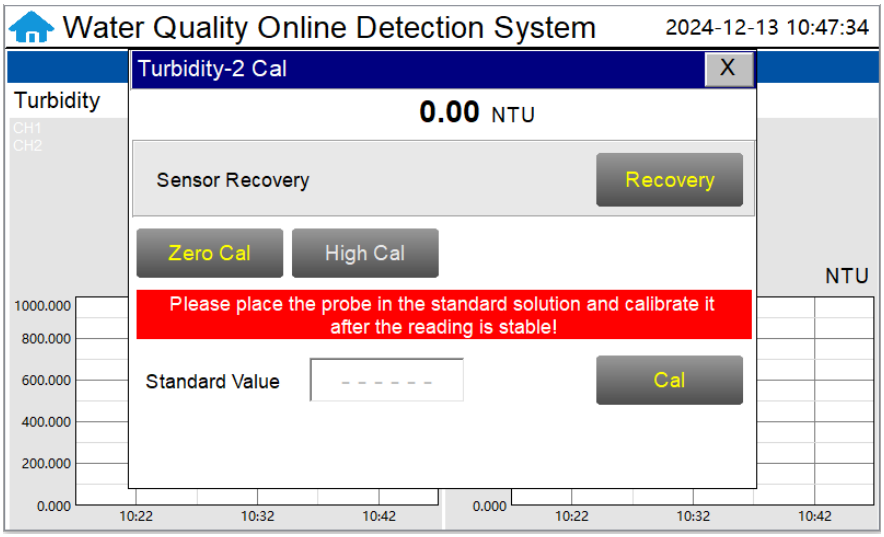


Figure. 18 Turbidity Calibration

One Point Calibration

Close the water inlet valve, drain all the water in the pipeline, take out the sensor, put it in the calibration tee, and rinse it with deionized water or tap water 3 times. Then fill the calibration tee with Turbidity standard solution and enter the value of the standard solution in the "High point" screen and click the "Calibration" under "High point" to start the high calibration. After the calibration success pop-up box pops up, the calibration is successful. ***NOTE*** *If deposits are present on the inside of the optical channel you may consider soaking the sensor in Pyxis Probe Cleaning Solution Kit (P/N SER-01) for 30 minutes, then brushing with the provided pipe cleaner brush of the kit.*

Two Point Calibration

Close the water inlet valve, drain all the water in the pipeline, take out the sensor, put it in the calibration tee, and rinse it with deionized water or tap water 2-3 times. Then fill the calibration tee with deionized water and click "Calibration “under the “Zero Point” to start the zero calibration.

Then, repeat the above steps and flush the sensor 2-3 times with deionized water or tap water. Fill the calibration tee with Turbidity standard solution, enter the value of the standard solution on the "High point" screen, and click the "Calibration" under "High point" to start the high calibration. After the calibration success pop-up box pops up, the calibration is successful. ***NOTE*** *If deposits are present on the inside of the optical channel you may consider soaking the sensor in Pyxis Probe Cleaning Solution Kit (P/N SER-01) for 30 minutes, then brushing with the provided pipe cleaner brush of the kit.*

3.1. Alarm Browsing

Click the **Alarm Browsing** button on the main interface to enter the alarm browsing interface.

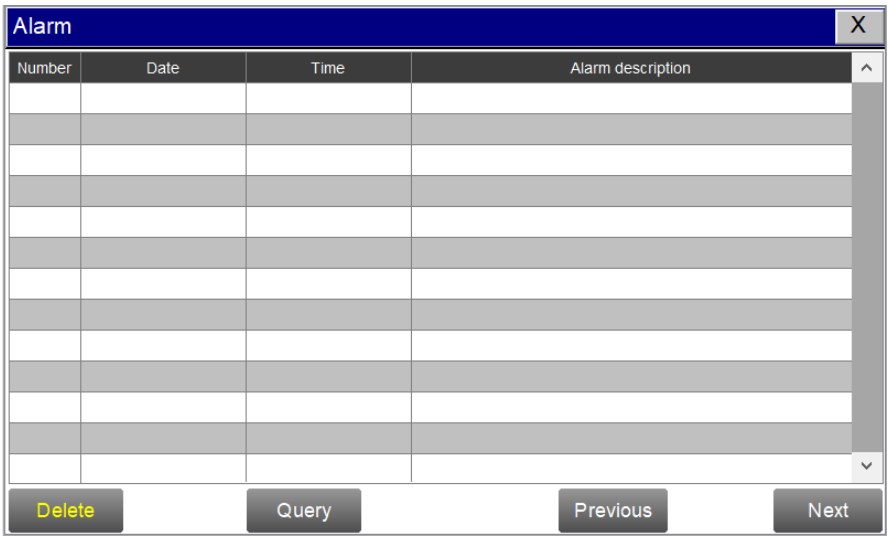


Figure. 19 Alarm Browsing

In this interface, the user can browse all alarm signals. Drag the right scroll bar to slide up and down to view historical alarm records. You can also click "Previous" and "Next" to turn pages quickly.

Click Query, enter the number in the pop-up box and query, you can quickly view the alarm problem of the corresponding number.

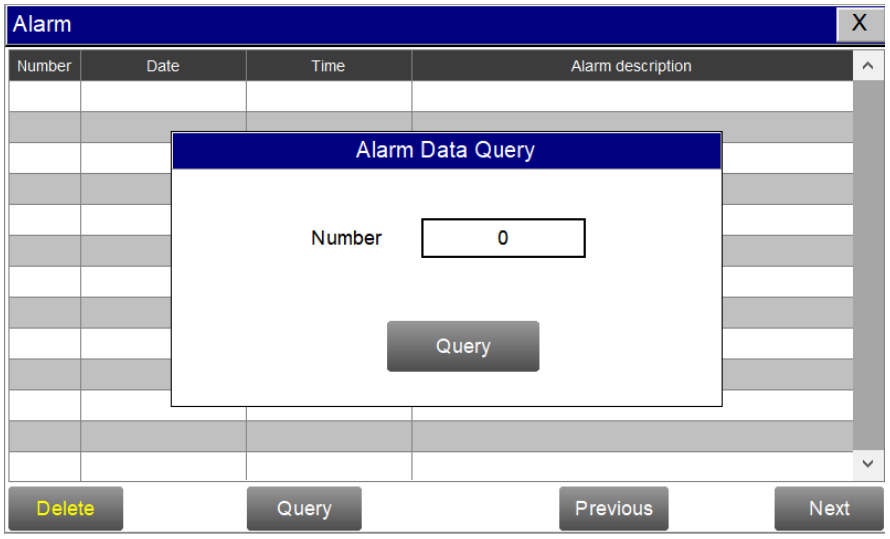


Figure. 20 Alarm data query interface

After clicking the delete button in the lower left corner, all alarm records will be deleted. After clicking delete, you need to exit the current interface and enter again, the historical data in the data report will be cleared.

3.2. Historical Data

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

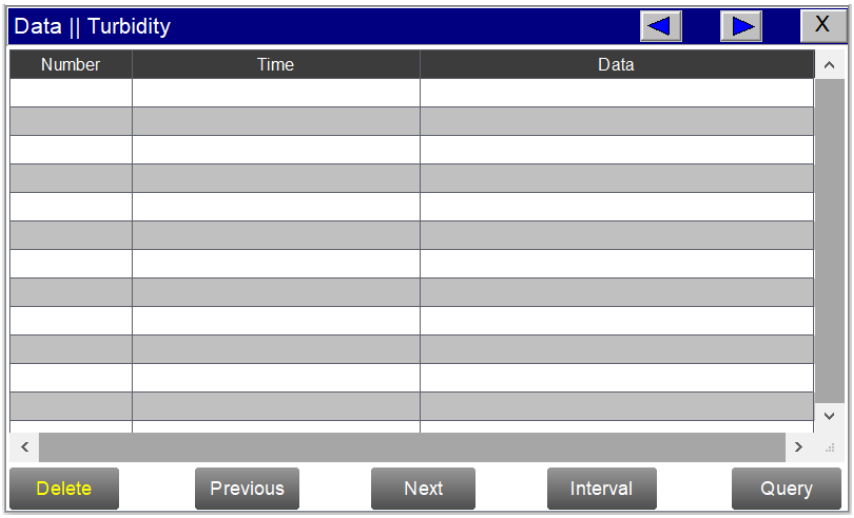


Figure. 21 Historical data

In the data report, the user can view the stored data of all parameters. The system records sensor readings every 4 seconds by default. 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 100,000 pieces of data. After 100,000 data points saved, new data will overwrite the previous data.

The user can click the ‘Periodicity’ button to change the data saving time interval

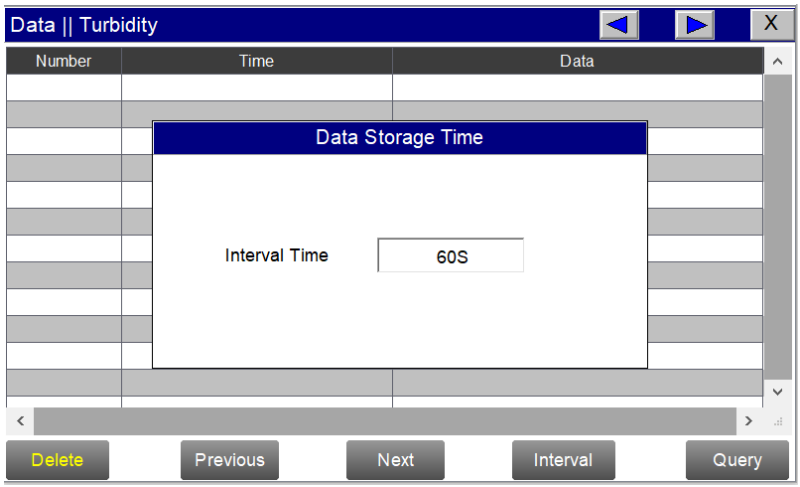


Figure. 22 Data storage retrieving setting

Click Delete in the lower left corner. After entering the retention time, click the Delete button to clear all historical data except for those within the retention time period.

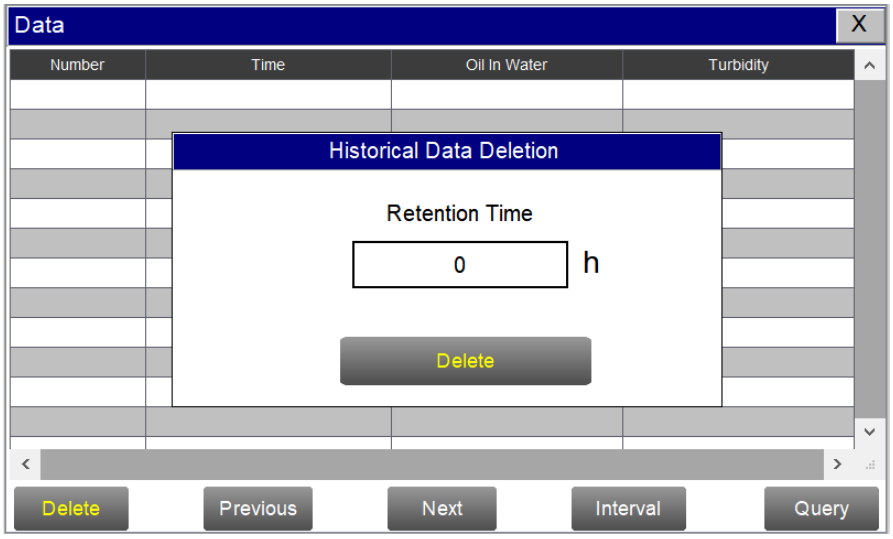


Figure. 23 Deleting historical data

Click the query in the lower right corner, enter the start time and end time, and then click the query button Note: The start time and end time need to be filled in completely and exactly according to the system time format. Otherwise, it will not be recognized for the query.

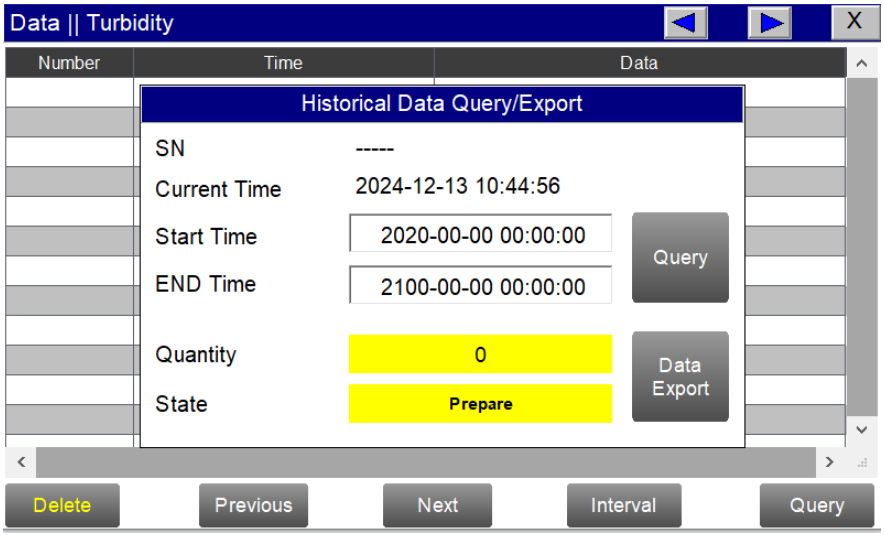


Figure. 24 Historical data query interface

Insert a USB disk behind the screen and enter the time range of the data to be exported in the query area, click on the data export, when the status is displayed as success, and the quantity is positive, the data export in the CSV format is successful. If the quantity is negative, the data was not successfully exported. Please check whether the time format is correct.

When the quantity appears, you can refer to the following table to check the problem.

Quantity	Description
-1001	Progress or control data object type is incorrect
-1004	Group object name does not exist or the group object does not have the save property
-1020	The start time of the export is greater than the end time
-1021	USB flash drive is not inserted
-1022	Only one export task is allowed at the same time
-1023	The number of records read is 0
-1024	File operation failed
-1025	Export path is empty
-1026	Export path is not legal
-1027	Incorrect time format
-1028	Unsupported export mode

3.3. Historical Data Curve

Click the **Historical Curve** button in the menu bar to launch the trend curve interface. You can click the button below the time axis to browse and view the values in different time periods. Clicking the Y-axis range will pop up the Y-axis range setup. Enter the minimum and maximum values to reset the Y axis range.

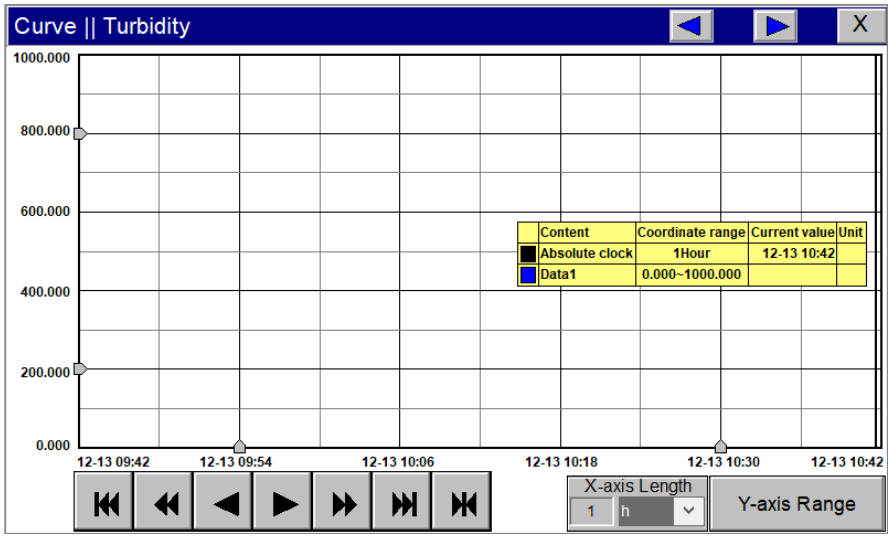


Figure. 25 Trend curve interface

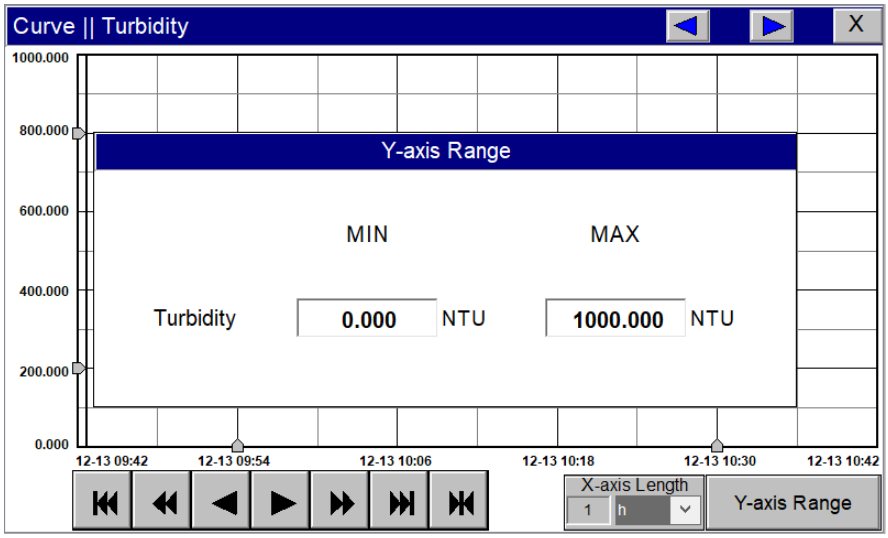


Figure. 26 Y-axis range setting

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. 27 Button Function Review

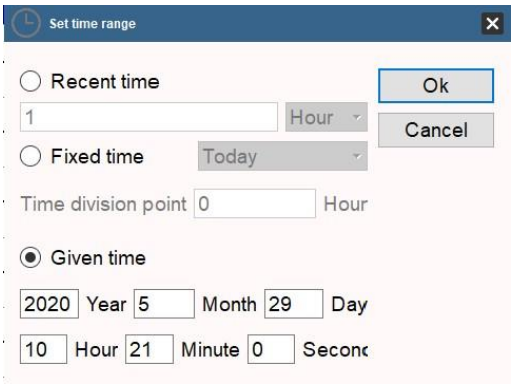


Figure. 28 System Time Setting

3.4. User Management

Click the **"User Management"** button on the menu bar, users can edit user information in this interface and switch between Chinese and English.

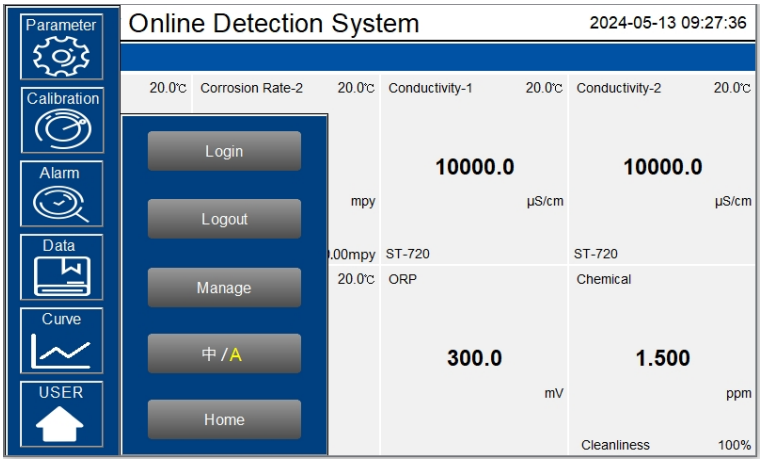


Figure. 29 User Management

Logout can make the user log out, and can only view the real-time reading, but cannot perform parameter setting and other operations.

Click **“Admin”** to enter the user management interface, where you can add users, modify passwords and other operations. Users can set their own user name and password, and select the user group to which they belong. Among them, only users in the administrator group can set parameters such as calibration.

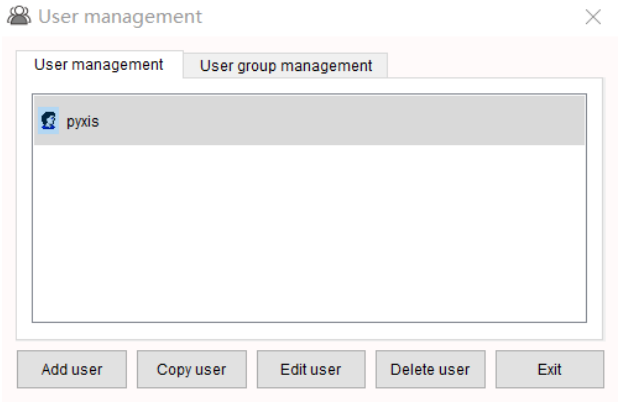


Figure. 30 User management interface

Change Password: Select the user to be changed, then click the **“Change 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 the user does not want to set a password, the password can be deleted and saved.*

4. Modbus Register Addresses

Table. 1 UC-100A Communication Address

No.	Define	Address	Format	Model	Unit	Note
1	Channel 1 display	1	float	Read only		Data format: ABCD
2	Channel 2 display	3	float	Read only		Data format: ABCD
3	Channel 3 display	5	float	Read only		Data format: ABCD
4	Channel 4 display	7	float	Read only		Data format: ABCD
5	Channel 5 display	9	float	Read only		Data format: ABCD
6	Channel 6 display	11	float	Read only		Data format: ABCD
17	The communication of the sensor in channel 1 is abnormal	13	float	Read only		0: normal / 1: Alarm
18	The communication of the sensor in channel 2 is abnormal	14	uint	Read only		0: normal / 1: Alarm
19	The communication of the sensor in channel 3 is abnormal	15	uint	Read only		0: normal / 1: Alarm
20	The communication of the sensor in channel 4 is abnormal	16	uint	Read only		0: normal / 1: Alarm
21	The communication of the sensor in channel 5 is abnormal	17	uint	Read only		0: normal / 1: Alarm
22	The communication of the sensor in channel 6 is abnormal	18	uint	Read only		0: normal / 1: Alarm
23	Communication between analog modules is abnormal	19	uint	Read only		0: normal / 1: Alarm
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						

5. Sensor Cleaning Pyxis Probe Cleaning Kit

In the event of heavy inorganic deposition on any of the Pyxis sensors, users may conduct an off line chemical cleaning using the Pyxis Probe Cleaning Kit (P/N: SER-01). Remove the sensor from the tee assembly and inspect the electrode head or optical channel. Soak the lower half of the sensor in 100 mL Pyxis Probe Cleaning Solution for 10-15 minutes. Gently wipe the sensor electrode head or the optical channel with the provided Q-tips and Pipe Cleaner provided. If the surface is not entirely clean, continue to soak the sensor for an additional time until clean. Rinse the sensor with distilled water. Pyxis Lab Probe Cleaning Kit can be purchased at our online Estore/Catalog at https://www.pyxis-lab.com/product/inline-sensor-cleaning-kit/

6. Contact Us

Contact us if you have questions about the use or maintenance of the analyzer:

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