



PLC Touch Screen

(Cooling & Heating Circulator)

Operation Manual

(Please read the instruction carefully before you use the machine)

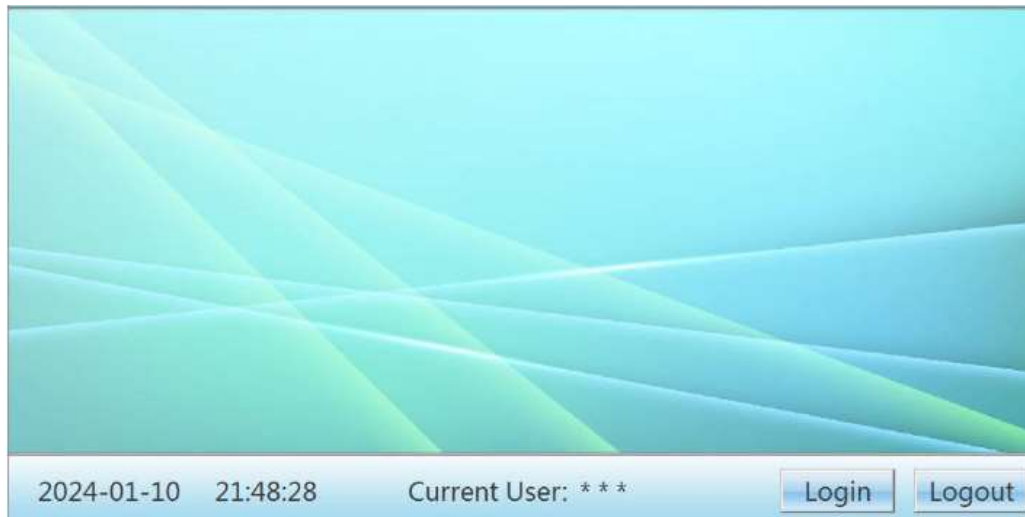
Contents

1. Power On and Screen Saver	1
1.1 Screen Saver Display	1
1.2 Login/Logout Functions	1
2. User Authority Levels	2
3. Homepage Overview	2
4. Temperature Values and Display	2
5. Program Segments and Timing Modes	4
6. Additional Buttons	4
7. Real Time Curve Display	4
8. X and Y-Axis Settings for Real-Time Curve	5
9. Real-Time Alarms	5
10. Historical Curve Operations	6
11. Curve Settings	7
12. Save and View Data	7
13. Parameter Settings	9
14. Self-Tuning Function	10
15. Network and Communication Status	10
16. User Management and Logs	10

1. Power On and Screen Saver

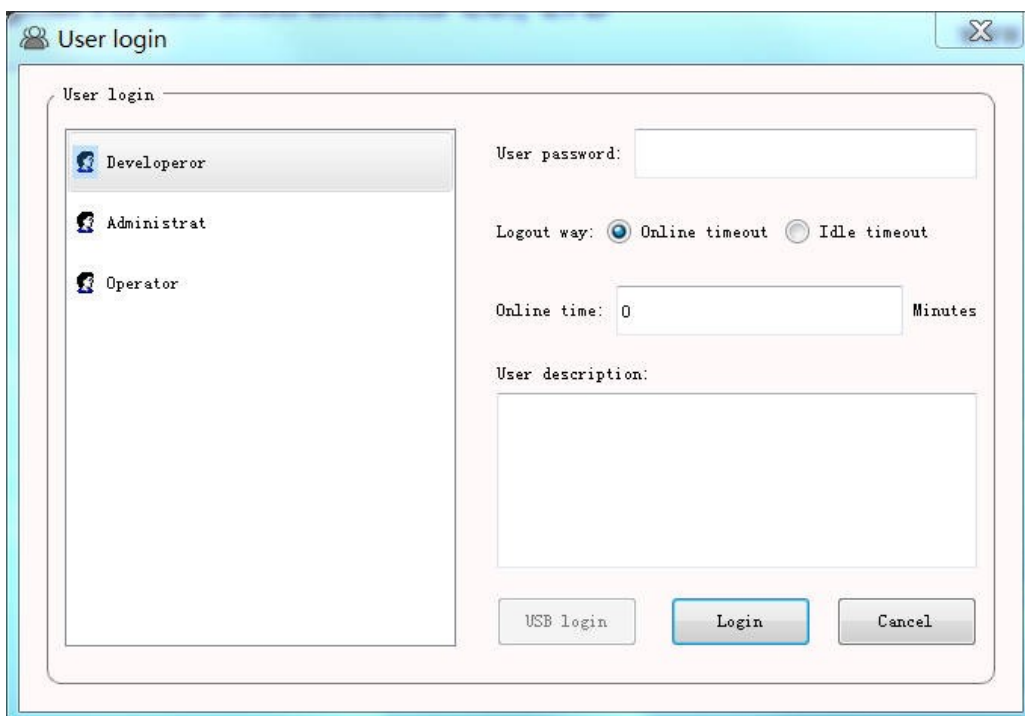
1.1 Screen Saver Display

After powering on, the touch screen defaults to the screen saver interface. The system date and time appear in the bottom left corner, while the current logged-in username is shown. If no user is logged in, "****" is displayed.



1.2 Login/Logout Functions

The login and logout buttons in the bottom right corner allow users to log in and out. Clicking the login button opens a system login dialog box.



2. User Authority Levels

- **Administrator:** Holds the highest level of authority and can configure advanced system settings and manage users.
- **Responsible Person:** Has secondary authority and can modify user parameters.
- **Operator:** Possesses the lowest authority, limited to basic device operation and monitoring.

3. Homepage Overview

- **Homepage Access:** After logging in, users are directed to the homepage, which features six buttons: Operation Monitoring, Real-time Curve, Real-time Alarm, Historical Curve, Save and View, and Parameter Setting.
- **Run Monitoring Access:** Click the "Run Monitoring" button on the homepage to access the status monitoring page.

4. Temperature Values and Display



- **Temperature Control Display Explanation**
 - a. The **measured value PV (green)** on the left shows the actual measured temperature in real time.
 - b. The **set value SP (red)** on the left represents the target temperature in constant temperature mode, which can be modified by the user.
 - c. The **set value SP (orange)** indicates the programmed target temperature in program mode, which corresponds to the current segment of the program and cannot be modified during operation.

- **Display Panel (Lower Left Corner)**

- a. Displays the actual measured values of outlet temperature/material temperature, and return temperature.
- b. Also shows the current temperature control mode and control object:
 - Control Modes: Constant Value Mode and Program Mode
 - Control Objects: Outlet Temperature or Material Temperature

Note:

- a. When Outlet Temperature is selected as the control object:
 - The green PV value shows the current outlet temperature.
 - The material temperature is displayed below.
- b. When Material Temperature is selected:
 - The green PV value shows the current material temperature.
 - The outlet temperature is displayed below.

- **Display Panel (Right Side):** Shows the operating status of key internal components, including:

- a. Circulating Pump
- b. Compressor
- c. Heating Element
- d. Solenoid Valve

- **Additional Display Information:**

- a. Runtime of the current control session is recorded.
- b. In program mode, the following parameters are displayed:
 - Step Temperature
 - Step Time
 - Segment Number
 - In this mode:
 - ◆ Green indicates the current segment's actual temperature, runtime, and segment number.
 - ◆ Orange represents the target temperature, set time, and total number of segments to be executed.
 - In constant temperature mode, these program parameters are not applicable.
- c. To edit segment parameters in program mode, click the Program Parameters button.

- This button is disabled in constant value mode.

5. Program Segments and Timing Modes

- **Setting Program Segments:** A total of 20 program segments can be configured, each with its own target temperature and heating duration.
- **There are two timing modes available:**
 - a. **Running Timing:** The program automatically proceeds to the next segment once the set duration for the current segment has elapsed.
 - b. **Constant Temperature Timing:** In addition to completing the set duration, the current temperature must also fall within the setpoint $\pm$ timing deviation before the program advances to the next segment.

6. Additional Buttons

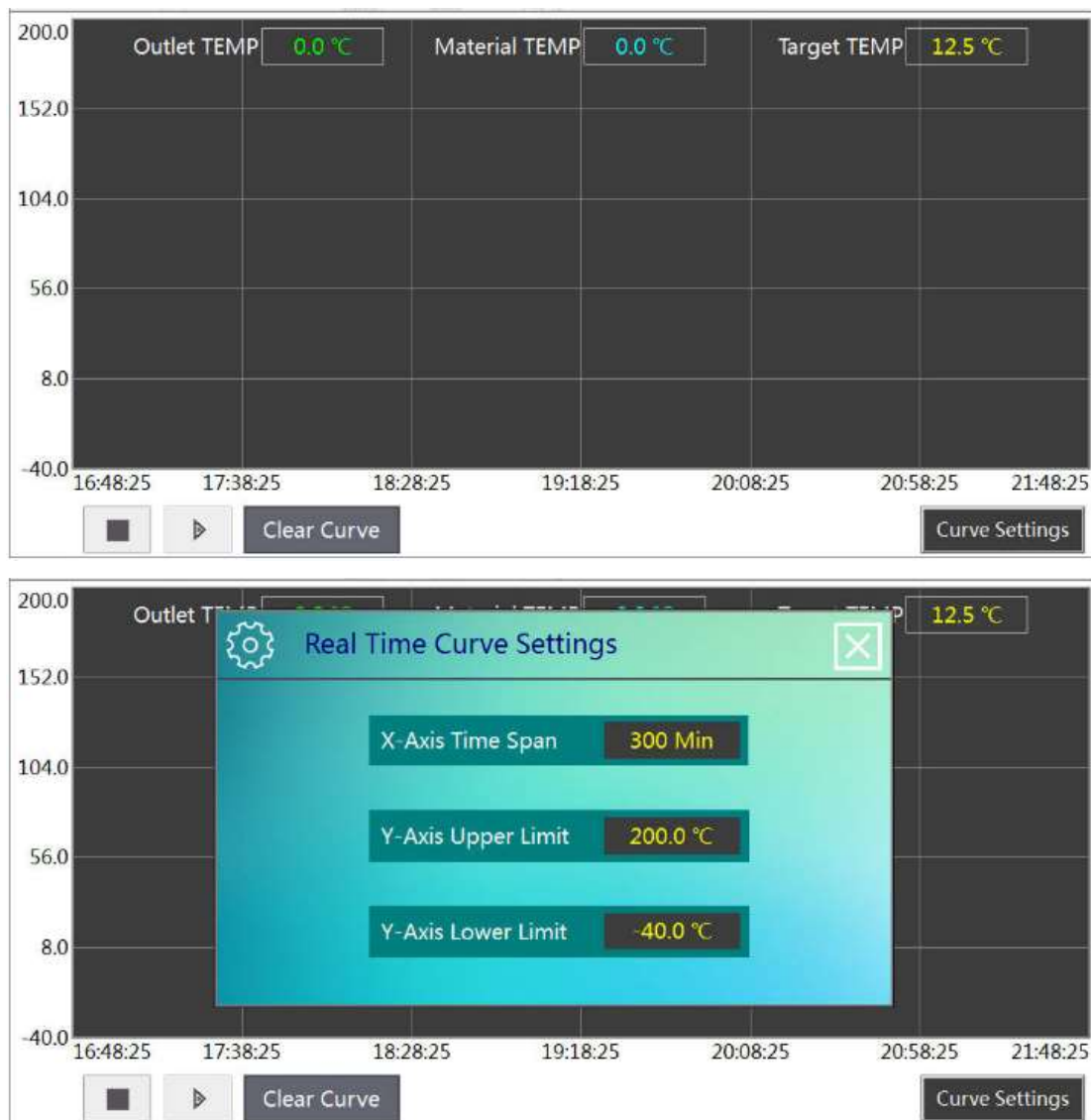
- **Cycle Button:** Allows users to fill or drain the liquid in the equipment.
- **Run Button:** A single-click button to start or stop the device. Once activated, the device will automatically regulate the outlet temperature to reach the specified setpoint.



Important: Do not activate the Run button during liquid filling or draining operations. Filling and draining should only be performed when the device is not running.

7. Real Time Curve Display

- **Curve Access:** Click the Real Time Curve button to access the real-time curve page.
- **Curve Control Buttons:** The bottom left corner features three buttons to stop drawing, start drawing, and clear the real-time curve.
- **Curve Settings:** Clicking the curve setting button brings up a dialog box to configure curve parameters.



8. X and Y-Axis Settings for Real-Time Curve

- **X-Axis Length:** The X-axis is set to the total duration of the real-time curve. For example, if it is set to 60 minutes, the X-axis will represent 60 minutes from the starting point to the ending point.
- **Y-Axis Upper Limit:** You can set the maximum value displayed on the Y-axis of the curve.
- **Y-Axis Lower Limit:** You can set the minimum value displayed on the Y-axis of the curve.

9. Real-Time Alarms

Click the **Real-Time Alarm** button on the homepage to access the real-time alarm page.

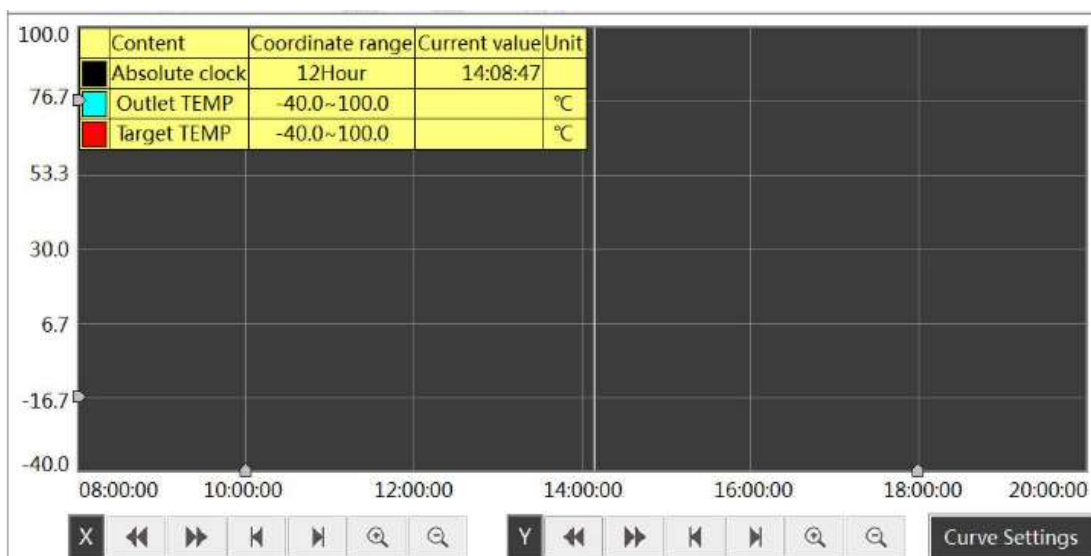
Date	Time	Alarm description
2024/01/10	21:48:29	HMI And TCM Communication Failure
2024/01/10	21:48:43	HMI And PLC Communication Failure

▲
▼
Alarm Reset
Historical Alarm

- Current Faults Display:** This page shows current system faults. Three buttons are available in the bottom left: **page up**, **page down**, and **fault reset**. If a fault still exists after clicking the Fault Reset button, it indicates that the hardware issue has not been resolved. In this case, immediately stop the equipment and perform maintenance. Once the fault has been physically resolved, click the Fault Reset button again and restart the equipment.
- Historical Alarms:** The button in the bottom right corner of the motor accesses the historical alarm page, where you can view past faults and their resolution times.

10. Historical Curve Operations

Click the **Historical Curve** button on the homepage to enter the historical curve page.



Use the corresponding control buttons to navigate through the curve display.

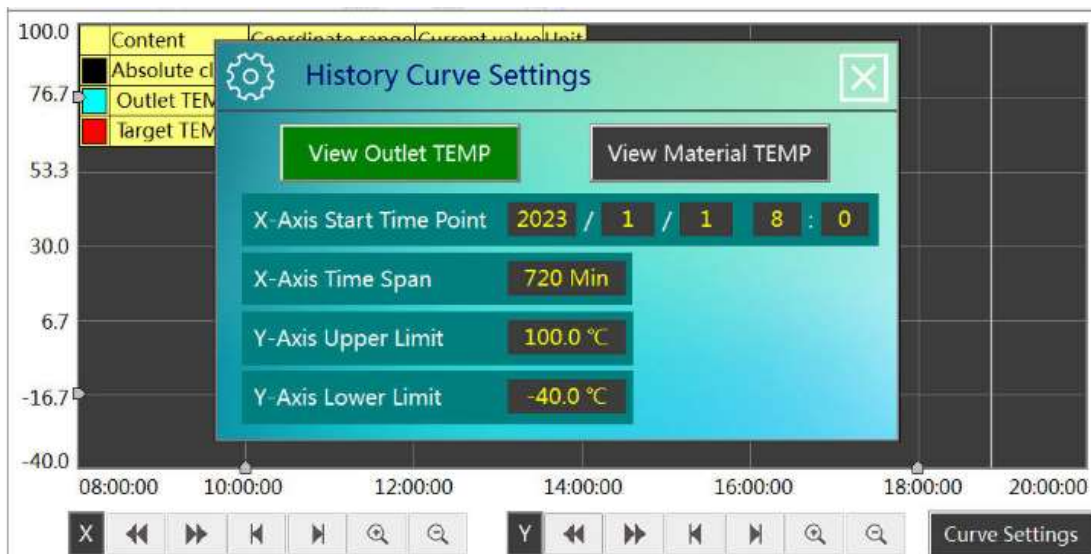
- X-axis operations:**

- a. Move X-axis forward by one page
- b. Move X-axis backward by one page
- c. Shift X-axis forward by one major division
- d. Shift X-axis backward by one major division
- e. Zoom in X-axis by 1x
- f. Zoom out X-axis by 1x
- **Y-axis operations:** The Y-axis supports the same set of operations as the X-axis, including page turning, shifting by major divisions, and zooming in/out.

11. Curve Settings

Click the **Curve Setting** button to open the historical curve configuration pop-up window.

- Select Export Temperature Curve and/or Material Temperature Curve to display the corresponding historical temperature data, either individually or simultaneously.
- X-Axis Start Time Point: Set the starting date and time for the X-axis of the historical curve.
- X-Axis Time Span: Define the time span displayed on the X-axis.
- Y-Axis Upper Limit: Set the maximum temperature value for the Y-axis.
- Y-Axis Lower Limit: Set the minimum temperature value for the Y-axis.



12. Save and View Data

Click the **Save and View** button on the homepage to enter the Saved Data Viewing page.

Num	Time	Outlet TEMP	Material TEMP	Target TEMP

Time Setting

0

Rows

Export

Delete

Num	Time	Outlet TEMP	Material TEMP	Target TEMP
1	024-01-09 13:46:3	-25.90	-22.30	-50.00
2	024-01-09 13:46:3	-25.90	-22.30	-50.00
3	024-01-09 13:46:3	-25.90	-22.30	-50.00
4	024-01-09 13:46:3	-25.90	-22.30	-50.00
5	024-01-09 13:46:3	-25.90	-22.30	-50.00
6	024-01-09 13:46:3	-25.90	-22.30	-50.00
7	024-01-09 13:46:3	-25.90	-22.30	-50.00
8	024-01-09 13:46:3	-25.90	-22.30	-50.00
9	024-01-09 13:46:3	-25.90	-22.30	-50.00

620

Rows

Export

Delete

Data export

Start Time 2000 / 1 / 1 0 0

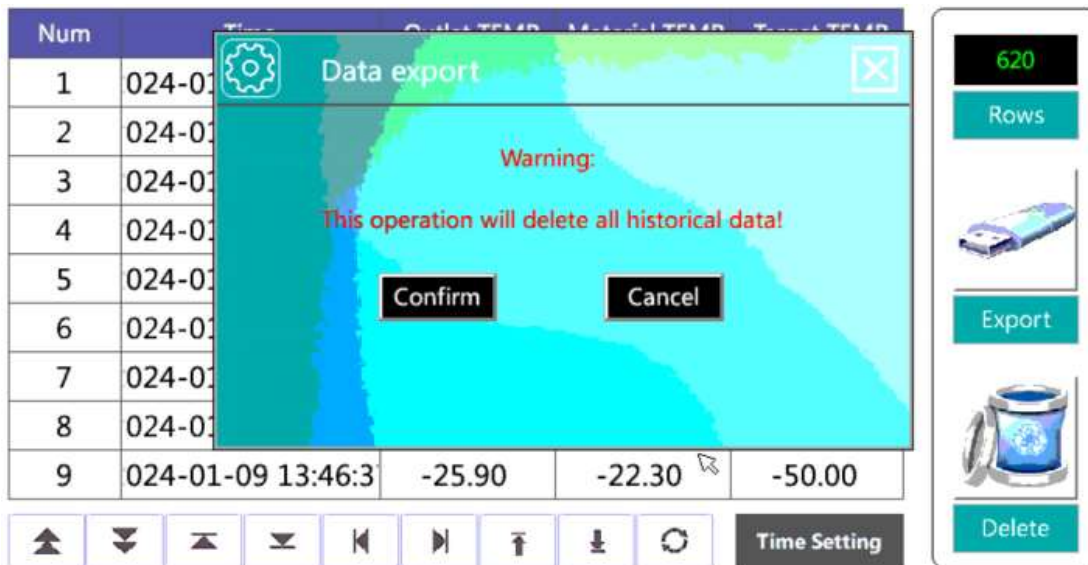
End Time 2025 / 1 / 1 1 0

Confirm

Cancel

Time Setting

- **Page Navigation:** The buttons at the bottom allow you to flip through pages of saved data.
- **Data Count:** The number of saved entries is displayed on the right.
- **Exporting Data:** Use the Export button to transfer data to a USB drive by inserting it into the port at the back of the touch screen. This allows data to be analyzed on a computer.
- **Deleting Data:** The Delete button deletes all saved data. Use with caution, as deleted data cannot be restored.



13. Parameter Settings

Click the **Parameter Settings** button on the homepage to enter the parameter settings page.



- **Screen Saver Duration:** Allows you to set the idle time before the touch screen enters screen saver mode. This helps reduce power consumption when the screen is not in use for extended periods.
- **Automatic Backlight Shutdown:** When enabled, the touch screen will automatically turn off after the specified duration, further extending the screen's service life.
- **Current Username & User Group:** Displays the currently logged-in user and the corresponding user group.
- **Control Object Selection:** Choose whether to control the material temperature or the outlet temperature.

- **Control Mode:** Two options are available - Fixed Value Mode and Program Mode.



Important: It is not recommended to modify the control object or mode while the equipment is running. Please make necessary adjustments only after the equipment has been shut down, and before restarting it.

14. Self-Tuning Function

If the default PID parameters don't fit the operational environment, you can activate the self-tuning feature to adjust the system parameters for optimal performance.

15. Network and Communication Status

- **Monitoring Network Status:** Displays real-time information such as network card status, signal strength, SSID, and IP address, allowing you to monitor the connectivity of the IoT touch screen.
- **Communication Status:** PLC_CS and TCM_CS indicate the communication status between the touch screen and the PLC or the temperature control module, respectively.

16. User Management and Logs

- The "Change Password" button allows the current user to update their login credentials.
- The "Edit User" button provides functions such as adding, deleting, and editing users.
- **Operation Log:** Records all user operations and actions performed on the device for future reference and troubleshooting.