



**Polymerase Chain Reaction (PCR) Analyzer
Temperature Validation System
1611A/PCRCAL**

User Manual

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1. System Overview

The 1611A/PCRCAL Polymerase Chain Reaction (PCR) Analyzer Temperature validation System is designed for temperature measurement and calibration of PCR instruments. It complies with the JJF 1527-2015 Calibration Specification for Polymerase Chain Reaction Analyzers, and meets the temperature measurement requirements of various PCR models and well configurations (384/96/60/48/32) for both domestic and international manufacturers.

The system consists of the 1611A/PCR multi-channel thermometer, probe plates with various well configurations (customizable upon request), and PCR thermal cycler temperature validation software.

2. 1611A/PCR Multi-channel Thermometer

The 1611A/PCR thermometer is a compact and lightweight handheld device, designed for easy portability and field operation.



Figure 1

2.1 Features

- 16-channel differential input with high-speed sampling at 10ms per channel
- 3.5-inch LCD screen for real-time data display
- Multiple power supply options - DC terminal, DC adapter, or lithium battery, suitable for both laboratory and field use
- Front panel USB port for data storage directly to a USB flash drive
- LAN and USB communication interfaces for PC connection, enable report generation via validation software
- RS485/RS232 communication protocols supported for data transmission and device control
- Flat flexible cable connection for improved compatibility
- Gold-plated sensor probes for faster and more stable response
- Full range of temperature probe plates choices, supporting 96/48/32-well PCR instruments
- Multiple cable exit configurations on probe plates for flexible adaptation to various PCR models
- Modular design-one main unit can be used with multiple probe plates

2.2 Technical Specifications

	1611A/PCR
Range	0~120℃
Accuracy	0.05℃
Resolution	0.01
Sampling Rate	Fast (10ms/channel), Medium (75ms/channel), Slow (150ms/channel)
Storage	4MB internal / External USB drive support
Data Interface	LAN, USB, Bluetooth
Dimensions	165mm*105mm*55mm
Power Supply	DC5V/12V/24, or rechargeable lithium battery
Battery Standby Time	Approx. 20 hours

2.3 Functions

2.3.1 Display and Buttons

Display

3.5-inch monochrome LCD with 240×160 resolution and LED backlight.

Buttons

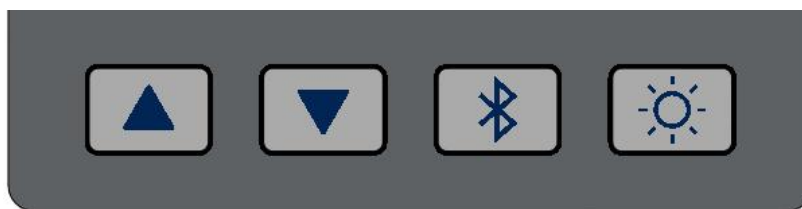


Figure 2

Up/Down Buttons: Scroll through temperature/resistance data pages.

Bluetooth: Toggle Bluetooth ON/OFF (default: OFF at startup).

Backlight: Toggle display backlight ON/OFF (default: ON at startup).

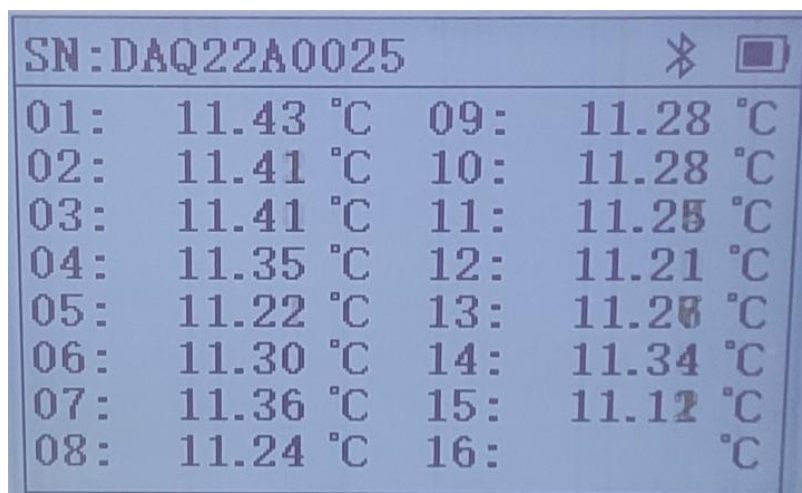
2.3.2 Interface

Status Bar

Display device serial number, USB storage status, Bluetooth status, battery power information, and Network port status.

Measured Data

The 1611A/PCR displays measurement data for 16 channels per page. Press the Up button to scroll through pages displaying temperature data (in °C), with a resolution of 0.01 °C. Press the Down button to scroll through pages displaying resistance data (in Ω), with a resolution of 0.1 Ω. As shown in Figure 2 and Figure 3, if a channel is disconnected or the probe returns an invalid reading, the display will show “OL” .





SN: DAQ22A0025							
01:	11.43 °C	09:	11.28 °C				
02:	11.41 °C	10:	11.28 °C				
03:	11.41 °C	11:	11.25 °C				
04:	11.35 °C	12:	11.21 °C				
05:	11.22 °C	13:	11.26 °C				
06:	11.30 °C	14:	11.34 °C				
07:	11.36 °C	15:	11.12 °C				
08:	11.24 °C	16:	°C				

Figure 3


PORT:5000		IP:192.168.1.150	
01:16942.7	Ω	09:16843.9	Ω
02:16836.9	Ω	10:16881.7	Ω
03:16849.6	Ω	11:16862.1	Ω
04:16786.8	Ω	12:16900.8	Ω
05:17014.2	Ω	13:16980.7	Ω
06:16767.2	Ω	14:16789.8	Ω
07:16808.8	Ω	15:16964.2	Ω
08:16996.2	Ω	16:	Ω

Figure 4

2.3.3 Front Panel

Power Switch: Press to power on the device. The data logger will load the last saved configuration and enter acquisition mode automatically. Press and hold for 3 seconds to power off the device.

Indicator Light: When in acquisition mode, the POWER indicator flashes green. The blinking frequency corresponds to the current data acquisition rate. If the POWER indicator flashes red, it indicates low battery. Please connect the power adapter to the device promptly..

USB Type-A (interface for connecting a USB flash drive): Once a USB drive is detected, the data logger automatically creates a folder named “1611A” on the drive and saves the temperature measurement data—timestamped—in a file named MEAS.CSV within that folder. If the USB drive is reconnected, the MEAS.CSV file will be overwritten. The USB storage icon  in the status bar indicates the device’s storage status - solid icon means that storage device connected, and flashing icon means that data is being written to the USB drive.

Note: Saving measurement data to a USB flash drive may reduce the data acquisition speed. For high-speed data acquisition and storage, it is recommended to use the LAN or USB port for real-time data transfer.

LAN Port: Enables TCP/IP communication over a local area network. Users can remotely configure the device or retrieve measurement data. In TCP Server mode, the default host settings are IP address 192.168.1.150 and port 5000. These parameters—including the IP address, port number, and MAC address—can be manually modified to meet different network requirements.

USB Type-B: This is a serial USB interface with a default baud rate of 9600 bps. After configuration, it can be connected to a computer and used in conjunction with

application software for remote configuration and data acquisition.

Bluetooth: The device is equipped with an integrated Bluetooth 5.0 Low Energy (BLE) module. When connected to a mobile app, it supports wireless data transmission and channel configuration via smartphone.



Figure 5

2.3.4 Rear Panel

The rear panel of the 1611A/PCR is equipped with a dedicated Mini HDMI interface, which can be connected to calibration probe plates with different numbers of wells (96/48/32), as shown in Figure 6.



Figure 6

Grounding: In factories or laboratories with strict protection requirements, connect the data acquisition unit to the ground via the grounding terminal to prevent electrostatic interference on the chassis.

DC Power Interface: This is the The charging port for the built-in lithium battery. Use only the dedicated 8.4V/2.0A power adapter for charging ; incompatible adapters may cause battery damage or other hazards. When the battery is low, the data

acquisition unit can also be powered directly by the adapter. Charging a depleted battery to full capacity takes approximately 2.5 hours.

2.3.5 Thermometer probes

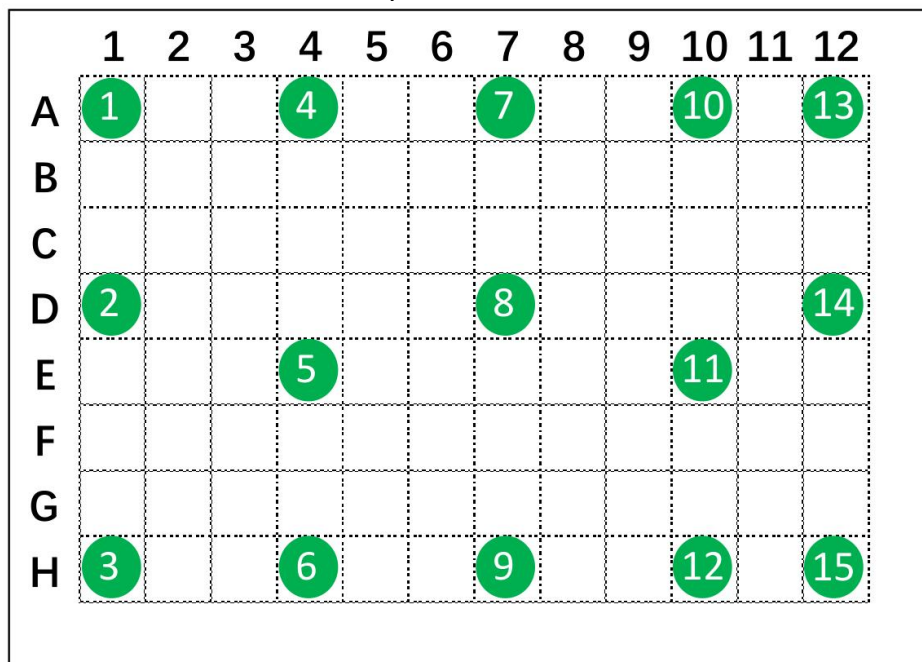
The temperature probe sensors feature a gold-plated copper design, offering faster response and improved stability. Three probe models are available, compatible with 96-well, 48-well, and 32-well PCR instrument calibration. The probes connect to the 1611A/PCR temperature calibrator via a pluggable flexible flat cable (default length: 1 meter). A single main unit can be used with multiple probe plates. Specifications of the probe plate are listed in the table below.

PCR Calibrator Probe Plate Specifications			
Model	ZCPCRCAL96	ZCPCRCAL48	ZCPCRCAL32
Calibration For	96-well PCR instrument	48-well PCR instrument	32-well PCR instrument
Outlet Direction	Bottom/Right Side	Bottom	Bottom
Number of Temperature Sensor	15	12	8
Sensor Plate Size	120 * 79 * 19 mm	65 * 79 * 19 mm	47 * 79 * 19 mm
Temperature Probe Length	15 mm		
Sensor Type	Thermistor		
Temperature Range	0-120 °C		

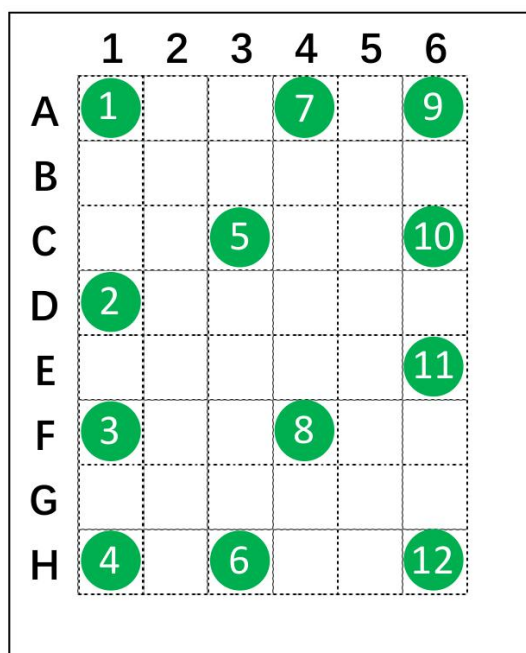


Figure 7

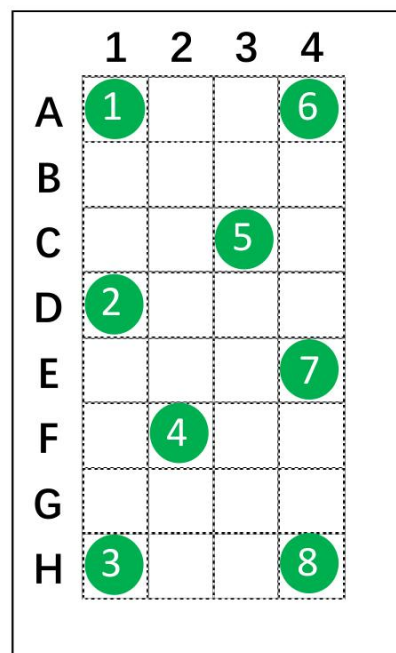
Temperature Measurement Point Layout



(1) ZCPCRCAL96 Temperature Sensor Layout (Top View)



(2) ZCPCRCAL48 Temperature Sensor Layout (Top View)



(3) ZCPCRCAL32

3. PCR Thermal Cycler Temperature

Validation Software

3.1 Overview

This software is designed based on the *JJF 1527-2015 Calibration Specification for Polymerase Chain Reaction (PCR) Analyzers*. It works in conjunction with the 1611A-PCR thermocyclers to measure the temperature of the PCR equipment to be calibrated. By analyzing the collected temperature data, the software evaluates key temperature performance indicators of the PCR equipment, including temperature indication error, temperature uniformity, and heating/cooling rates. Besides, a calibration report conforming to the standard format is automatically generated.

Additionally, the software supports secondary calibration of the thermistor sensors in the 1611A-PCR by the user to enhance measurement accuracy.

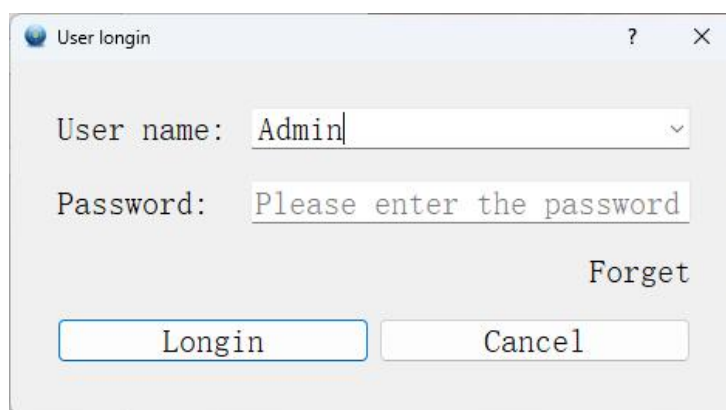
3.2 Software Instructions

3.2.1 Login

Launch the PCRCaI software from the desktop. The initial login window will appear as shown below.



After the software initialization is complete, the system will enter the login interface, as shown below.

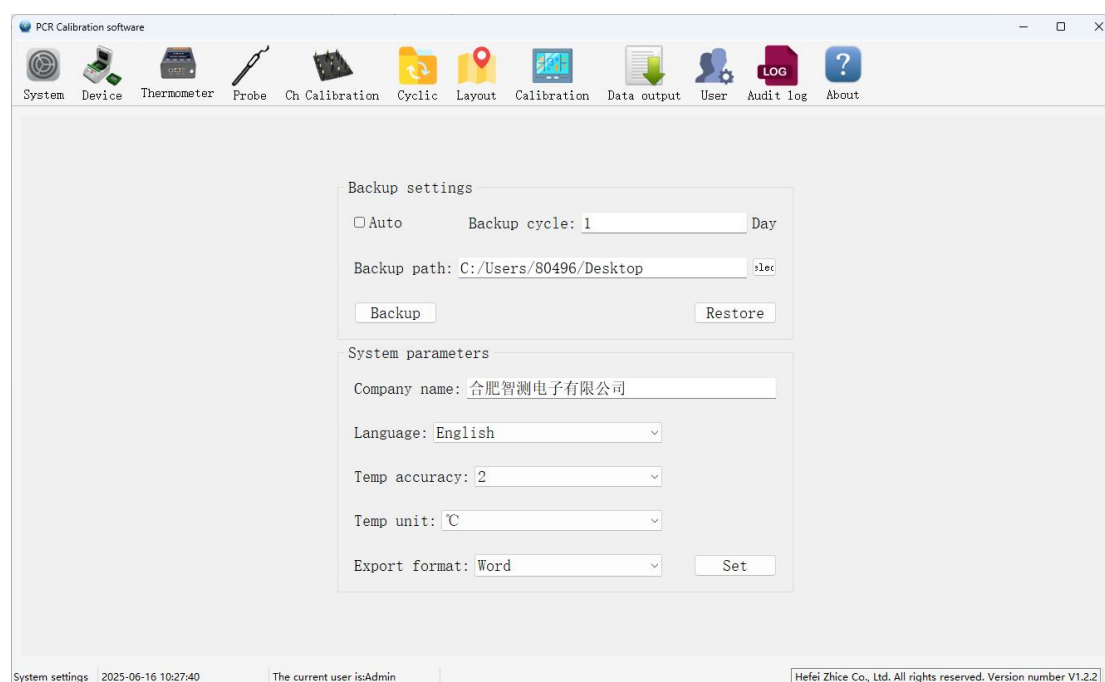


Enter the user name and password in the corresponding fields. If you forget your password, click the "Forgot Password" button and answer the predefined security question to recover it. If a user account has become invalid or expired, it will be locked and login will not be permitted.

Note: If the password is entered incorrectly three consecutive times, the user account will be locked automatically.

3.2.2 System Settings

Click the "System Settings" button in the menu bar to enter the interface shown below.



Backup Settings: This section is used for backing up and restoring the software's database file. All data within the software is stored in the PCR.db3 database file located in the software installation directory. Both backup and restore operations are performed on this database file.

Automatic Backup: This is an option-based feature. When checked, the software will

automatically perform backups according to the specified interval and destination path.

***Note:** Automatic backup only functions while the software is running. Once the software is launched, check whether the defined backup interval has been reached. If so, one backup will be performed.*

Backup Interval: Specifies the interval (in days) for automatic backups. This parameter must be set when using the automatic backup feature.

Backup path: Defines the destination path for database file backups. This path is used for both automatic and manual backups.

Backup: For manual backup, click the button, and the software will copy the PCR.db3 file from the installation directory to the specified backup path.

The backup file will be named using the format YYYY_MM_DD_HH_MM_PCR.db3, for example: 2024_06_14_11_45_PCR.db3.

Restore: Use with caution. When this option is selected, a dialog box will prompt you to choose a previously backed-up database file. The selected backup file will completely overwrite the current PCR.db3 file in the software directory.

***Note:** After restoration, the software will only display data contained in the selected backup. For example, if you select 2024_06_14_11_45_PCR.db3, the software will only show the data before 2024-06-14-11-15.*

Company Name: Enter your company name (optional).

Language: Dropdown selection: Chinese / English. Takes effect immediately after clicking the "Set" button.

Decimal Places: Sets the number of decimal places for numerical data in the interface and reports. Dropdown options: 0 to 4.

Temperature Unit: Dropdown selection: °C / °F.

Export Format: Dropdown selection: Word / Excel / PDF. Specifies the file format for exported reports.

Settings: Click this button to apply changes made in the system parameter section.

3.2.3 Device Management

Click the Device Management button to enter the interface shown below. This interface is used to add and manage PCR devices to be calibrated.

The screenshot displays the 'PCR Calibration software' window. At the top is a menu bar with icons for System, Device, Thermometer, Probe, Ch Calibration, Cyclic, Layout, Calibration, Data output, User, Audit log, and About. The main area is divided into two sections: 'Device Information' and 'Operating area'. The 'Device Information' section contains several input fields: 'Numbering' (a text box), 'Device name' (a dropdown menu showing 'PCR仪'), 'Device model' (a dropdown menu showing '1586'), 'Status' (a dropdown menu showing 'Not yet in school'), 'serial number' (a text box), 'Manufacturer' (a dropdown menu showing '合肥智测电子'), 'Method' (a dropdown menu showing 'Standard'), 'Calibration date' (a date/time picker showing '2025-06-16 10:27'), 'Recheck date' (a date/time picker showing '25-06-16 10:27'), 'Cycle' (a text box), and 'Remarks' (a text box). The 'Operating area' section contains three buttons: 'Add', 'Modify', and 'Delete'. Below these sections is a table with the following columns: 'Calibration status', 'Numbering', 'Device name', 'Device model', 'serial number', 'Manufacturing unit', 'Calibration method', and 'Cal'. The table is currently empty. At the bottom of the window, there is a status bar with the text 'PCR equipment management: 2025-06-16 10:27:52', 'The current user is Admin', and 'Hefei Zhice Co., Ltd. All rights reserved. Version number V1.2.2'.

Device Information: To add the device information, fill in all required fields in the Device Information section, then click the Add button. The entered information will be saved in the software, eliminating the need to re-enter it in future sessions—simply select the saved device to use. Newly added devices will have the calibration status, calibration date, and recalibration date left blank by default, indicating an uncalibrated state.

Once a device is selected for calibration, the calibration and recalibration dates will be automatically filled in, and the calibration status will be updated accordingly.

Each time the software is launched, it will automatically refresh the calibration status of all listed devices. If a device is overdue for calibration, a red warning will appear, indicating that the device has not been calibrated.

Modifying Device Information: double-click an existing device entry in the table. Its information will be loaded into the Device Information section for editing. After making changes, click the Modify button to save the updated data.

Deleting Device Information: to delete a device entry, double-click it in the table, then click the Delete button. The selected device information will be permanently removed.

Note: Deleted device information cannot be recovered. Please delete with caution.

3.2.4 Thermometer

Click Thermometer to enter the measuring instrument management interface. This interface is used to add and manage 1611A-PCR devices, as shown below.

Add thermometer information: Fill in all required fields in the Device Information section as well as the Parameter Settings. Click the Add button to save the logger information into the software. Once saved, the thermometer device can be selected directly in future sessions without the need to re-enter the data.

Modify the thermometer information: Double-click an existing entry in the device table. The corresponding information will be loaded into the Thermometer Information section. Edit the desired fields, then click the Modify button to save the changes.

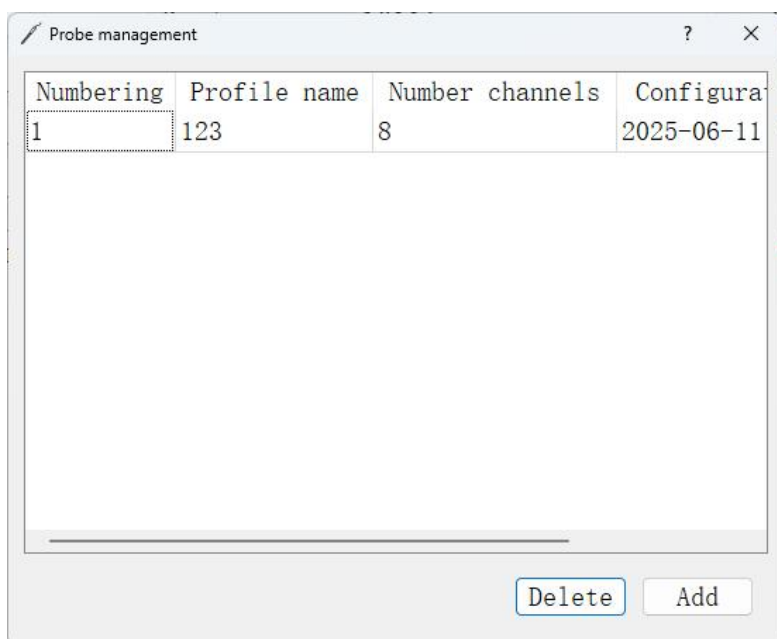
Delete thermometer information: To delete a thermometer device entry, double-click it in the table, then click the Delete button. The selected device information will be permanently removed.

Communication settings: First, choose the communication method—either Network or Serial Port. Enter the appropriate connection parameters based on the selected method. Click the Test button to verify connectivity with the device. Once the connection is confirmed, click the Save button to store the settings.

Note: Deleted information cannot be recovered. Please delete with caution.

3.2.5 Probe Management

Click Probe Management and the following interface will pop up:

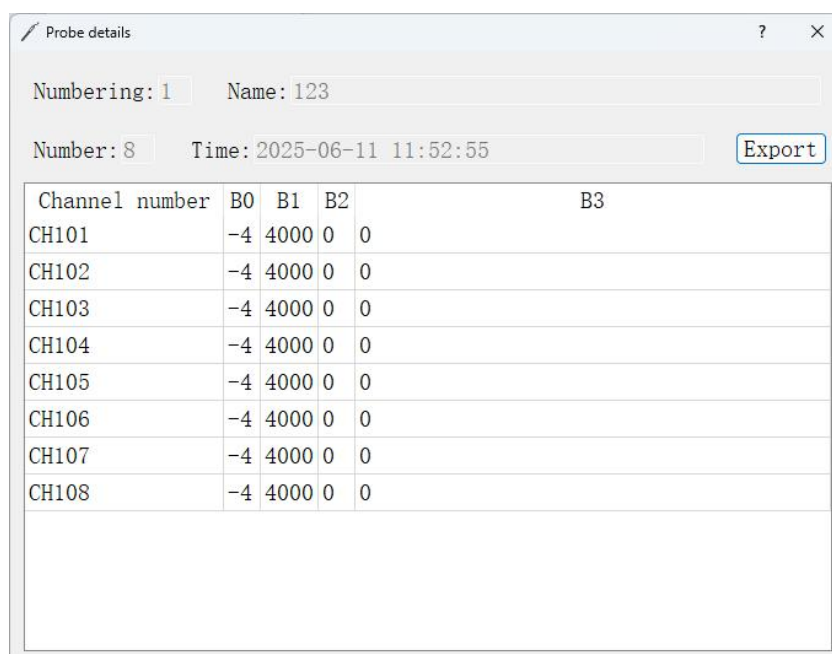


The 'Probe management' window displays a table with the following data:

Numbering	Profile name	Number channels	Configura
1	123	8	2025-06-11

At the bottom right of the window are two buttons: 'Delete' and 'Add'.

Probe details: Double-click the probe information, and a window will pop up, showing the current probe file information in detail, including the probe information file number, probe information file name, the total number of probes set in the current file, the channel information, parameters of each probe, and the setting time of the probe file. Click the Export button to export the current channel parameters as an ini file, which can be used later when adding configuration files in PCR software on other computers.



The 'Probe details' window shows the following information:

Numbering: 1 Name: 123

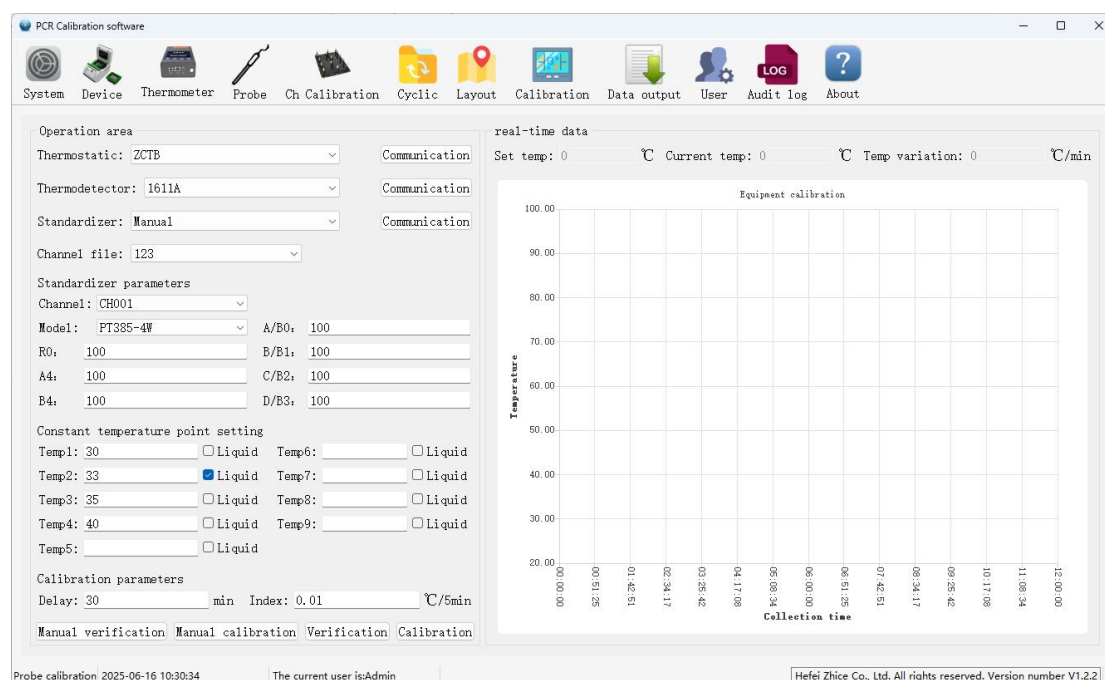
Number: 8 Time: 2025-06-11 11:52:55 **Export**

Channel number	B0	B1	B2	B3
CH101	-4	4000	0	0
CH102	-4	4000	0	0
CH103	-4	4000	0	0
CH104	-4	4000	0	0
CH105	-4	4000	0	0
CH106	-4	4000	0	0
CH107	-4	4000	0	0
CH108	-4	4000	0	0

Probe Add: Click the Add button to enter the probe add window, enter the probe file

3.2.6 Probe Calibration

This interface is used for the overall calibration of the NTC probes used by the 1611A-PCR, improving the temperature measurement accuracy of the probes.



Before shipment, we generally calibrate your probes and provide calibration parameters. General users typically do not need to use this function. However, if you have the necessary hardware conditions such as a temperature field equipment and temperature standards, you may perform the calibration yourself.

There are two methods for probe calibration: automatic and manual.

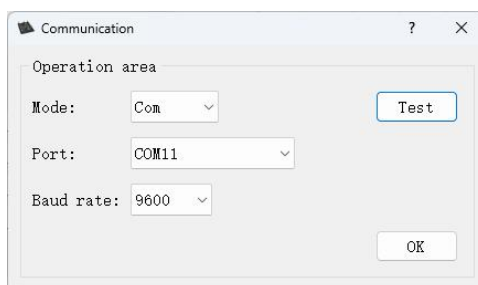
Automatic calibration requires using ZHICE-ELEC's temperature field device and temperature standard. During the calibration process, the software will automatically control the temperature field device to perform heating and cooling, as well as automatically read data from the temperature standard.

If the customer's equipment is not from ZHICE-ELEC, manual calibration must be used.

Thermostatic Device:

Use the dropdown menu to select either "Oil Bath" or "Oil Bath-R," representing two models of temperature baths from ZHICE-ELEC.

For automatic calibration, click the Communication button on the right to enter the oil bath communication test interface, as shown below.



Communication Method:

The default communication mode is serial port communication.

Serial Port Number: Select from the dropdown menu. The port number can be found in Computer - Management - Device Manager - Ports. You can identify the correct port by plugging and unplugging the USB communication cable. If no valid port appears, please install the USB driver included in the software installation package.

Baud Rate: Default is 9600. You can verify this on the oil bath screen under System Parameters - Communication Parameters.

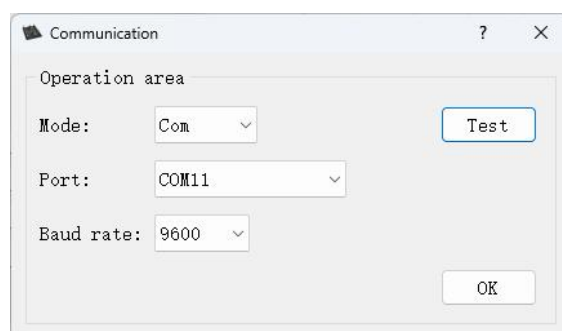
Test: Click the button to test whether the current port number and baud rate are correct. After receiving a success message, click OK to save and exit this interface.

Note: During automatic calibration, the software automatically controls the oil bath device, ensuring the oil bath screen remains always on the top layer. Do not operate any buttons on the oil bath panel during calibration, as this will cause the software to lose control of the oil bath.

Thermometer:

The default choice of thermometer is 1611 A;

Thermometer-Communication:



The temperature measurement instrument supports two communication methods: serial port and network.

The serial port operation is the same as for the oil bath device—simply select the corresponding port number and baud rate for the 1611A.

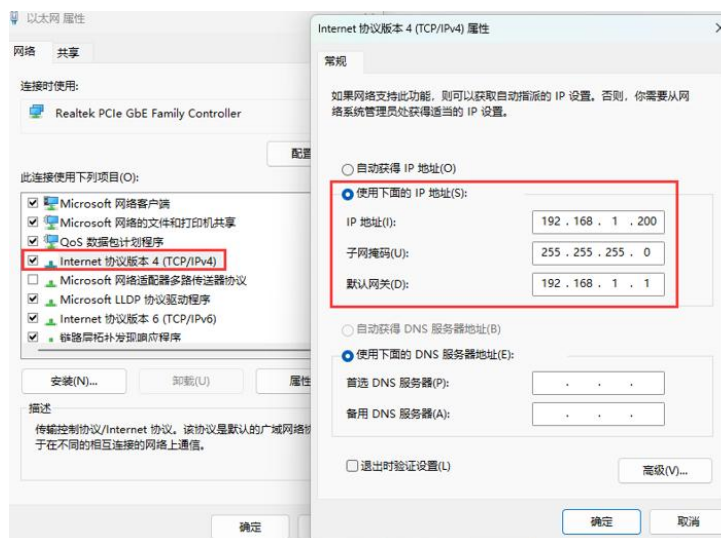
The Network Mode requests to set the IP address and port number of the 1611A. These two parameters are displayed at the top of the 1611A screen when powered on. The default IP address is usually 192.168.1.150 and the default port number is 5000.

Here are some notes when connecting the 1611A via network:

STEP 1: Use a network cable to directly connect the computer's Ethernet port to the 1611A's Ethernet port.

STEP 2: Set your computer's Ethernet IPv4 address to a static IP address within the same LAN as the 1611A. See the figure below for recommended settings.

(Please ensure your computer has one Ethernet port only; if multiple Ethernet adapters exist, disable the others first.)

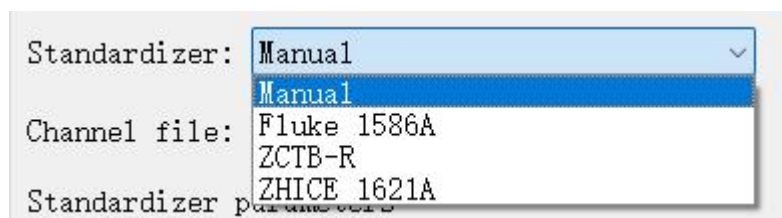


STEP 3: After completing the settings, click the Test button to check if the communication is normal. If the test is successful, click the OK button to save and exit.

Standard Device:

Select the standard device you are using from the dropdown menu.

Manual indicates manual calibration, where the user manually inputs the standard temperature values corresponding to the calibration points during the calibration process. The other options represent the standard devices supported by the software for automatic calibration.



Channel File:

Select the channel configuration file added in Section 2.2.4 from the dropdown menu. After calibration is completed, the software will automatically update the calibration coefficients of the probes in the configuration file.

Standard Device Parameters:

This parameter is only applicable when using the 1586A standard device. Select the channel number connected to the standard probe and enter the corresponding calibration parameters. The calibration parameters should be filled in according to the standard probe's calibration certificate.

Standardizer parameters			
Channel:	CH001		
Model:	PT385-4W	A/B0:	100
R0:	100	B/B1:	100
A4:	100	C/B2:	100
B4:	100	D/B3:	100

Constant Temperature Point Settings:

Based on the temperature range of the PCR device being calibrated, typically 4 to 9 temperature points are evenly set.

Liquid Replacement: When the temperature range is wide, for example from -20°C to 100°C, alcohol should be used as the medium for the constant temperature bath at low temperatures, while silicone oil is required for high temperatures. In such cases, check the "Liquid Replacement" option at the appropriate temperature. During automatic calibration, the software will prompt a pop-up reminder when medium replacement is needed. The process will resume only after the medium has been replaced.

Constant temperature point setting					
Temp1:	30	<input type="checkbox"/> Liquid	Temp6:		<input type="checkbox"/> Liquid
Temp2:	33	<input checked="" type="checkbox"/> Liquid	Temp7:		<input type="checkbox"/> Liquid
Temp3:	35	<input type="checkbox"/> Liquid	Temp8:		<input type="checkbox"/> Liquid
Temp4:	40	<input type="checkbox"/> Liquid	Temp9:		<input type="checkbox"/> Liquid
Temp5:		<input type="checkbox"/> Liquid			

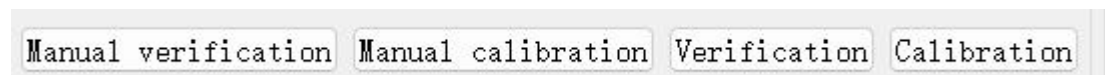
Calibration parameters:

Calibration parameters	
Delay:	30 min Index: 0.01 °C/5min

Stabilization delay: After the temperature field stabilizes, this setting determines the delay time before data collection begins. To ensure the calibrated sensor is fully stabilized, adjust this value based on actual conditions. Different calibration fixtures may require different stabilization delay times.

Stability Criterion: 0.01°C/5min indicates that the temperature field is considered

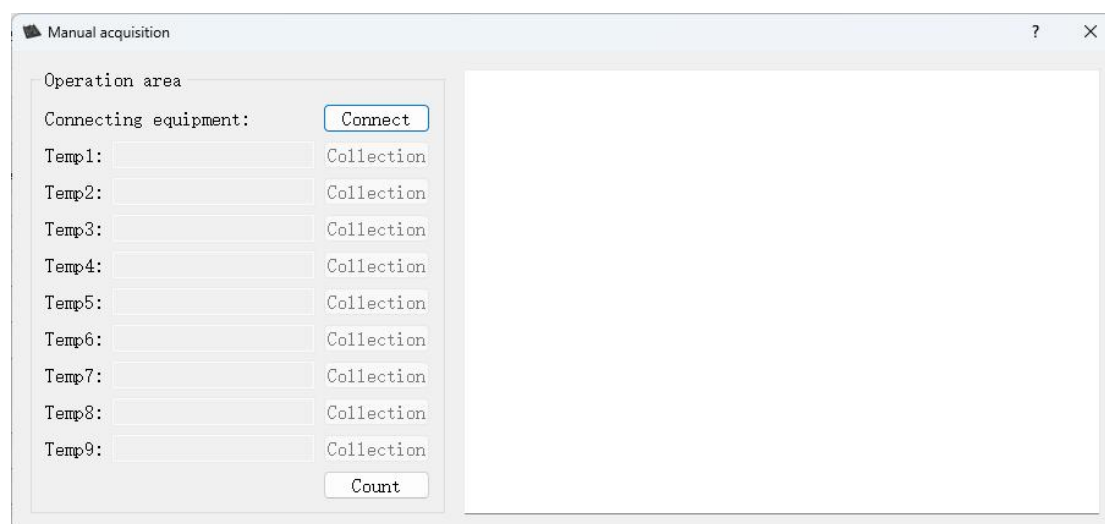
stable when the standard temperature fluctuation does not exceed 0.01°C over any continuous 5-minute period.



Calibration: Click this button to start the automatic calibration process.

validation: Click this button to enter the automatic validation process. Based on the previously configured temperature points and stabilization delay, the software will collect a set of temperature data from the 1611A at each stabilized temperature point. This data is used to verify the accuracy of the temperature after calibration.

Manual Calibration: In manual calibration mode, the temperature field and standard device are not controlled by the software. Click the Manual Calibration button to open the interface shown below. Then follow the steps below to perform manual calibration.



Manual Calibration – STEP 1: Connect the device. Click the Connect button. A success message will confirm the connection.

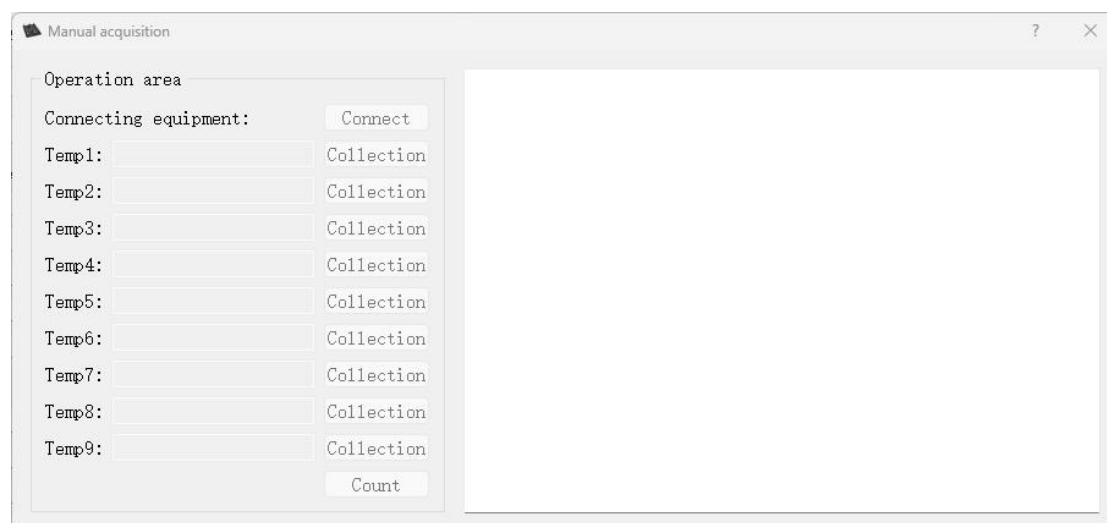
Manual Calibration – STEP 2: Once the temperature field is deemed stable by the operator, click the corresponding Collect button. The software will prompt you to input the current standard temperature, which will then be displayed next to Temperature Point 1. The software will also read a set of resistance values from the 1611A to complete data collection for Temperature Point 1.

Manual Calibration – STEP 3: Repeat STEP 2 to collect data for the remaining temperature points.

Manual Calibration – STEP 4: After all temperature points have been collected, click the Calculate button. A success message will indicate that the manual calibration process is complete.

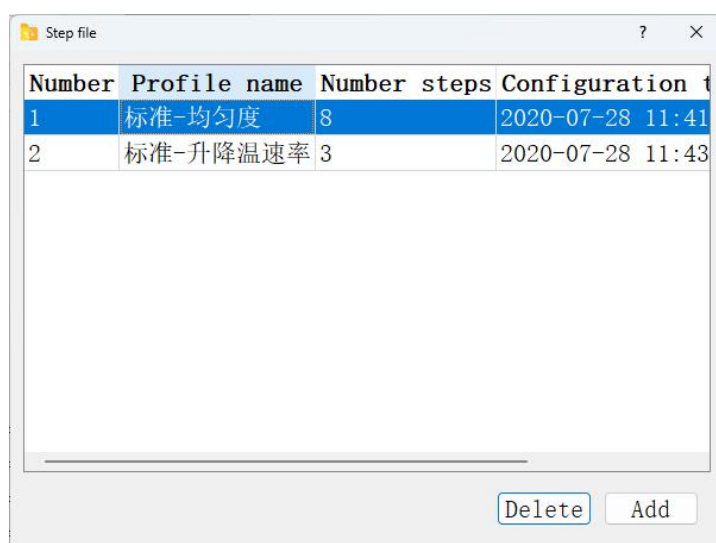
Manual validation: This process is similar to manual calibration, except that the

collected values are the post-calibration temperature values at each temperature point.



3.2.7 Cycle File

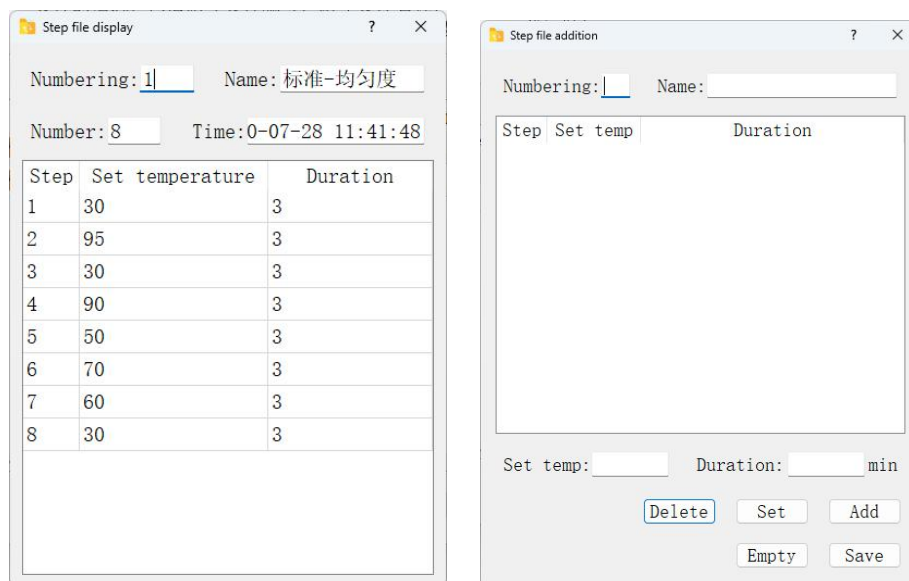
Click the Cycle File and the following interface will pop up:



Cycle File Details: Double-clicking a cycle file entry, there will be a window displaying detailed information about the selected cycle file. This includes the cycle file ID, name, total number of steps, detailed parameters for each step, and the time the cycle file was created. Two files are preloaded in the software by default. Users may delete them and add new ones as needed.

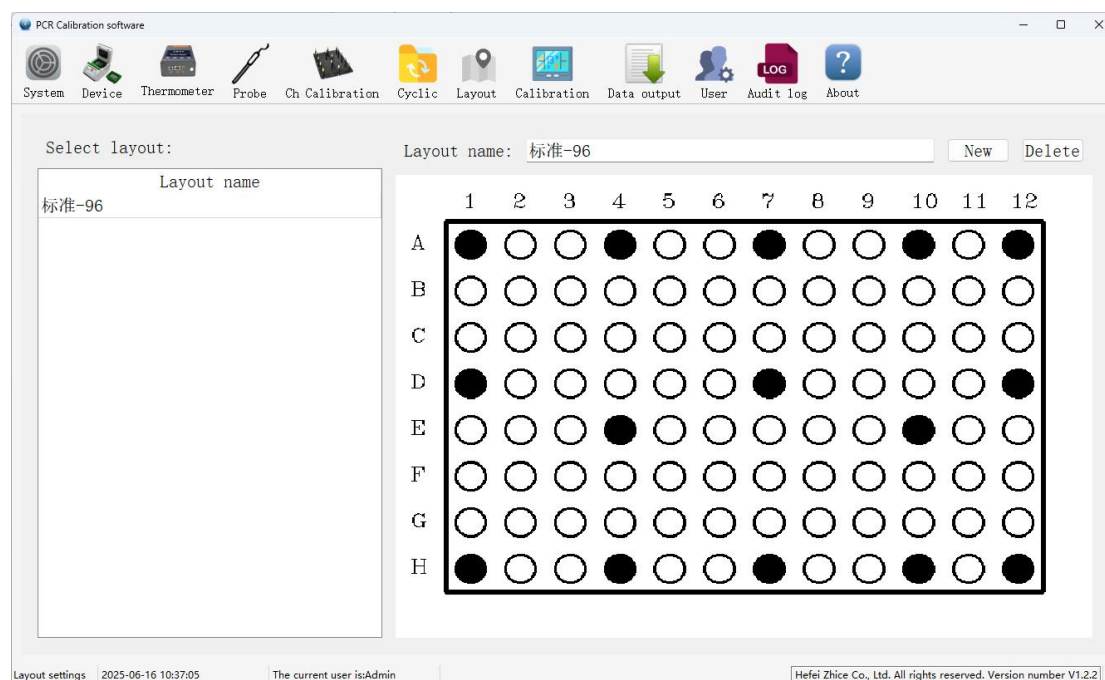
Adding a Cycle File: Click the Add button to open the cycle file creation window. Enter the cycle file ID and name, then configure the step details below. Set the required temperature points and the duration for each temperature point. Use the Add Step button to insert a new step, the Set button to modify the currently selected step, and the Delete button to remove a step. Once all step parameters are configured, click the Save button to store the new cycle file.

Deleting a Cycle File: To delete a cycle file, double-click the entry in the table to select it, then click the Delete button. The selected cycle file will be permanently removed.



3.2.8 Layout map

Click on the layout map to enter the interface shown below:



View the layout diagram: Double-click the name of layout diagram to update and display the corresponding image in the preview area.

Adding point distribution map: Click the Add button to open the diagram creation window. Enter a name for the layout, specify the number of the layout configuration.

After clicking the Confirm button, a blank layout diagram will be generated. Use the

mouse to click on the diagram to set the positions. Once the layout is complete, close the diagram window. The diagram will appear in the layout list. Click the Save button to store the layout diagram on the local computer.

Number of holes: Long 12 Piece Width 8 Piece

Layout name:

Number of holes: Long 12 Piece Width 8 Piece

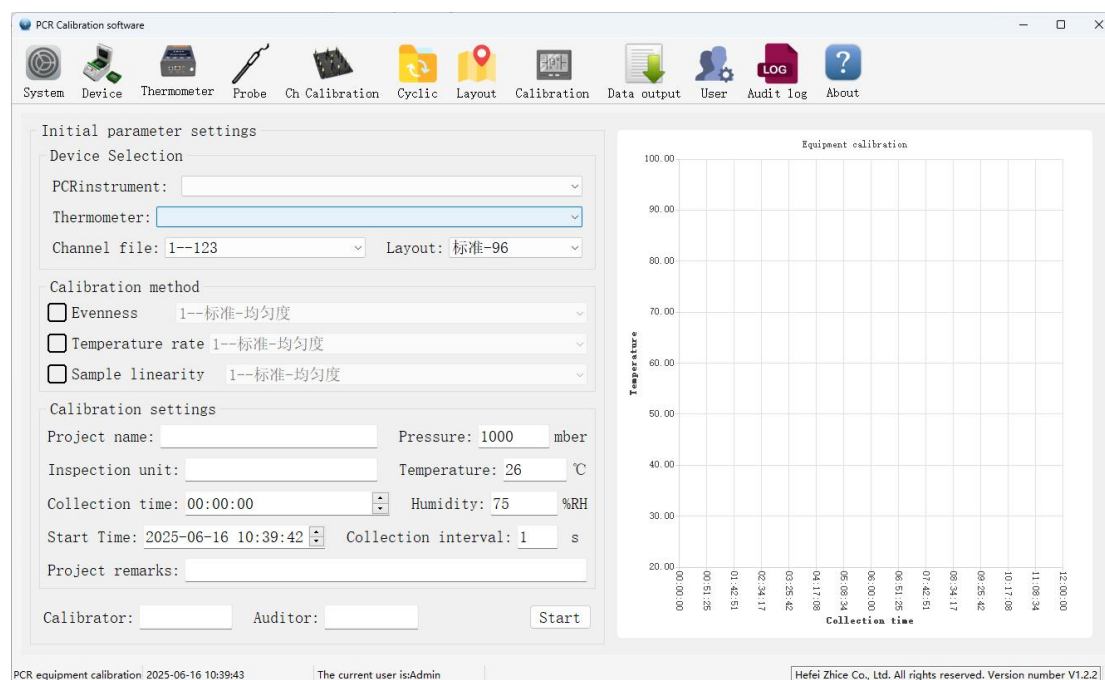
Layout name: 123

	1	2	3	4	5	6	7	8	9	10	11	12
A	○	○	○	○	○	○	○	○	○	○	○	○
B	○	○	○	○	○	○	●	○	○	○	○	○
C	○	○	○	○	○	●	○	○	○	○	○	○
D	○	○	○	○	○	○	○	○	○	○	○	○
E	○	○	○	●	○	○	○	○	○	○	○	○
F	○	○	○	○	○	○	○	○	○	○	○	○
G	○	○	○	●	○	○	○	●	○	○	○	○
H	○	○	○	○	○	○	○	○	○	○	○	○

Deleting a Layout Diagram: To delete a layout diagram, double-click the desired item in the table to select it, then click the Delete button. The selected layout will be permanently removed.

3.2.9 Calibration

Click Calibration to enter the interface shown below:



Device selection:

First, select the PCR cycler to be calibrated. Then choose the thermometer and the corresponding standard reference file and probe layout diagram. When selecting the probe layout diagram, ensure that the number of probes configured matches the number of probes on the standard reference device.

Calibration methods:

Issuing a calibration certificate requires performing three calibrations - Uniformity Calibration, Temperature Ramp Calibration, and Sample Linearity Calibration. The Sample Linearity Calibration requires the user to manually input parameters. When selected, a prompt window will appear at the end of calibration for entering sample linearity data. If Uniformity Calibration and Temperature Ramp Calibration are not selected, their corresponding fields in the exported report will be left blank.

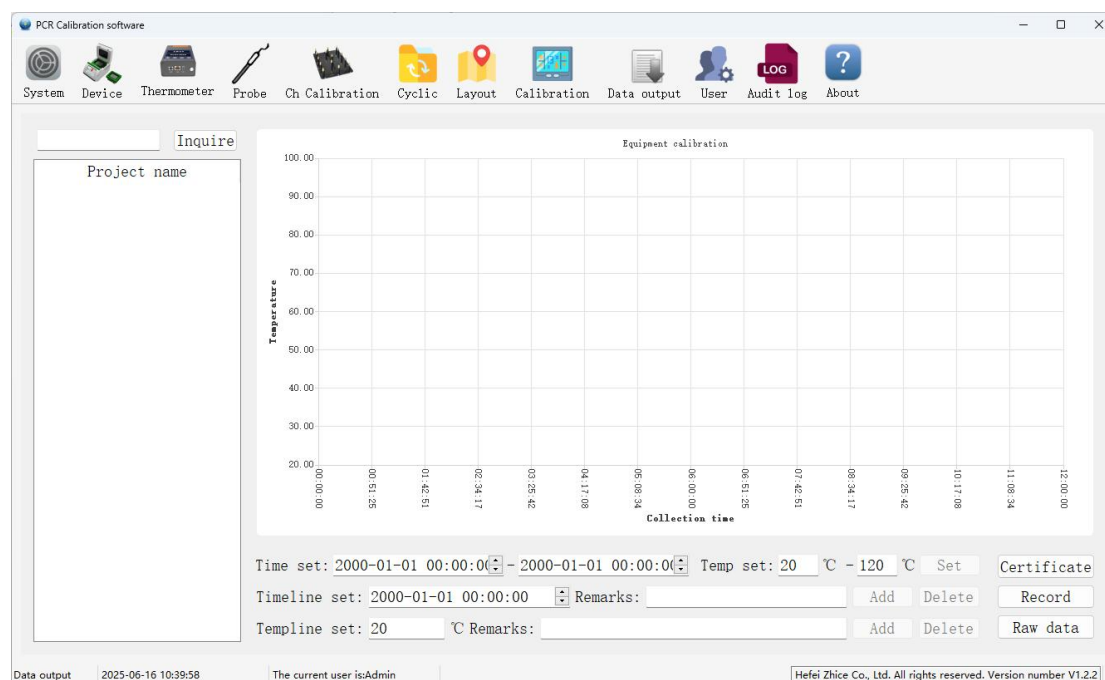
Calibration settings:

Before starting calibration, the following information must be entered - calibration project name, inspection unit name, the start time for temperature data collection by the temperature measurement device, collection duration, and sampling interval. The start time must not be earlier than the calibration start time. Additionally, fill in the environmental temperature, atmospheric pressure, humidity, and the Calibrator and the Auditor at the start of calibration. Once all fields are complete, click Start Calibration to begin.

Note: Calibration cannot be paused once started. Clicking the Stop button will terminate the calibration prematurely for the current project.

3.2.10 Data Output

Click Data Output, and the following interface will pop up:



Query:

Search for successfully calibrated data by entering the project name. The search supports fuzzy matching, allowing you to input keywords related to the project name. Click the Search button to filter results.

Data viewing:

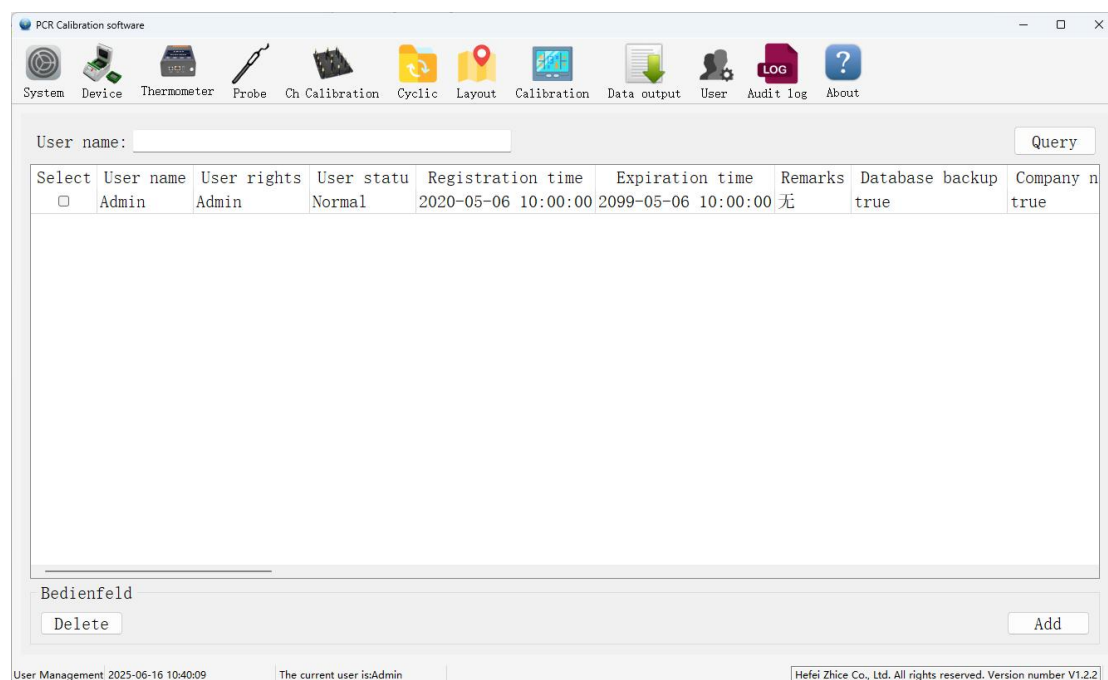
Double-click a project entry to display the temperature data recorded during the calibration process in a chart. When no project is selected, chart settings are disabled. Once a project is selected, you can adjust the time axis and temperature axis settings of the trend chart. Additionally, you can add annotation lines on both the time and temperature axes.

Certificate and raw records: Click the Calibration Report or Raw Records button to analyze the saved temperature data according to the cyclic file procedure and generate the corresponding report. The export format can be configured via System Settings.

Note: The raw records export currently supports Excel format only. Even if the system export format is set to PDF, raw records will still be exported in Excel format.

3.2.11 User Management

Click User and the following interface will pop up:



User Modification:

Double-clicking on an existing user entry will open a detailed user information window. This window displays information such as username, password, security question and answer for password recovery, user status, user permissions, validity period, and user remarks. Click the Detailed Permissions button to view and configure the user's specific access rights.

Add User:

Click the Add button to open the user creation window. Enter the username, password, security question and answer, user status, user permissions, validity period, and any remarks. If needed, click the Detailed Permissions button to further configure the user's permissions. The scope of detailed permissions is restricted by the selected basic user role.

Delete User:

Double-click on the user entry in the table, then click the Delete button to remove the selected user.

User modification

User Info

User name: Admin

User password: ●●●●●●

Problem: What is your compa ▾

Answer: ●●●●●●

User status: Normal ▾

User rights: Admin ▾

Validity period: -06 10:00:00

Remarks: 无

Detailed OK

Add user

User Info

User name:

User password:

Problem: is your company? ▾

Answer:

User rights: Admin ▾

Term validity: 3-16 10:40:36

Remarks:

Detailed OK

Detailed permissions

Set

☒ Data backup ☒ Company ☒ Set ☒ Export format

PCR management

☒ PCR add ☒ PCR modify ☒ PCR delete

Thermometer management

☒ Add ☒ Modify ☒ Delete ☒ Communication

Probe management

☒ Probe add ☒ Probe delete

Cycle file management

☒ Cycle file add ☒ Cycle file delete

Layout management

☒ Layout add ☒ Layout delete

Calibration management

☒ Start calibration ☒ Delete Data

Data export management

☒ Calibration report ☒ Record export ☒ Original record

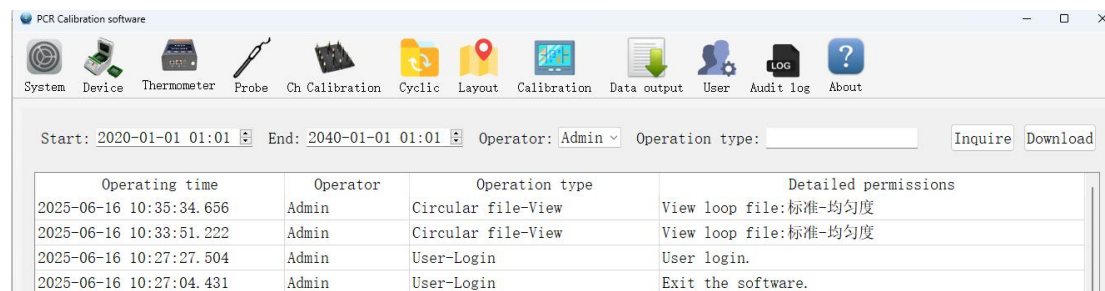
User management and audit log

☒ User add ☒ User delete ☒ Audit log download

OK

3.2.12 Audit log

Click Audit Log and the following interface will pop up:



Audit Log Query:

Users can perform audit log queries by specifying the start and end time, operator, and operation type. The operation type supports fuzzy search, allowing users to input partial keywords for flexible filtering. After setting the desired criteria, click the Search button to display the filtered log records.

Audit Log Download:

Click the Download button to export the current audit log data as a PDF document. This feature supports exporting the filtered results, allowing users to query logs first and then download only the relevant entries.

3.2.13 About

This interface displays the software version information and company contact details.

If you have any questions regarding the use of the software, you can refer to the contact information shown on this screen. Alternatively, you may click the Help button to open the user manual for further guidance.

