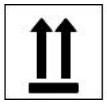
LABDEX

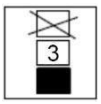
Real-Time Quantitative PCR LX150RTP

Index

1. Safety Measures

Symbol	Title	Description
	Caution/ Warning	This symbol is used to inform you of incorrect operations that could result in physical injury or damage to the instrument. When the Caution or Warning sign appears, read the corresponding text, to understand the type of potential danger and any solutions that must be taken.
	Prohibition	This symbol indicates prohibited behaviors. Continuation of such behaviors could destroy the instrument, or even injury and death to the user.
	Pinch Points	Watch your hands at areas on the instrument with this sign.
	Biological Hazard	During the operation of the instrument, the user might be exposed to leftover substances that are harmful or infectious to organisms. The operator should acknowledge its danger.
	Hot Surface	This sign is presented on areas on the instrument that would emit high heat during operation. Be warned of burns.
	Pinch Points	Watch your hands at the areas on the instrument with this sign.
	Biological Hazard	During the operation of the instrument, the user might be exposed to leftover substances that are harmful or infectious. The operator should acknowledge its danger.

	Protective Conductor Terminal	This symbol is affixed next to a protective conductor terminal on the instrument.
	Carefully read this User Manual	Presented on the nameplate of the instrument.
	CE logo	Presented on the nameplate of the instrument. It indicates that the instrument fulfills the requirements of relevant European directives.
	WEEE (Waste from Electrical and Electronic Equipment)	Presented on the nameplate of the instrument. The instrument abides by the European WEEE directives and is not allowed to be disposed of in the public waste disposal system.
POWER	Power Switch	The power switch of the instrument is near the position where the label is pasted.
Standby	Standby Button	The standby button of the instrument is near the position where the label is pasted.
	USB Port	The USB port is near the position where the label is pasted into the instrument.
	Network Cable Port	The network cable port is near the position where the label is pasted in the instrument.
250V T10AL	Fuse specifications	It is pasted at the position of the fuse of the instrument, and the symbol marks the fuse specifications.
	This side up	Indicates that the correct position of the transport package is upwards.

	Fragile, handle with care	The transport package contains fragile components, that need to be handled with care.
	Keep dry	The transport package needs to be kept dry, to avoid rain.
	Stacking limit	Indicates that the packages are not to be vertically stacked higher than 3 layers (does not include the bottom package) during static storage and transportation.
	Temperature limit	The transport package must be kept and handled within the temperature range of - 20 °C to 55 °C.
	Humidity limitation	The transport package must be kept and handled within the humidity range of 0% to 85%.

- To avoid electric shock, the input power cord for the instrument must be properly grounded. The instrument uses a three-prong grounded plug with a third (ground) pin that can only be used with a grounded power socket.
- Operators are not allowed to disassemble the instrument. Replacing components or adjusting certain parameters inside the machine must be accomplished by certified maintenance professionals.
- Before switching on the power, always check if the voltage of the power supply matches the required power (100-240V～, 50/60Hz), and make sure that the rating load of the power socket is not less than that of the instrument 750W.
- This instrument should normally be used with the supplied power cord. If the power cord is damaged, it must be replaced and cannot be repaired.
- When the power cord is inserted or pulled, hold the plug with your hand in the correct position.
- Ensure the plug is fully and firmly inserted into the socket while inserting it. When disconnecting the power cord, do not pull the line but plug it out from the socket.
- The instrument must be installed where the power supply is easy to cut off.
- The instrument should be placed on a clean, tidy workbench or table with little dust and a place far away from the water source, such as a pool, pipe, etc.

- The room ought to be well-ventilated, having no corrosive gas or interference of a strong magnetic field.
- The table for the instrument must be stable with the horizontal top.
- Do not place your hand nearby when the tray is in motion to avoid harm.
- The instrument can be interconnected with computers, USB memory, and USB scanners through the USB interface and network port.

2. Introduction

Real-Time Quantitative PCR LX150RTP is a 96-well quantitative fluorescence, designed with a 10.1-inch high-definition color touch screen and built-in analysis software for spontaneous operation and analysis. High-precision temperature control guarantees the block temperature resolution at 0.1 °C and temperature uniformity of 0.1°C. The gradient temperature control range is 30-100°C and the maximum temperature difference is 40°C. It has two temperature control modes settings which enable to control of either block or tube temperatures.

3. Features

- It has 96-well high-throughput
- Microprocessor control system with a 10.1-inch large touch screen for precise response and convenient operation
- Having full spectrum and high-power LED with highly sensitive PMT (photomultiplier tube) detection
- Sample tray automatically moves in/out, enabling integration with automated workstations/plate
- Built-in software and PC software with flexible program settings
- Preset templates + quick run starts the experiment immediately

4. Specifications

Model No.	LX150RTP
Throughput	96 well (12 × 8)
Applicable consumables	PCR single tube or strip, 96wellx0.2ml half-skirted/no skirted plate
Dynamic range	1-10x10 copies
Detection location	Top detection
Excitation light wavelength	400-800nm
Detection wavelength	500-800nm
Fluorescence channels	6 channels
Fluorochrome/Dye	Channel 1: FAM/SYBR Green I Channel 2: JOE/HEX/TET/VIC Channel 3: NED/TAMRA/Cy3 Channel 4: ROX/Texas red Channel 5: Cy5 Channel 6: Cy5.5
Excitation light source	Full-spectrum LED
Detector	PMT
Block temp. range	Block temp. range: 4~105℃ Block temp. accuracy: ≤±0.1℃ Block temp. precision: ≤±0.1℃ Block temp. uniformity: ≤±0.1℃
Max heating & cooling rate of block	≥6℃/s
Gradient temp. difference	1-40℃
Block temp. control mode	Block mode, Tube mode
Sample volume range	5-100μL
Heated lid temp. range	30℃-110℃ (default 105℃)
Fluorescence intensity	CV≤3%
Touch screen	Yes, 10.1-inch touch screen
Scan mode	Full plate scan or specified line scan
Software functions	Absolute quantification, Relative quantification, Melting curve, SNP Genotyping, HRM, Quick run, etc.
Operating system	PC software (Windows 8 or higher), Built-in software
Ports	USB Type-A port × 2, USB Type-B port, RJ45 port
Power-off protection function	Yes, Data can be restored after power-on
Sample tray control mode	Sample tray automatically moves in/out, enabling integration with automated workstations/plate handlers
Product dimension (W x L x H)	320 x 525 x 420 mm

Net weight	27 kg
Packing dimension	920 x 820 x 780 mm
Gross weight	70 kg

5. Applications

Used for sequencing, genotyping, cloning, and mutagenesis that require quantification and detecting target nucleic acids, in institutes, research, diagnostics centers and laboratories, etc.

6. Installation

6.1 Wire Connection

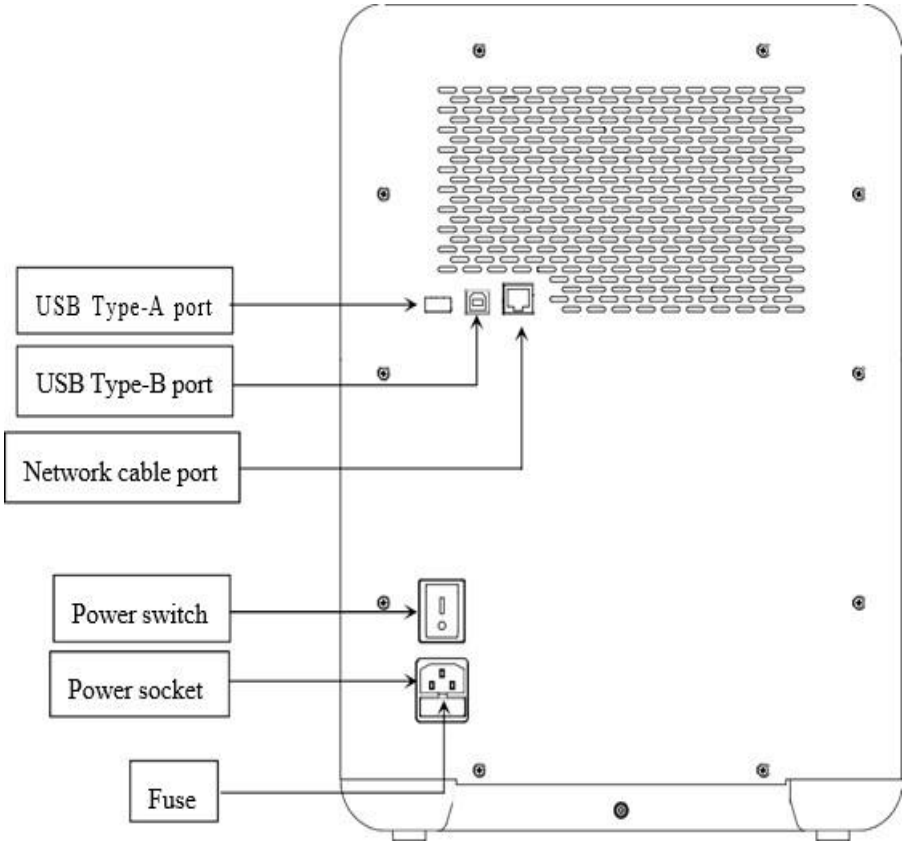


Figure-1

1) As shown in the figure below, before using the instrument, connect the power cord to the socket and turn **ON** the power supply.
2) **Power cord connection**: The power cord attached to the instrument should be used. When connecting, the power switch of the instrument should be turned **OFF** after connecting, check the tightness of the power cord and the power socket of the instrument. If it is loose, replace it.
3) **Network cable connection**: The network cable attached to the instrument should be used. After connecting, check the tightness of the network cable and the instrument network cable port. If it is loose, replace it.
4) **USB port**: For external connection of USB devices.
5) **Code scanner**: Before using the instrument, connect the code scanner to the data line, and then insert it into the USB interface of the computer.

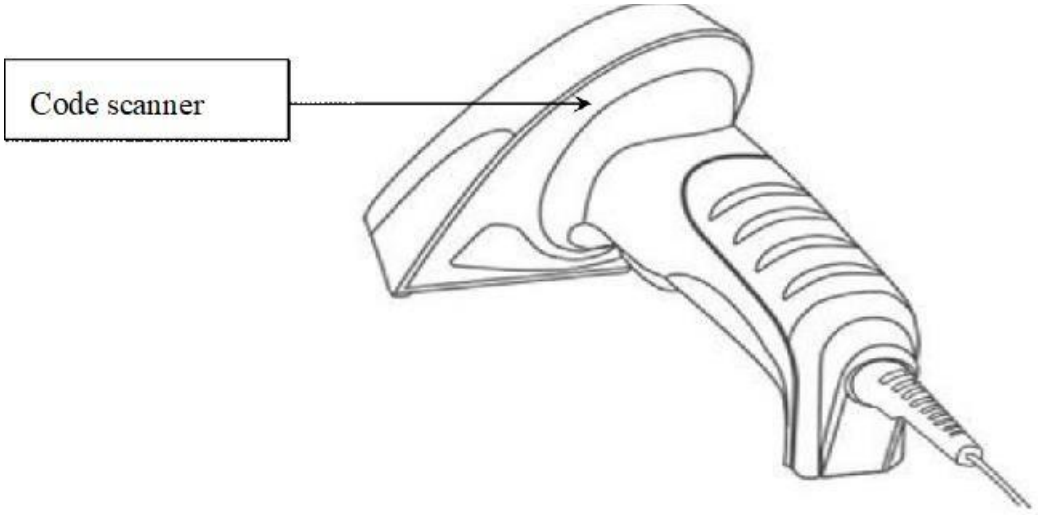


Figure-2

6.2 Preparation before startup

1) Check whether the working environment meets the requirements of the working environment of the instrument before using it.
2) Place the instrument on a horizontal workbench.
3) The main view of the instrument is shown in the figure below.

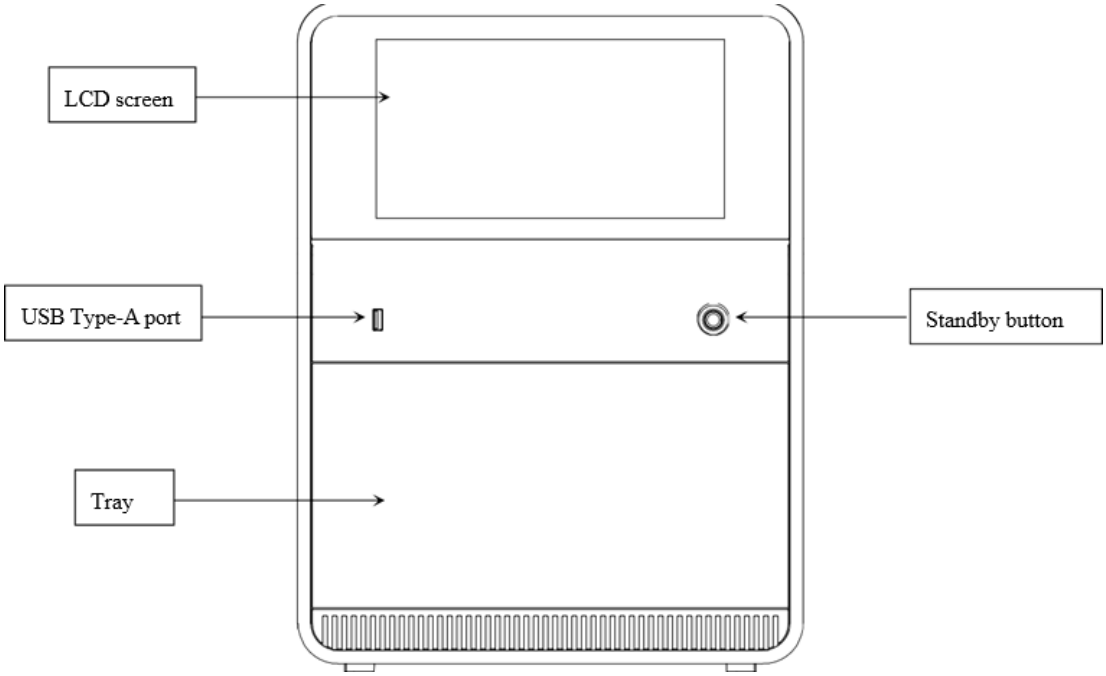


Figure-3

No.	Description
1.	**LCD screen**: Fixed on the front top of the instrument. The user can touch the screen for a series of operations.
2.	**USB port**: To connect to an external USB driver, when connected, it can perform functions like data import, export, or software upgrade.
3.	**Standby button**: When the instrument is powered on, press the button to open/close the instrument
4.	**Tray**: It can be opened/closed by the instrument terminal or PC terminal software for placing/taking out the samples. The tray must not be blocked when it is opened and closed.  **Note:** Do not block the tray with the hands when opening/closing, as this may cause accident injury.

7. Operations

7.1 Instrument Startup

1) Press the power switch on the back of the instrument to the "I" position to connect to the power.
2) Press the standby button on the front of the instrument to turn on the instrument.
3) The LCD screen of the instrument lights up and it can enter the login interface.
4) Enter the username and password to login to the instrument terminal.
5) When using the instrument for the first time, the user needs to set the initial password of the admin account through the instrument terminal in the instrument and log in, then it can be used.
6) When it is not used for the first time, it can be used directly online through the PC, and it does not need to login to the instrument terminal.

Figure-4

7.2 Check before shutdown

1) Whether all test tubes and 96-well plates in the block of the instrument have been removed.
2) Whether the inside of the hole in the instrument module has been cleaned.
3) Whether the tray is completely closed.

7.3 Instrument shutdown

1) Press the standby button on the front of the instrument to turn **OFF** the instrument.
2) Press the power switch on the back of the instrument to the " O " position to disconnect the power supply.
3) If contaminants are spilled on the instrument, wipe it with 75% ethanol with a soft cloth.

7.4 Software operation guide

After startup, the instrument enters the initialization and self-checking, checking the functions of temperature control, optical detection, motor activity, positioning, communication, and so on. If there is any abnormality, an alarm will be given. After passing the self-check, it will enter the user login interface automatically.

7.4.1 User login

1. Initial login (Instrument only)

Before first using the instrument, the initial password of the administrator account must be set through the instrument software (that is, the initial password must be confirmed and login on the instrument terminal, so it can be used online on the PC terminal for the first time, and then the subsequent functions like creating a new user and deleting a user of the instrument can only be performed on the PC terminal).

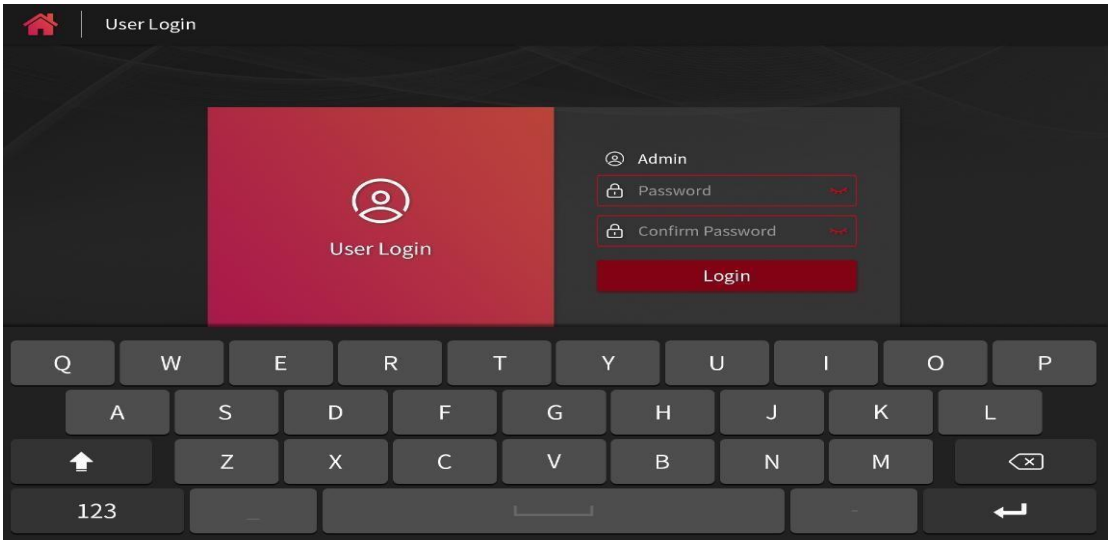


Figure-5

2. Routine login (Instrument only)

1) If the instrument is not used for the first time after it is powered on, enter the user login interface, click the **"User Login"**, and enter any username and password under the instrument for login.

Figure-6

2) If you forget the password when logging in to the administrator account, click the **"Forget Password"** to generate a **"Request code"**. The user can apply to get an authorization code to reset the password of the administrator account.

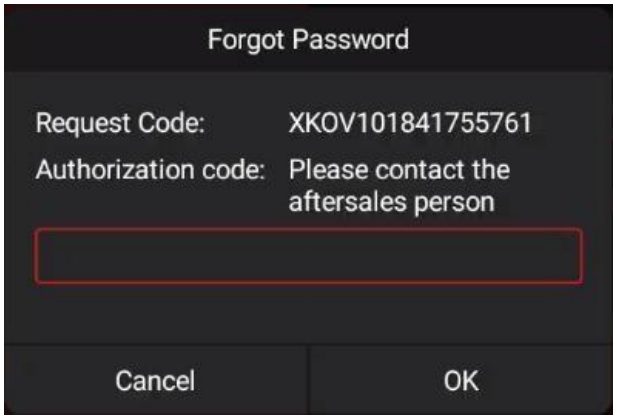


Figure-7

3) After login, the user enters the main interface of instrument terminal software, which includes
   - User Logout
   - Template Library
   - Import
   - Quick run
   - Real-time graphics
   - Experiment library
   - Settings

Figure-8

4) Instrument terminals cannot only run an experiment directly, but also import, export, and view files, or set the system.

3.No need to log in (PC connected)

1) If it is not used for the first time and the instrument has been connected through a PC there is no need to log in to the instrument terminal and only the viewing of the experiment state function is effective.
2) In the online mode, the instrument terminal automatically jumps to the online interface of the experiment.

Figure-9

3) If the experiment is running in the online mode, click the button on the home page to view the current experiment state.

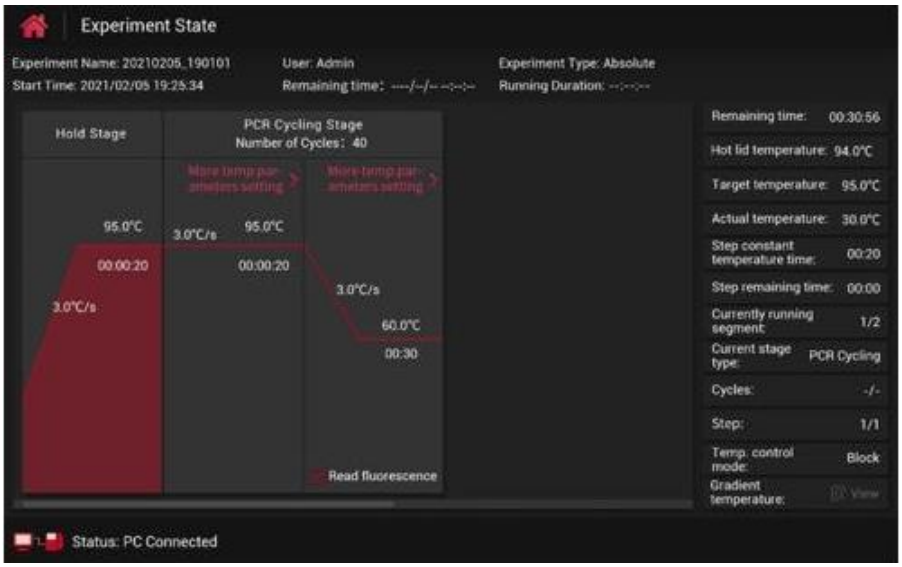


Figure-10

4) If the online mode is disconnected while the experiment is running, the instrument status on the home page will change to the online disconnected, running offline experiments.

Figure-11

5) Click the home button to enter the experiment status interface.
6) The user manually stops the offline experiment or when the offline experiment is completed, the interface will jump to the user login stand-alone mode.

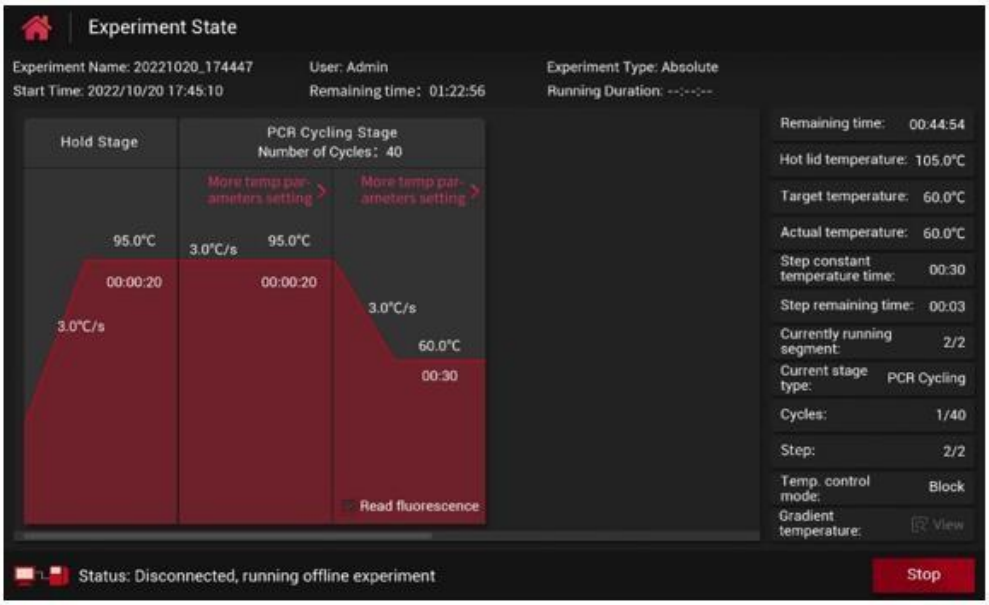


Figure-12

7) After reconnecting to the PC, the user can view the running experiments or instrument experiment files to view the experiments that were running before the disconnection.

7.4.2 Run an experiment

The instrument terminal can run an experiment in the following two ways.

Via the template:

Template → Click any template file → Plate settings → Open module → Place samples → Close module →Next → Method settings → Gain settings → Start run

Via the quick run:

Quick run → Template selection → Open module → Place samples → Close module → (Plate settings →Next → Method settings →) Start run

1. Plate settings

a. The general setting of the plate

1) After selecting the template, jump to the plate settings, which can set the experiment name, target, and sample, and select the plate.

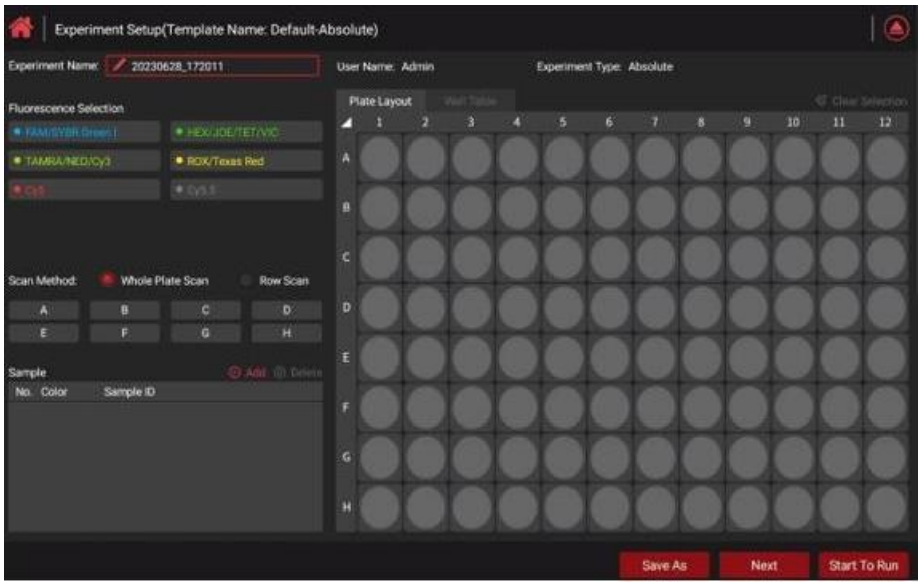


Figure-13

2) **Select the plate**: The required hole can be directly selected through the plate layout or well table on the right.
3) **Clear selection:** You can quickly clear the selected plate hole by clicking the **"Clear selection"** button in the upper right corner.
4) **Experiment Name:** The creation time is the default name or click to edit the name manually.

Figure-14

5) **Fluorescent selection:** Select the fluorescence channel.

Figure-15

6) **Sample:** It can add or delete sample information.
7) After selecting the well location of the plate, click the check box next to the sample ID to add the sample to the plate.

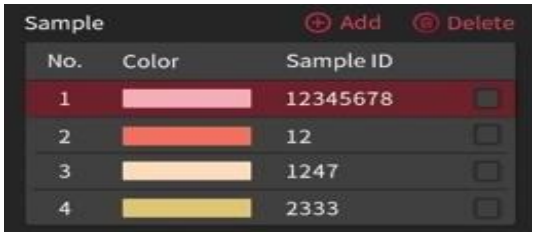


Figure-16

8) Click the **"Add"** button to add sample information.
9) The sample ID can be added manually or by an external code scanner.

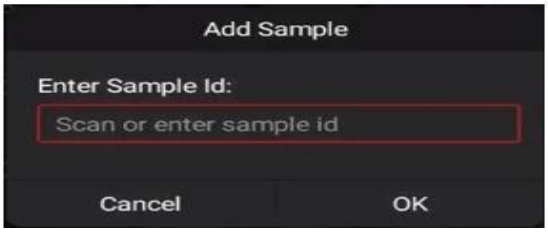


Figure-17

10) Select a certain sample information and click **"Delete"** to delete this sample information.
11) If the sample information has been selected on the plate, the system will pop up to prompt you before deleting.

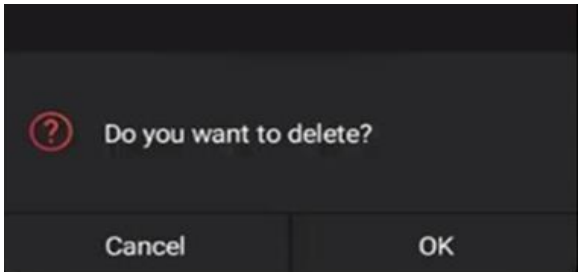


Figure-18

12)**Switch between Plate and Table**: You can switch the display of the well plate through the plate or table.

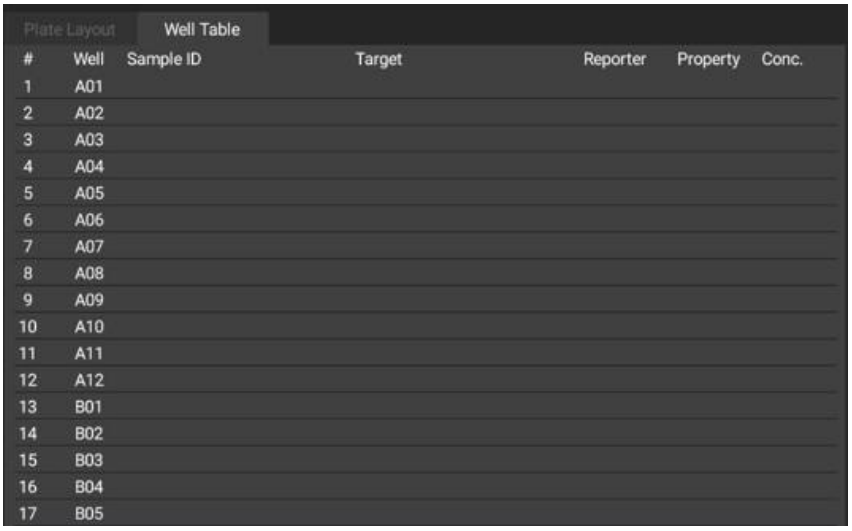


Figure-19

b. Plate information save as: After setting the plate, click the **"Save As"** to save the information settings as a new template file.

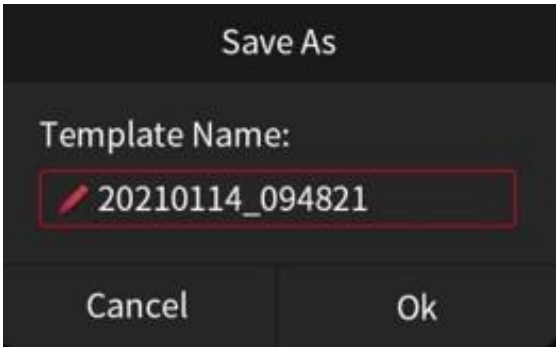


Figure-20

2. Sample preparation

After setting the plate information, click the icon on the upper right of the plate setting to open the module, and place the samples into the module according to the configured plate layout. Click the icon again to close the module.

3. Experiment Setup

1) Click the **"Next"** of the plate setting interface to jump to the experiment setup interface:

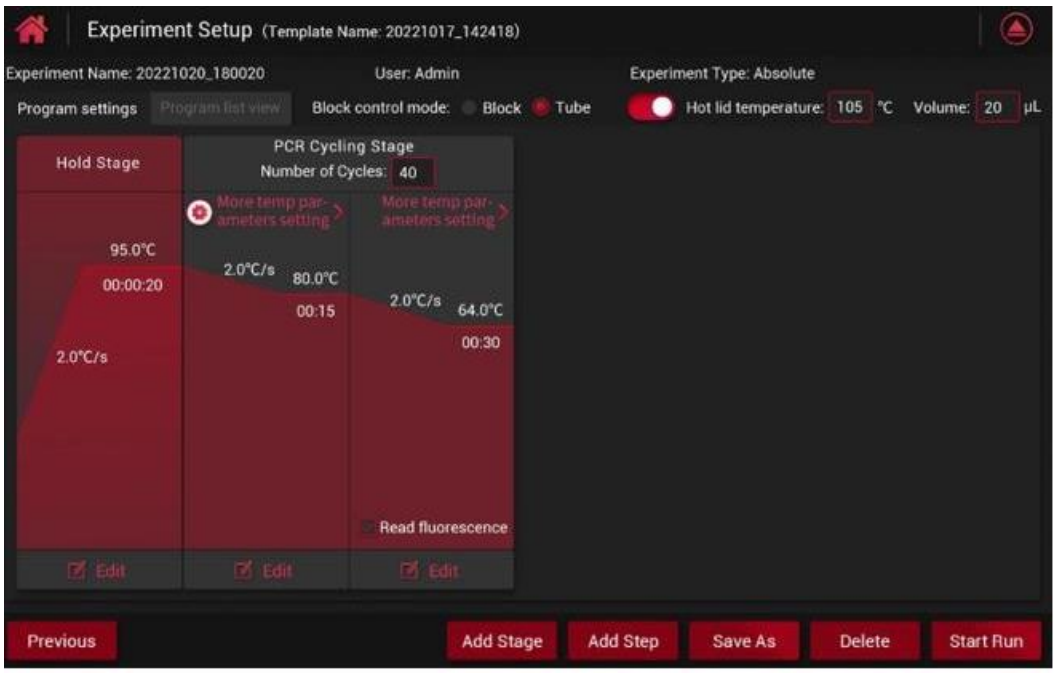


Figure-21

2) Click the **"Previous"** to return to the plate setting interface to reconfirm.
3) The experiment setup interface can set the specific running program, select run mode, set the hot lid temperature and liquid quantity, and save the file as a template file.
4) **Method View**: Add step, delete stage, delete step, and set the temperature & time of each program stage.
5) **Add Stage**: Click to select a holding stage, cycle stage, melting stage, or infinite stage.
6) **Add Step**: Click to add a step before or after the current step.

Figure-22

7) **Add Step**: Click to add a step before or after the current step.

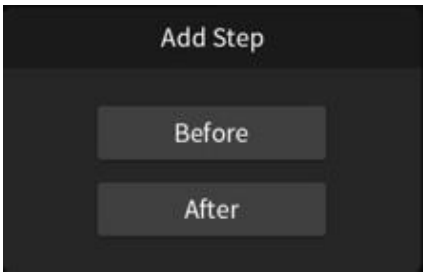


Figure-23

8) **Delete:** It can delete selected steps or stages.
9) **Modify**: It can set the target temperature, ramp rate, step hold time, and whether to sample the fluorescence in the selected step.
10) **More temperature parameter settings:** The extended parameters of each step can be set in the cycle stage.

Figure-24

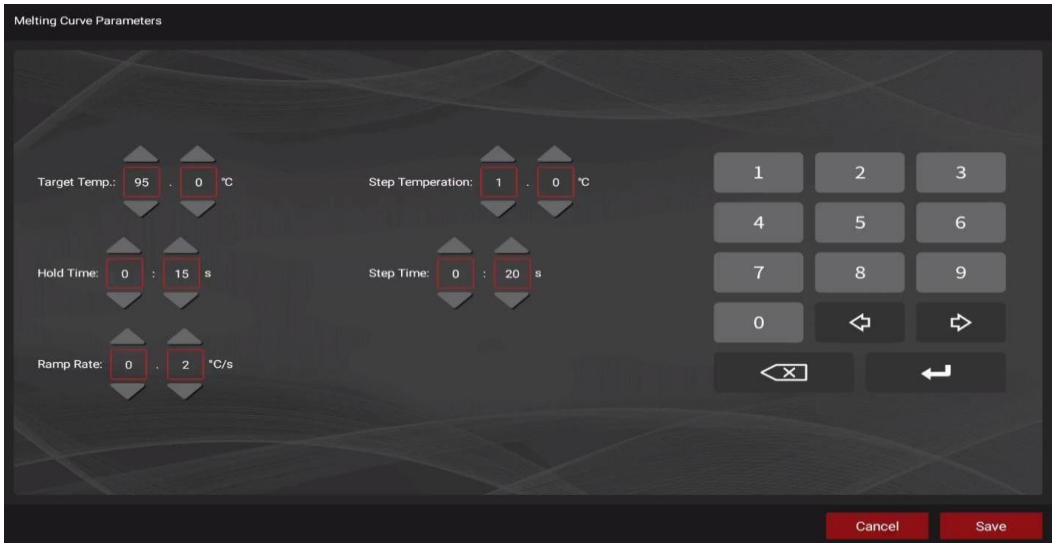


Figure-25

11) **Melting Parameters:** The melting parameters can be set in the last stage of melting.

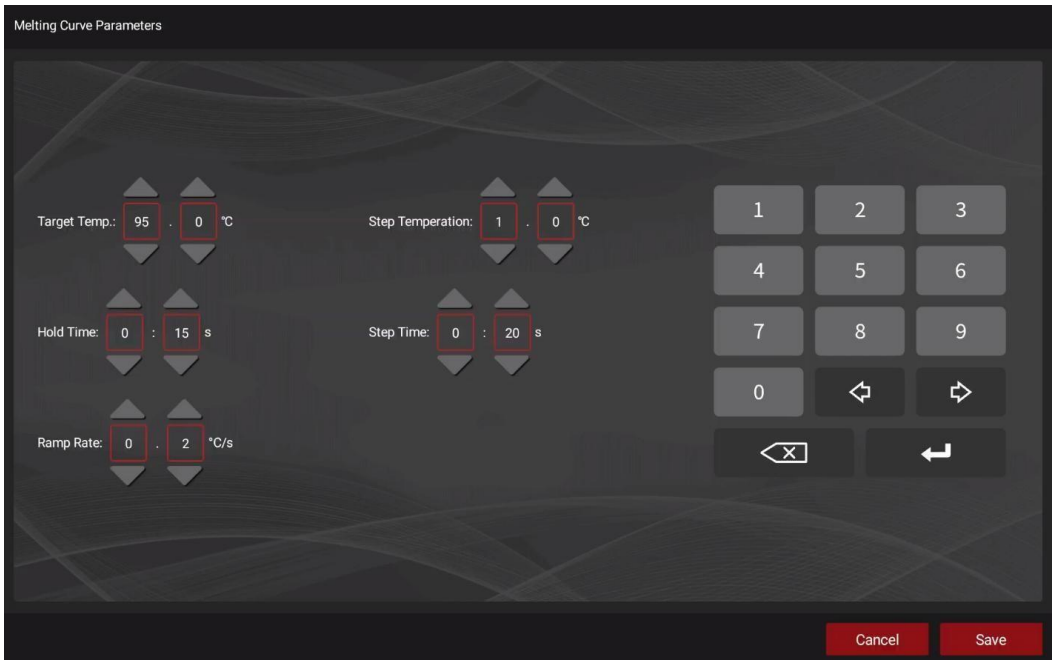


Figure-26

12) **Settings of cycle number**: Click the cycle number box of the cycle stage to manually edit the cycle number.

Figure-27

13)**Run Mode:** Block or Tube temperature control mode can be selected
14)**Hot-lid Temp:** If the function of hot lid temperature is enabled, the heating temperature of the hot lid can be set, ranging from 35 °C to 105 °C.
15)**Liquid Quantity**: Set the liquid volume, and the default is 20 μl.
16)**List View:** Switch to the list mode to view the running program.

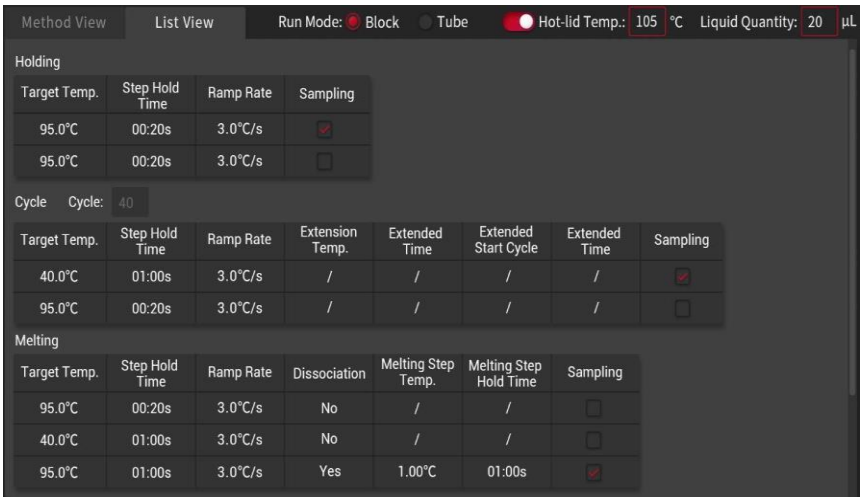


Figure-28

17)**Save As**: Click the **"Save As"** to save the setting information as a new template file.

4. Start Run

1) Click the **"Start Run"** to jump to the Run Confirm interface, where to select the gain mode and set the gain value.

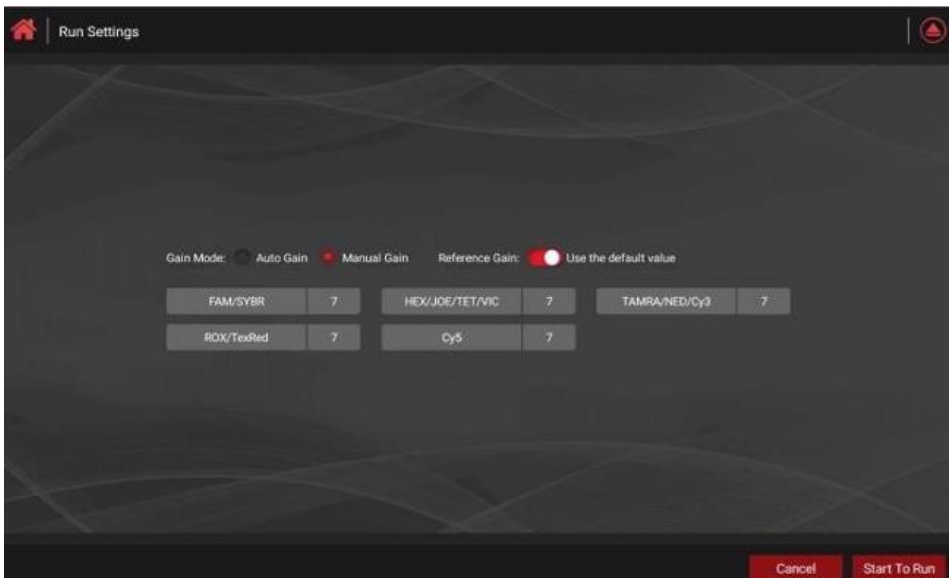


Figure-29

2) Click the **"Start Run"** to jump to the Run Confirm interface, where to select the gain mode and set the gain value.

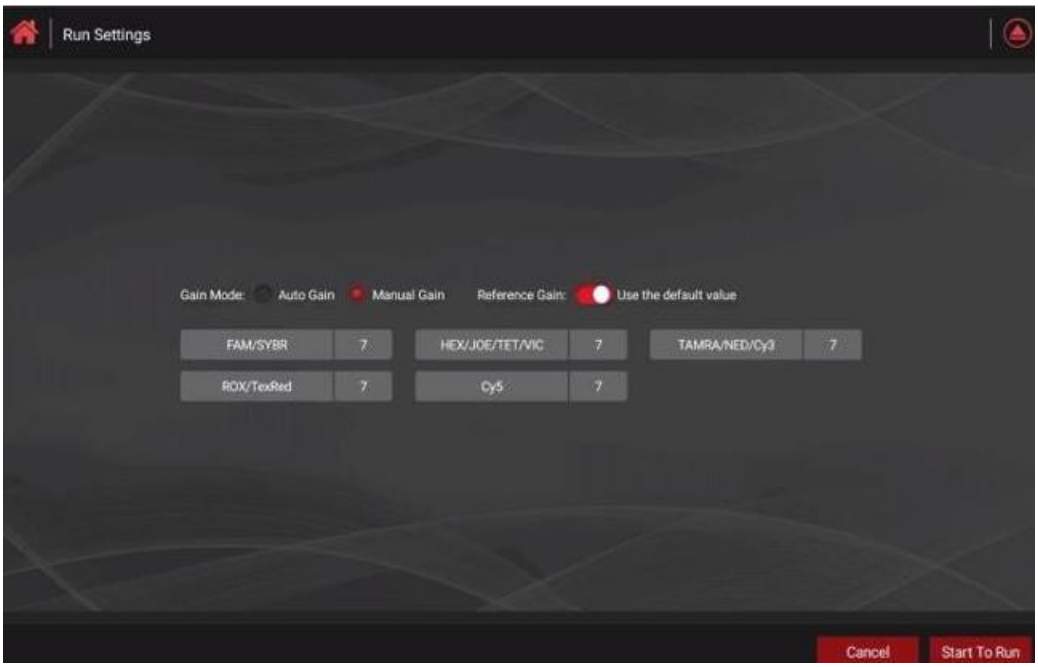


Figure-30

3) After the gain setting is completed, click the **"Run"**, and the system will prompt " check whether the sample is loaded" again.

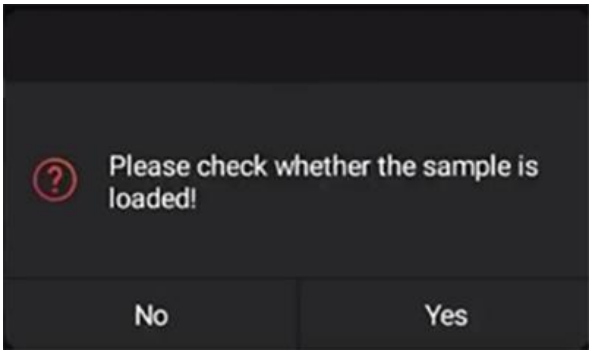


Figure-31

4) If no sample is placed, click the **"Cancel"** button to return to the Run Confirm interface, click the  icon on the interface to open the module, and place the sample into the tray according to the plate layout.
5) Then click the  icon again to close the module. If you confirm that the samples are placed into the block, click **"OK"** to the experiment begins and it will enter the real-time graphics interface.

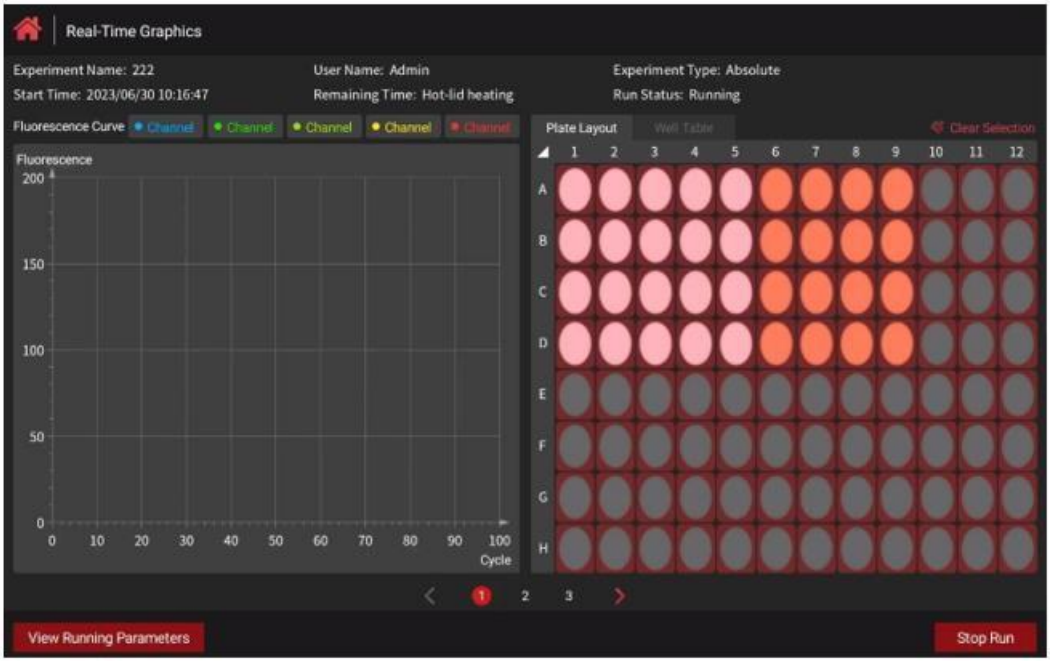


Figure-32

7.5 User logout

- Click the **"User logout"** and confirm to exit the current user interface.

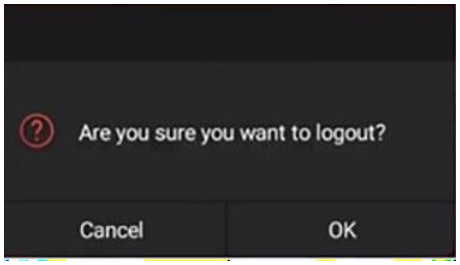


Figure-33

- It cannot log the current user when the experiment is running, a dialog box will prompt to pause the experiment or log out after the experiment is done.

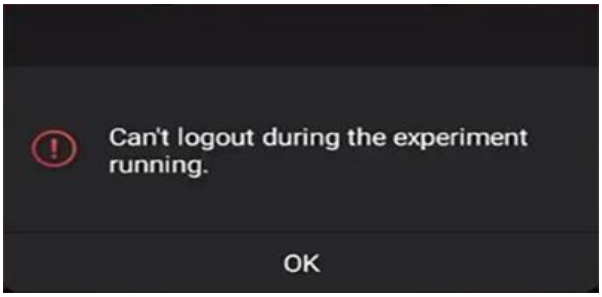


Figure-34

1. **Template Library**
   1) It can review all template files (When using for the first time, the administrator account has 4 types of experiments by default.
   2) Each type of experiment can be set as an initial template, which can be saved as a new template after setting the preset template or import the template file with the same user's name on the PC into the Instrument terminal), open, search, select, export or delete a file.
   3) Click any template file to open the template file and enter the plate setting interface.
   4) Template files under the instrument can be searched and viewed through template name, time review, experiment type, and username (only the administrator account can view all the files of all users in the instrument, while the ordinary user can only view the files under his name).

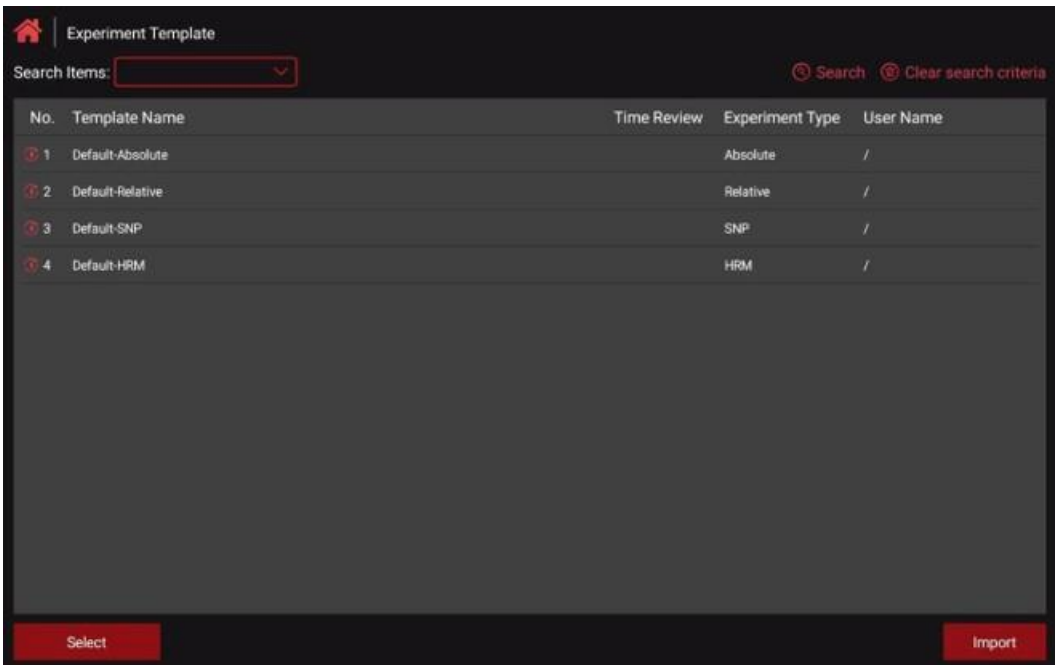


Figure-35

   5) Click Import, it can import the template file from the same user's name through the external USB drive.

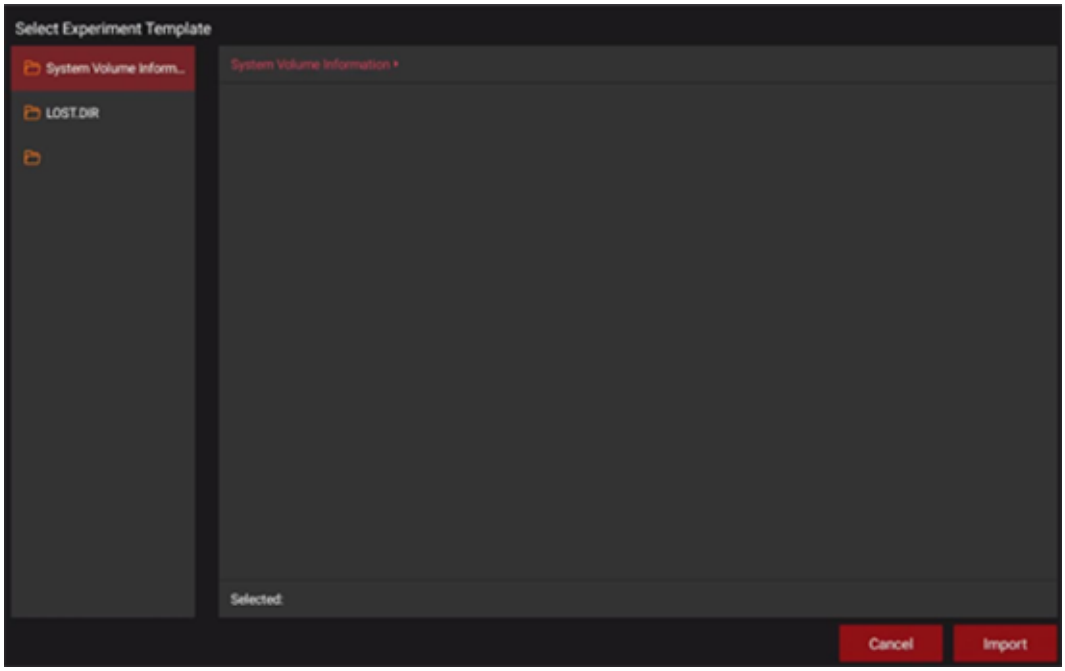


Figure-36

6) Check the template file to export or delete the selected file.

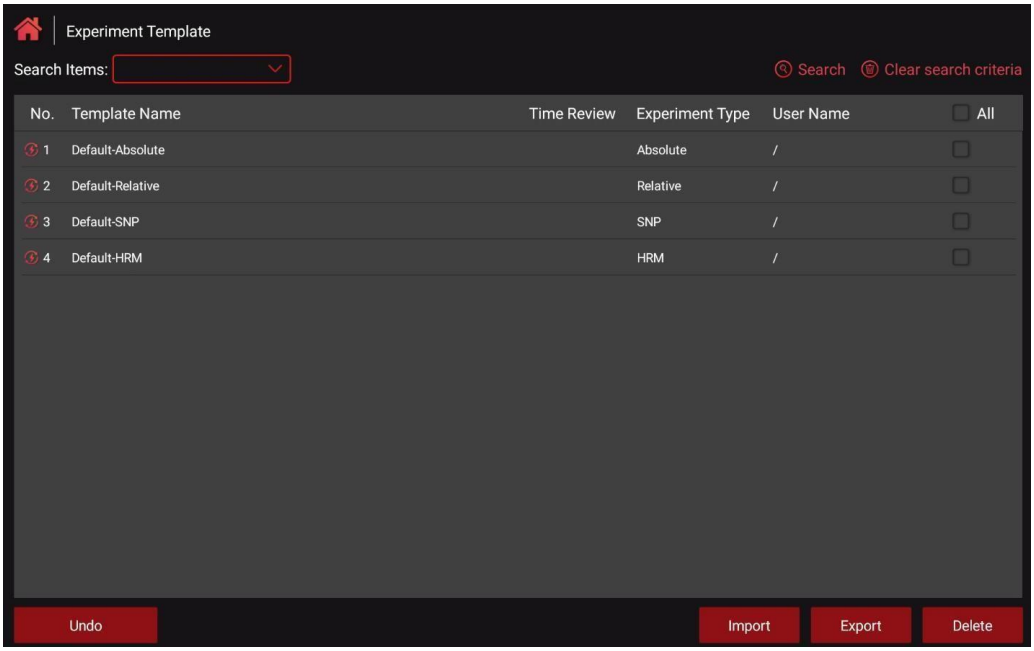


Figure-37

2. Import

It can import the template files under the same user's name into the instrument terminal software through the external USB driver.

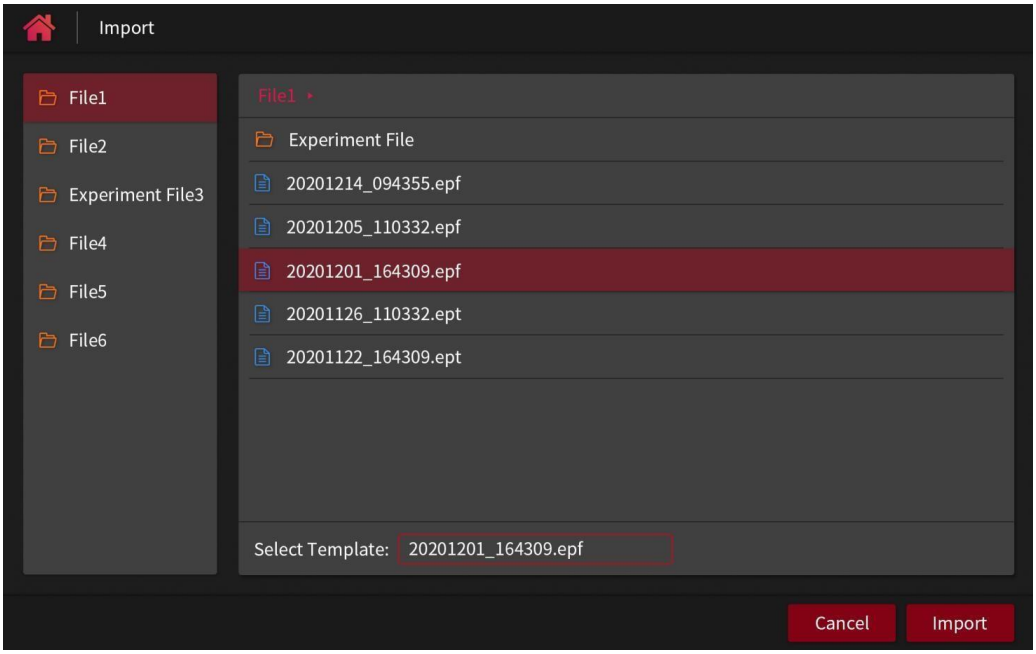


Figure-38

3. Quick run

1) Click the **"Quick Run"** to select the preset template (the template file settings and gain settings.

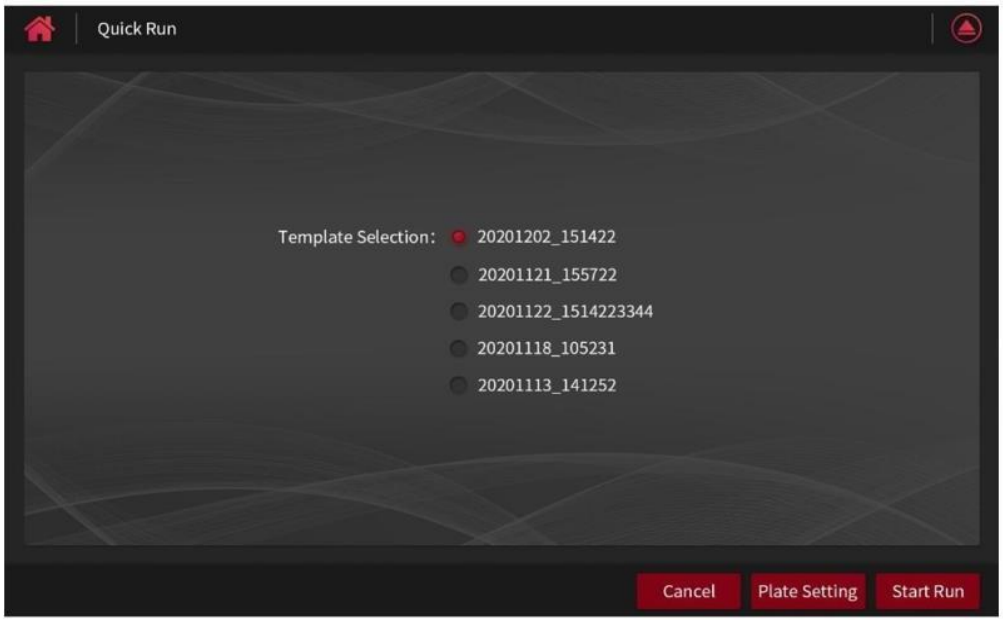


Figure-39

2) If there is no need to change experiment settings after selecting the template, click the icon on the upper right to open the module and place the samples into the block according to the plate layout.
3) Then click the icon again to close the module and click the **"Start Run"** button to run the experiment.

4. **Real-time graphics**
   1) Click **Real-Time Graphics**. If the program is not running, click the **"Real-Time Graphics"** and a pop-up prompt will appear.

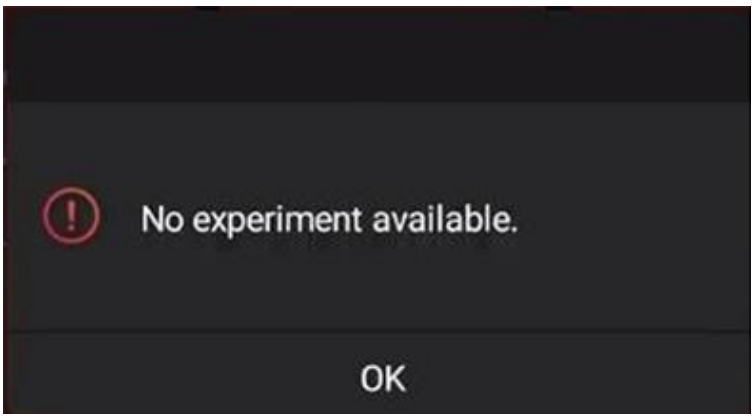


Figure-40

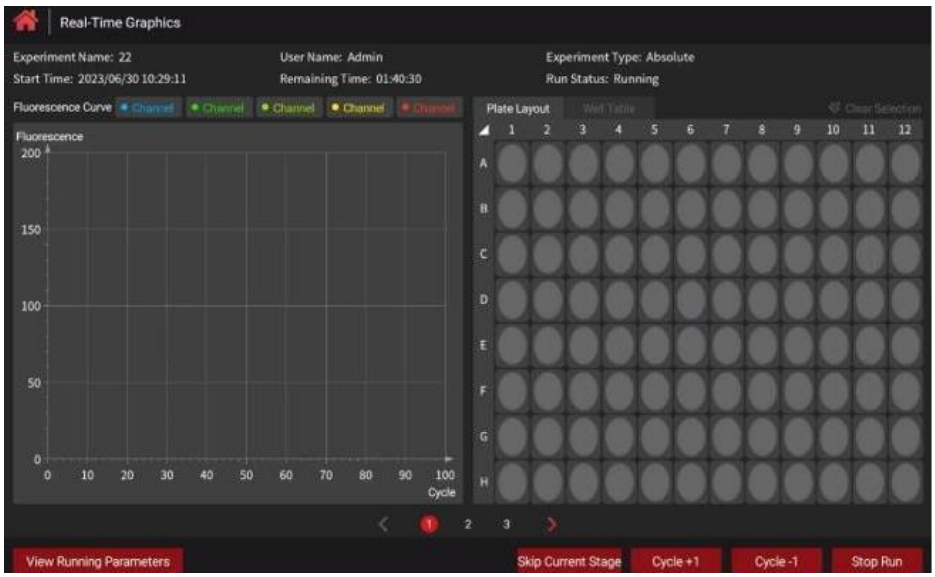


Figure-41

   2) **Experiment running time**: The start time of the experiment can be viewed at the top of the interface, and the complete time and total running time can also be viewed after completion.
   3) **Run status:** Displaying the running status of the experiment.
   4) **View experiment data**: Slide the interface to switch to the viewing interface of different experiment result curves and the viewing interface of running programs.
   5) **View run parameter**: The experiment running parameters of the target stage (step) can be checked.
   6) **Experiment operations**: The "Skip Current Stage" and "Stop Run" can be carried out, and the "Cycle +1" or "Cycle -1" can be operated after entering the cycle stage.

7) **View the error log:** If there is an error warning during the running, the interface will pop up a warning box, and the user can decide to stop or continue running according to the warning content.

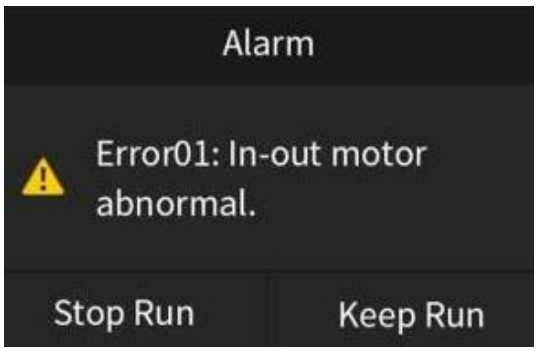


Figure-42

8) After the running continues, the user can click the **"View"** next to the error log to check all error logs.

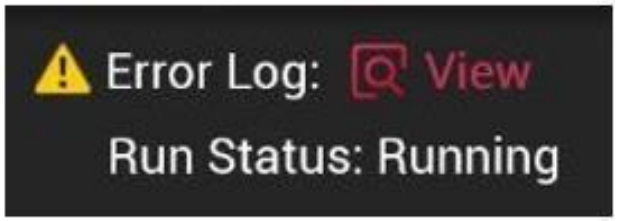


Figure-43

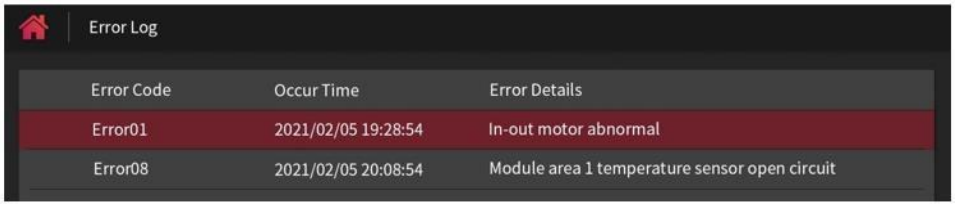


Figure-44

5. Experiment library

1) Review all experiment files under the user's name, and search, view, select, or export the file.
2) The experiment files in this instrument can be searched and viewed by the experiment name, finish time, experiment status, experiment type, and username.
3) Only the administrator account can view all the files with different usernames in the instrument, a common user can only view the files under their own user's name.

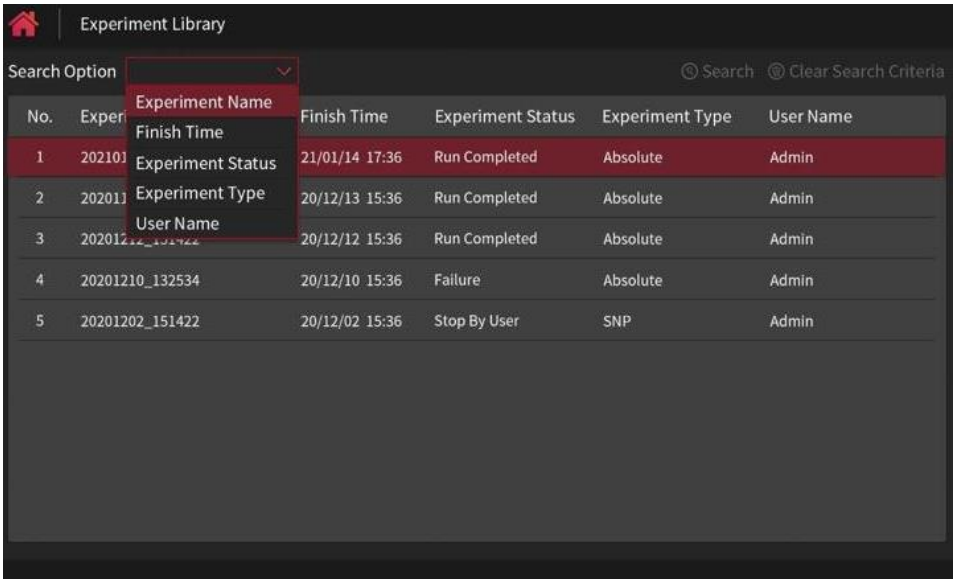


Figure-45

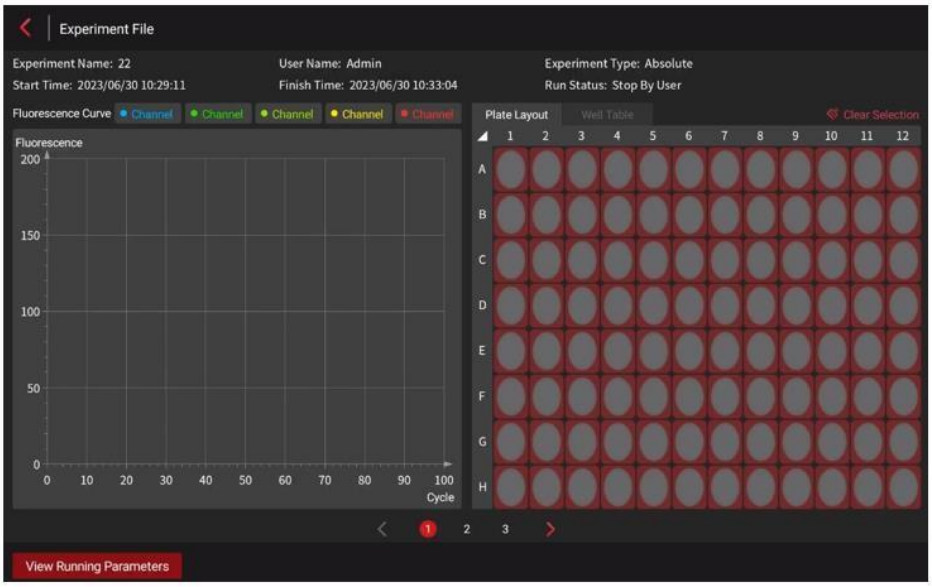


Figure-46

4) Click the **"View Run Parameter"** button below to switch to view the experimental running parameters.

Figure-47

5) The experiment files that are selected in the checkbox can be exported as CSV files or directly as .epf format experiment files.
6) The user can also click **"Export Encrypted CSV"** to encrypt and protect the files that need to be exported or delete the selected experiment files

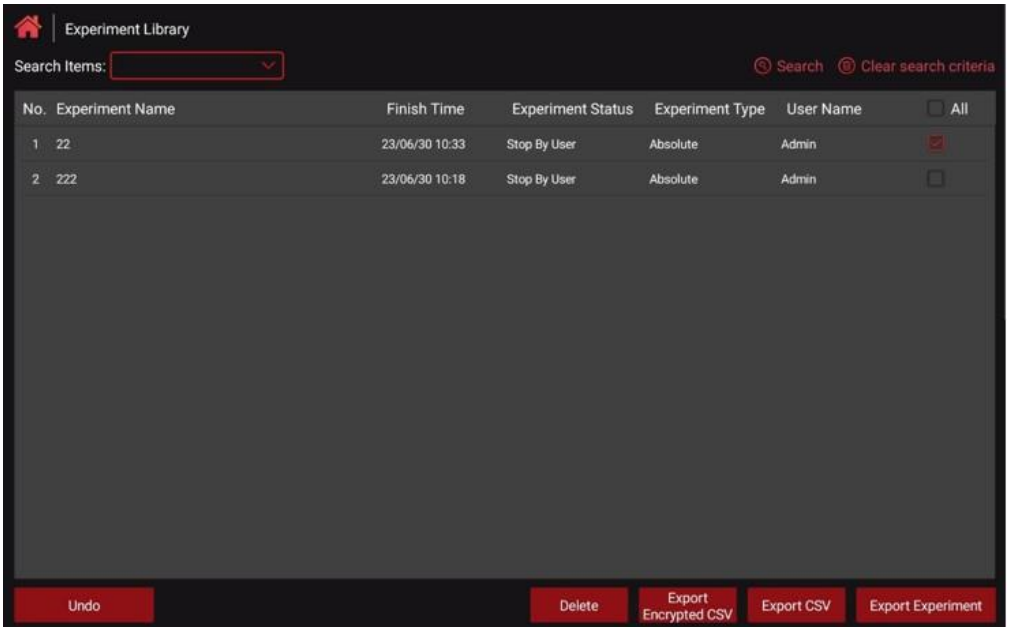


Figure-48

7) The password needs to be set by yourself. After setting the password, click **"Export".**

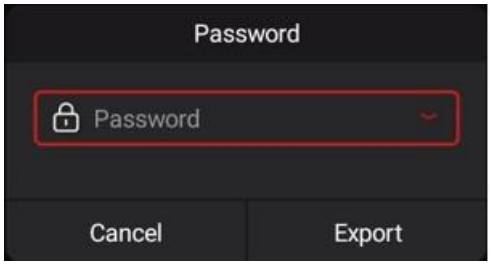


Figure-49

6. Settings

a. Basic settings

1) Set screen display brightness, instrument date, lock screen, completion prompt sound, and alarm sound, administrator account can also upgrade software through U disk.

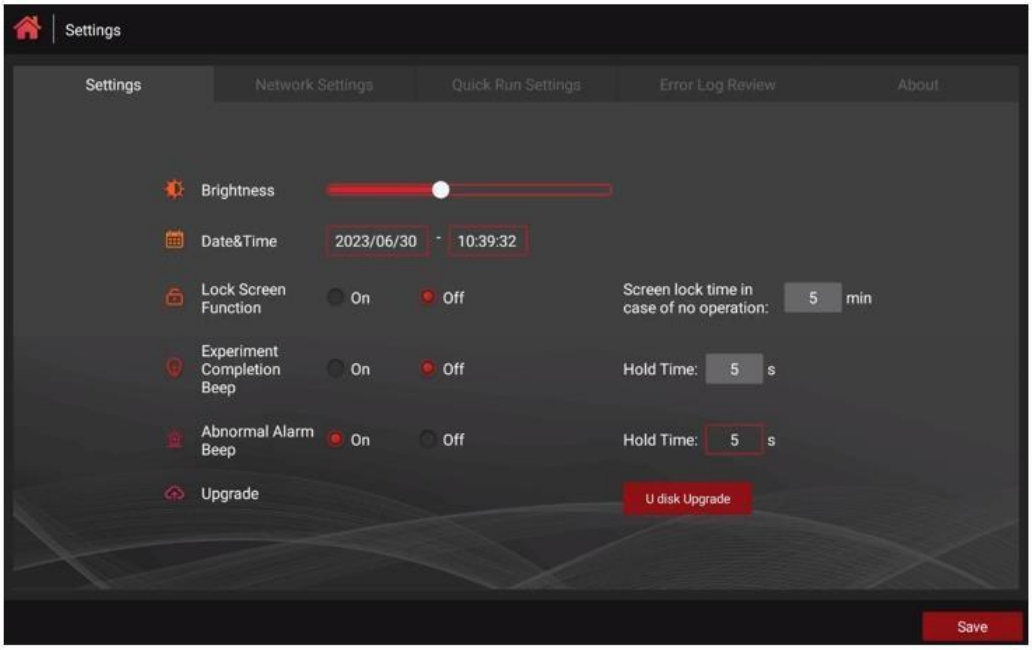


Figure-50

2) After selecting **"Open"** at the lock screen function, you can set the lock screen time.

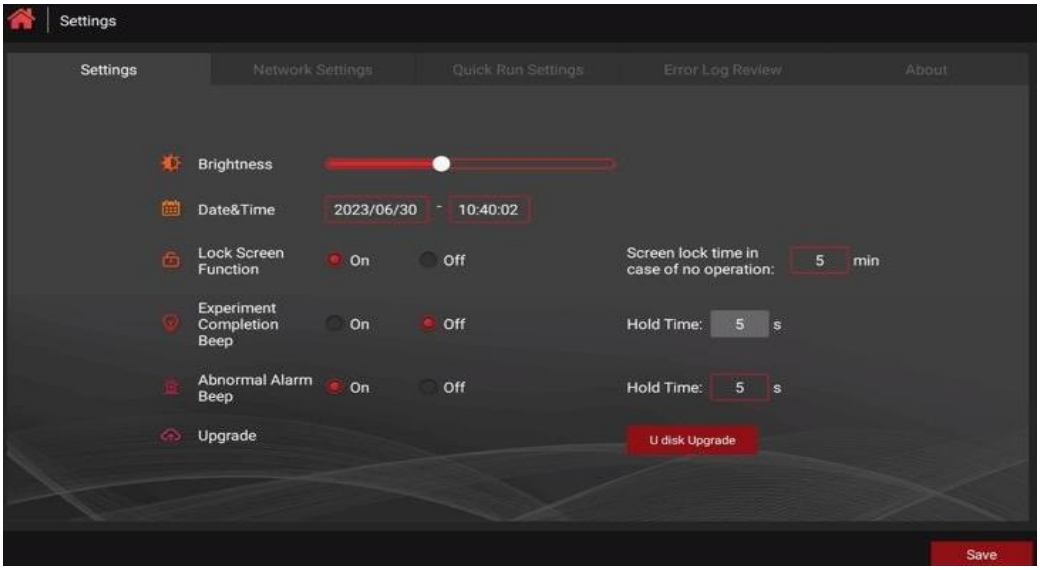


Figure-51

3) After the instrument locks the screen, you need to enter the login password and unlock:

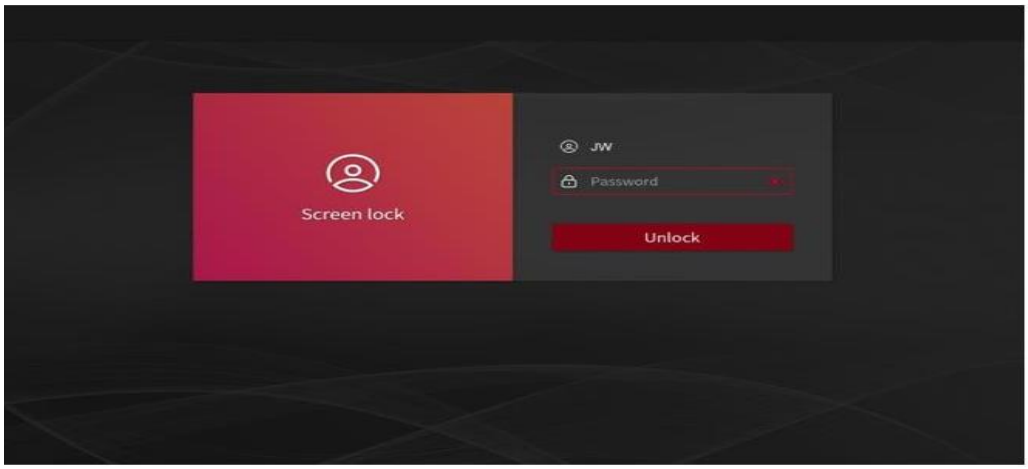


Figure-52

4) If the user did not click **"Save"** after modifying the parameters, it will exit the setting interface directly, but the system will pop up a prompt box to ask the user whether to save the modified parameters or not.

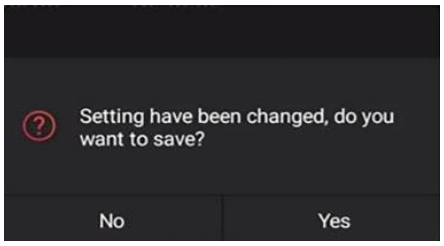


Figure-53

b. Network Settings

By performing network settings, the user can view the IP address of the Ethernet connection.

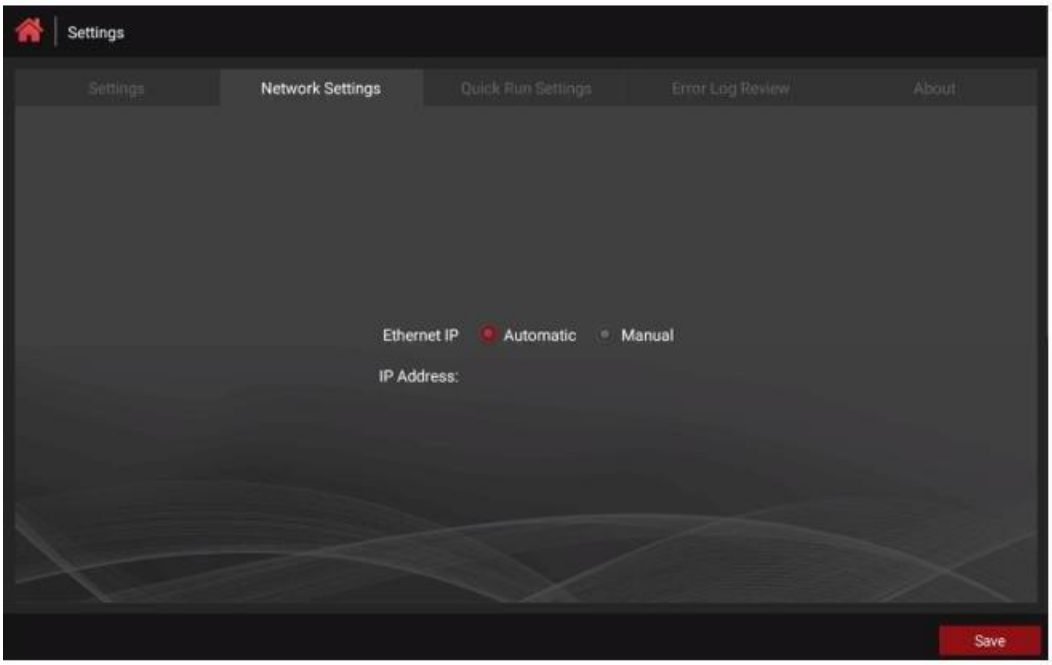


Figure-54

c. Quick run settings

1) It can set template files and gain setting parameters for a quick run.

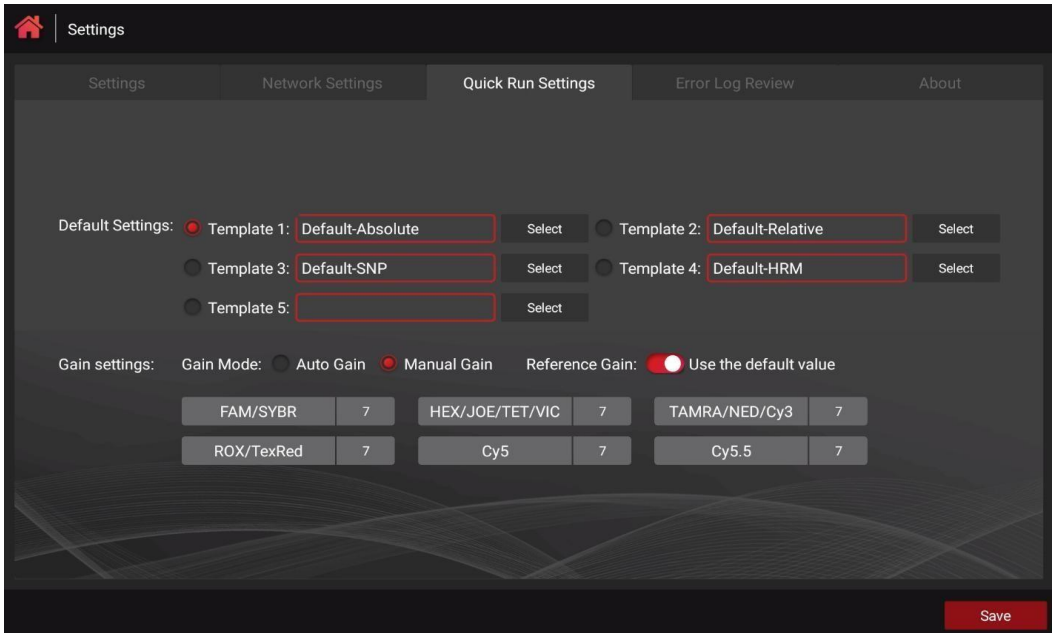


Figure-55

2) There are up to 5 preset quick-run templates, and one of them can be set as the default template.

3) For each template, it can be selected as the template file to run one experiment.

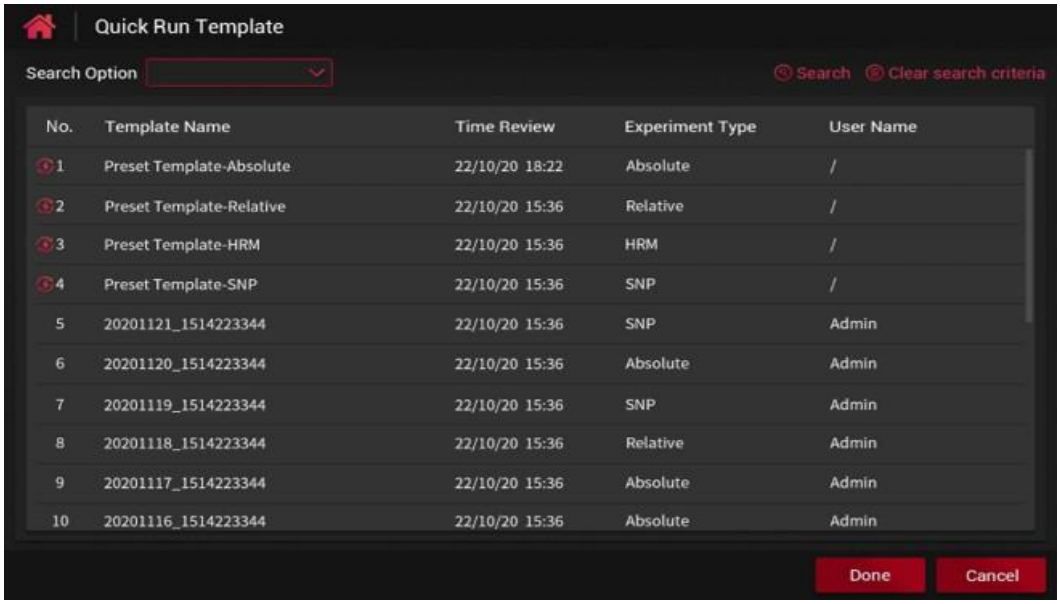


Figure-56

d. Error log review

1) The administrator account can view the error log of the instrument (Common users do not have this function), including the error code, time of occurrence, and username.

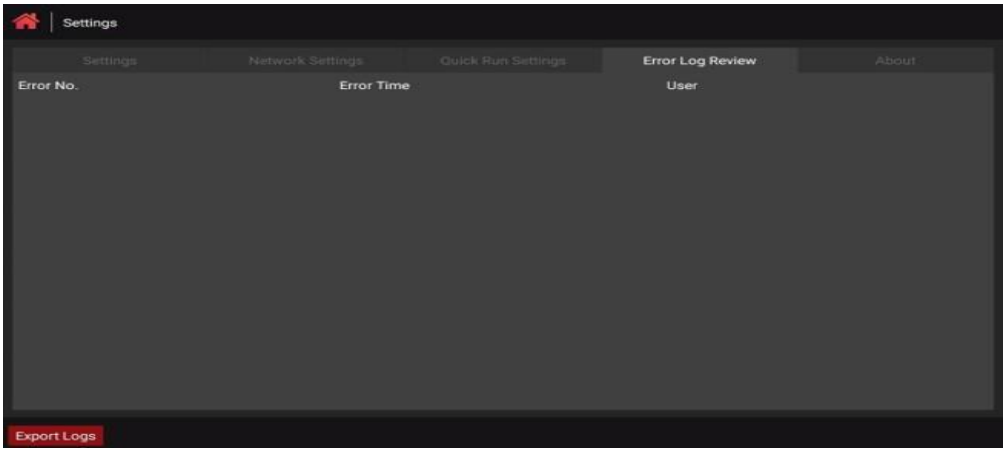


Figure-57

2) Common user system setting interface no option for error log review.

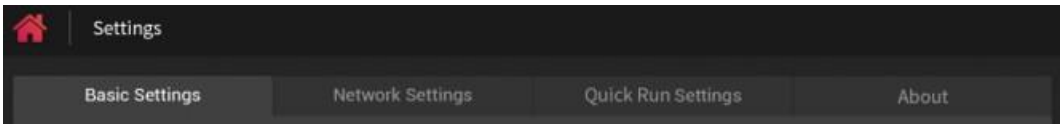


Figure-58

3) **About**
About includes the instrument software version and its release version, the instrument model, and the serial number.

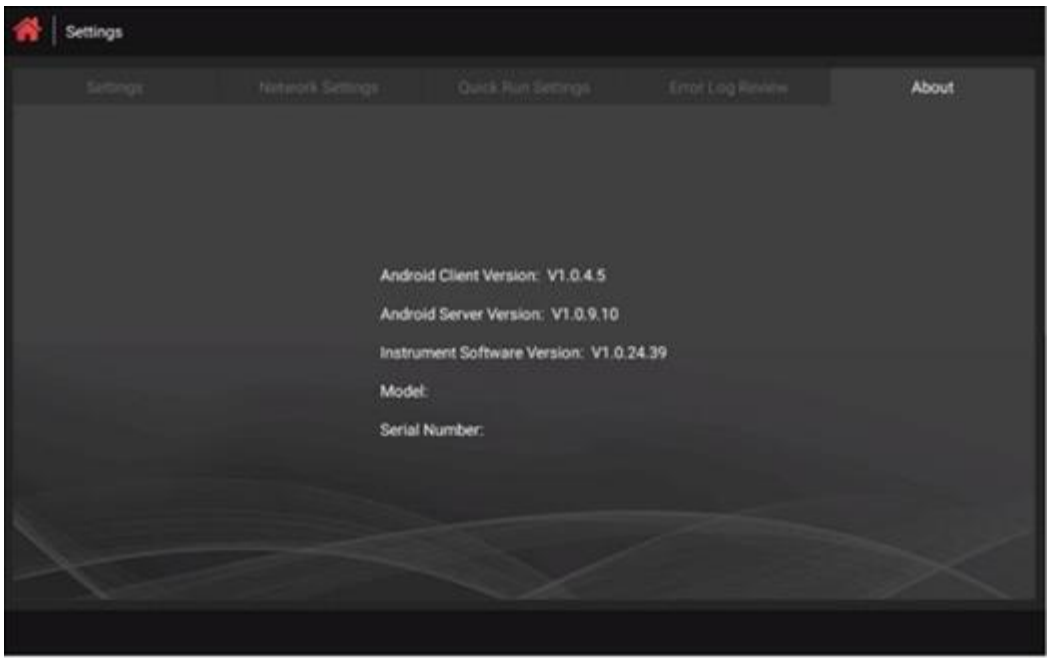


Figure-59

7.6 Software Installation

1. **Hardware requirements**
   - A computer with at least the following configuration
   - Intel i3 CPU
   - 2GB RAM
   - 200GB available hard drive space
   - At least one USB-A port
   - At least one Ethernet port

2. **Software requirements**
   - Windows 8/8.1/10 operating system and compatible versions
   - SQLite 3 database software and compatible versions
   - Net Framework 4.6.1 and compatible versions

3. **Installation method**
   Double-click the setup file → select the target folder → select the start menu folder → select additional tasks → prepare the installation confirmation interface → install → complete

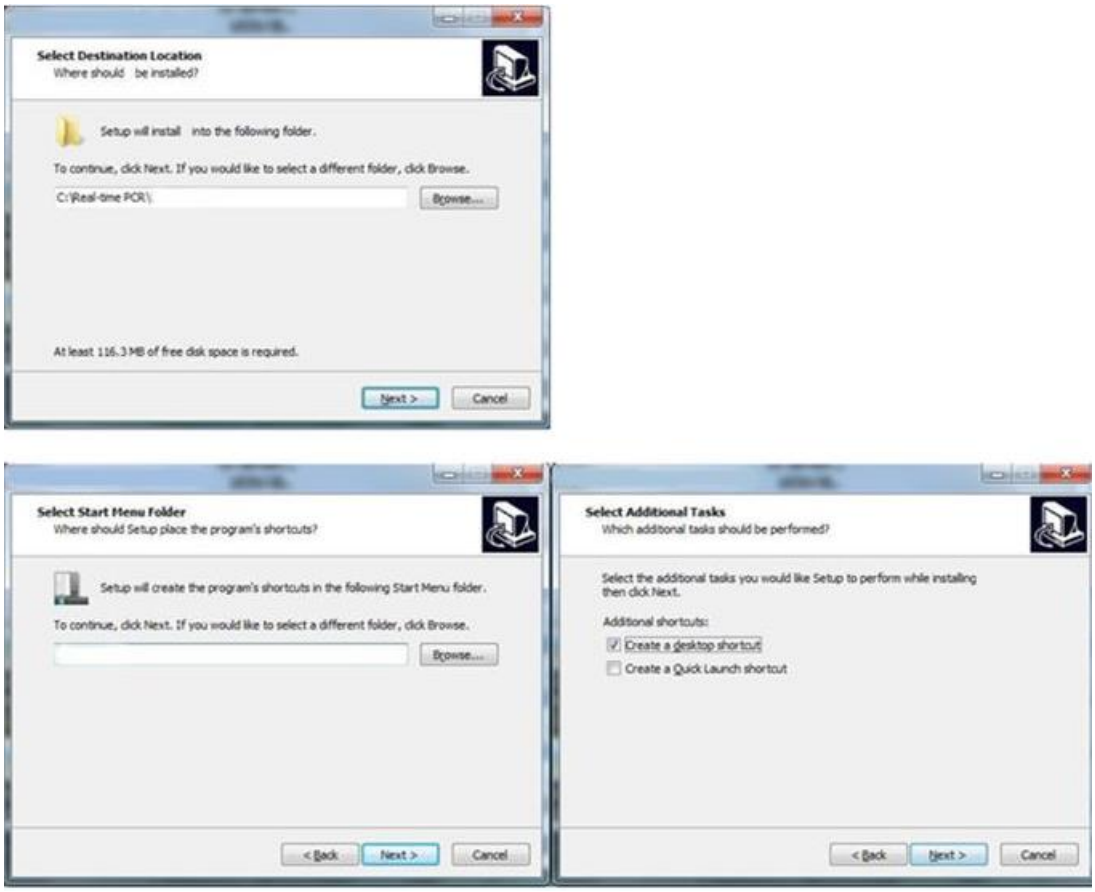


Figure-60

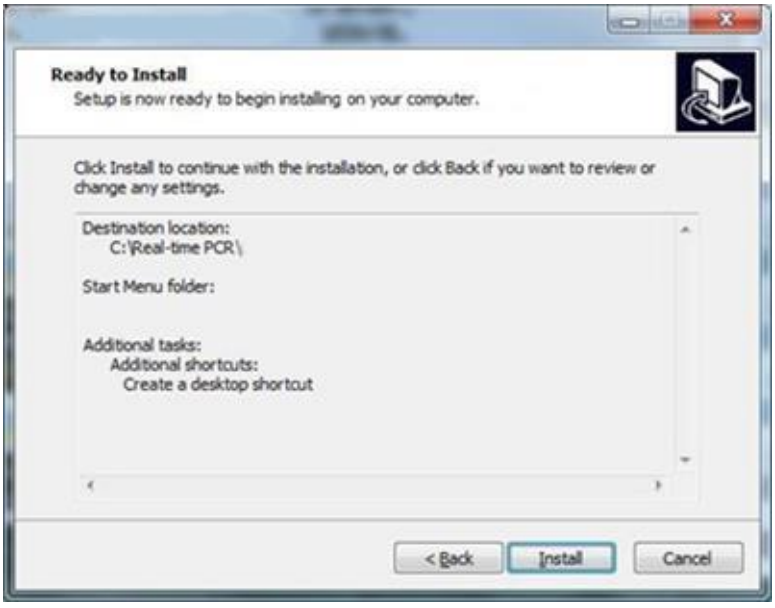


Figure-61

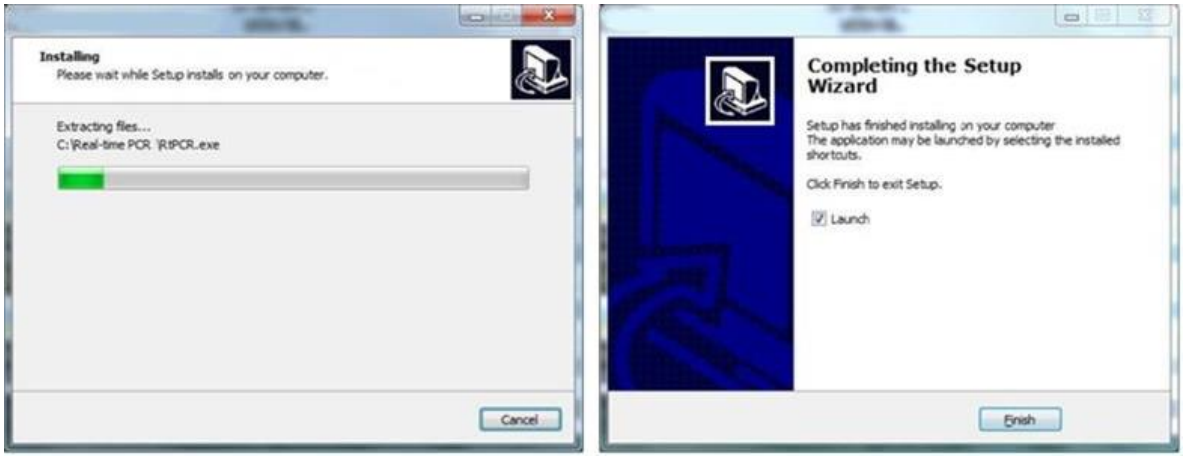


Figure-62

7.6.1 User login

1) Double-click the icon on the desktop to start the software.
2) The software automatically initializes the configuration and detects the software operating environment.
3) After the startup is completed, it enters the user login interface of the Real-Time Fluorescent Quantitative PCR System.

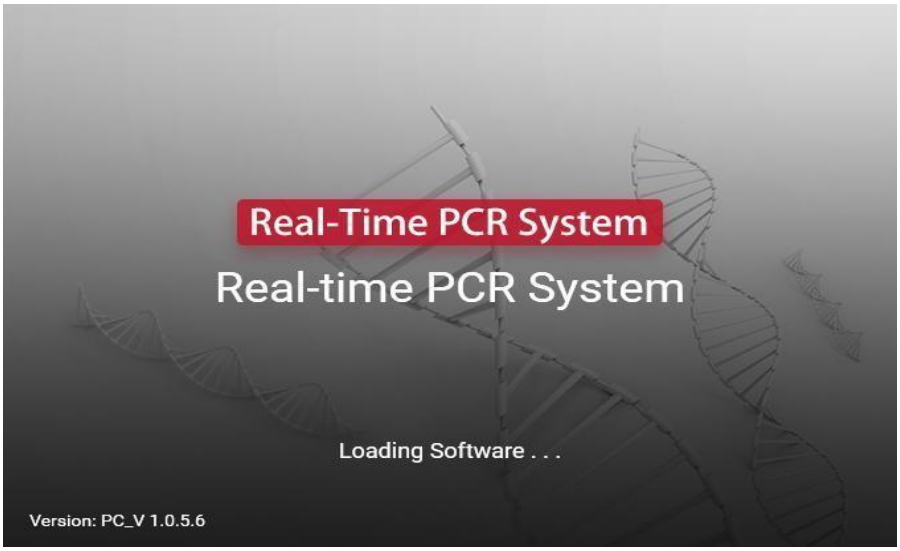


Figure-63

4) **Initial login**: Enter the instrument serial number, administrator account, and the administrator account password set for the first time on the instrument terminal to log in.

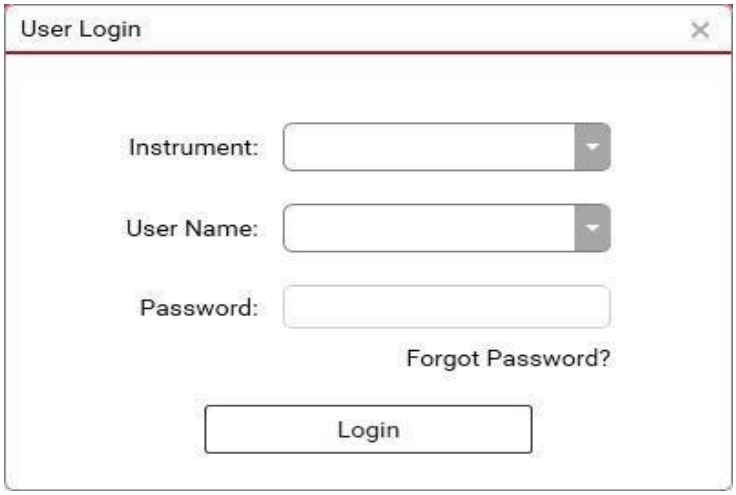


Figure-64

- When the PC software is used for the first time if it is not detected that the instrument is connected, a pop-up window will prompt "Instrument not connected!".
- When the instrument is connected, the PC software reads the administrator password on the instrument.
- If there is no administrator password, a pop-up window prompts "Set administrator password on the tablet before login.

7.6.2 Regular Login

1) After the initial login, multiple usernames can be set on the PC side (up to 20, see introduction for specific operations), and subsequent logins can be logged in with the administrator or common username and password.

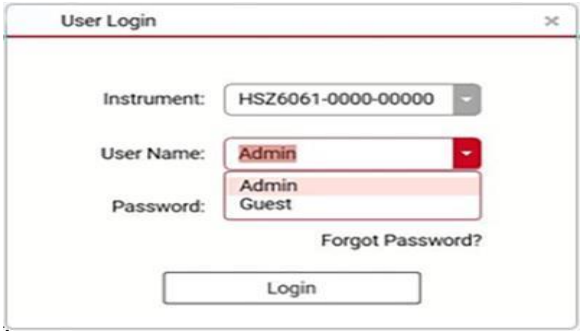


Figure-65

2) After logging in, enter the main interface of the Real-Time Fluorescent Quantitative PCR System, the main interface includes:
   - The top menu bar contains 8 main function buttons, including File, User, Instrument, Analysis, Tool, Report, Database and Help.
   - The function keys below the menu contain 5 buttons: New, Open, Save, Close, and Open Module.
   - The shortcut keys on the main interface contain 4 buttons: Open template, Quick run, new experiment, and Open experiment.

- The status bar at the bottom displays the connection status, instrument serial No., and currently logged-in username, and the module status is also displayed in the online status.
- The main interface and experiment interface can be switched in the form of option bars in the interface option bar switching area.

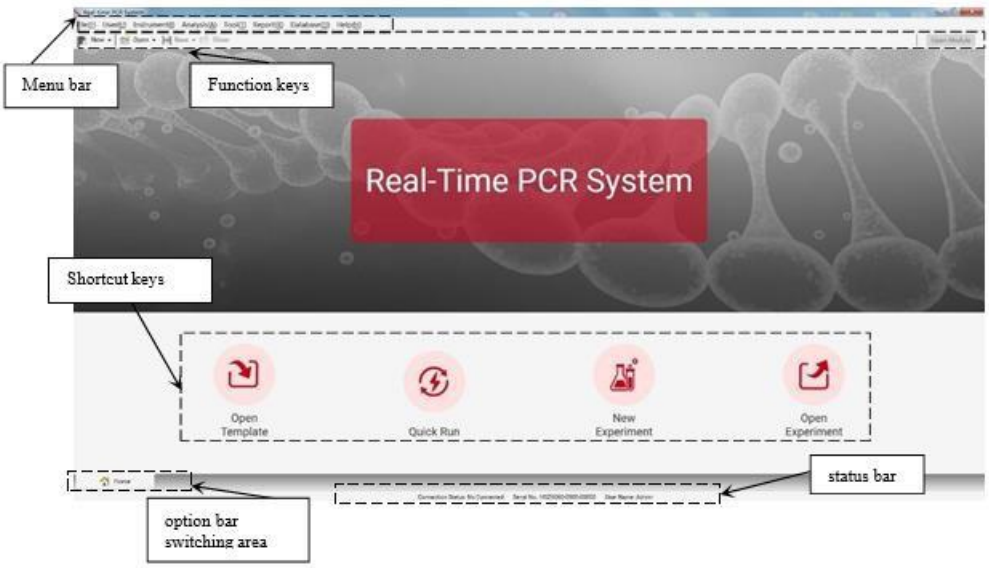


Figure-66

7.6.3 Experiment interface operation

1) It can enter the running experiment interface in several ways.
2) The navigation bar of the experiment interface after the initial creation of a new experiment contains two option bars for Setup and Run.

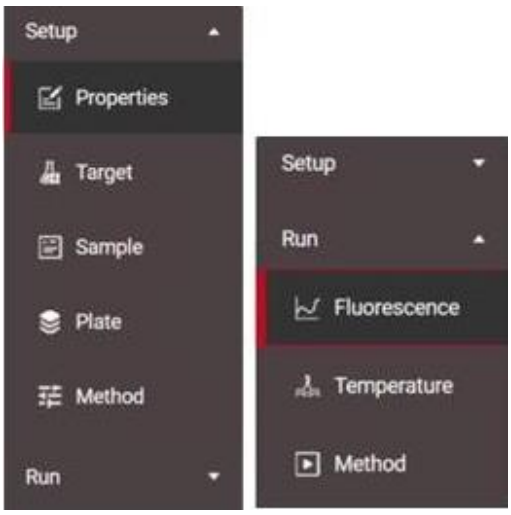


Figure-67

3) After the experiment is running, the navigation bar of the experiment interface adds two option bars Analysis and Report.

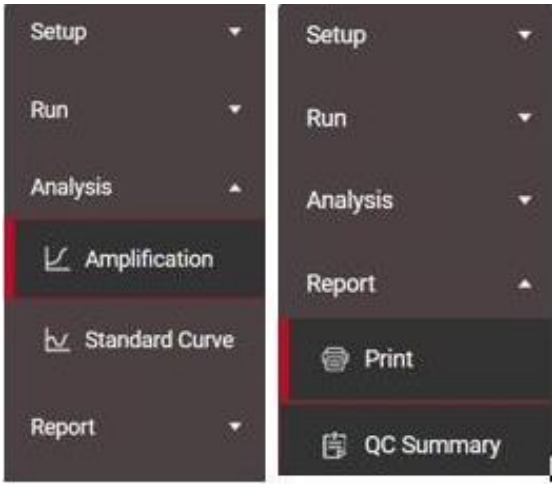


Figure-68

7.6.4 Experiment information settings

1. Properties settings

1) The "Properties" must include "Experiment Name", and "Experiment Name" defaults to the current time, with a maximum length of 20 characters, and cannot start or end with a space; "Comment" and "Username" are optional fill in the targets, choose to fill in as needed.

Figure-69

2) **Experiment type**: Absolute, Relative, SNP, or HRM can be selected according to the type of experiment.

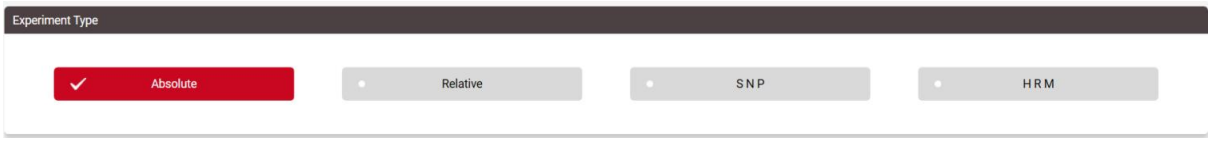


Figure-70

3) **Run mode**: Block or Tube can be selected according to experimental needs.

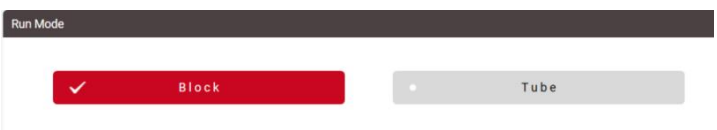


Figure-71

4) **Block scan method**: According to the experiment's sample situation, it can scan all lines or specified lines.
5) For scan-specified lines, it can select any required line or multiple lines in A-H for the scan (choose at least one line to scan).

Figure-72

2. Target settings

Figure-73

1) Click **"Add"** to add targets individually (the default is target 1, and the maximum is 100).
2) For each target, click the **"Target Name"** to edit, click the drop-down **"Reporter"** to select the dye used in this experiment (the default is FAM, there is a total of 13 fluorescent dyes for each option), and click **"Color"** to choose different colors (up to 48 colors for option), double-click the **"comment"** to edit the contents.
3) The Endogenous Control check box can be selected according to the needs of the experiment (only for the relative quantitative PCR experiment use)
   - Channel 1：FAM/SYBR Green I
   - Channel 2：JOE/HEX/TET/VIC
   - Channel 3：NED/TAMRA/Cy3
   - Channel 4：ROX/Texas Red
   - Channel 5：Cy5
   - Channel 6：Cy5.5

Figure-74

4) Click **"Save to Library"** to add the selected target (the selected target bar turns pink) to the detection target library.
5) The name of the added detection target cannot be the same as the name of the existing detection target in the library.
6) Click **"Import from Library"** to directly import the existing targets in the inspection target library.
7) The imported inspection target name cannot be the same as the added inspection target name.
8) Click **"Delete"** to delete the selected target in the list.
9) Click **"Clear All"** to delete all targets added this time.
10) Click the drop-down box of **"Passive Reference Dye"** to select the reference fluorescence of this experiment.
11) Click **"Gain Settings"** to pop up the interface, it can choose auto gain (500-60000 can be set) or custom gain (1-20 can be set), and then choose whether to use the default value, if not use the default value, manually enter the parameters of each fluorescence channel.

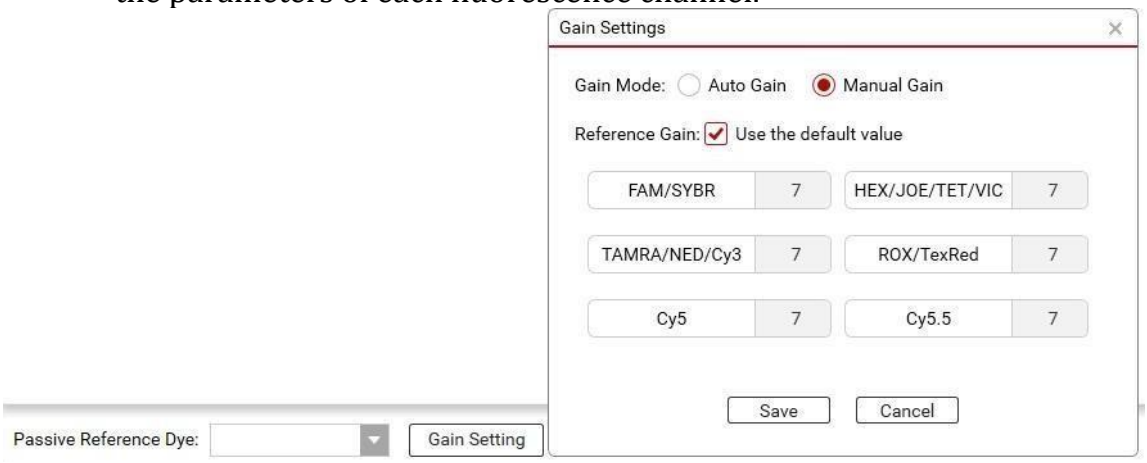


Figure-75

3. Sample information settings

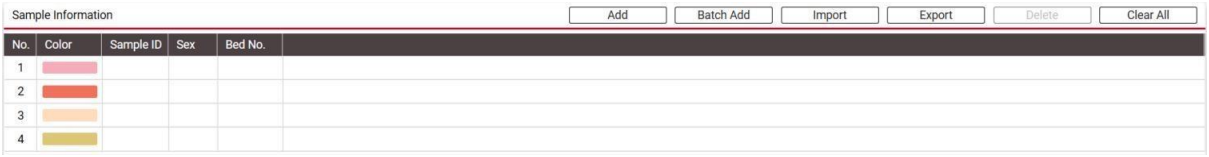


Figure-76

1) Click **"Add"** to add sample information one by one (add up to 96).
2) For each sample, the corresponding information can be selected in the "Sample Columns" in the toolbar.
3) The color and sample No. are mandatory, and the rest can be edited and filled here when selected.

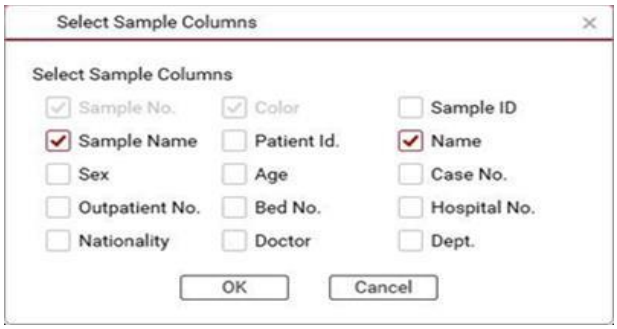


Figure-77

4) The input of hospital sample ID and other information can also be scanned and input by connecting a code scanner through the USB interface.
5) Click **"Batch-add"** to pop up the box for adding samples in batches, enter the number of samples that need to be added, and click **"Add"** to quickly add the corresponding number of samples.

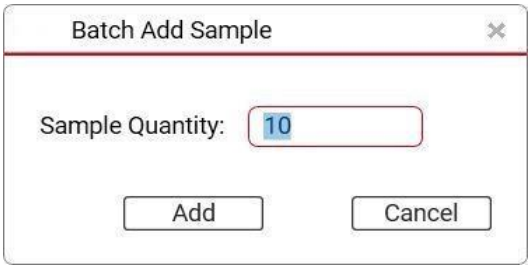


Figure-78

6) Click **"Import"** to import the sample information file in .xlsx format
7) Click **"Export"** to export the sample information file in .xlsx format.
8) Click **"Delete"** to delete the selected sample information.
9) Click **"Clear All"** to clear all sample information added this time.

4. Plate settings

Figure-79

1) Click **"Plate"** or **"Table"**, select the plate wells that need to be set, and set the target and sample information for these wells on the left.
2) **Target setting**: Select 6 different concentration units according to the drop-down box (or not selected); check the concentration box, 4 different attributes can be selected from the attribute drop-down box.
3) After setting the corresponding plate, the attribute identifier and target name will appear on the screen (the table will record the set target information); up to 6 different targets can be set for the same well**.**
4) **Sample information setting**: It can be marked by the check box on the right side of the sample name. After checking, the corresponding sample name will appear on the plate, and the background color will change to the color corresponding to the sample (The table will record the set sample information).
5) After setting the plate information, select the three drop-down boxes of "Sample", "Target", and "Property "after "Select Wells" at the top right to view the corresponding wells**.**
6) **In the plate interface**: Click the magnifying glass symbol on the upper right to enlarge the plate layout; click the shrink symbol to reduce the plate layout; click the restore symbol to restore the layout to its original state.
7) **In the plate interface**: By right-clicking, it can clear the settings of the wells (clear the target settings, clear the sample settings, or clear all settings), copy and paste operations.

5. Method settings

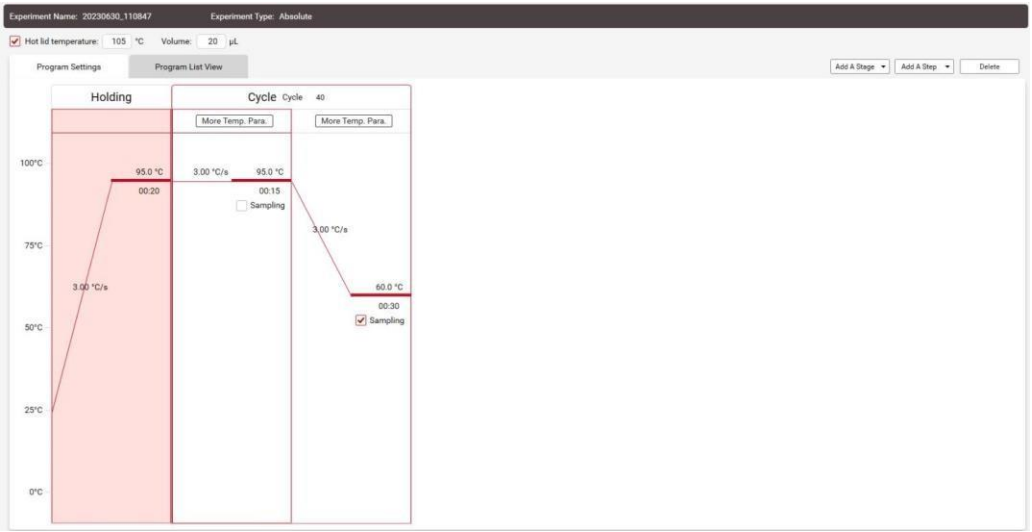


Figure-80

1) **Hot-lid Temp**: Check the checkbox to set the heating temperature of the hot lid, the setting range is 35°C-105°C.
2) **Liquid Quantity**: Set the sample dosing volume**.**
3) **Add Stage**: The user can create a new Holding stage, cycle stage, melting stage, or Infinite stage through the drop-down box (directly click the Add Stage to create a new cycle stage by default).
4) **Add Step:** The user can add a step before or after the selected step through the drop-down box, (directly click "Add step" to add a new step after the selected step by default, each stage can be set up to 20 steps**).**
5) **Delete**: Delete the chosen stage or step.
6) Parameter setting of holding stage, cycle stage, melting stage, or infinite stage. In each stage, the user can set the ramp rate, target temp., step hold time, and sampling fluorescence or not.
7) In addition, the cycle stage can additionally set the extension parameters of each step (extension temp., extension time, grad temp., and extension start cycle).
8) The melting stage can additionally set the melting parameters of the last step of the melting step (melting step temp., melting step hold time).

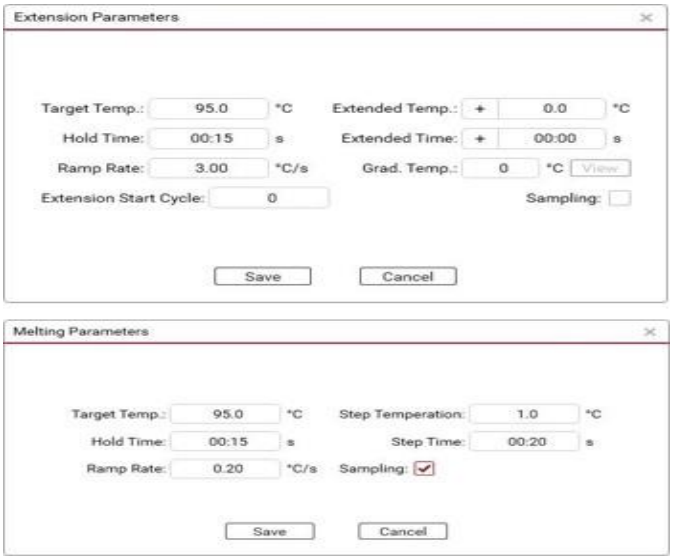


Figure-81

6. Sample preparation

After setting programs and before running, make sure that the reaction samples are ready

- Make sure to use appropriate consumables
- Make sure that the arrangement of the PCR reaction plate is consistent with the settings of the above plate.
- When ready, click the **"Open Module"** button in the function keys below the menu bar, then place the samples according to the plate layout, insert them into the module tray, and then click **"Close Module"**.

7.6.5 Start to run

1) **Start to run:** After the preparation, make sure that the PC is connected and the instrument is idle without abnormal alarms, then click Run.
2) On the right side of the "Run Status" box, click the **"Start Run"** button to start running the experiment.
3) The experiment in running is marked with a green circle.

Figure-82

4) **Offline operation**: If the connection with the instrument is disconnected during the experiment, the instrument will continue to run the experiment offline.
5) After the operation is completed, reconnect the instrument and the PC software, and the user can go to the menu bar→ view instrument-side experiment files, jump to the instrument-side experiment file library, and view the list of experiment files.

6) **Running status**: After the experiment starts, the “Run Status” box will display the experiment starting time, the experiment complete time, the “Run Status” (including 5 states of not run, running, failure, stop by the user and run completed), Remaining time, currently running segment, Cycle, Step, Hot lid temperature, Target temperature, Actual temperature, Gradient temperature.

Figure-83

7) After running, the user can perform "Skip current stage" or "Stop".
8) During the running of the cycle stage, the user can operate "Cycle +1" to add one cycle or "Cycle -1" to delete one cycle
9) **Fluorescence curve**: The fluorescence intensity will change with cycles.
10) The curve will appear after at least one cycle is finished. The well can be selected on the right side.
11) On the left side, the user can set the targets for view and the curve color of the selected well (all displayed by default).
12) The mouse is placed between the curve frame and the hole position frame, so the user can adjust the display range.
13) The mouse is placed on the curve interface, and the curve coordinates can be zoomed by scrolling the mouse.
14) Click on the curve to perform settings of the graph as "Save image", "Copy to clipboard", "Print" and "Fix size”.
15) **Temperature curve**: The temperature changes with the experimental time, and it appears after the running. scroll the mouse to zoom in and out of the curve coordinates. click on the curve to perform settings of the graph, such as "Save image", "Copy to clipboard", "Print" and " Fix size".
16) Melting curve (it has no melting curve if no melting stage is set in the running program): The fluorescence intensity changes with the temperature and appears after completing a melting. scroll the mouse to zoom in and out of the curve coordinates.
17) Click on the curve to perform settings of the graph, such as "Save image", "Copy to clipboard", "Print" and " Fix size".
18) **Method:** The user can view the specific program of this running experiment but can't modify it.

7.6.6 Analysis

After the running is completed, the analysis bar will automatically appear in the experiment interface, including display option buttons for different result curves, such as amplification curve, standard curve, melting curve, etc.

1. Experiment result curve

The analysis functions for different experimental results are as follows

Amplification curve and amplification analysis Result viewing function	The amplification curve and amplification analysis result of the reaction well can be viewed.
Standard curve and standard analysis result viewing function	Check the standard curve, specific parameters, and analysis results according to the test target. The user can also view the imported standard curve information, and the user can also export the standard curve or save the standard curve to the standard curve library.
Melting curve and melting analysis result viewing function	The user can view the melting curve and melting result of each test target in each reaction well, as well as the fluorescence curve and derivative curve.
Relative quantitative graph and relative quantitative analysis result viewing function	The user can view the relative quantitative graph and the relative quantitative analysis results.
SNP chart and SNP analysis result viewing function	The user can choose to view the SNP map and SNP analysis results according to the test targets.
HRM curve and HRM analysis result viewing function	The user can view the fluorescence curve, derivative curve, normalization curve, and difference graph.

2. Analysis

"Analyze" and "Analysis Setting" buttons will appear at the upper right of each curve result interface. Click the **"Analyze"** button to analyze the experimental results (according to the default parameter settings).

Figure-84

3. Analysis setting

1) If the user needs to adjust the analysis parameters and re-analyze, click the **"Analysis Setting"** button to set different analysis parameters, and then click "**Apply Analysis Settings"** to analyze according to the newly set parameters.
2) For the amplification curve, there are Ct analysis parameter settings and advanced parameter settings.

Ct analysis parameter settings: Select the stage to use for Ct analysis →Select the algorithm to calculate Ct→Select whether to use s-shaped curve fitting→Set thresholds for each target, Start cycle, and End cycle.

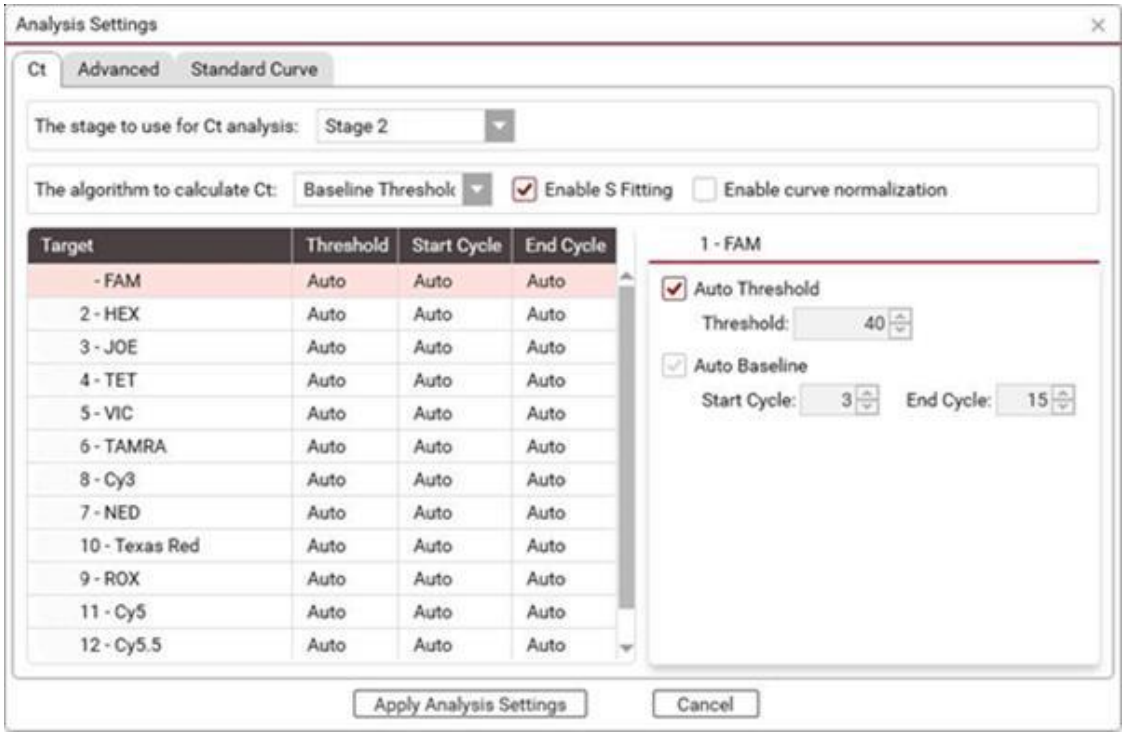


Figure-85

3) **The advanced parameter settings**: Auto Baseline, Start Cycle, and End Cycle are set for each target at each well.

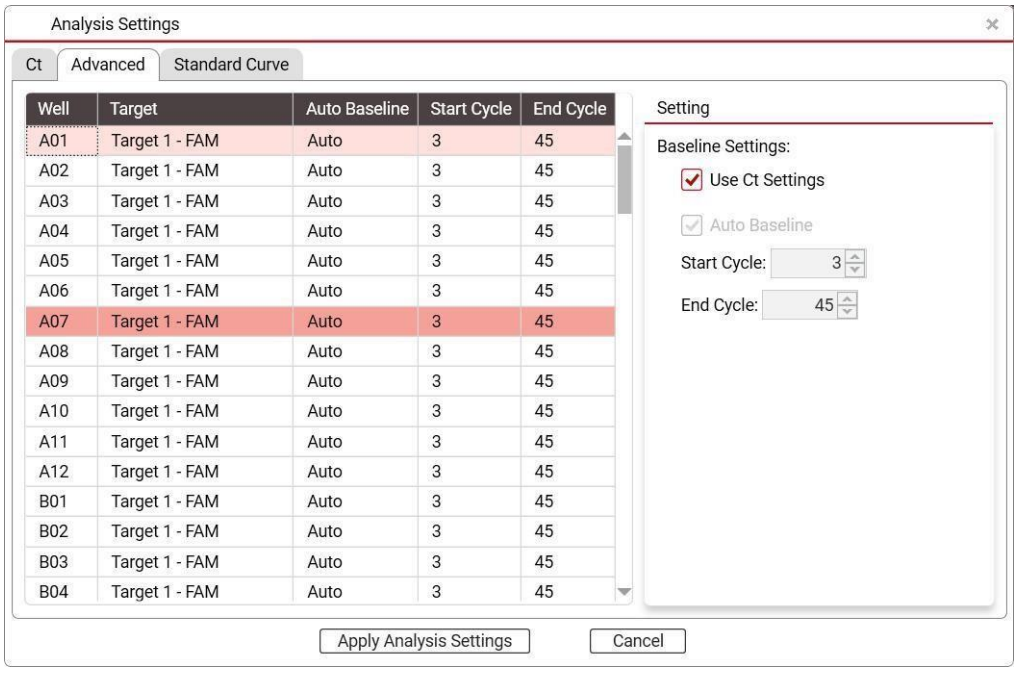


Figure-86

4) **Parameters set in standard curve settings**: The standard curve acquisition method is set, and it will use the standard curve from this experiment by default (the standard curve is available only when the test target contains at least 2 standard products with different concentrations; otherwise, the target has no standard curve).
5) If the standard curve imported from external is selected, targets, imported standard curve file and standard curve used need to be set.
6) **External import standard curve setting**: Click the target in an experiment, click **"External Import"**, and the selection box of the standard curve file will pop up (only the standard curve stored by the current user will be displayed, and all standard curves will be displayed when the administrator logs in)→Select the file that meets the standard file format and click **"OK"** → drop down to select the detection target in the imported standard curve.
7) If the generated sampling number of the imported standard curve is inconsistent with the current sampling number, the statement " Sampling count of the imported standard curve does not match to current experiment" prompts.
8) If the generated sampling temperature of the standard curve is inconsistent with the current sampling temperature, the statement. "Import failed: Sampling Temp. does not match."
9) If the content of the imported standard curve file cannot be analyzed, the statement "Cannot find valid standard curves." The prompt.

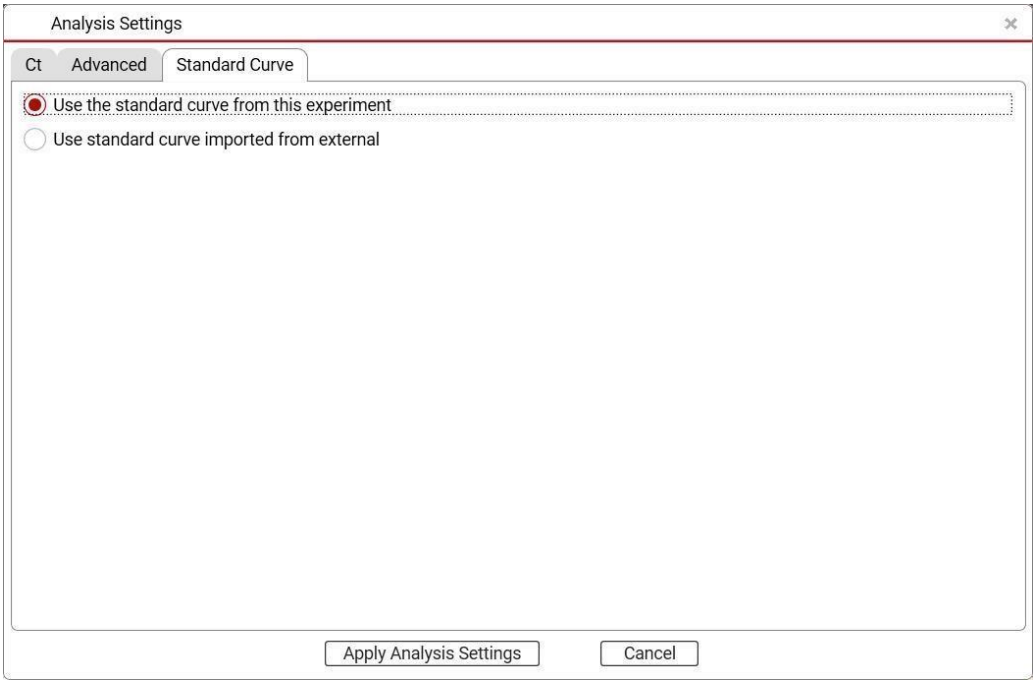


Figure-87

10) **Setting the parameters in melting curve settings:** Select the Melting step to be analyzed→Select whether to enable advanced fitting and set the Min. Tm, Max. Tm Width, and Min. Tm Width for each target.

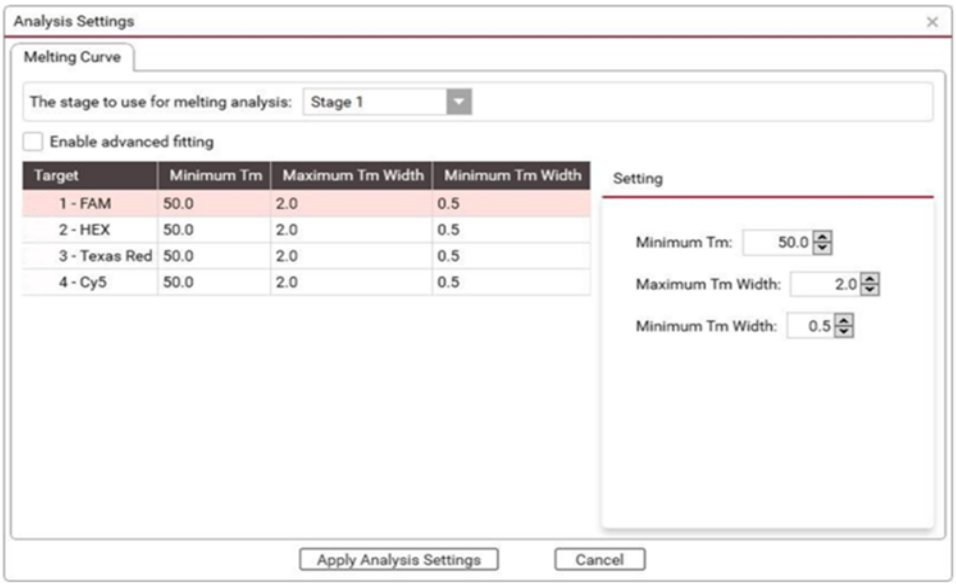


Figure-88

11) **Setting the parameters of relative quantitative analysis**: Choose the Analysis Method of Relative Quantification→Select Reference Sample (One, which can be selected from the Settings sample, or null, which is null by default) →Set Endogenous Control (all targets can be selected, not selected by default) →Select the relative quantitative confidence interval algorithm and set the algorithm parameters (The Confidence Level is given as a percentage).

12) Optional 95.0%, 97.0%, 99.0%, 99.5%, 99.7%, 99.9%; Multiple of Standard Deviations can be 1, 2 or 3).

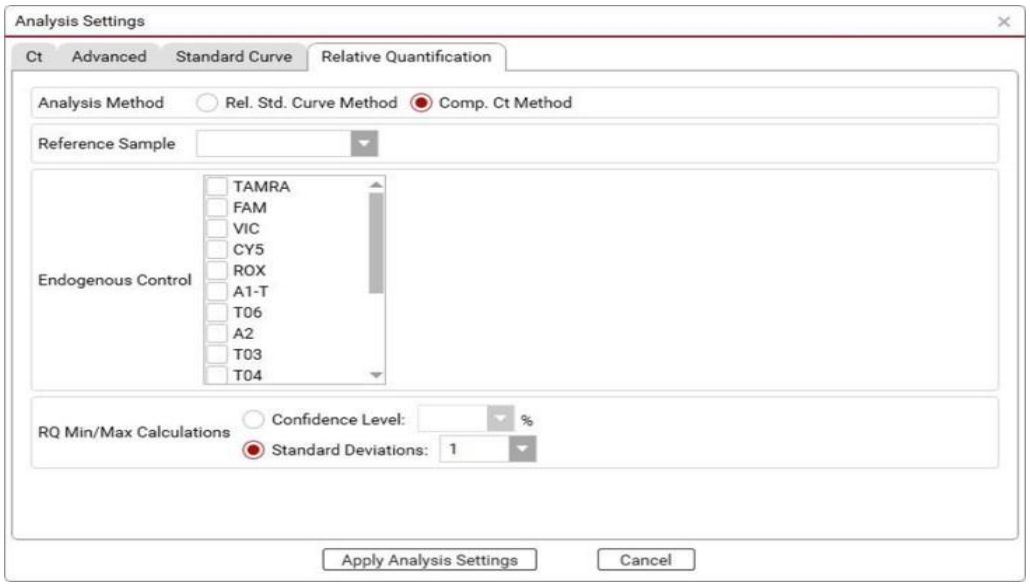


Figure-89

13) In the SNP settings, it can set the parameters of SNP analysis: Drop down to select SNP analysis data→ Check whether each target keeps manual calls.

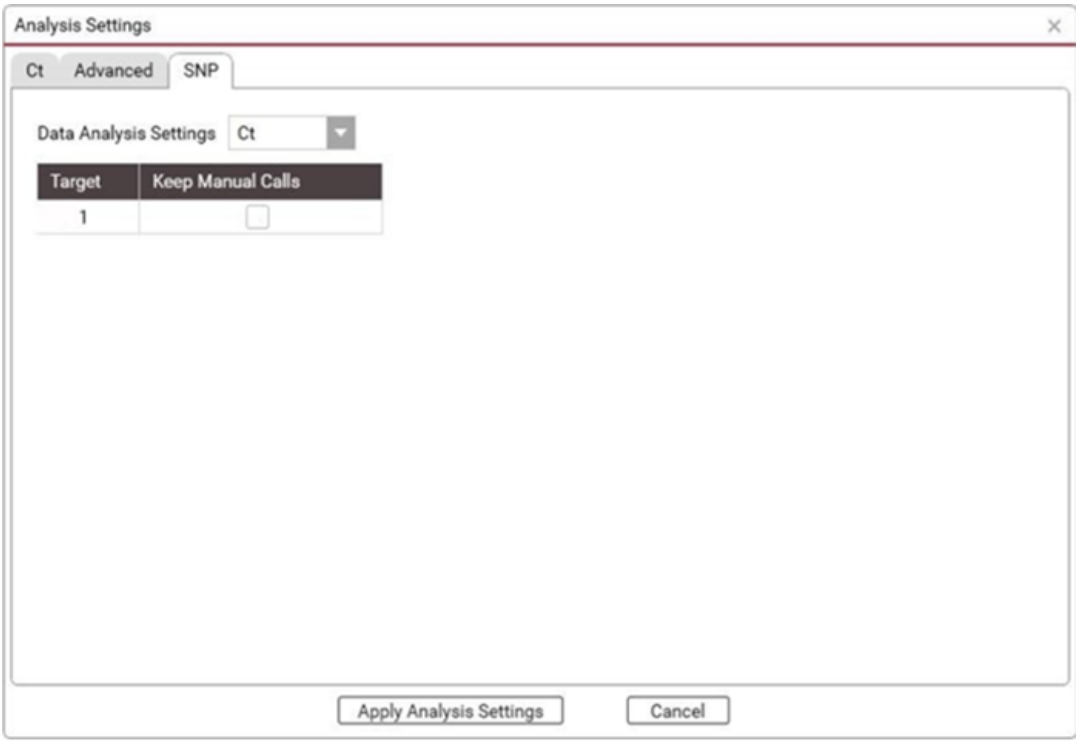


Figure-90

14) In HRM settings, it can perform the settings of HRM curves: Set Pre-Melting Start Temp., Pre-Melting EndTemp., Post-Melting Start Temp. and Post-Melting End Temp. for each target.

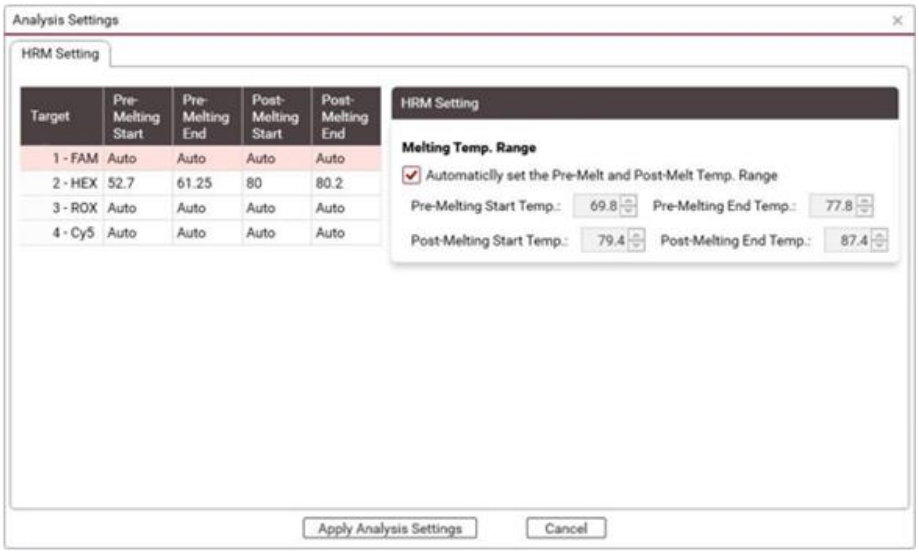


Figure-91

7.6.7 Report

After the running is completed, the report column will automatically appear in the experiment interface, including the print and QC Summary tabs.

1. Print

1) Only when the experiment is absolute quantification or SNP, and the status of the experiment file is completed, the report be viewed and printed.
2) The interface on the right side of the printed report displays the judgment result corresponding to each sample and its target.
3) When viewing the report for printing, the analysis results of each target in each well are arranged by default according to the well number.

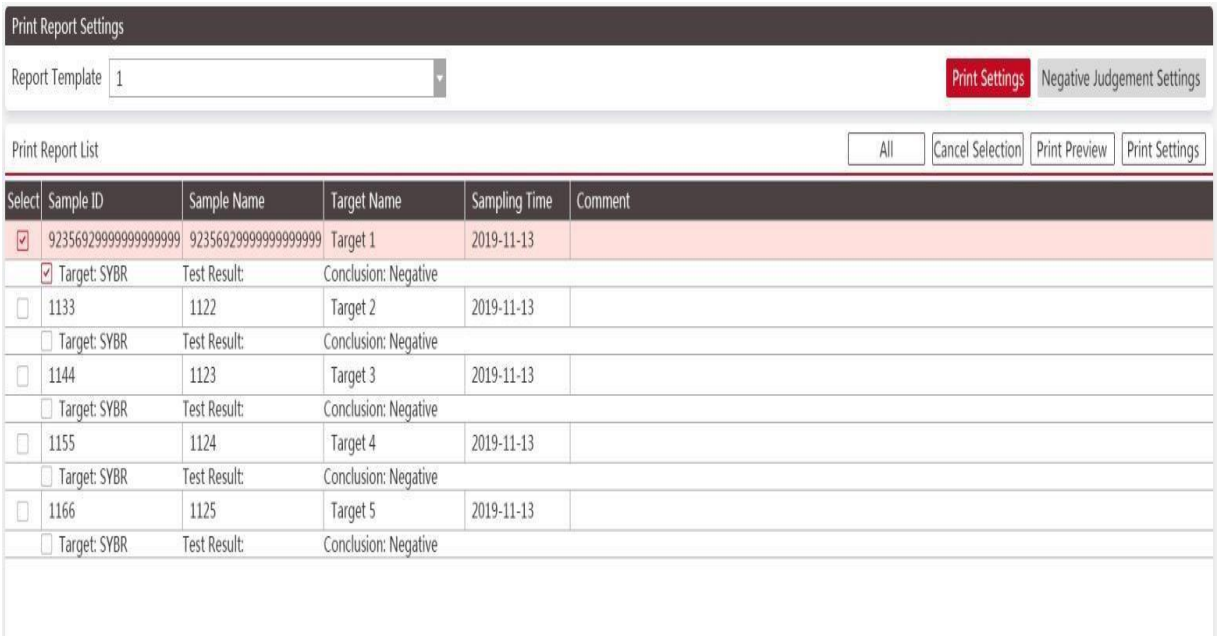


Figure-92

4) **Report Template**: Drop down the selection box to select the report template to be printed, and the report will be printed in the form of a print report template.

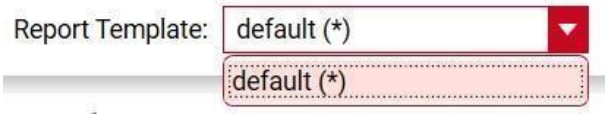


Figure-93

5) **Print Settings**: Click this button to pop up the print settings dialog box, and enter the content required in the report template.

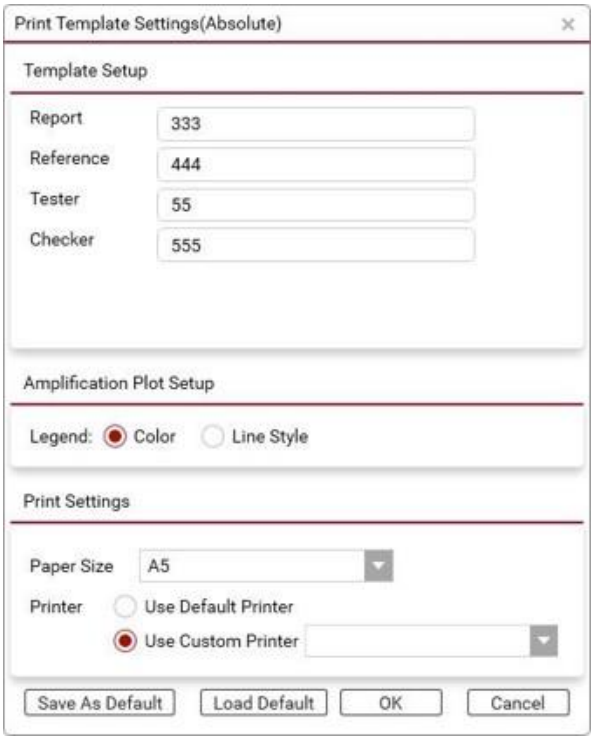


Figure-94

6) **Negative Judgment Settings:** Click this button, and the negative judgment setting dialog box will pop up, and the user can set the negative judgment parameters.

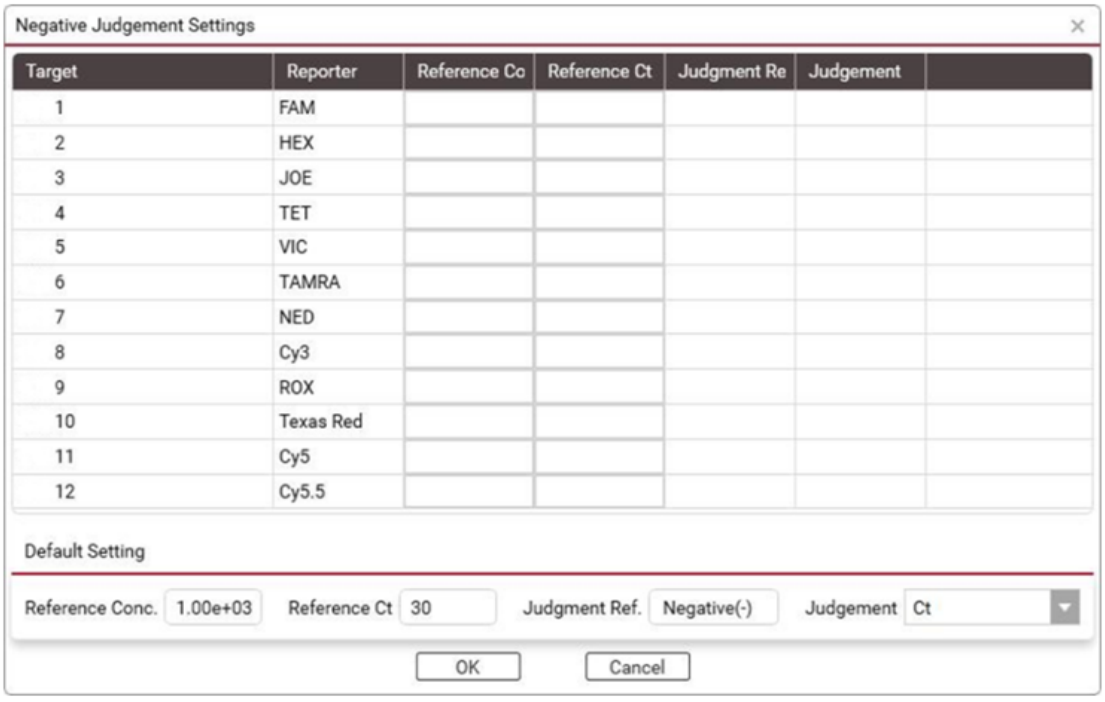


Figure-95

7) **All**: Select all information targets in the list for printing, and the tick box in front of all information targets is automatically selected.
8) **Cancel Selection**: Click this button, and all the selected information targets in the list will be cancelled.
9) **Information targets tick:** The user can print each target of each sample. All can be ticked or cancelled automatically, or manually ticked or cancelled individually.
10) **Print Preview**: Click to pop up the print preview dialog box for reviewing
11) **Print Settings**: Click to pop up the Windows print setting interface. After setting parameters, such as the number of copies, click to print the report in the form of the report template.

2. QC summary

1) In the quality control summary interface, the user can view the amplification curve, the user can select the well to view the corresponding curve of the well, and the user can also select the Curve Color, Graph Type, and displayed fluorescence channel of the Amplification Curve.
2) The user can view the results of QC information (displaying the unknown samples and standards of the specific non-amplified).

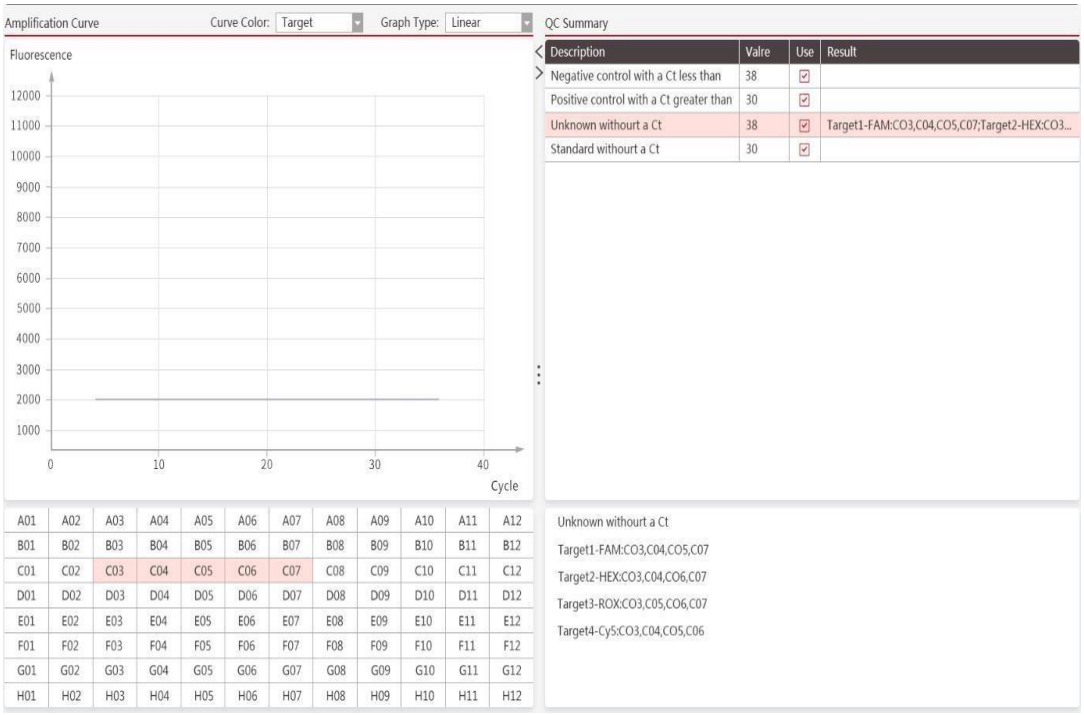


Figure-96

3) **Curve Color**: Drop-down box to select and set the curve color.
4) **Graph Type:** Drop-down box to set the amplification curve style.
5) **QC Summary bar:** If the QC information is ticked to be used here, it will display the wells that meet the rules in the result bar below.

6) **QC summary result bar**: It displays the wells that meet the selected QC information rules, and the format is displayed as "test target 1: well 1, well 2, test target 2: well 1, well 2.
7) **Display the amplification curve**: After selecting the well, the corresponding curves will be displayed.
8) **QC information results**: Display the unknown samples and standards of the specific non-amplified.
9) **File:** Menu bar function description.

7.6.8 New

1. New experiment

File→New→New Experiment, create a new experiment (default named as current time) and then turn to the experiment interface. For specific operations on the experiment interface:

To create a new experiment, the user can also,

1) Click **"New"** directly in the function keys below the menu.

Figure-97

2) In the main interface, directly click the shortcut key of "New Experiment".

Figure-98

2. New experiment from complete

1) File→ New→ New from the template, the "Select Template" box will pop up.
2) Select and open any template file in the template Library, and the system will automatically generate a new experiment file (default named as current time).

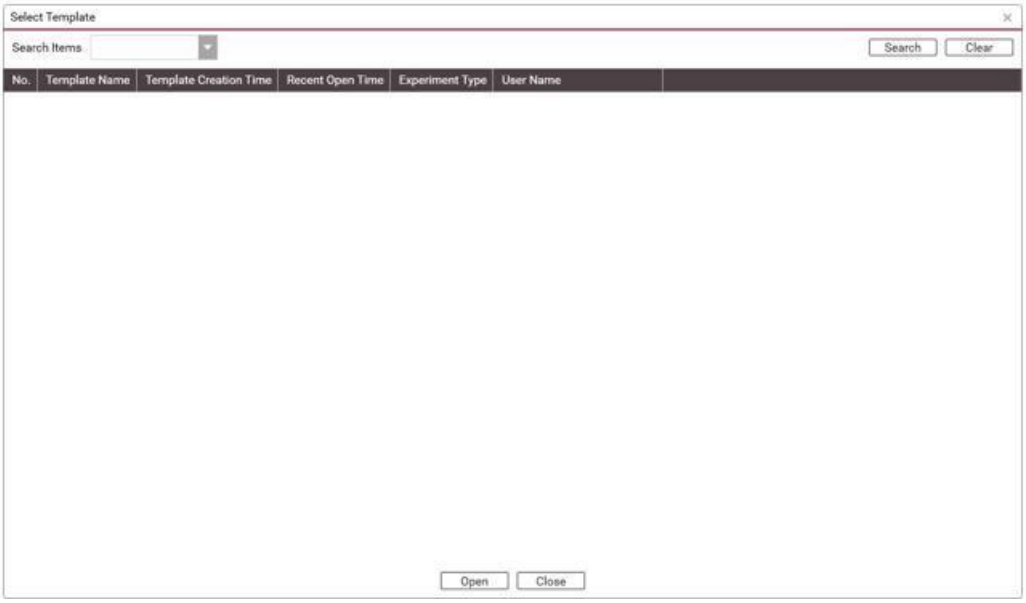


Figure-99

3) Then turn to an experiment interface that saves the setting data in the template, and the user can directly run the experiment according to the settings in the template.

3. To create a new experiment from a template

1) Click the drop-down box of "**New"** in the function keys at the bottom of the menu.

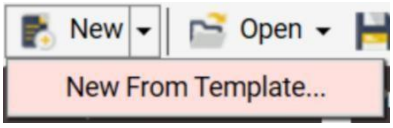
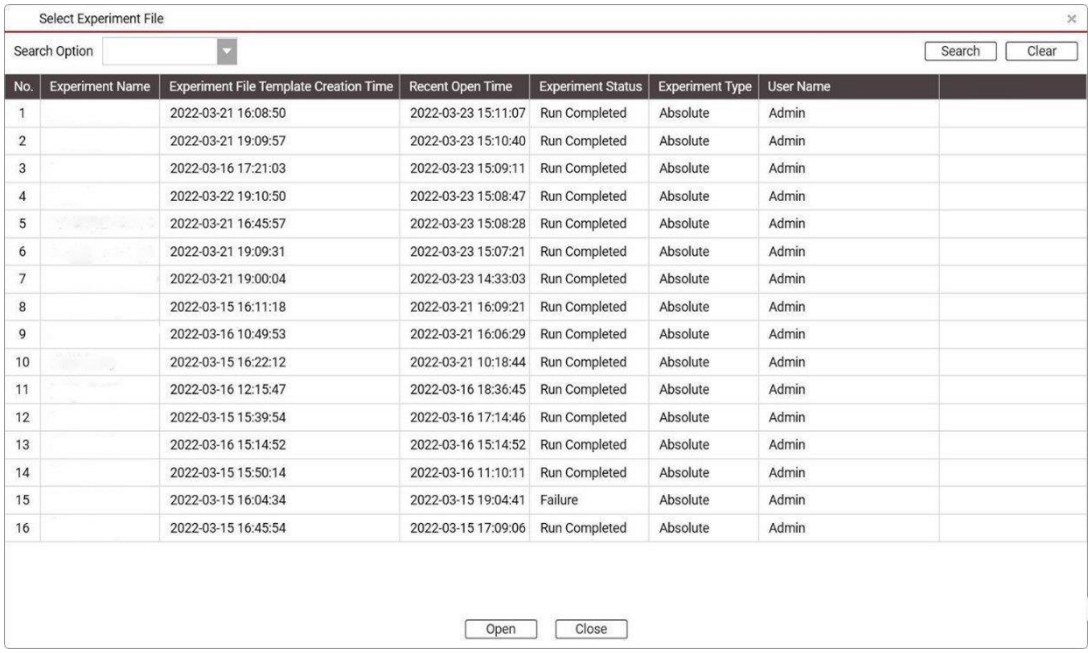


Figure-100

2) **Open (Experiment file):** File → Open → Turn to the "Select Experiment File" box.



No.	Experiment Name	Experiment File Template Creation Time	Recent Open Time	Experiment Status	Experiment Type	User Name
1		2022-03-21 16:08:50	2022-03-23 15:11:07	Run Completed	Absolute	Admin
2		2022-03-21 19:09:57	2022-03-23 15:10:40	Run Completed	Absolute	Admin
3		2022-03-16 17:21:03	2022-03-23 15:09:11	Run Completed	Absolute	Admin
4		2022-03-22 19:10:50	2022-03-23 15:08:47	Run Completed	Absolute	Admin
5		2022-03-21 16:45:57	2022-03-23 15:08:28	Run Completed	Absolute	Admin
6		2022-03-21 19:09:31	2022-03-23 15:07:21	Run Completed	Absolute	Admin
7		2022-03-21 19:00:04	2022-03-23 14:33:03	Run Completed	Absolute	Admin
8		2022-03-15 16:11:18	2022-03-21 16:09:21	Run Completed	Absolute	Admin
9		2022-03-16 10:49:53	2022-03-21 16:06:29	Run Completed	Absolute	Admin
10		2022-03-15 16:22:12	2022-03-21 10:18:44	Run Completed	Absolute	Admin
11		2022-03-16 12:15:47	2022-03-16 18:36:45	Run Completed	Absolute	Admin
12		2022-03-15 15:39:54	2022-03-16 17:14:46	Run Completed	Absolute	Admin
13		2022-03-16 15:14:52	2022-03-16 15:14:52	Run Completed	Absolute	Admin
14		2022-03-15 15:50:14	2022-03-16 11:10:11	Run Completed	Absolute	Admin
15		2022-03-15 16:04:34	2022-03-15 19:04:41	Failure	Absolute	Admin
16		2022-03-15 16:45:54	2022-03-15 17:09:06	Run Completed	Absolute	Admin

Figure-101

3) This interface displays the list of all experiment files, the user can sort, search, open, and close the experiment files.
4) **Sort**: Click the head of the list to sort the experiment files.
5) **Search drop-down box:** Click the drop-down box of the Search Option, and the user can select the experiment name, Experiment File Template Creation Time, Recent Open Time, Experiment Status, Experiment Type, User Name (only the administrator account can view all files of all users in this instrument, ordinary users can only view the files of their user’ s name) to search for experimental files.
6) When searching, up to 4 search targets, and the selected search targets cannot be selected again.

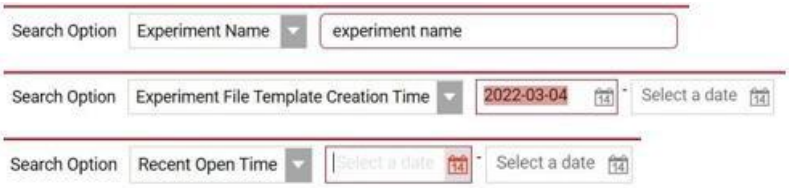


Figure-102

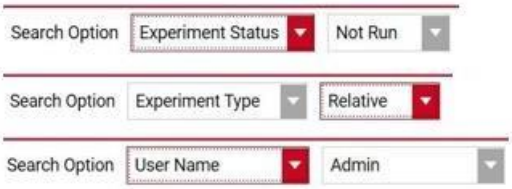


Figure-103

7) **Search**: Click this button to search the experimental file library with the set search conditions.
8) **Clear:** Click this button to clear all the contents in the search options.
9) **Open**: Select an experiment in the experiment file list, and then click this button to open the selected experiment.
10) **Close:** Click to close the **" Select Experiment File"** interface.

4. To open the experiment file bars

1) Directly click **"Open"** in the function keys below the menu.

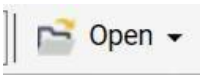


Figure-104

2) Directly click the shortcut key **"Open experiment"** on the main interface.

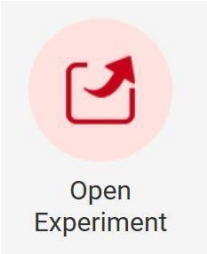


Figure-105

5. Open template (File)

1) File → Open from template → Turn to the "Select Template" box:
2) This interface displays the list of all template files, and the user can sort, search, open, and close with the specific operations as follows:
3) **Sort**: Click on the head of the list to sort the template files.
4) **Search drop-down box**: Click the drop-down box of the search option, and the user can search for template files by the Template Name, Template Creation Time, Recent Open Time, and User Name (only the administrator account can view all files of all users in this instrument, ordinary users can only view the files of their user's name).

Figure-106

5) **Search**: Click to search the template file library with the set search conditions.
6) **Clear**: Click to clear all the contents in the search options
7) **Open**: Select an experiment in the template file list, and then click this button to open the selected template file, and automatically create a new experiment every time the user can open one file (default named as current time) and turn to the experiment interface. For specific operations of the experiment interface.
8) **Close:** Click to close the **"Select Template"** interface.
9) Click the drop-down box of "Open" in the function keys below the menu.
10) Directly click the shortcut key **"Open template"** on the main interface.

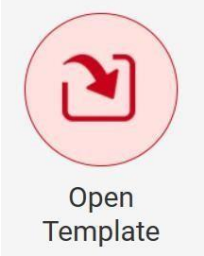


Figure-107

6. Import experiment file

1) Import the template file from outside:
2) File→Import template file→Import file selection box pops up (file opening dialog box of Windows system)→Select the file in the format of .ept→Open.

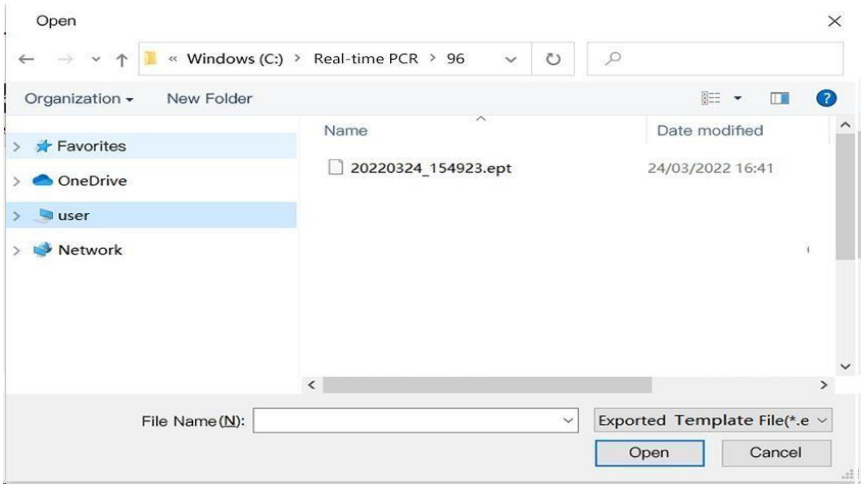


Figure-108

7. Export Excel

Export Excel data:

1) File → Export to Excel→ Select hole arrangement → Select Export path → Select Export content → Click OK.
2) If you want to encrypt the exported Excel, you can check "Export Encrypted" and set a password to encrypt the exported Excel.

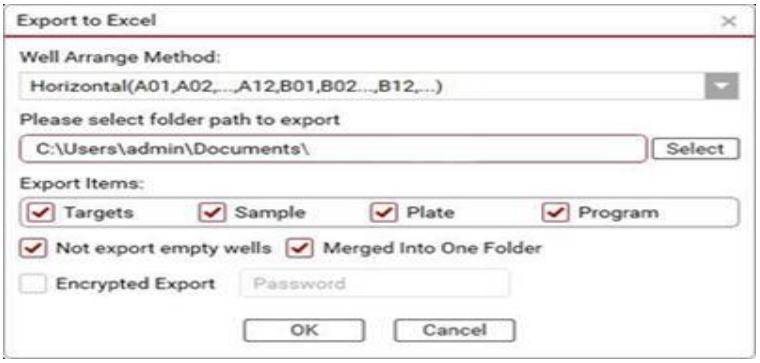


Figure-109

Save

1) Save the modified information of the experiment interface to a file.
2) If the user opens an experiment file and modifies it, click **"Save"** to save the modified information to the original experiment file.
3) If the user opens a template file and modifies it, click **"Save"** to save this file as an experiment file, and a prompt box will pop up, and the user needs to enter a new experiment file name.

Figure-110

To save file information

Directly click **"Save"** in the function key below the menu.

Figure-111

Save as (Experiment file)

Save the file as an experiment file.

In the experiment interface: File → Save As → Enter the experiment file name (default named as creating time) → save as an experiment file.

To save as an experiment file

Click the drop-down box of **"Save"** in the function key area below the menu.

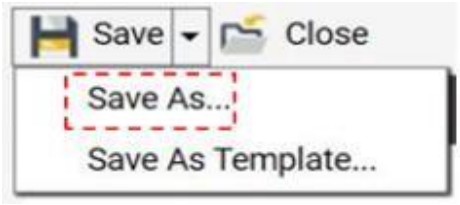


Figure-112

Save as a template (File)
Save the file as a template file.
In the experiment interface: File→Save As Template→Enter the template file name (default named the file creation time)→Save as template file.
To save as a template
Click the drop-down box of **"Save"** in the function key area below the menu.

Figure-113

Export standard curve
Save experimental information as a standard curve file: Only the opened experimental file has been run with the standards set, it can be operated
File→Export standard curve→Enter the file name of standard curve→Save
Exit
Exit the Real-Time Fluorescent Quantitative PCR System directly: File→Exit
If there is still an experimental interface that has not been closed, it will prompt.

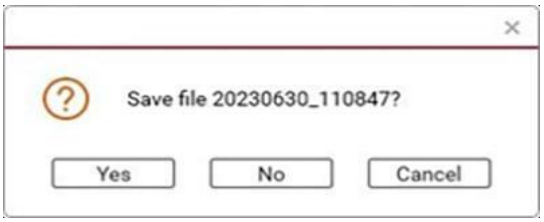


Figure-114

7.4.8 Menu bar function description

1. User management

1) When the instrument is connected, User Management can be performed.
2) It will display the list of user information including No., UserName, User Status, Created Time, Last Login Time of the user, and current user status.

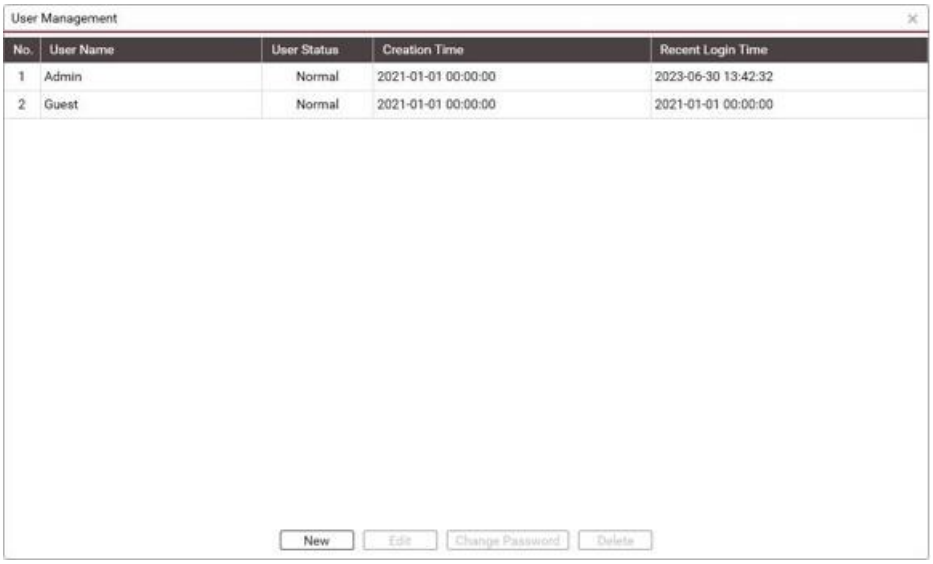


Figure-115

3) Common users can only view their information and modify their passwords; administrators can view all user information under the instrument but can only modify its passwords.
4) At the same time, the administrator account also has the authority to create a new user, edit users, and delete users
5) **Modify Password:** Change the password of your account.
6) **New**: To create new user information, one needs to set a username and password.

Figure-116

7) **Edit**: To edit a user, it can reset the existing user password and unlock or lock the user status. The reset user password is unified as 888888.

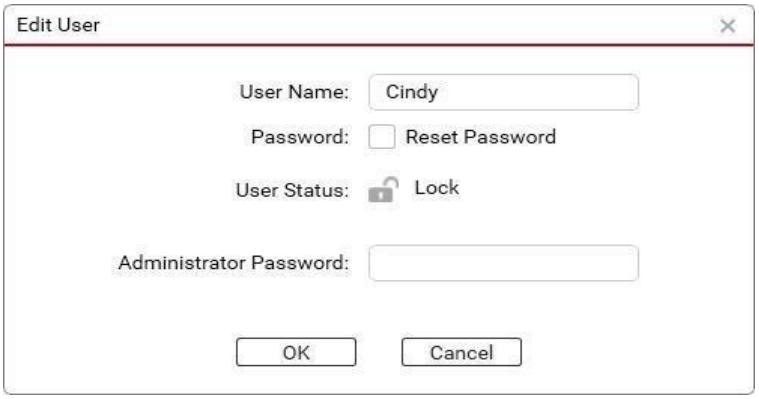


Figure-117

8) **Delete**: Deleting user information will delete the user's name and all templates under this username in this machine.

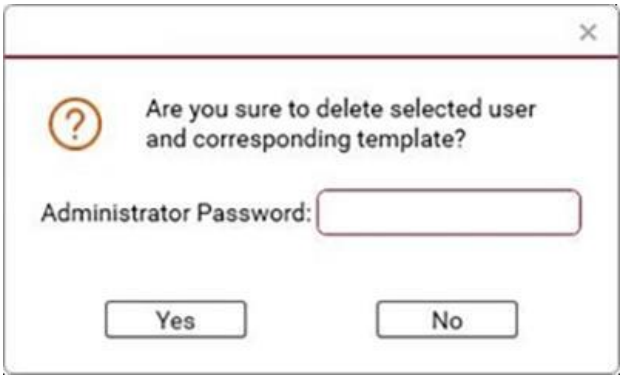


Figure-118

9) **Username format requirements**: Numbers, uppercase, and lowercase letters, spaces, underscores, and minus signs, but cannot start or end with a space.
10) A string of 1 to 15 characters (one character counts as one character).
11) The user's name cannot be used again (for the same instrument batch number).
12) **Password format requirements**: numbers, uppercase, and lowercase letters, the length is 6 to 12 characters.
13) If there are 20 users whose status is not "deleted", the "New" button is not selectable.
14) To create, edit, and delete users, it needs to enter the administrator to get administrator authentication.
15) If the administrator password is not entered, a pop-up window will prompt "Enter the administrator password!"; If the administrator password is entered incorrectly, it prompts "Wrong Admin Password!" automatically.
16) If the password is entered incorrectly 5 consecutive times, it will automatically end the current operation (close the relevant pop-up box) and prompt administrator authentication fails, the operation failed.

2. User login

For user login and switch user to login

User→ User Login→ Enter the login interface: Select the instrument serial number, user name, and password→ click Login→ Enter the new user interface.

Figure-119

7.4.9 Menu bar function description: Instrument

Instrument includes connecting the instrument, disconnecting the instrument, viewing the instrument information, setting the instrument alarm sound, viewing, running, and importing the experiment, including the firmware upgrade.

1. Connect

1) If the instrument is online, it will automatically connect to the instrument when logging in; if the instrument is not online when logging in, the instrument is set to automatic connection when online.
2) It will automatically search to check whether the instrument is online and will connect to the instrument after it is online.
3) Otherwise, when selecting the instrument connection, it will try to connect to the current instrument.
4) It can set the automatic connection or manual connection, and the priority of connection between the USB port or network port.
   Instrument → Connect→ Select port or auto-match port

Figure-120

5) After the connection is successful, the status bar becomes: Connected.
6) At this time, according to the controllable state of the instrument, it can be divided into two online states.
7) **Connected, Not Controlling:** When the instrument terminal is logged in online and the instrument terminal rejects PC control, data can only be transmitted between the PC and the instrument terminal, but not the operation of the instrument.
8) **Connected Controlling:** When the instrument terminal is not logged in or the instrument terminal is controlled by the PC, the PC can control the instrument in this state, and the instrument terminal can only view the experimental status.

2. Disconnect

1) Instrument → Disconnect → Disconnect the currently connected instrument.
2) If the instrument is running the experiment, it cannot be disconnected.
3) Click **"Disconnect"** and the following prompt will pop up.

Figure-121

4) After disconnection, the status bar becomes not Connected.

3. Instrument information

1) When the instrument is connected, you can view the information of the current online instrument, including basic instrument information and instrument abnormal information
2) **Basic instrument information**: instrument batch number and current instrument status
3) **Instrument abnormal information**: recent abnormal operation log, such as: Abnormal No., Abnormal Specific Contents, and The Time When the Abnormity Happens.

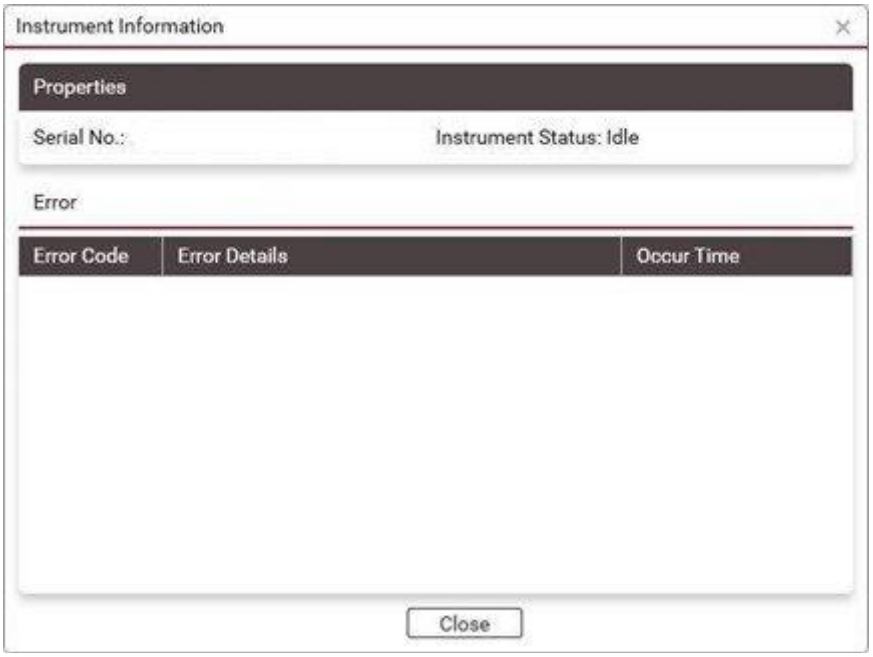


Figure-122

4. Alarm

View and change the settings of the current instrument alarm sound.

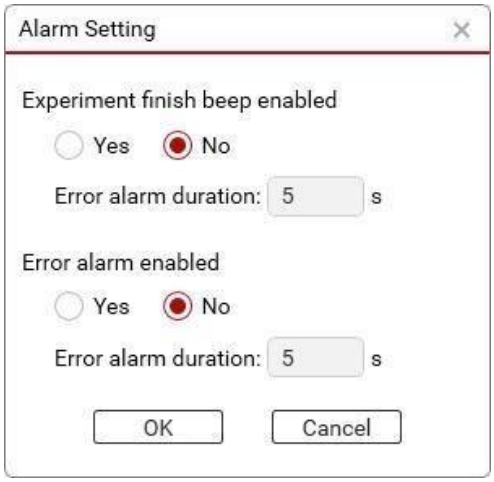


Figure-123

5. Show running experiment

When the instrument is running an experiment, click this button to quickly jump to the running experiment interface.

6. View instrument-side experiment files

Jump to the instrument-side experiment file library to view the list of experiment files:

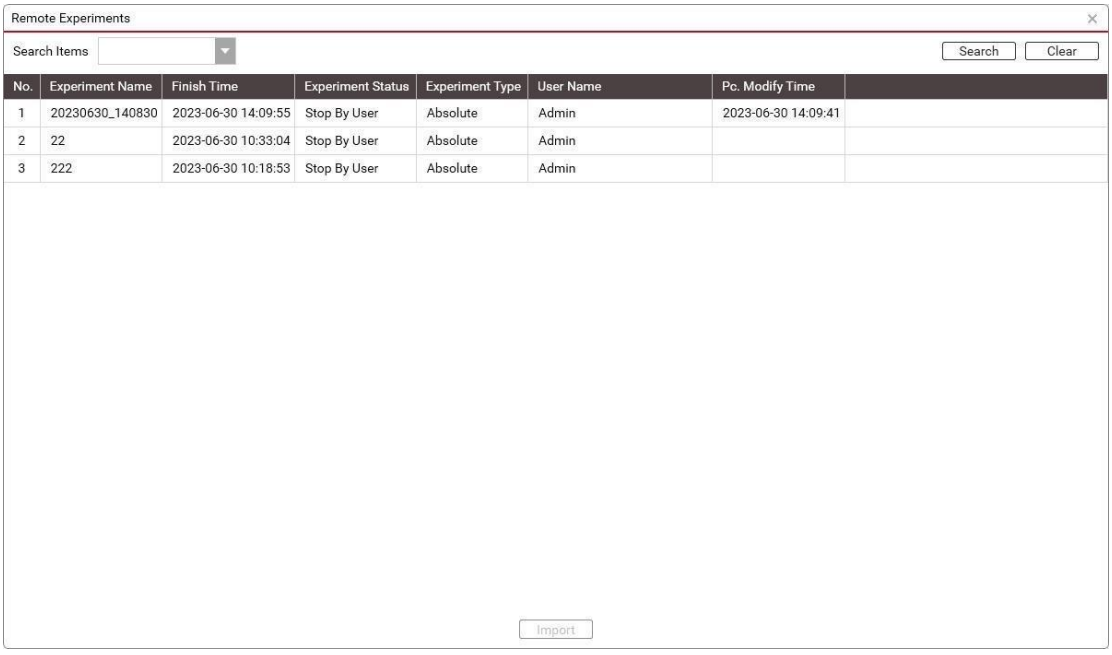


Figure-124

The user can search by experiment name, experiment status, experiment type, and user name. After searching, select the required file, and then import the selected experiment file from the instrument to the PC.

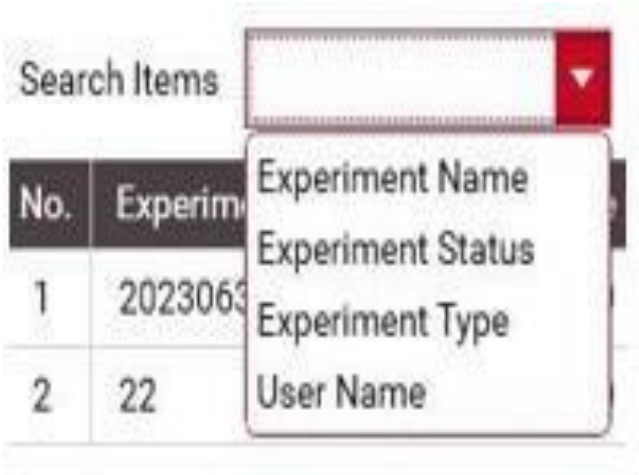


Figure-125

7. Quick run

1) In the controllable state of the online instrument and the template file has been stored in the template library (the plate information has been set), you can quickly create an experiment and start the run through the “Quick run” button.
2) The "Quick Run" under the instrument in the top menu has the same function as the shortcut key "Quick Run" on the main interface.
3) Click to jump to the **"Quick Run"** interface, where you can edit the basic information of the experiment and click to import the template.

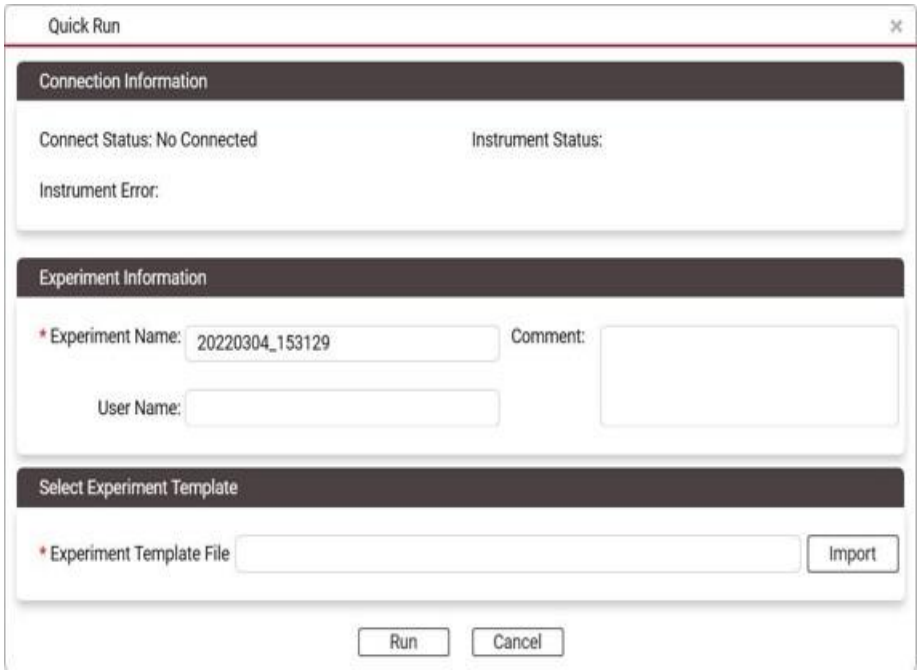


Figure-126

4) Select the file in the template library and open it.

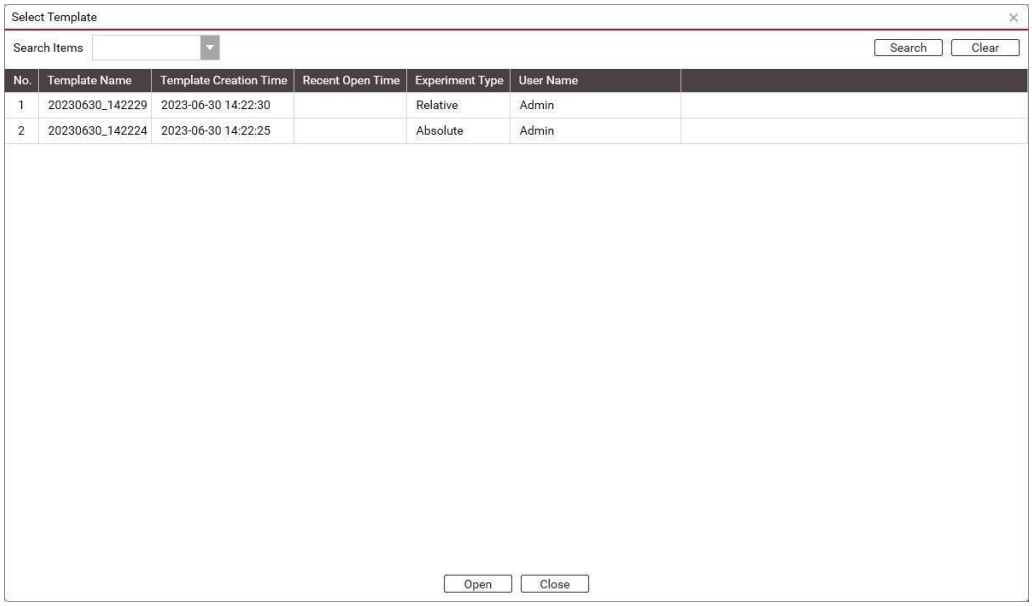


Figure-127

5) After confirming, click to start running.

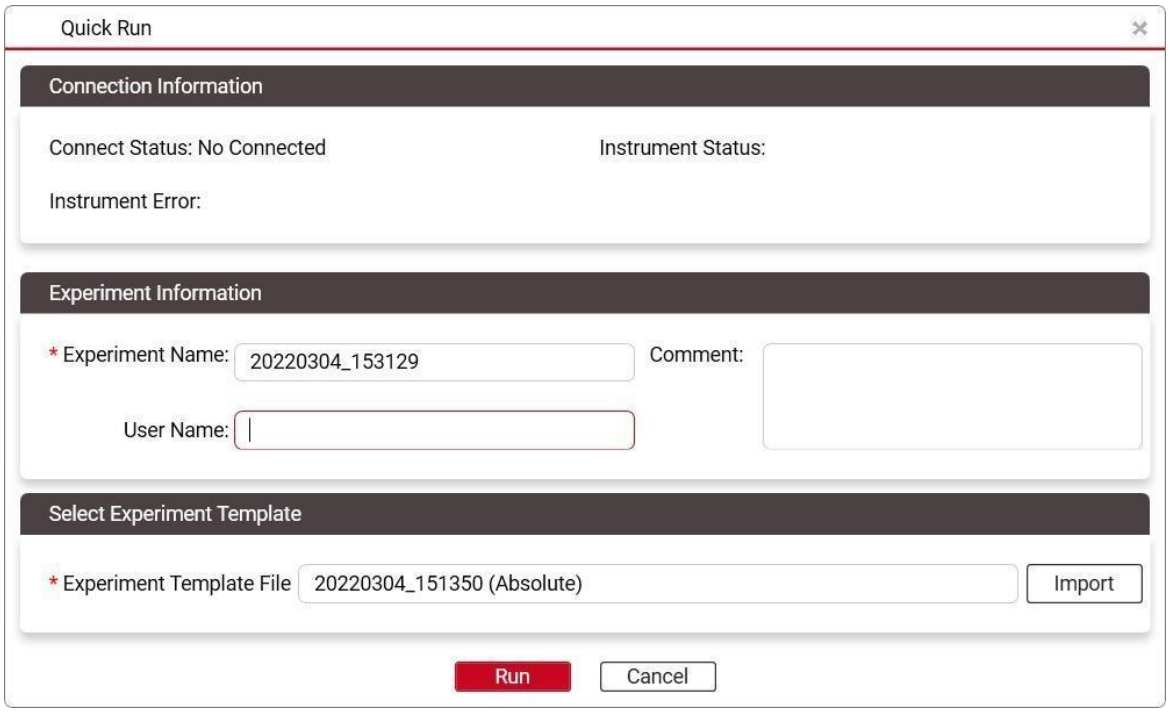


Figure-128

6) Confirmation of running parameters.

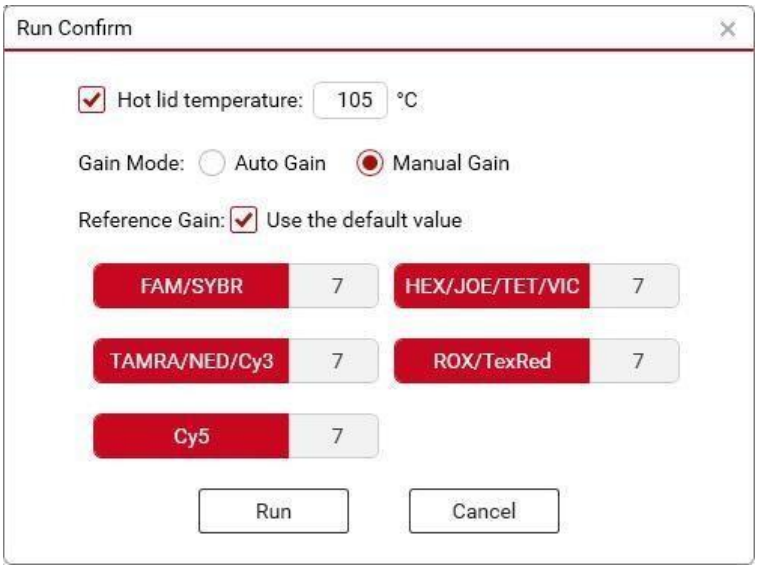


Figure-129

7) After confirming, click **"Run"** to enter the experiment running interface.

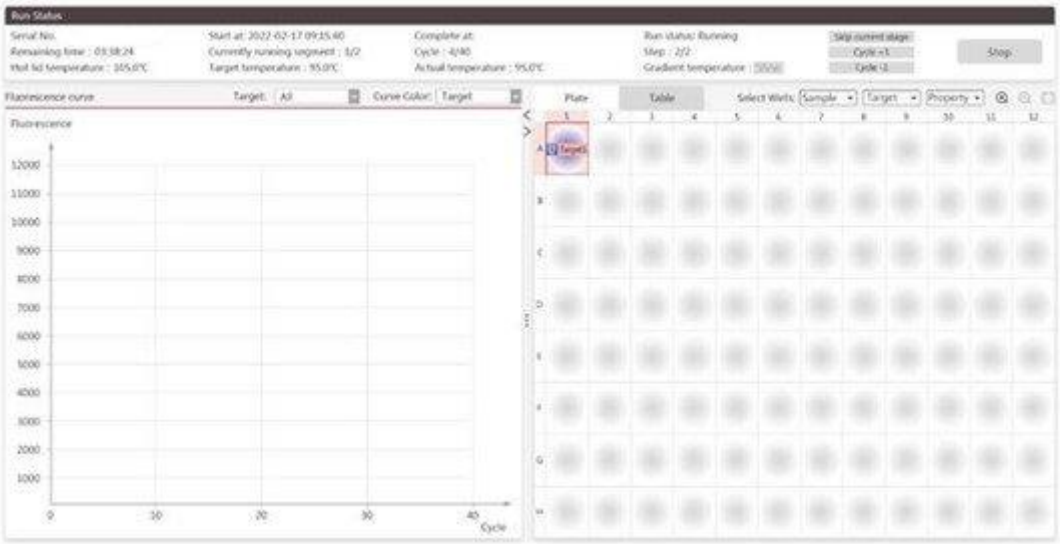


Figure-130

7.4.10 Calibration

1. Calibration instrument

The user can view the calibration status data, gain values, and other information on the online instruments.

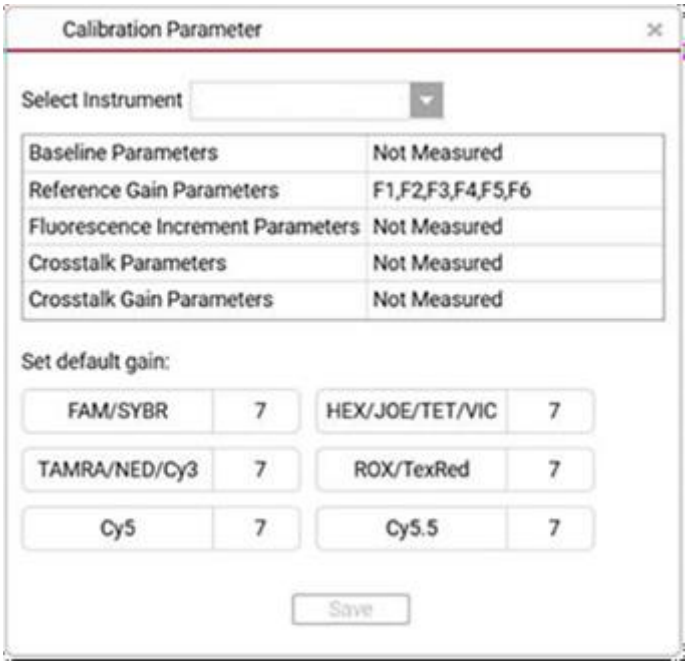


Figure-131

2. **Baseline calibration**
   1) Instrument→ Calibration→ Baseline-Calibration. Set relevant information as required and run the experiment. After the operation is completed, the baseline calibration data of the online instrument will be output.
   2) Only the administrator can have this function.
   3) This function can be selected only when the online instrument is in an idle state, and the calibration experiment cannot be resumed if the power failure is recovered.
   4) If the calibration procedure is not completed normally, the current calibration will be invalid, and the calibration data will not be saved.

3. **Fluorescence increment calibration**
   1) Instrument-Calibration-Fluorescence Increment Calibration- to set relevant information and run the experiment as required.
   2) After the operation is completed, the fluorescence incremental calibration data of the online instrument will be output.
   3) Only the administrator can have this function.
   4) This function can be selected only when the online instrument is in an idle state, and the calibration experiment cannot be resumed if power fails and is recovered.
   5) If the calibration procedure is not completed normally, the current calibration will be invalid, and the calibration data will not be saved.

4. **Crosstalk calibration**
   1) Instrument-Calibration-Crosstalk Calibration to set relevant information and run the experiments required.
   2) After the operation is completed, the crosstalk calibration data of the online instrument will be output.
   3) Only the administrator can have this function.
   4) This function can be selected only when the online instrument is in an idle state, and the calibration experiment cannot be resumed if power fails and is recovered.
   5) If the calibration procedure is not completed normally, the current calibration will be invalid, and the calibration data will not be saved.

5. **Crosstalk gain calibration**
   1) Instrument-Calibration-Crosstalk Gain Calibration to set relevant information and run the experiment as required.
   2) After the operation is completed, the crosstalk gain calibration data of the online instrument will be output.
   3) Only the administrator can have this function.
   4) This function can be selected only when the online instrument is in an idle state, and the calibration experiment cannot be resumed if power fails and is recovered.
   5) If the calibration procedure is not completed normally, the current calibration will be invalid, and the calibration data will not be saved.

7.4.11 Menu bar function description

1. **Analysis**
   After the experiment is completed, click on the analysis or report column of the experiment interface, the analysis function key in the menu bar is available, and the function is the same as the analysis button of the experiment interface.

2. **Analysis settings**
   After the experiment is completed, click on the analysis or report column of the experiment interface, the analysis setting function key of the menu bar is available, and the function is the same as the analysis setting button of the experiment interface.

7.4.12 Menu bar function description: Tool

1. **Network configuration checking and setting**
   The user can view the local IP of the instrument, add the IP of the instrument, and communicate when the two are on the same network end.

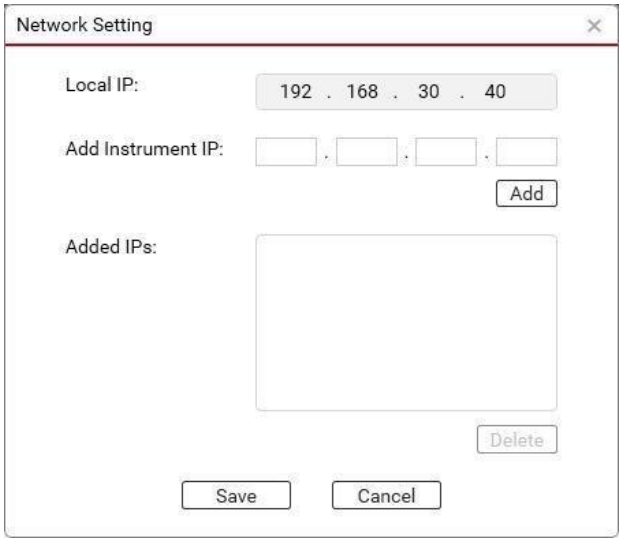


Figure-132

2. Automatic lock settings

1) After the automatic lock is enabled, you can set the automatic lock waiting time.

Figure-133

2) If you do not perform any operation within the specified time, the PC will be automatically locked, and you need to enter the current user password to unlock the PC.

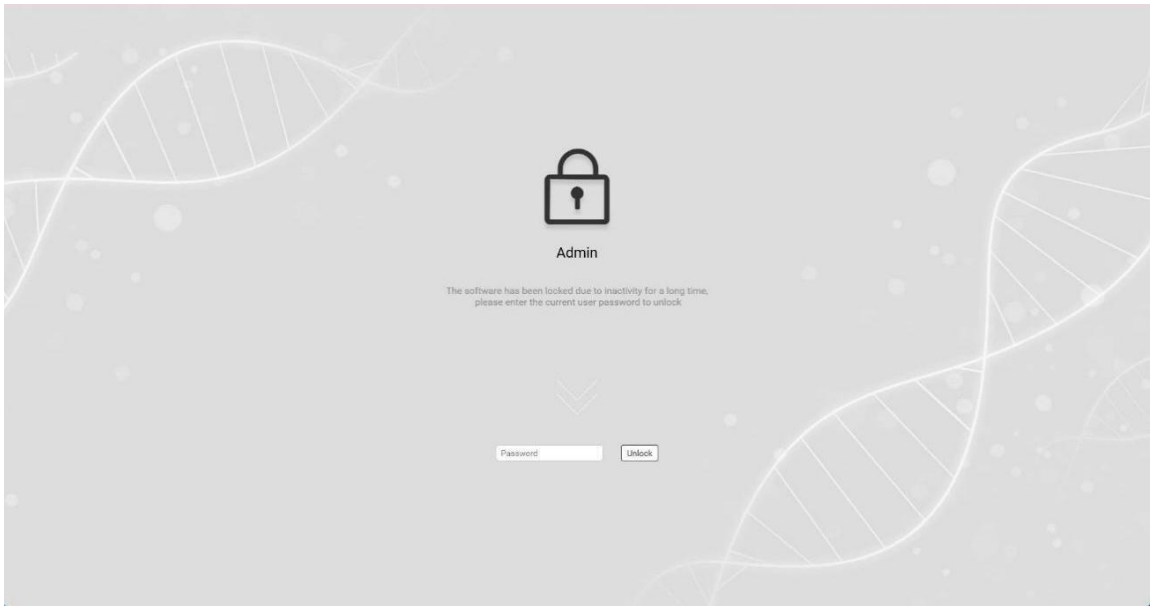


Figure-134

3. Scan method

Select the module scan method of “Scan All Lines” or “Scan Specified Lines” (it can select any required line or multiple lines in A-H to scan, by default all lines A-H are selected and scanned).

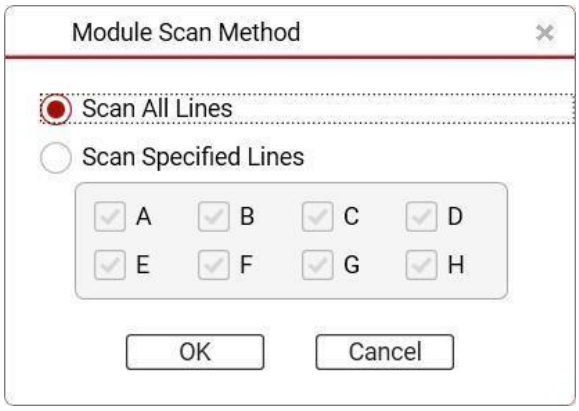


Figure-134

4. Run mode

Block mode or Tube mode can be set for temperature control.

5. Sample columns

It can tick the required sample columns, among which "Sample No." and "Color" are mandatory by default.

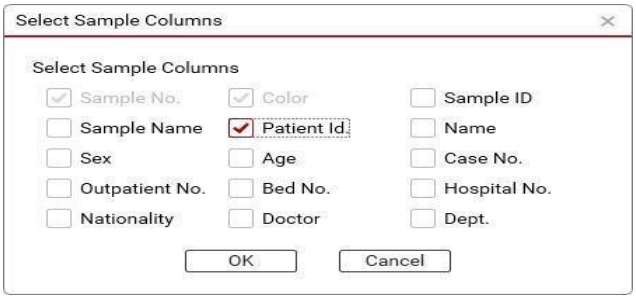


Figure-135

6. Run confirm items

Select to confirm again the key information before running the experiment file. Before running, several ticked targets will be judged. If the information is not complete, the experiment cannot be started.

Figure-136

7. Target library

1) Create, edit, delete, and clear the targets files of four kinds of experiments: "Absolute ", "Relative ", "SNP" and "HRM".

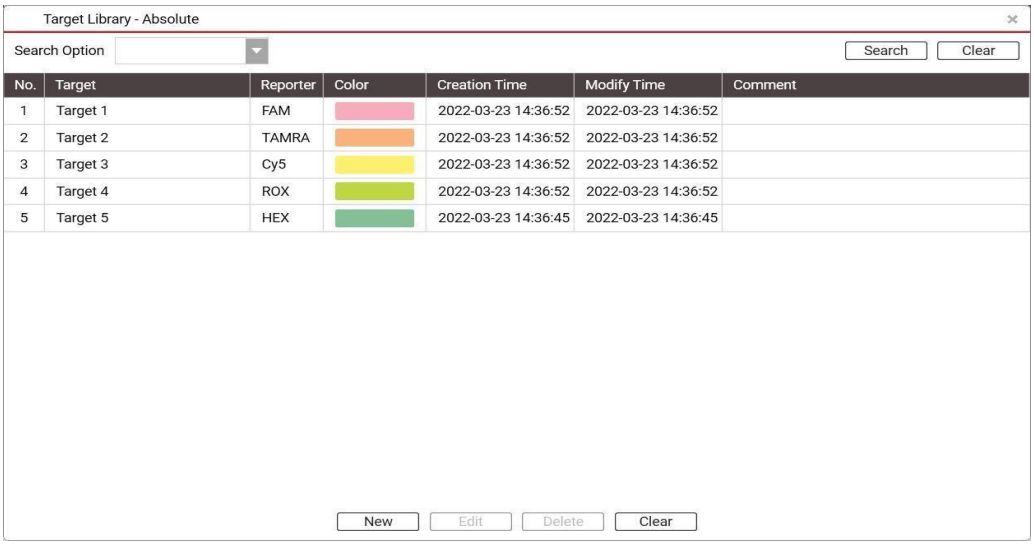


Figure-137

2) **Sort**: Click the header of the list to sort the corresponding tests.

No.	Target	Reporter	Color	Creation Time	Modify Time	Comment
1	Target 1	FAM		2022-03-23 14:36:52	2022-03-23 14:36:52	
2	Target 2	TAMRA		2022-03-23 14:36:52	2022-03-23 14:36:52	
3	Target 3	Cy5		2022-03-23 14:36:52	2022-03-23 14:36:52	
4	Target 4	ROX		2022-03-23 14:36:52	2022-03-23 14:36:52	
5	Target 5	HEX		2022-03-23 14:36:45	2022-03-23 14:36:45	

Figure-137

3) **Search**: Search by Creation Time, Target, Reporter, and Modify Time.

Figure-138

4) **New**: Create a new target.

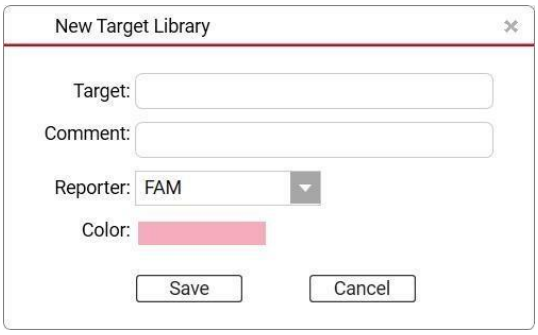


Figure-139

5) **Edit:** Edit the selected target.

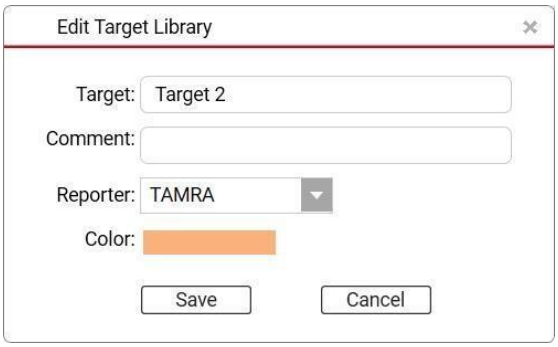


Figure-140

6) **Delete:** Delete the selected target (multiple targets can be deleted at the same time).

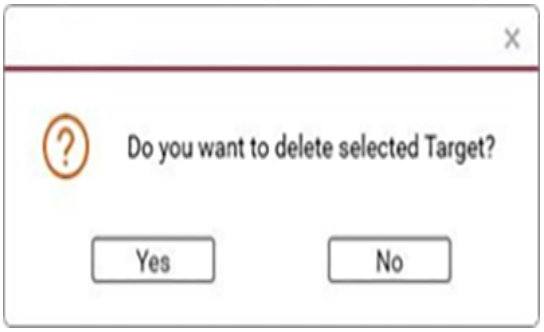


Figure-141

7) **Clear**: Delete all targets.

Figure-142

7.4.13 Menu bar function descriptions: Report

1. Select the default template

The default print report for absolute and SNP-type experiments can be selected, and the report format can be viewed.

2. Print template

It can set the manual editing items for the printing report template of the absolute and SNP type experiment and select the printing paper and printer.

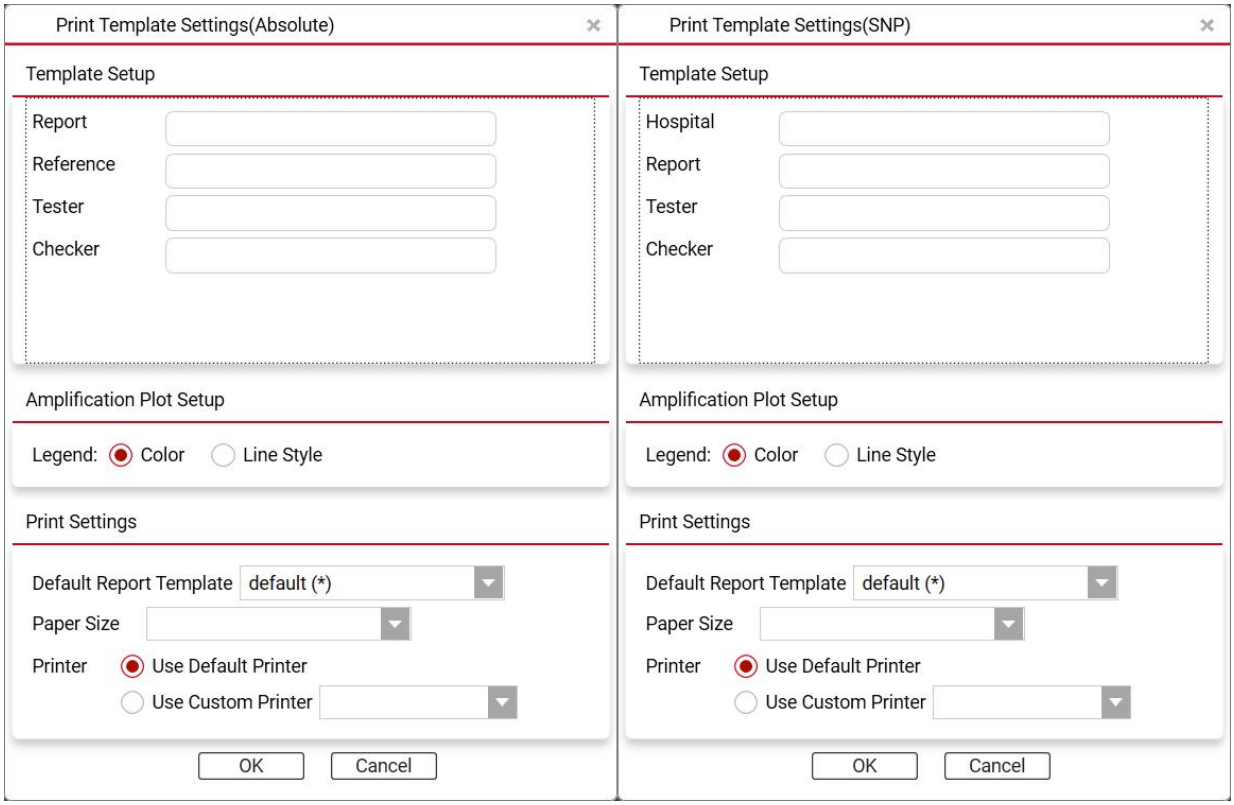


Figure-143

3. Default negative judgment

Set the default negative judgment parameters.

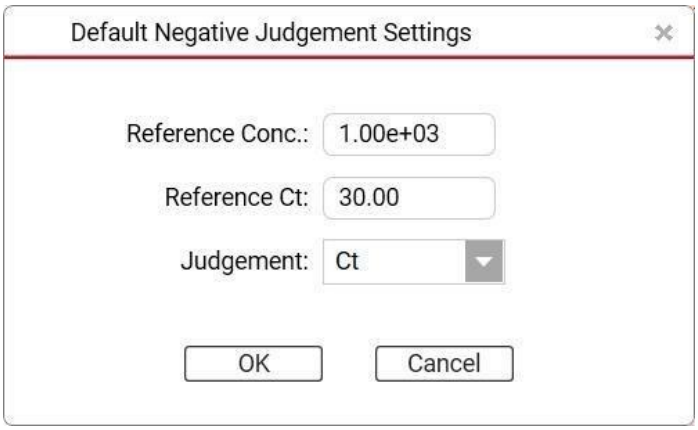


Figure-144

4. Report template library

1) Management of the report template library.
2) It displays the list of all report templates and can create a new template, edit the existing template, import a template, export the template, and delete templates.

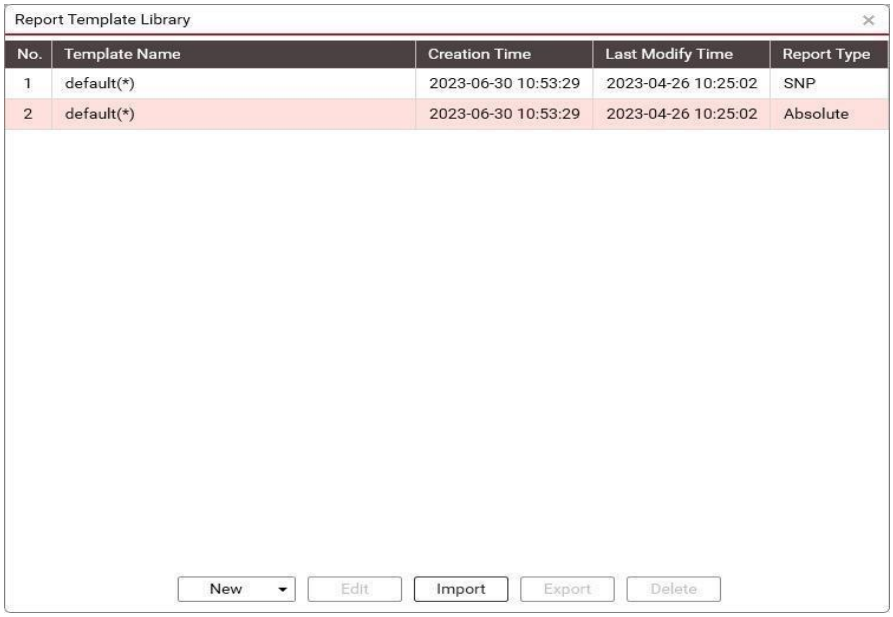


Figure-145

3) **New**: For absolute quantification and SNP only, it can create a new absolute or SNP report from the drop-down box.

5. Designer of absolute report template

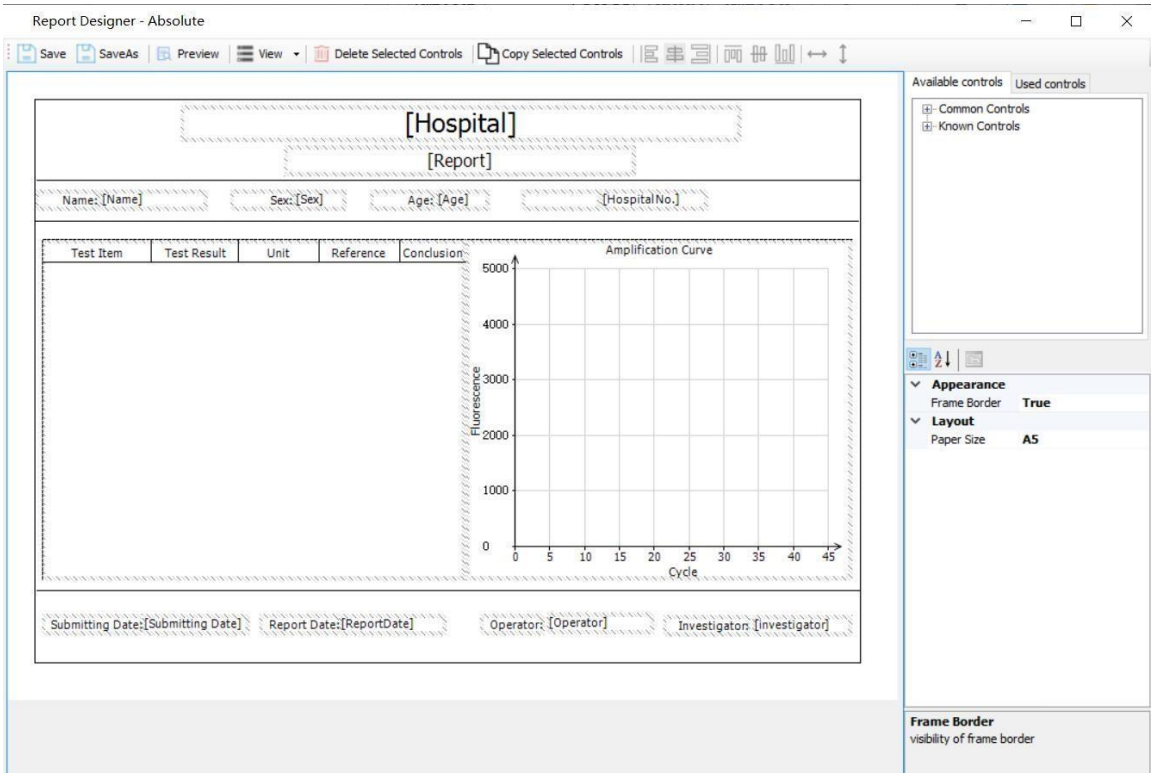


Figure-146

6. Designer of SNP report template

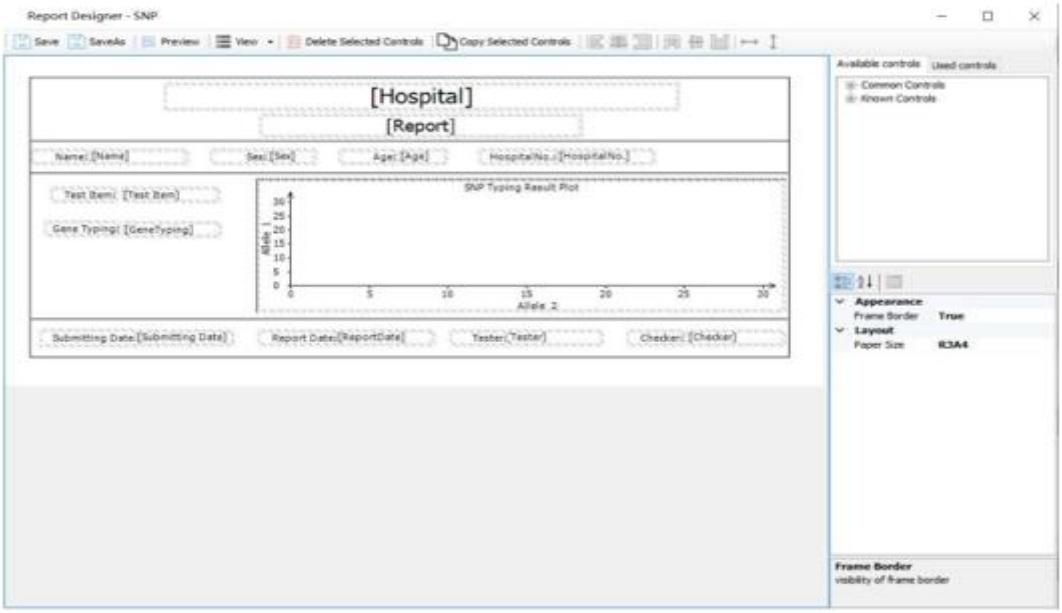


Figure-147

1) **Edit**: To edit the selected report template, the interface is the same as "New".
2) **Import**: Import report template file from outside, the supported file format is rpt.exp.
3) **Export**: Export the selected report template, and the exported file format is rpt.exp.
4) **Delete**: Delete the selected report template.

7. Consolidated report

1) Open the experiment file that has been run and click **"Consolidated Report"** to view and print the consolidated report of the experimental results (the report will take some time to generate, wait patiently.

Figure-148

2) **Generate report**: The user can set the report items in the "Report Items" on the right side.
3) After resetting each time, click **"Generate"** to regenerate a consolidated report again (the default report contains all report items when entering).

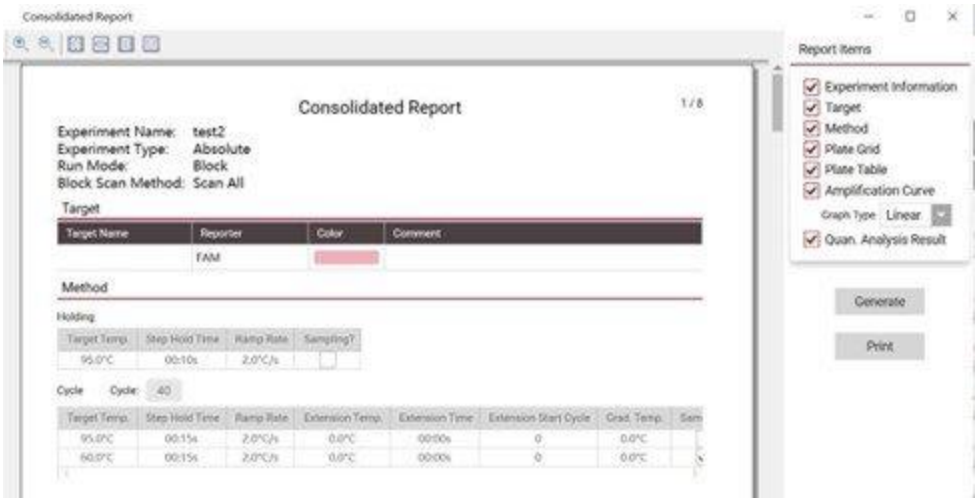


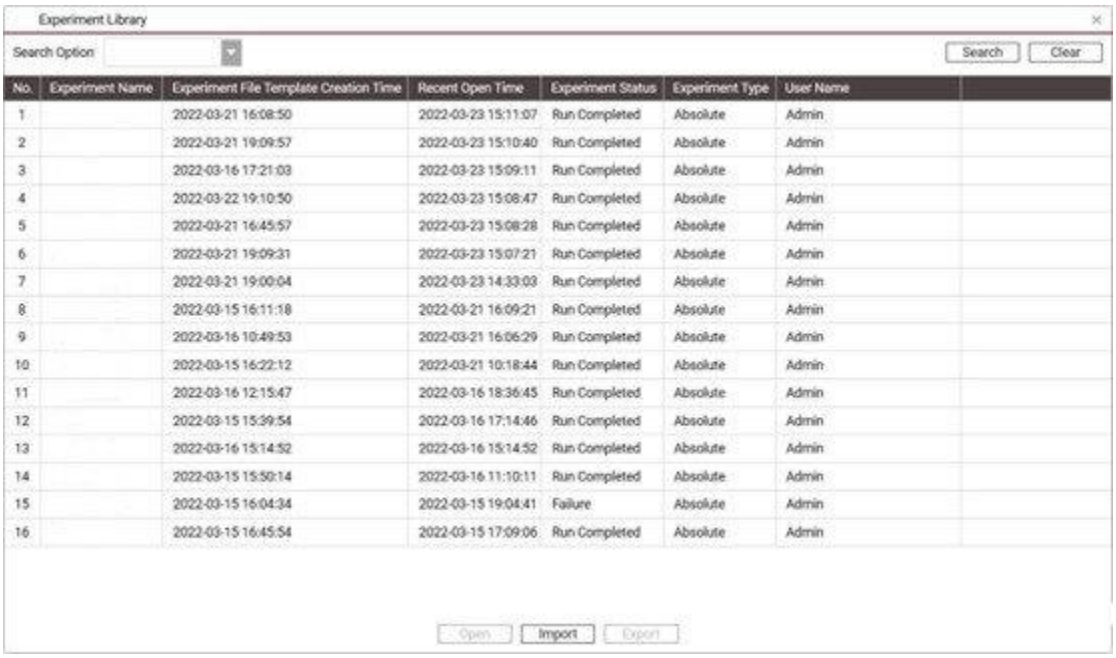
Figure-149

4) **Print:** It will use the computer's print settings to print the generated report.

7.4.14 Menu bar functions description: Database

1. Experiment library

1) The user can view the experiment file library, and at the same time sort, search, open, import, and export them.



No.	Experiment Name	Experiment File Template Creation Time	Recent Open Time	Experiment Status	Experiment Type	User Name
1		2022-03-21 16:08:50	2022-03-23 15:11:07	Run Completed	Absolute	Admin
2		2022-03-21 19:09:57	2022-03-23 15:10:40	Run Completed	Absolute	Admin
3		2022-03-16 17:21:03	2022-03-23 15:09:11	Run Completed	Absolute	Admin
4		2022-03-22 19:10:50	2022-03-23 15:08:47	Run Completed	Absolute	Admin
5		2022-03-21 16:45:57	2022-03-23 15:08:28	Run Completed	Absolute	Admin
6		2022-03-21 19:09:31	2022-03-23 15:07:21	Run Completed	Absolute	Admin
7		2022-03-21 19:00:04	2022-03-23 14:33:03	Run Completed	Absolute	Admin
8		2022-03-15 16:11:18	2022-03-21 16:09:21	Run Completed	Absolute	Admin
9		2022-03-16 10:49:53	2022-03-21 16:06:29	Run Completed	Absolute	Admin
10		2022-03-15 16:22:12	2022-03-21 10:18:44	Run Completed	Absolute	Admin
11		2022-03-16 12:15:47	2022-03-16 18:36:45	Run Completed	Absolute	Admin
12		2022-03-15 15:39:54	2022-03-16 17:14:46	Run Completed	Absolute	Admin
13		2022-03-16 15:14:52	2022-03-16 15:14:52	Run Completed	Absolute	Admin
14		2022-03-15 15:50:14	2022-03-16 11:10:11	Run Completed	Absolute	Admin
15		2022-03-15 16:04:34	2022-03-15 19:04:41	Failure	Absolute	Admin
16		2022-03-15 16:45:54	2022-03-15 17:09:06	Run Completed	Absolute	Admin

Figure-150

2) **Sorting**: Same as the sorting operation
3) **Search**: Same as the search operation
4) **Delete**: Delete the selected experiment file.
5) The user needs to confirm again before deleting.

Figure-151

6) **Open**: Same as the search operation.
7) **Import**: Same as the import operation.
8) **Export**: Select one or use the shift + ctrl keys of the keyboard to select multiple files.
9) Click export and select the target folder to export the data to the target directory.

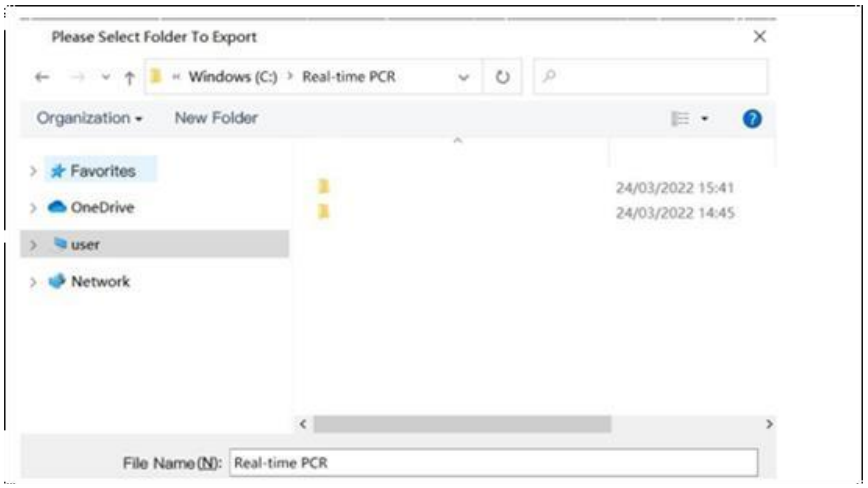


Figure-152

10) If the selected file(s) to be exported already exists (s) in the target folder, the user can skip or overwrite.

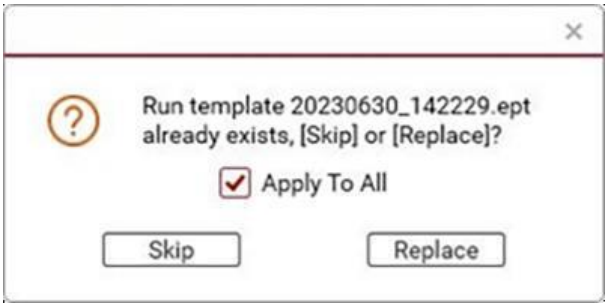


Figure-153

11) **Delete**: Delete the selected template file. The user needs to confirm again before deleting.

Figure-154

7.4.15 Menu bar functions description: Help

1. Documentation

The user can consult the software and the operating manual matched with the instrument. Before using the instrument, the novice can view the operation process in the "Documentation". This process can help the user quickly become familiar with the experimental operation.

2. About

The user can view information such as instrument model, serial number, PC full version, and PC release version.

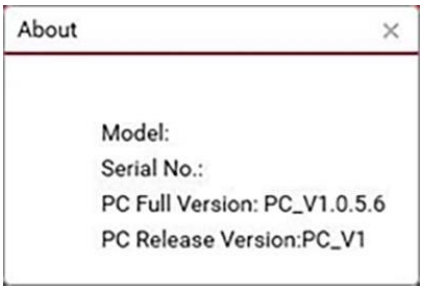


Figure-155

8. Maintenance

8.1 Instrument cleaning

8.1.1 Cleaning of instrument shell

If the surface of the instrument is splashed with contaminants, use a dust-free cloth dipped in 75% ethanol to wipe the surface of the instrument, and wipe back and forth twice each time.

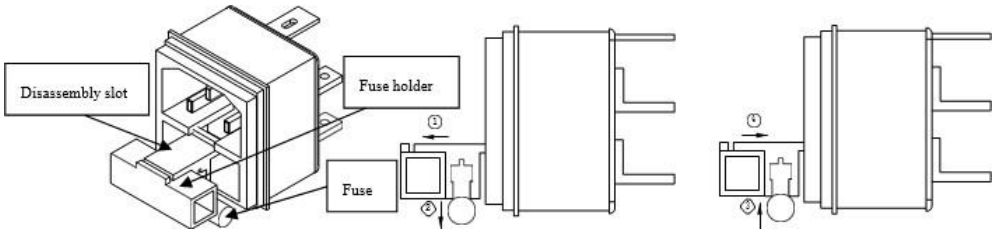
8.1.2 Cleaning the block wells of the instrument

If liquid or other contaminants enter the block well, use a medical cotton swab soaked in 75% ethanol put it into the block well, and gently rotate it 5-10 times, cleaning 3 times each time.

8.2 Routine maintenance

1) Check regularly whether the operating environment and placement of the instrument comply with the requirement.
2) Run the experiment regularly to avoid the instrument not being turned on for a long time.
3) Clean regularly according to the method.

9. Replacement



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When the fuse is damaged, the user can replace the fuse as follows:

1) As shown in Figure use a flat-blade screwdriver (or other objects) to insert into the disassembly slot.
2) Move in the direction of arrow① and remove the fuse holder.
3) Remove the fuse in the direction of arrow ②.
4) In the direction of arrow ③, press the new fuse into the slot.
5) In the direction of arrow④, press the fuse holder into the power holder to complete the installation.

10. Troubleshooting

Alarm signal/instrument failure	Cause analysis	Solution
Error01: In-out motor abnormal.	Instrument failure.	
Error02: Up-down motor abnormal.	Instrument failure.	
Error03: X axis motor abnormal.	Instrument failure.	
Error04: Y axis motor abnormal.	Instrument failure.	
Error05: Circular channel motor abnormal.	Instrument failure.	
Error06: Fluorescence detection abnormal.	Instrument failure. If the fluorescence signal is too low no test tube or empty tube may be placed.	Check whether the plate placement is consistent with the plate layout in the program.
Error07: Module temperature sensor short/open circuit.	Instrument failure.	
Error08: Module heating function abnormal.	Instrument failure.	
Error09: Module cooling function abnormal.	Instrument failure.	
Error10: Hot-lid temperature sensor short/open circuit.	Instrument failure.	
Error11: Hot-lid heating function Abnormal.	Instrument failure.	
Error 12: Radiator temperature sensor short/open circuit.	Instrument failure.	
Error 13: The heat dissipation function of the radiator is abnormal.	Instrument failure.	
Error 14: The module is unplugged, and the experimental data is invalid.	The block is pulled out during runtime.	Check the module status, relocate the sample, and restart the experiment.

Error15: The firmware upgrade failed. upgrade again!	The power is cut off. The PC is disconnected from the instrument terminal.	Power on and start online again to reconnect.
Error16: Communication failure of Firmware!	Communication data error. Instrument failure.	Check the connection and reconnect it.
Error17: Instrument disconnected!	Instrument online disconnection.	Check the connection and reconnect it.