Real-Time qPCR System

Model Q2000A/B/C

User Manual

Ver. 2.1
2026.08

LongGene®

Contents

About the manual

Please read this manual carefully before using this instrument!

Purpose of This Manual

This manual provides instructions on how to set up and use the Q2000(Q200) Real-Time qPCR System instrument.

We reserve the right to modify this manual at any time without prior notice.

Writing Conventions

This manual uses the following conventions:

- **Bold** text indicates user operation.

  For example:

  Touch **Ok** to accept changes and return to last screen.

- Note: Provides instructions that draw your attention or may be helpful.

  For example:

  Note:

  When the instrument is set aside for a long time, disconnect the power cable from the socket.

- IMPORTANT! Provides information that must be read carefully. Ignore the information will possibly result in damage to the instrument or to the user.

  For example:

  IMPORTANT!

  Do not touch the surface of the sample block because it may be very hot!

[Chapter 1]Instrument Overview

1. Instrument Components

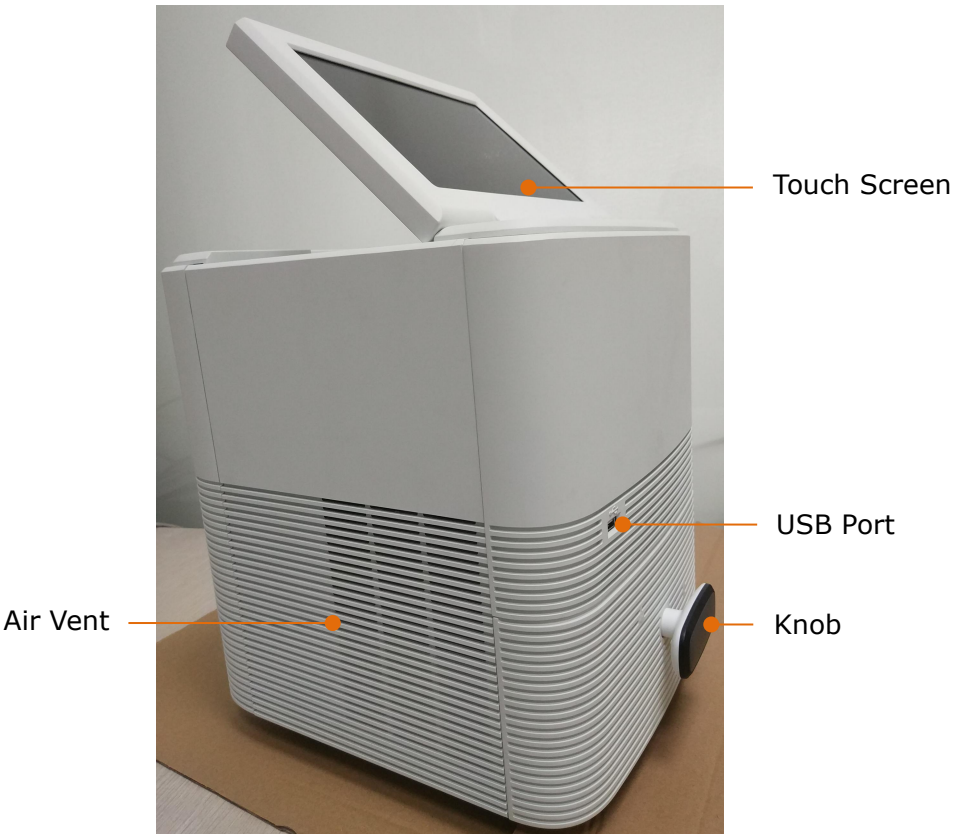


Figure 1 Front View of the Instrument

Figure 2 Rear View of the Instrument

Table 1 Function of the Instrument Components

Component	Function
Touch screen	Used to interact with the instrument, create a new experimental program, view and control the experimental run, set the instrument parameters and so on. The screen angle can be arbitrarily adjusted within the range of 0-90 °.
USB – Port	Connect a U disk to export the result data, to export run records or to upgrade the instrument software.
Knob	The sample block is opened and closed by pulling / pushing the knob; the heated lid is pressed against the reaction vessel or out of the reaction vessel by rotating the knob. The heated lid prevents the reaction liquid from evaporating and condensing by heating the top of the reaction vessel.
Air Vents	Let air go into and go out of the instrument.
Power Switch	Powers on (1) and powers off (0) the instrument.
Power Inlet	Connects the instrument to a socket via supplied power cable.
Ethernet Port	Network control the instrument by a computer.

2. Touch Screen Buttons

Table 2 and Figure 3 describe buttons and virtual keyboard common to many of the screens.

IMPORTANT!

It is recommended to use a stylus or a fingertip to touch the touch screen. Do not use any sharp object (e. g., a pencil) to touch the touch screen as it may cause damage.

Table 2 Buttons in the screens

Button	Function
	Closes current screen without changing any parameters and returns to previous screen.
	Accepts present parameters setting and closes the screen.
Scroll left and right	Swipe your finger left or right in the corresponding area of the screen.
Page up and down	Swipe your finger up or down on the corresponding area of the screen.

You can enter letters or numbers by using the virtual keyboard:

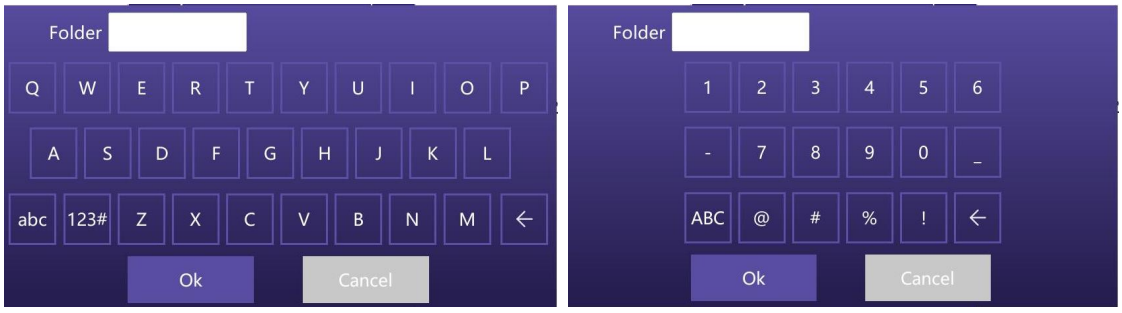
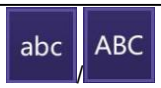


Figure 3 Virtual keyboard

To...	Touch...
Enter a letter/number	A letter/number button.
Switch the keyboard, enter capital letters / lowercase letters	
Switch the keyboard, enter numbers or special symbols	
Delete the last character in an input field	

[Chapter 2]Getting Started

1. Install the Instrument

1.1 Site Requirements

The instrument is intended for indoor use. Ensure that the installation site meets conditions below.

Power supply

The instrument requires 100-240V, 50-60Hz and grounded outlet. The power cable supplied is rated to carry 10A. Please always use the power cable supplied with the instrument.

Environmental Conditions

Table 1 Temperature and humidity conditions:

Condition	Acceptable range
Ambient temperature	10 to 30°C (50 to 86°F)
Relative humidity	20 to 80%, non-condensing

Place the instrument on a stable table or bench. Avoid placing the instrument adjacent to heaters, cooling instruments, water sink or in direct sunlight. Keep away from any equipment that vibrates, such as a shaker or a centrifuge. The recommended distance between the instrument and the back wall is 20 cm (7.9 in). When more than one instrument is used at the same time, the distance between two instruments should not be less than 30cm (11.85 in).

1.2 Unpack

1. Remove the packaging materials and store them in case of transport use.
2. Inspect the instrument for shipping damage.
3. Included in the box should be:
   - The Q2000 (Q200)Real-Time qPCR instrument
   - Power cable
   - Warranty card
   - Cable
   - USB
   - Instruction

IMPORTANT! If the instrument is damaged or some items are missing or damaged, contact our company or local distributor.

1.3 Power On and Power Off

1. Connect the power cable to the power inlet in the rear of the instrument.
2. Connect the power plug to the socket.
3. To power on: Turn the power switch to position ‘1’.
   To power off: Turn the power switch to position ‘0’.

Note: When the Instrument is not used for extended periods of time, disconnect the power cable from the socket.

1.4 Opening and Closing the Sample Block

The instrument uses a unique drawer model structural design to open and close the sample block, to facilitate the user to place and remove the reaction vessel.

When the sample block is closed, turn the knob clockwise to lock the door of the block, and the sample block will raise the height until the heated lid is pressed against the reaction vessel to reduce the evaporation of the reaction solution.

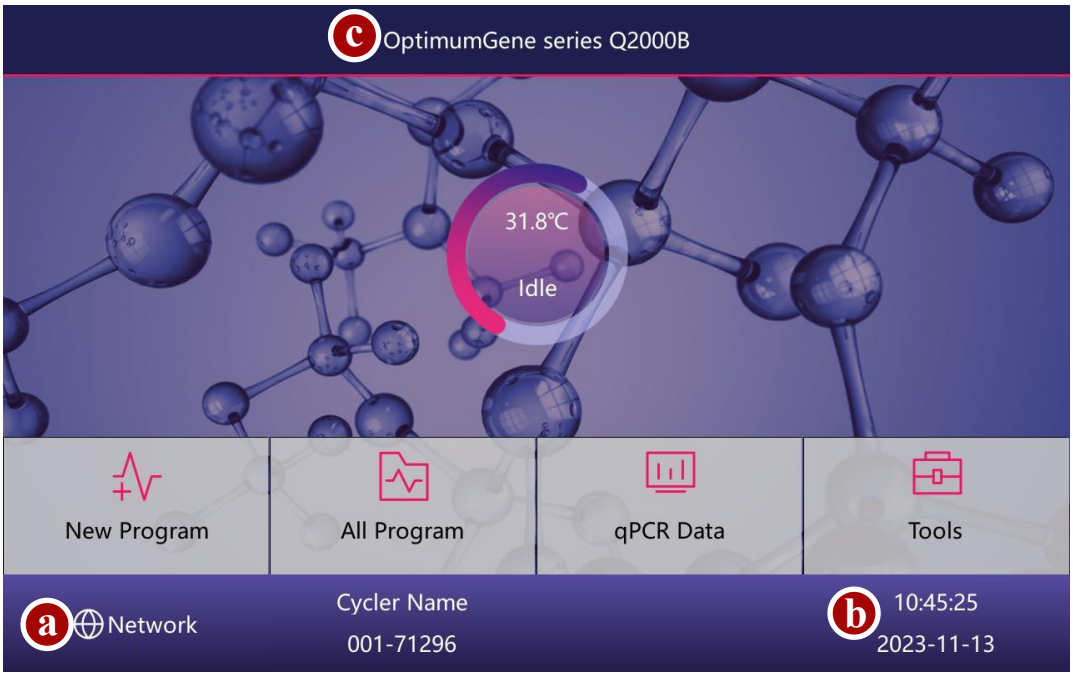
IMPORTANT!

Temperature of the sample block may be very high (over 50°C). Never touch the surface of the sample block.

Opening/Closing the block:

1. Turn the knob counter clockwise, unlock the door lock, so that the height of the sample block down away from the heated lid.
2. When the knob is rotated to the limit position, grasp the knob and gently pull the sample block forward;
3. Place the reaction vessel (sample tubes) in the hole (sample well) of the sample block;
4. Gently push the door of the sample block, turn the knob clockwise until the knob is in the horizontal position and you will hear a 'click' sound. The door has been locked and heated lid will press the reaction vessel with an appropriate pressure.

2. Introduce the Home Screen



When the instrument powers on, the boot screen is displayed for a while.
The Home screen is then displayed (see above).

Items in the Home screen:

a. Shows login user name.

b. Shows date and time.

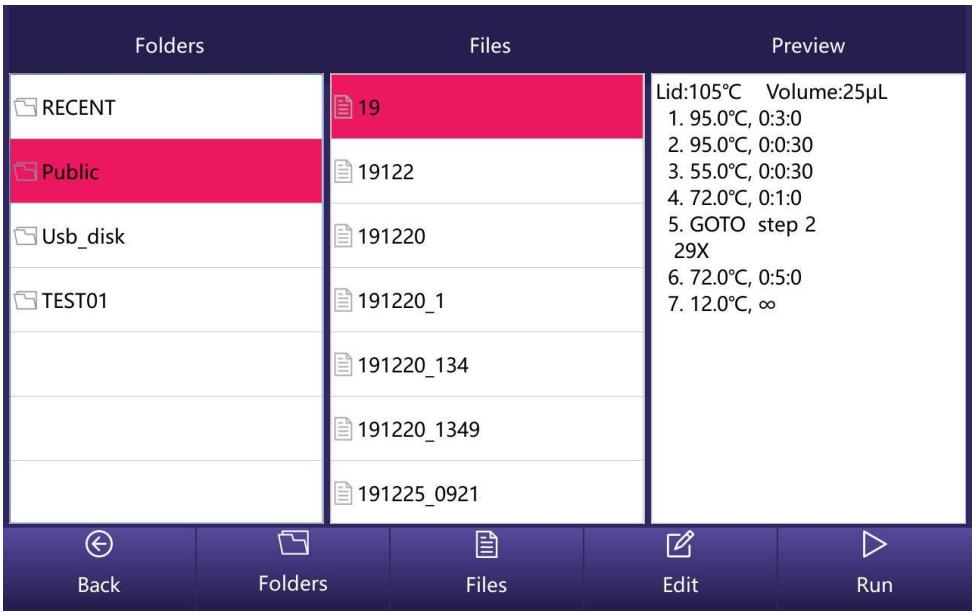
c. Instrument name and model

Buttons of Home Screen

Button	**Function**
New Program	Creates new programs.
All Program	Open and view all saved programs.
qPCR Data	View and export qPCR experiment data.
Tools	Sets instrument parameters and uses other tools.
The ring in the center of the screen	Displays the current running status (idle or remaining time) and sample temperature. Touch it to open Run Status screen.
 Login	Switch another user and login system.
 Network	Network User is displayed when using the PC software to control the instrument.

[Chapter 3]Manage Folder and Program

1. Introduce the All Program Screen



In the Home screen, touch **All Program**.

The All Program screen opens.

The screen has three columns. The first column lists all available folders. Touch Page Up and Page Down to move between pages. The following folders are system folders:

- RECENT: shows the recently run 20 programs for quickly viewed/run again.
- Public: used as the default folder for saving programs. All login users can use programs saved in the Public folder.
- Usb_disk: This folder contains program files that stored in the U disk. Program files can be copied to and from the U disk.

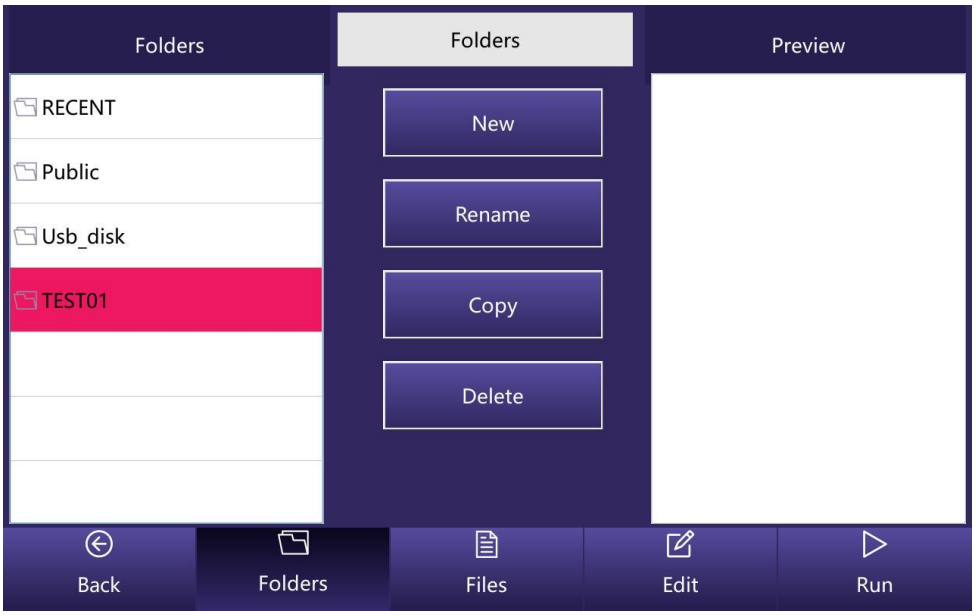
Note: System folders cannot be renamed or deleted.

The second column shows all files of a selected folder. Touch a file to view program steps in the Preview column.

Buttons of All Program Screen

Button	**Function**
Back	Returns to the Home screen.
Folders	Creates a new folder, renames or deletes a selected folder, copies all programs in one folder to another folder.
Files	Copy a program file, renames or deletes a selected program file, create a new program.
Edit	Edits a selected program.
Run	Runs a selected program.

2. Manage Folder and Program



2.1 Add Folder

To add a folder:

1. In the All Program screen, touch **Folders**, and then touch **New**.
2. Enter a folder name up to 12 characters and touch **Ok**.

2.2 Rename Folder/Program

To rename a folder or program file:

1. In the All Program screen, select the folder or program file.
2. Touch **Folders** > **Rename** to rename a folder or touch **Files** > **Rename** to rename a program file, and then touch **Ok** to accept changes.

2.3 Delete Folder/Program

To delete a folder or program file:

1. In the All Program screen, select the folder or program file.
2. Touch **Folders** > **Delete** to delete a folder or touch **Files** > **Delete** to delete a program file. Touch **Yes** in the displayed pop-up window to confirm.

2.4 Copy Folder

To copy all programs of Folder A to Folder B:

1. In the All Program screen, select the folder A to be copied.
2. Touch **Folders** > **Copy** to open the Copy Folder keyboard.
3. In the Copy Program keyboard, enter the target Folder's name "B", and then touch **Ok** to copy all program to Folder B.

If:

a. Folder B does exist, the folder will be created firstly, and then all programs

will be copied to Folder B.

b. Folder B exists, all program will be copied to Folder B, but some program which has the same name as that of Folder B's will not be copied.

c. To copy all programs to a U disk, insert the U disk in the USB-A port of the Thermal Cycler. In the Copy Program keyboard, enter the target Folder's name "Usb_disk" (case-sensitive), and then touch **Ok**.

2.5 Copy Program

To copy a program file:

1. In the All Program screen, select a program file to be copied and then touch **Files > Copy** to open the Copy Program keyboard.
2. In the Copy Program keyboard, select a Folder in the drop-down list box, and then touch **Ok** to copy the program file.

If you want to:

a. Rename the program before copy - clear the old program name, and then enter a new name.

b. Insert the U disk in the USB port of the Thermal Cycler. Select Usb_disk in the Folder drop-down list box to export the program file to the U disk.

2.6 New Program

For creating a new program, please see chapter 4 for details.

2.7 Run Program

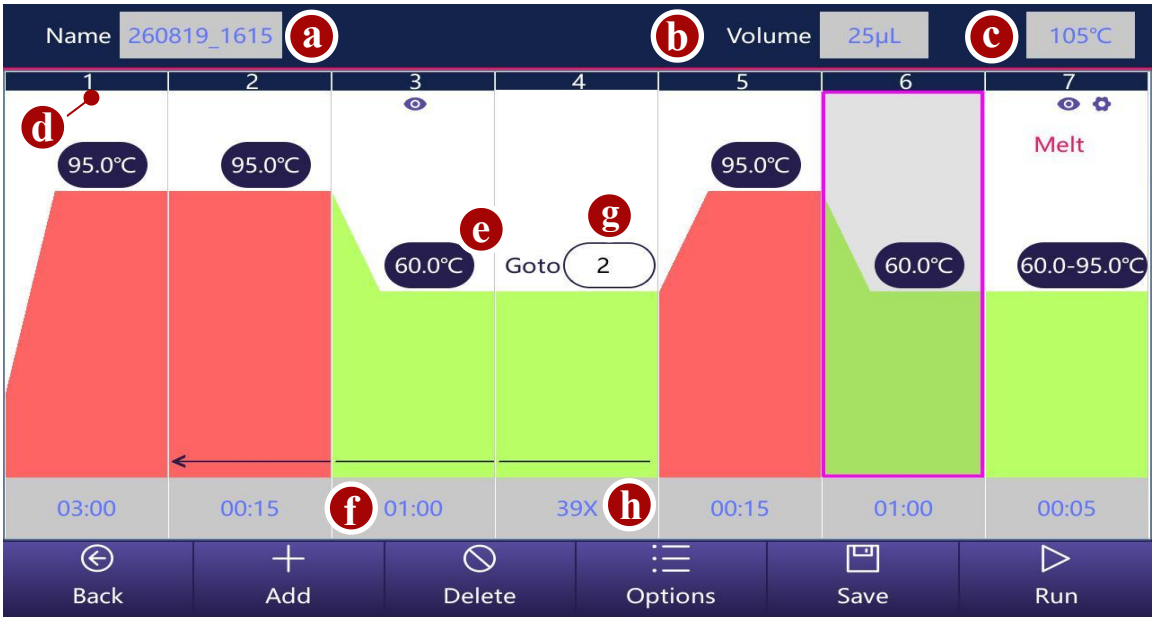
For running a program, please see chapter 5 for details.

[Chapter 4]Create and Edit Program

1. Create New Program

1.1 Introduce the Edit Program Screen

In the Home screen, touch **New Program** to open the Edit Program screen.



Items in the Edit Program screen:

a: Program name

b: Sample volume

c: Lid temperature

d: Step number

e: Temperature for a constant temperature step or a gradient temperature step

f: Step holding time (hour: min: sec)

g & h: The start step number and amounts of additional repeats for cycles

Buttons of Edit Program Screen

Button	**Function**
Back	Returns to the Home screen or the All Program screen.
Add	Adds a constant temperature step, a gradient temperature step, a goto step or melt step.
Delete	Deletes a step.
Options	Set additional parameters for a selected step.
Save	Saves the program.
Run	Run the program.

This is an open-architecture system compatible with consumables and reagents from different brands, provided these products meet the quality standards for qPCR applications. When needed, the system can also function as a conventional PCR instrument. By adjusting the time-temperature parameters of

each cycle, touchdown and long-range PCR protocols can be executed.

1.2 Add Steps

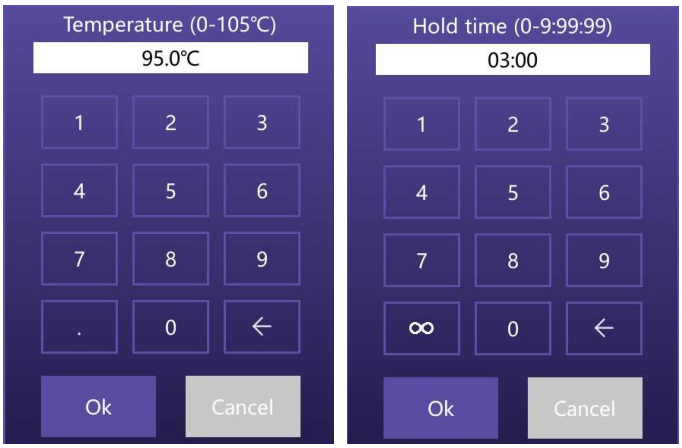
A PCR program comprises several steps. Step types include Constant, Gradient and Goto steps. Each new step will be inserted after the selected step while the initial step will be inserted without selecting a step. The maximum amount of steps for a program is 30.

1. In the Edit Program screen, touch anywhere in the column for a step to select it. When a step is selected, a red border is displayed around the step.
2. Touch **Add** and the Add Step window opens.

3. Touch **Constant** to add a constant temperature step or touch **Gradient** to add a gradient temperature step or touch **Goto** to add a goto step.

1.3 Changing Temperature and Hold Time in a Constant Step

1. In the Edit Program screen, touch temperature box or hold time box of a step.
2. Enter a value in the pop-up keyboard and then touch **Ok**.



Note:

The allowable temperature range is visible on the digital keypad display.

Touching ∞ **(Forever)** in the keyboard will cause the program to hold indefinitely after reaching this step until it stopped manually.

1.4 Changing Temperature and Hold Time in a Gradient Step

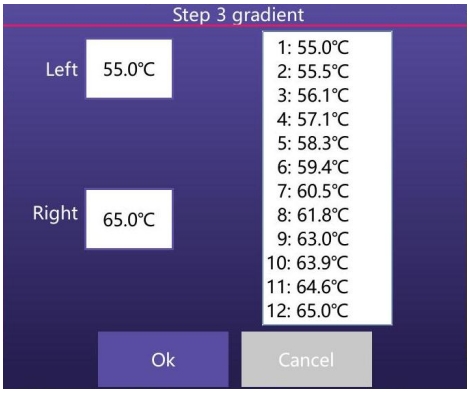
To change temperature value:

1. In the Edit Program screen, touch up or down temperature box to open the Gradient Temperature Edit window.

2.Touch **Left** and **Right** to enter temperature of the Left and Right column of sample block. The right part of the window will display calculated temperature gradient from the first line to the last line (from the 1st to 12th for the 96 wells sample block module).

Note:

The allowable gradient temperature range is visible on the digital keypad display.



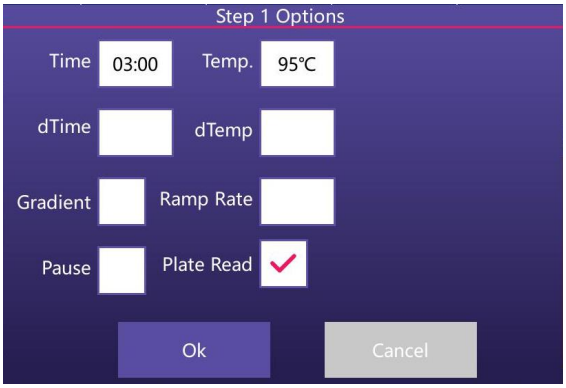
To change hold time:

1. Touch hold time box.
2. Enter a value in the pop-up keyboard and then touch **Ok**.

1.5 dTemp, dTime, Ramp Rate and Pause

To add dTemp, dTime, Ramp Rate and Pause to a constant temperature step:

1. In the Edit Program screen, selects a step. Touch **Options** to open the Step Options window.



2. To edit an item, click on the appropriate text box.
3. Enter a value in the pop-up keyboard and then touch **Ok**.
4. Touch **Ok** to accept changes and close the window.

• **dTemp**: adds temperature increments to step with each cycle.

Touch +/- in the keyboard to shift between "+" and "–" (to increase or decrease temperature for each cycle), and then enter the number of degrees of increment temperature.

Note:

Parameters cannot be set that would cause a step to fall outside of the operating range of the instrument (i.e. below 0°C or above 105°C).

• **dTime**: adds time increments to the holding time within the step for each cycle.

Touch +/- in the keyboard to shift between "+" and "–" (to increase or decrease time for each cycle), and then enter the seconds. The allowable increment time range is 1 sec ~ 600 sec.

Note:

Parameters cannot be set that would cause the dwell time to fall below zero.

• **Ramp Rate**: Adjust the heating or cooling ramp rate.

Make the instrument heat up or cool down at a specified average rate to reach the set step temperature.

If you type 0 or do not type anything on the digital keypad, the program will run at the maximum heating and cooling rate that the instrument can achieve.

Note:

The actual maximum ramp rate of heating and cooling varies with block module type. Refer to the instrument specifications for the maximum value. If a value larger than the block's maximum rate is entered, the block's maximum rate will be used. If you do not want to slow the running, just leave this option empty.

• If you touch **Pause**, the program will automatically pause as soon as the desired step temperature is reached and the instrument will beep twice. Touch **Resume** in the Run Status screen will continue the program running. Pause can be used to add reagents (i.e. A manual hot start method) or when adding or removing tubes every few cycles.

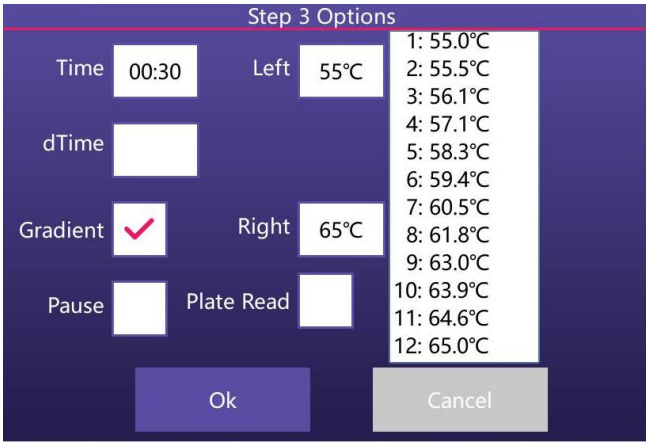
• **Plate Read**: When this check box is selected, the program runs through the steps and fluorescence is collected before running the next step.

Note:
You can also add Pause, dTime and Plate Read as you need to a gradient temperature step.

To remove the dTemp, dTime, Ramp Rate and Pause,
1.1 In the Step Options window, click on the dTemp, dTime or Ramp Rate numeric box. Delete the old value in the pop-up keyboard or enter "0" and then touch **Ok**.
1.2 Uncheck the **Pause/Plate Read** check box.

1.6 Exchange between Constant Step and Gradient Step

To change a constant step to a gradient step:
1. In the Edit Program screen, selects a constant temperature step. Touch **Options** to open the Step Options window.
2. Click the **Gradient** check box to enable the gradient function.
   The right part of the window will display calculated temperature gradient from the first column to the last column (from the 1st to 12th for the 96 wells sample block module). Change the **Left** and **Right** temperature as you need.



To change a gradient step to a constant step:
1. In the Edit Program screen, selects a gradient temperature step. Touch **Options** to open the Step Options window.
2. Uncheck the **Gradient** check box.
3. Change the temperature as you need.

4. Touch **Ok** to accept changes and close the window.

1.7 Set Cycle

1. In the Edit Program screen, select or add a goto step.
2. Touch **Goto** box, select the start step number of the cycle in the pop-up box.

In the figure below, steps 2-4 will run repeatedly for the specified cycle numbers.

3. Touch **X** box, enter additional cycle numbers (1-99) in the pop-up keyboard and then touch **Ok**.

Note:

Actual cycle numbers will be 'N+1' where N is the entered cycle numbers. To perform a PCR reaction with 30 cycles, you should enter 29 as the number of repeats.

1.8 Sample Volume and Lid Temperature

1. In the Edit Program screen, touch **Volume** or **Lid** text box.
2. Enter new value in the pop-up keyboard and then touch **Ok**.

Note:

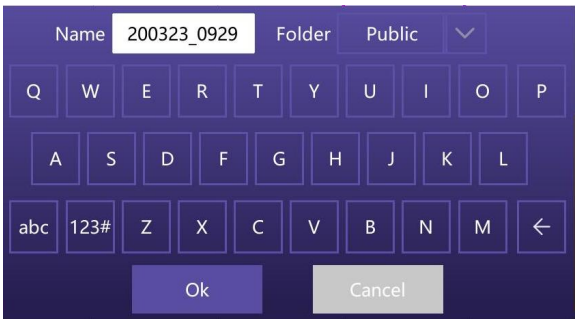
- For lid temperature control, it is recommend to select a temperature five to ten Celsius degrees above the highest temperature of the program steps (e. g., the pre-denaturation step) to protect sample from evaporation and condensation.
- Setting a lid temperature to below room temperature will cause the program never run.

1.9 Delete Step

1. In the Edit Program screen, touch a step to select it.
2. Touch **Delete** to delete this step.

1.10 Save Program

1. In the Edit Program screen, touch **Save** to display the Save Program screen.



2. Enter a new name up to 12 characters.
3. From the Folder drop-down list box, select a folder to save the program to.

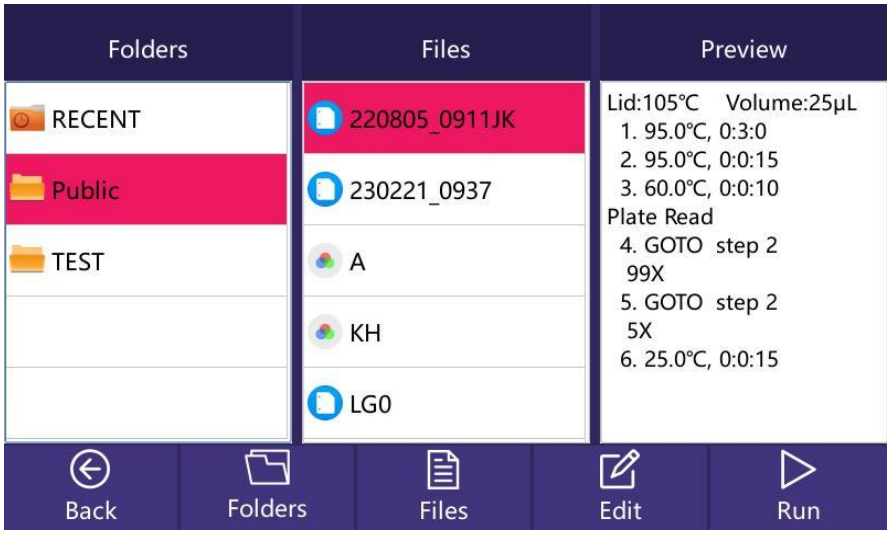
• Insert the U disk in the USB port of the Thermal Cycler. Select USB_disk in the Folder drop-down list box to export the program file to a U disk.

4. Touch **Ok** to save the program.

2. Edit Saved Program

To edit a saved program:

1. In the Home screen, touch **All Program**.



2. In the All Program screen, select a folder and then select a program and touch **Edit**.
3. In the Edit Program screen, you can edit the program and then save and / or run it following the instructions described above.

[Chapter 5]Perform Run

1. Load Samples

1. Open the sample block. Place 8-tube strips or 96-well plate in the sample wells of the sample block.

IMPORTANT!

- Do not touch the surface of the sample block to avoid hurt because it may be very hot (105°C/221°F)!
- The sample block of this instrument can only use 0.1mL PCR tubes, 0.1ml 8-tube strips or 0.Lml 96-well PCR plate (no skirt or half-skirt, half-skirt 0.1mL 96-well PCR plate is recommended) and cannot use 0.2mL ordinary PCR tubes, 0.2ml 8-tube strips or 0.2mL 96-well PCR plate! Recommended white tubes.

Note:

- Wear a powder-free latex glove or PE glove when handling quantitative PCR reaction vessels.
- The reaction vessels should be sealed tightly with optical flat caps or sealing film to prevent sample evaporation. Before using new reaction vessels, flat caps, and sealing film for the first qPCR experiment, ddH_2O should be used instead of the reaction mixture to test the sealing performance. Do not use dome caps, opaque films or foils to seal the vessels!
- To achieve consistent PCR results, use uniform, thin-walled vessels designed for qPCR. White tubes may be better than frosted tubes, frosted tubes may be better than clear tubes. The vessels should have heat resistance of up to about 120°C.
- The sample wells of the sample block should keep clean.

2. Close the block. Before starting the running, turn the knob clockwise until the knob is in a horizontal position.

2. Select Program to Run

To run a Real-Time PCR program,

- From the Home screen, touch **New Program**, create a new program and then touch **Run**.
- Select a RECENT run program from the All Program screen and touch **Run**.
- Select a saved program from the All Program screen and then touch **Run**.
- Select a saved program from the All Program screen, touch **Edit**, change step parameters, and then touch **Run**.
- Open the qPCR Design and Analysis Software on the computer, edit the

experiment's properties, protocol and plate information, save it to the root directory of a U disk (file suffix should be *.txc), insert the U disk into the front USB port of the instrument, touch **All Program** on the instrument Home screen, then select **Usb_disk** folder, browse the saved program, copy it to a folder in the instrument, select the copied file, and touch **Run**.

• Ensure that the computer and the instrument are connected to the same LAN, open the qPCR Design and Analysis Software, edit the experiment's properties, protocol and plate information, switch to the software's Run page, touch **Run**.

For details on how to connect the computer and the instrument, as well as editing and running the program using the qPCR Design and Analysis Software, please check the software's Help menu.

Note:

When a qPCR program in the All Program screen is selected to run, the program will be displayed as a new name and the name can be modified if necessary.

1. After you touch **Run** on the instrument, the Run Setting window opens(To run an ordinary PCR, fluorescence signal collection within the step needs to be canceled first. While qPCR has plate editing option.

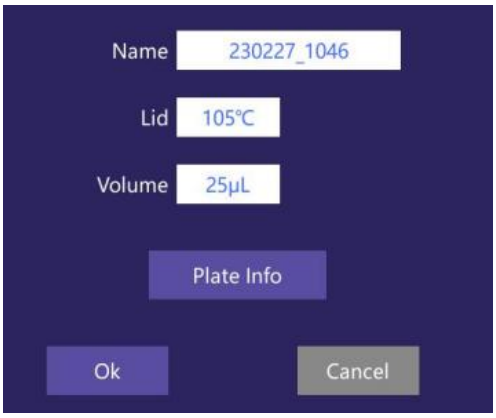


Figure1. The interface of an qPCR experimental procedure

2.In the Run Setting window, check the sample volume and lid temperature before run.

3. Touch **Plate info**, fill plate information, then touch **Next** to return Run Setting window.

4. Touch **Ok** to begin the run. The Run Status screen opens.

3.Plate Info

Touch **Plate Info** in the Run Setting window will open the Plate Info screen (see below).

For each sample well used, enter the target gene name, the dye, the type, (the

concentration of standards), and the name of each sample.

IMPORTANT!

The edited plate information should match the actual arrangement information of the sample. After the experiment starts running, the plate information cannot be modified!

Note:

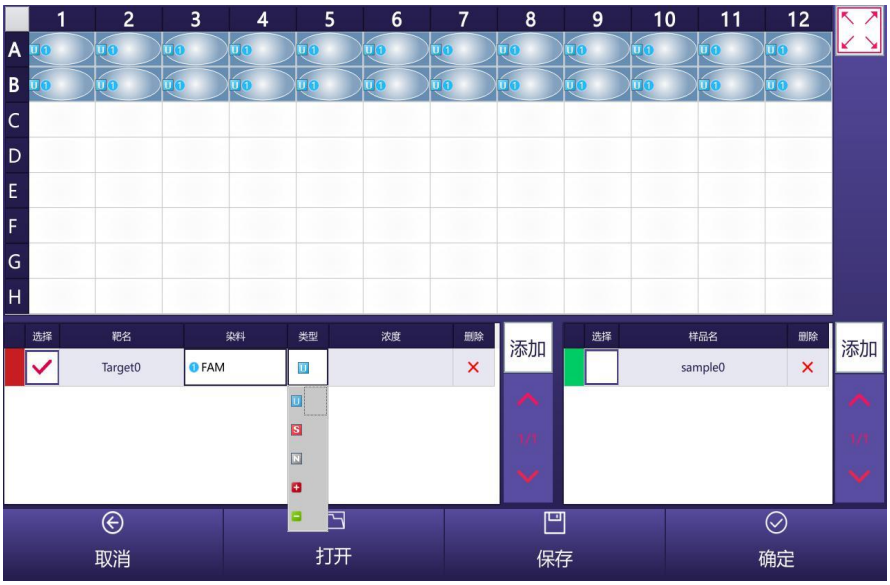
1.A non-empty sample well may have no sample name, but must have a target name. Wells that are not filled with target names will not be displayed in the Results screen or in the report.

2.Only absolute quantitative Settings are supported.

3.After the end of the experiment board edited information can be modified.

To edit plate information:

1.Select the sample well(s) to be used. You can single-click to select one well each time, or hold your finger to drag on the screen to select continuous multiple wells:

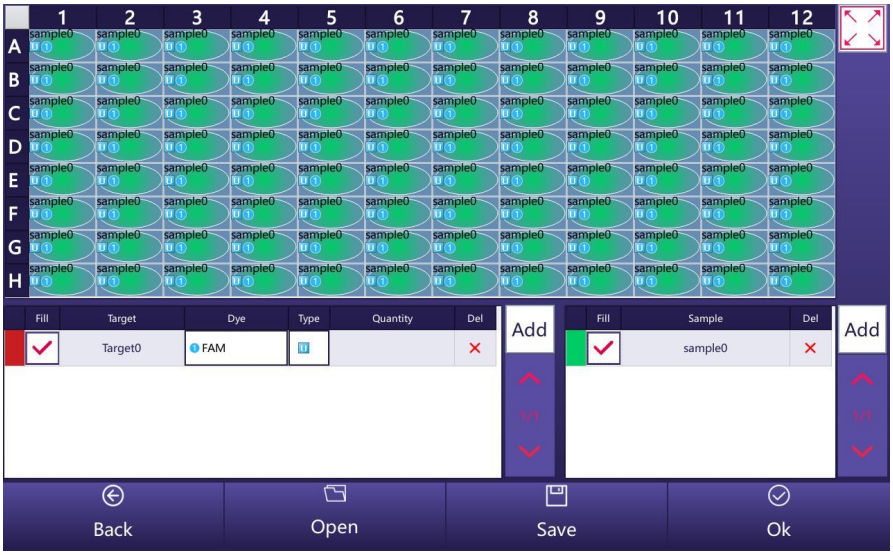


Check the box in front of the Target color ■ and fill the target "Target0" into the well(s) to be used.

2.Re select the first well and select the type from the Type drop-down list:

U represents the sample to be tested (Unknown,UNK); S represents the standards (Standard, STD); N represents the non-template control (NTC); + represents the positive control (Positive, POS); - represents the negative control (Negative, NEG).

As shown in the figure below, using a virus detection kit to detect two unknown samples (A2, A3); A1 is a negative control; A4 is a positive control.



3.Modify the target name：

the target name is displayed in the result, the default is 1 when editing the version, and 1 represents the reagent of the first channel.

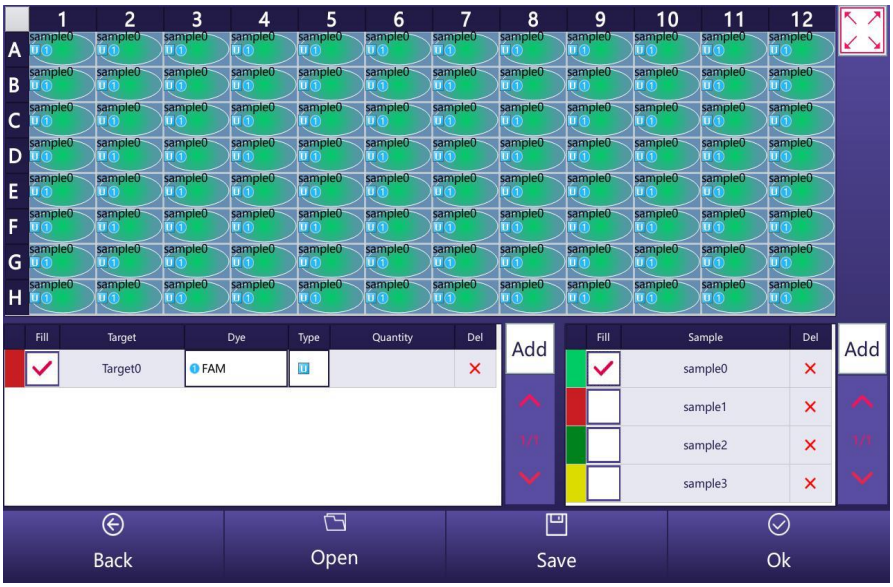
Click on the target name box to modify the target name.

4.Modify sample name:

Click on the target name box to modify the target name.

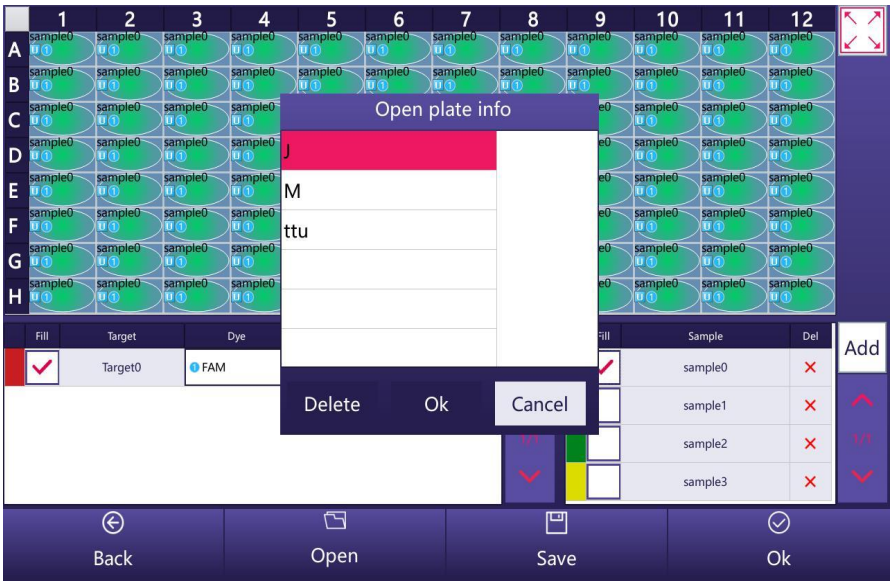
Touch the **Add** button above the sample name to add multiple samples.

Click on each sample name box to change the name of each sample. For example, four samples are added in the figure below. Select A1, A2, A3, and A4 wells in turn, and check the box in front of each sample to fill each sample into the corresponding well.



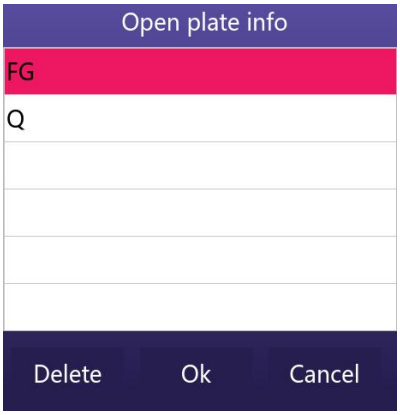
5.Save the plate information:

Touch the **Save** button, enter the name of the plate information file. In the next experiment, touch **Open** to open the saved plate information file to use.



6.Open the plate information:

Touch the **Open** button, enter the open plate information file. Open the saved plate information directly without editing from scratch again.



4.Save Template

To save the template on the instrument and run the experiment Program directly, you can:

1. Click **New Program** from the main interface to create an experiment program, after running it, find the experiment program that just ran in the RECENT folder and copy it as the template program.
2. Start the OPTIMAL software in the computer, edit the experiment properties, programs, and plate information, and save the information to the root directory of the USB (txc). Insert the USB into the USB port of the instrument, touch the **All Program** on the main interface of the instrument, and then click the Usb_disk folder to browse the saved program. Copy it to the instrument folder.

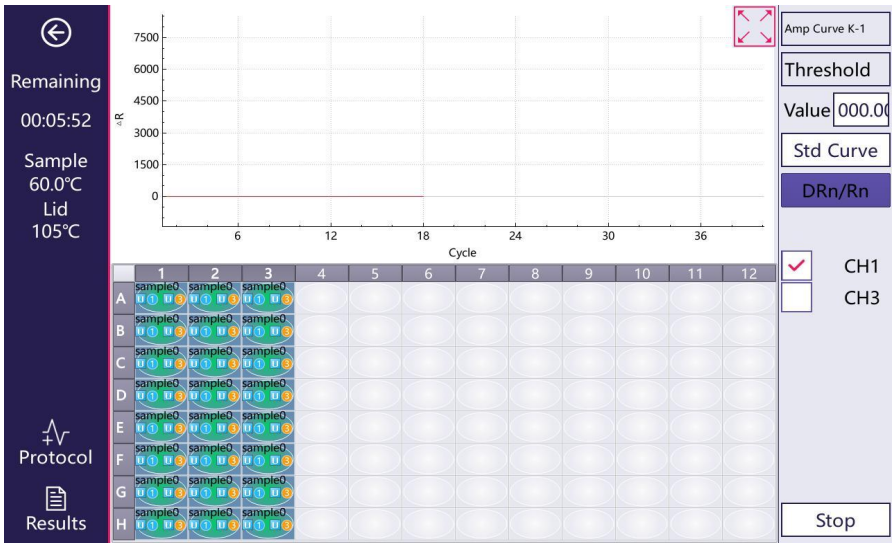
5. View Run Status and Control Run

5.1 View Run Status

Introduce the Run Status Screen

After the experiment starts running, the software will display different screens and information according to the different qPCR programs and the different channel dyes selected.

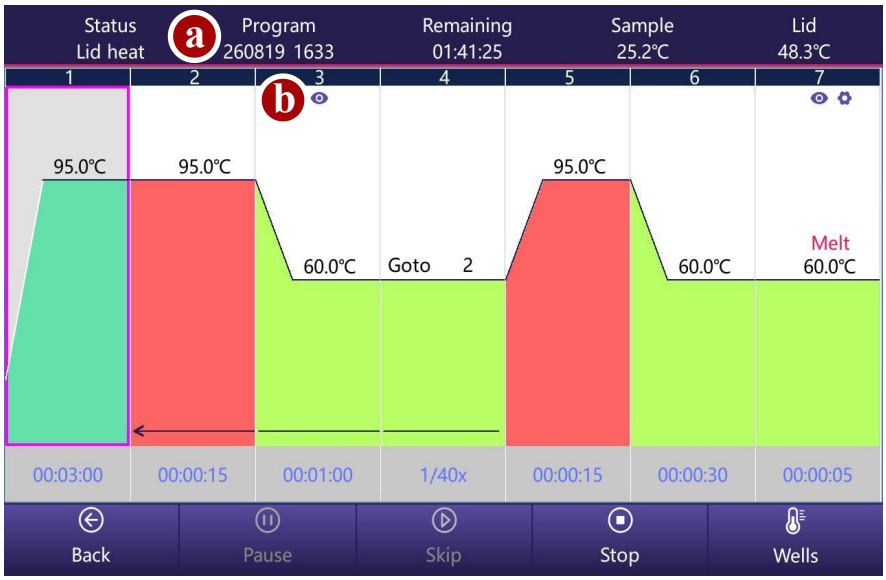
When there is a fluorescence acquisition step in the program, the graph screen is displayed:



The user can switch from the right side of the graph to display the amplification curve, the melting peak curve and the standard curve;

For multi-channel experiments, you can choose to view other channel curves.

You can view the status of running using the Run Status screen below.



The items displayed on the Run Status screen:

a: the current status, including: Lid heat, Running, Pause, Idle;

Program: the program name;

Remaining: the estimated remaining time;

Sample: the sample temperature;

Lid: the lid temperature;

b:Fluorescence Acquisition Icon: Indicates that this step will acquire fluorescence.

Under the conditions shown in the figure above, an amplification run including melting-curve analysis takes only 102 minutes (the specification requires a duration of less than 120 minutes).

Buttons on the Run Status screen:

Button	**Function**
Pause/Resume	Pauses and Resumes run.
Skip	Skips one step and runs the next step.
Stop	Stops run.
Wells	Views bar chart of sample wells temperature.

View Bar Chart of Sample Wells Temperature

1. In the Run Status screen, touch **Wells** to view the temperature of each column of sample wells in real-time.

Step Time: the countdown holding time of the current step after the step temperature reached the setting value.

3. Touch **Back** to return to the Run Status screen.

View fluorescence Curve

When there is a fluorescence acquisition step in the amplification phase of the running PCR program, the real-time amplification curve can be viewed in the graph window.

The x-axis of the curve represents the number of cycles, and the y-axis represents the value of the fluorescence intensity after the baseline is subtracted.

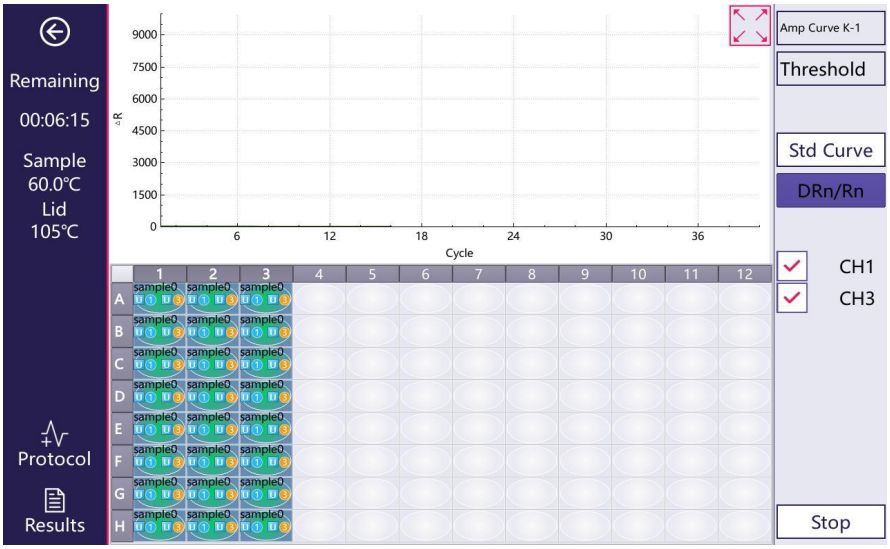
The remaining time,sample and lid temperatures are shown on the left side of the

amplification curve.

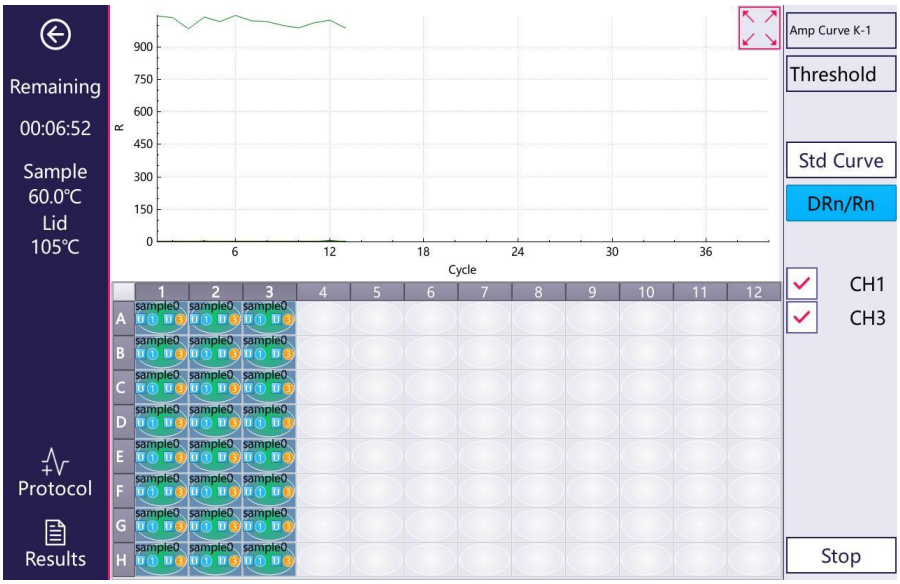
Ct Method:

The software supports two Ct methods: manual threshold method (Threshold) and second derivative method (Derivation).

If you choose the manual threshold method, you can modify the value of the threshold. The new threshold will take effect immediately and no need to be saved.

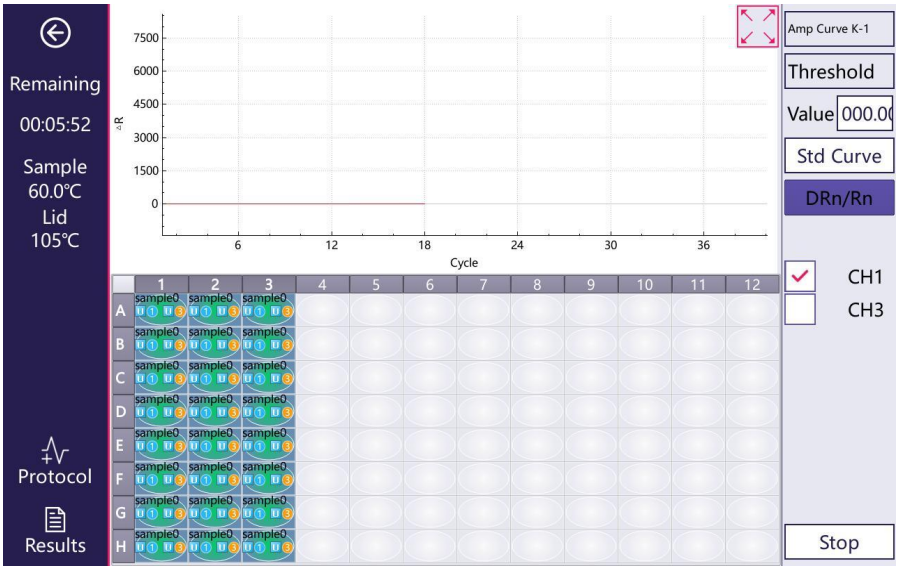


Uncheck the DRn/Rn on the right side of the graph to see the amplification curve without deducting baseline.



Click a well below the curve to view the curve corresponding to that well

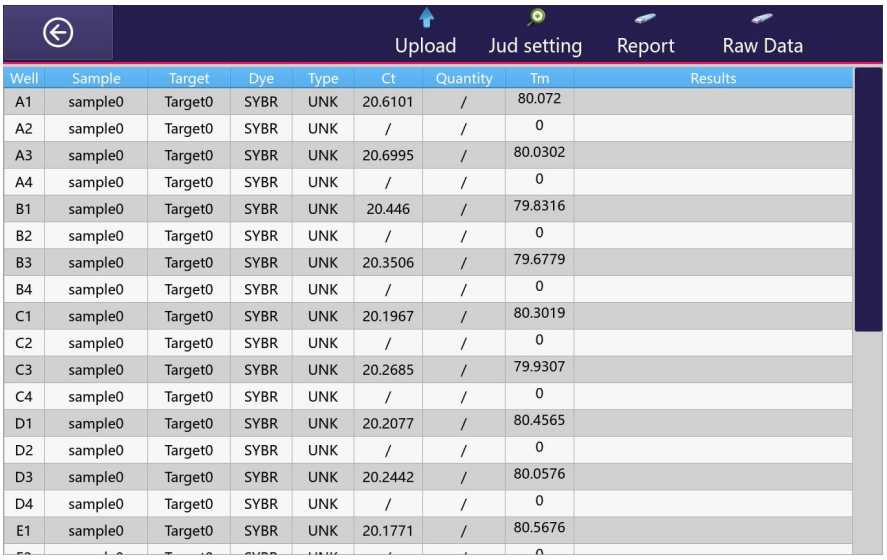
For a multi-channel experiment, click on the channel checkbox to view the curve for one channel:



When the PCR program has a melt curve stage, in the graph screen, you can view the melting peak curve. The melting peak curve is displayed only when the experiment run ends.

View Results

After the experiment is finished, the Results button becomes available. Touch the **Results** button to open the Results screen, you can view the analysis results, as shown below:



Well	Sample	Target	Dye	Type	Ct	Quantity	Tm	Results
A1	sample0	Target0	SYBR	UNK	20.6101	/	80.072	
A2	sample0	Target0	SYBR	UNK	/	/	0	
A3	sample0	Target0	SYBR	UNK	20.6995	/	80.0302	
A4	sample0	Target0	SYBR	UNK	/	/	0	
B1	sample0	Target0	SYBR	UNK	20.446	/	79.8316	
B2	sample0	Target0	SYBR	UNK	/	/	0	
B3	sample0	Target0	SYBR	UNK	20.3506	/	79.6779	
B4	sample0	Target0	SYBR	UNK	/	/	0	
C1	sample0	Target0	SYBR	UNK	20.1967	/	80.3019	
C2	sample0	Target0	SYBR	UNK	/	/	0	
C3	sample0	Target0	SYBR	UNK	20.2685	/	79.9307	
C4	sample0	Target0	SYBR	UNK	/	/	0	
D1	sample0	Target0	SYBR	UNK	20.2077	/	80.4565	
D2	sample0	Target0	SYBR	UNK	/	/	0	
D3	sample0	Target0	SYBR	UNK	20.2442	/	80.0576	
D4	sample0	Target0	SYBR	UNK	/	/	0	
E1	sample0	Target0	SYBR	UNK	20.1771	/	80.5676	

The items displayed on the screen:

Ct: Ct value of each sample;

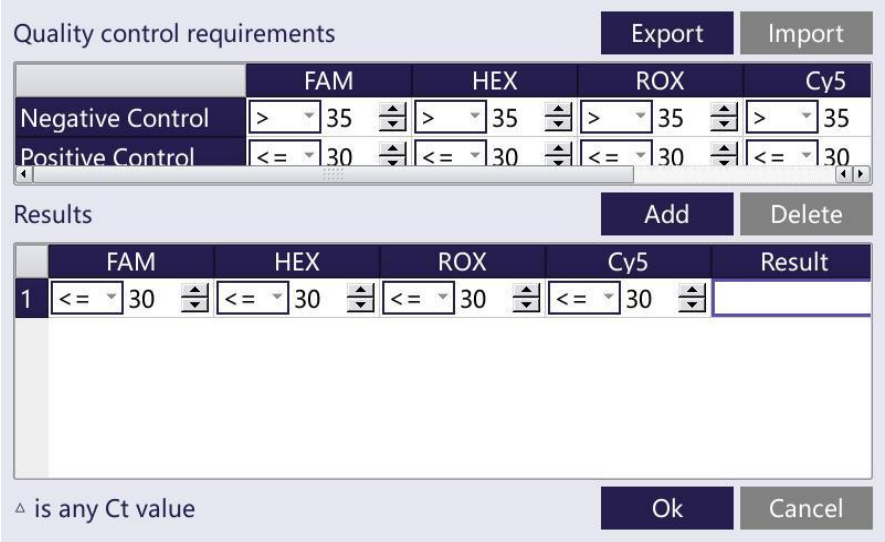
Quantity: Quantity value of each sample;

Tm: Tm value of the highest melting peak of the amplified product;

Results: Negative / positive judgment result;

Depending on the qPCR program and the pre-run settings to view the selection, the result page may only display some items.

1. click on the setting criteria to open the result judgment window:



If positive control and negative control holes are specified in the experiment, when the Ct value of positive control and negative control exceeds the prescribed range of the experimental quality control table, the experiment is invalid. If the positive control and negative control holes are not specified in the experiment, the software does not make this determination.

For the sample to be tested, one or more decision rules can be added, and the result interpretation when the rule is satisfied can be defined in the result judgment text box.

Single result determination, the relationship between each channel dye is (meeting A、B、C and D at the same time). For example, for a positive result, the dyes FAM, HEX, ROX, and Cy5 of the four channels in the picture must meet three or four at the same time. , The result will be shown as positive.

Click Export to export decision rules, click Import to re-import decision rules.

2.Click Print Report to connect to the printer.

3.After inserting a U disk, touch **Export Report** to export the report in pdf format or doc format.

5.2 Control Run

Pause Run

In the Run Status screen, touch **Pause** and the run will pause and beep twice.

Note:

The temperature will continue increase or decrease until it reaches the setting temperature of a step.

After paused, the Pause button changes to Resume button and you must touch **Resume** to continue the program.

Skip Run Step

In the Run Status screen, touch **Skip** to skip running step and run the next step.

Stop Run

In the Run Status screen, touch **Stop**, a confirmation window will prompt to ask you whether you really want to stop, touch **Yes** will stop run.

5.3 Save Data

If the program has a fluorescence acquisition step, the software will automatically save the data after collecting the fluorescence signal in the "qPCR Data" screen. The filename shall be determined by the user's input during the creation of a new experiment, or defaulted by the software.

IMPORTANT!

The qPCR data run by the computer software will be saved under the Network user with the file name N_et_work. Every time you run a new experiment through your computer software, the old N_et_work file will be overwritten and cannot be recovered! So if you need to copy the N_et_work file on the instrument, be sure to do it after the end of the current run and before the next run!

5.4 Export Data

Touch **qPCR Data** on the Home screen, open the qPCR Data screen. This screen lists the data for the automatically saved qPCR experiments. The data of the most recently run experiments are listed first, and the data of the currently running experiment is not displayed in the list until the run is stopped.

Insert a U disk into the USB port on the front of the instrument, click **Export**, export the experimental data to the root directory of the U disk (the file suffix is *.zsj), the file can be opened with the Optimal qPCR Design and Analysis Software on the computer.

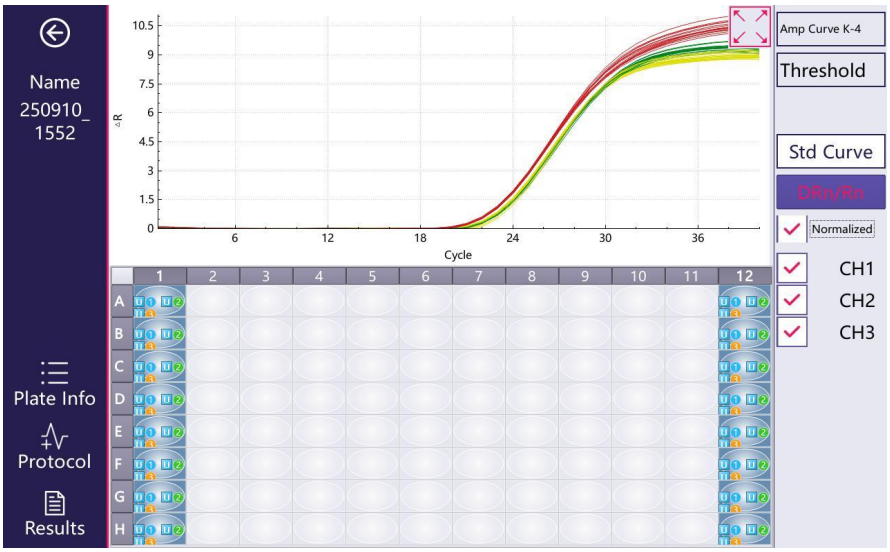
5.5 View and Export File

Touch the **qPCR Data** button on the Home screen to open the qPCR Data screen. The data file for each experiment is listed here. The currently running experiment will only be displayed in the list until it finished running.

Touch **View** to open and view a data file.

Insert a U disk into the instrument and touch **Export** to export the data file (the file format is .zsj).

Touch **View** to open and view a data file.



Click the **Plate Info** to edit the plate information again.

Click the **Protocol**, view the temperature control program of the experiment.

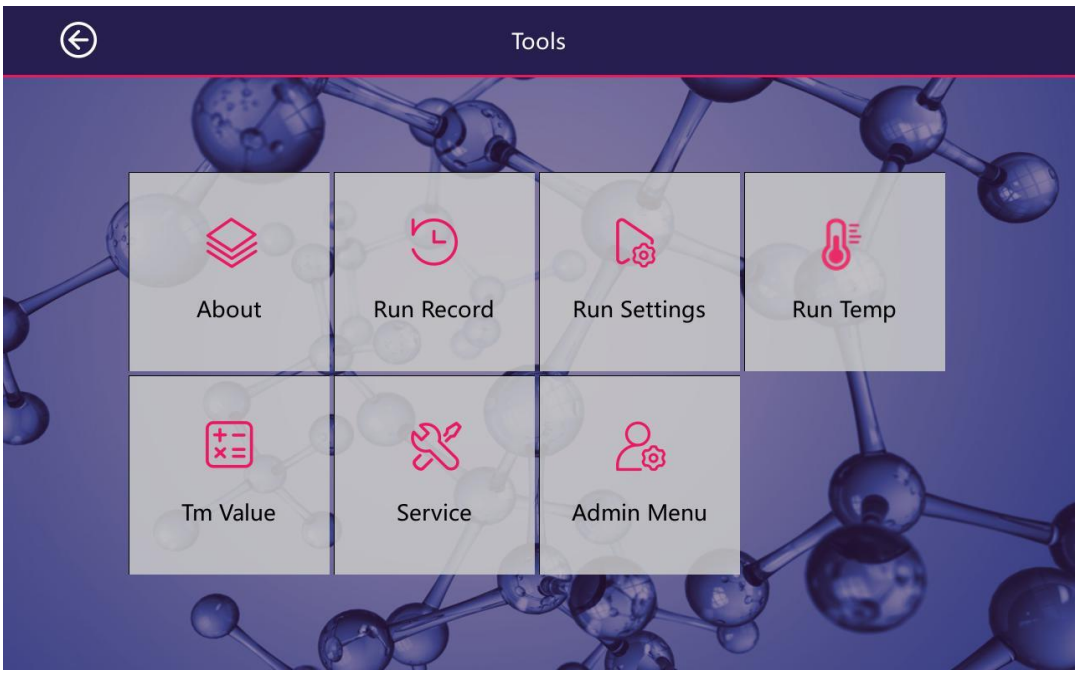
Click the **Results**, open the result interface, you can view the analysis results.

[Chapter 6]Tools

1. Introduce the Tools Screen

In the Home screen, touch **Tools**.

The Tools screen opens.



Buttons of Tools Screen

Button	Function
About	Views product information about the instrument.
Run Record	Views stored run records.
Run Settings	Configures parameters for run.
Run Temp	Check the temperature curve of the instrument heated lid and sample block in operation.
Tm Value	Calculates the Tm values and Ta value of a pair of primers.
Service	This function is reserved for service.
Admin Menu	When 'admin' login, the Admin Menu's icon appears. Use this function to manage users, reset to factory settings, set cycler name, configure network connection, calibrate the background and dye and upgrade software.

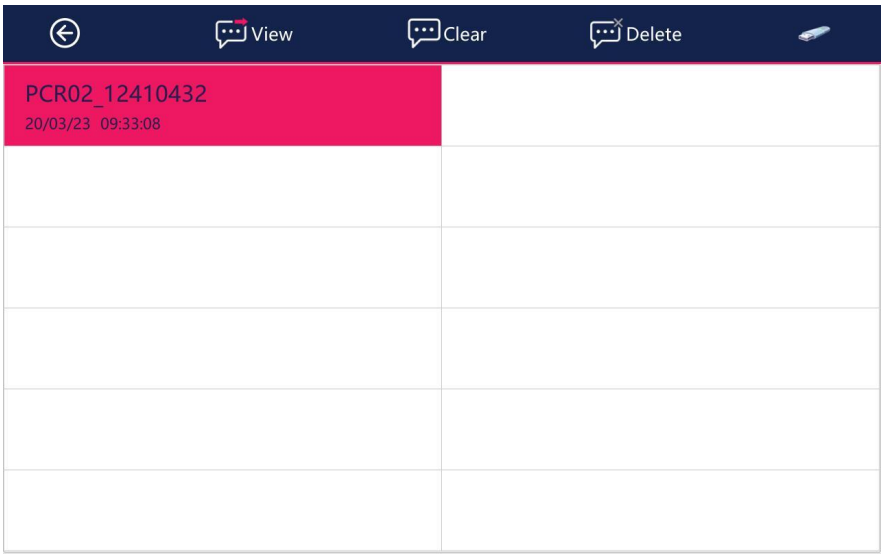
2. About

To view product information about the Thermal Cycler:

1. In the Home screen, touch **Tools**.
2. In the Tools screen, touch **About** and the About screen appears.
3. When you finish, touch **Back** to return to the Tools screen.

3. Run Record

1. In the Tools screen, touch **Run Record** to open the screen:

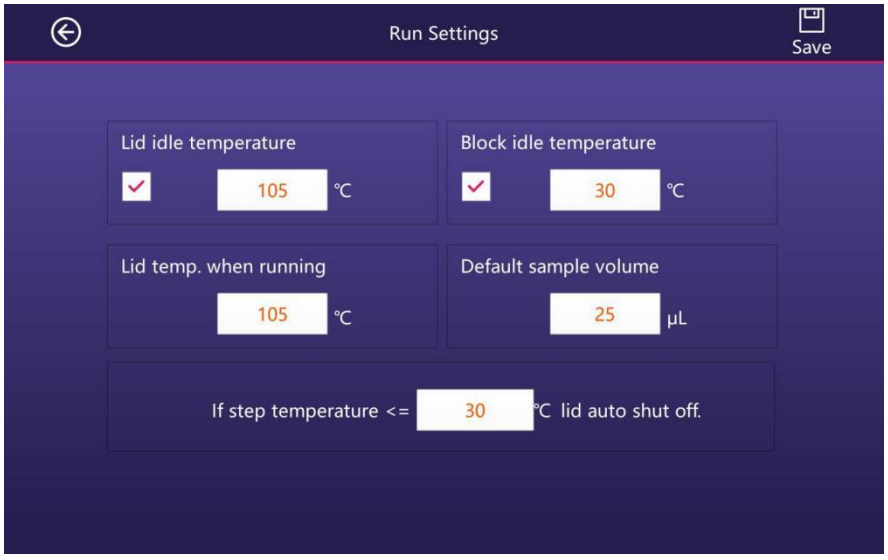


2. Select a record and touch **View** to open the Run Record screen.
3. After you finished, touch **Back** to return to the Run Records screen.
4. In the Run Records screen, you can touch **Clear** to clear all records, touch **Delete** to delete a selected record.
5. After you finish, touch **Back** to return to the Tools screen.

4. Run Settings

This function is used to set parameters for run.

1. In the Tools screen, touch **Run Settings** to open the screen:



- Enter 'Lid temp. when running' to pre-heat lid to a desired temperature when running a program. We recommend you select a temperature five to ten Celsius above the highest temperature of the program steps (e. g., the denaturation step) to protect sample from evaporation and condensation. If you deselect 'On', the lid heating function will be disable when a program is running.
- Enter most frequently used sample volume value in the 'Default sample

volume' field.

- Enter 'Lid idle temperature' to let the lid heating to the desired temperature when no program is running. If you deselect 'On', the lid heating function will be disable when no program is running.
- Enter 'Block idle temperature' to let the block heating or cooling to the desired temperature when no program is running. If you deselect 'On', the block heating or cooling function will be disable when no program is running.

  For 'Block idle temperature', we recommend you select a temperature below 20°C so that when a program starts run, the block temperature will maintain below 20°C while the lid is heating to the specified temperature before the actual program starting running. Because the sample temperature does not increase, so the activity of DNA polymerase is inhibited, the likelihood of nonspecific primer binding and the yield of unwanted products such as primer dimers are decreased.
- Enter 'If step temperature below: lid auto shut off" to automatically turn off the lid heating function when block temperature below a value.

2.Touch **Save** to accept changes.

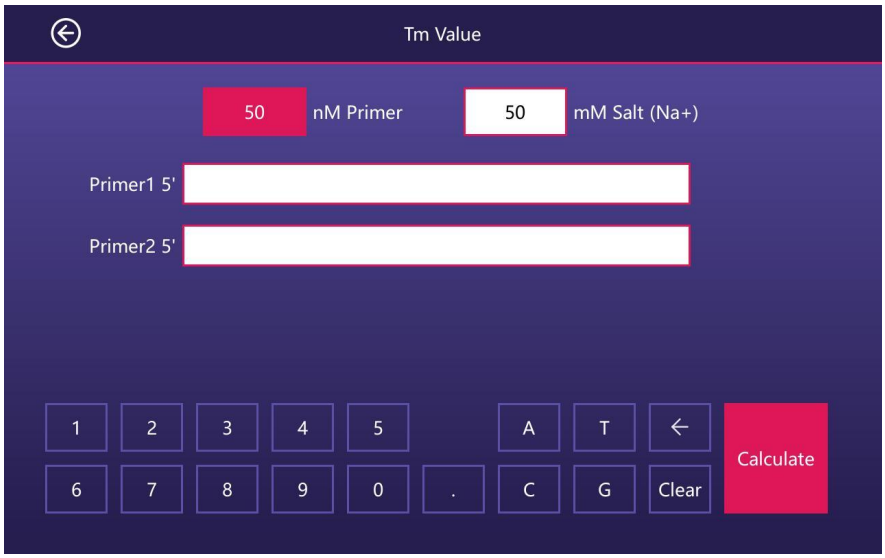
5.Run Temp

Check the temperature curve of the instrument heated lid and sample block in operation.

6.Tm Value

The Tm Value is used to calculate the Tm (melting temperature) and Ta (annealing temperature) for a primer pair.

1. In the Tools screen, touch **Tm Value** to open the screen.



2. Enter the primer concentration and the salt concentration.
3. Enter each primer sequence and then touch **Calculate** to view the Tm value of each primer, the average Tm value and the Ta value.
4. After you finish, touch **Back** to return to the Tools screen.

7. Service

This function is reserved for service.

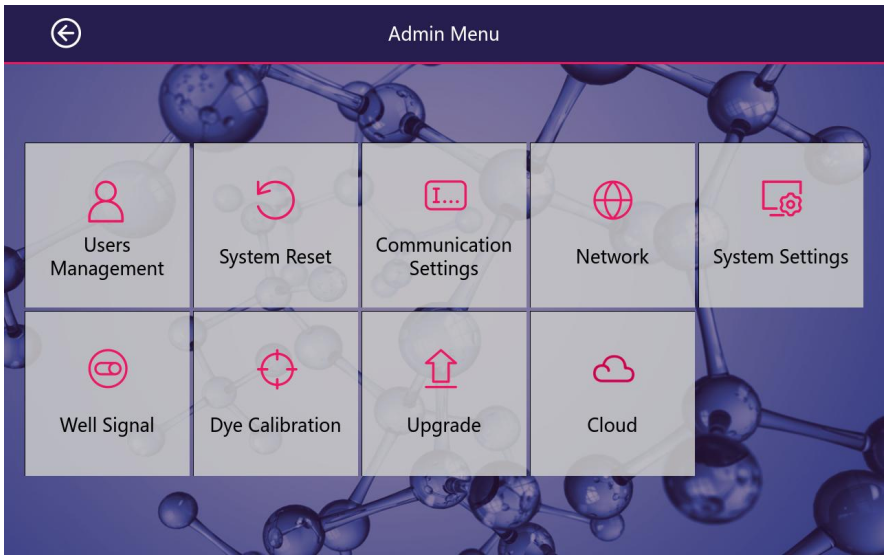
8. Admin Menu

The Admin Menu is used to manage user accounts, reset to factory settings, backup and restore data. This function is only available when login as 'admin'. The default password for admin is 'admin'.

To use Admin Menu functions:

In the Home screen, touch **Tools**, then **Admin Menu**.

The Admin Menu screen opens.



8.1 Users Management

The Users Management function is used to manage user accounts.

To manage user accounts, login as 'admin':

1. In the Admin Menu screen, touch **Users Management**.
2. The Users Management screen lists all accounts currently available.

In the Users Management screen:

a. To create a new user account, touch **Add** to open the New User screen. Enter a username and password of no more than eight characters.

b. To edit a user account, select a user and then touch **Edit** to open the Edit User screen. Enter the new user's password and touch **Ok**.

c. To delete a user account, select a user and then touch **Delete**. Touch **Yes** in the displayed pop-up window to delete the user.

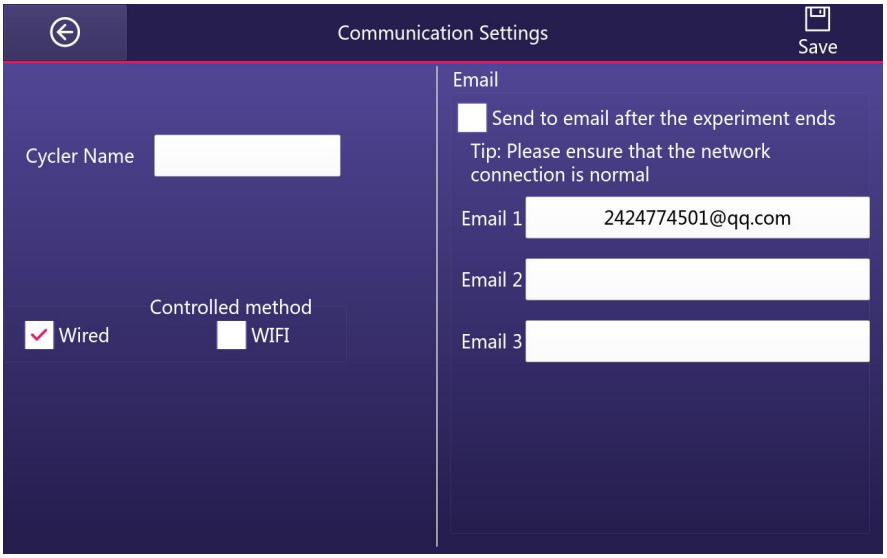
8.2 System Reset

Use this function to reset the system to factory settings.

8.3 Communication Settings

The communication settings is used for identifying the instrument when it is controlled via network by a computer. By default the cycler name is set to the instrument's serial number. You can change it as need.

1. In the Admin Menu screen, touch **Communication Settings**.



2. In the communication settings screen, set a new Cycler Name.
3. Select the control method. If you need to control the instrument through the OPTIMAL management software on your computer, it is recommended to choose "Wired".
4. When you finish, touch **Save** to accept changes and return to the last screen.

8.4 Network

To set IP address (wired connection) and set WiFi (wireless connection).

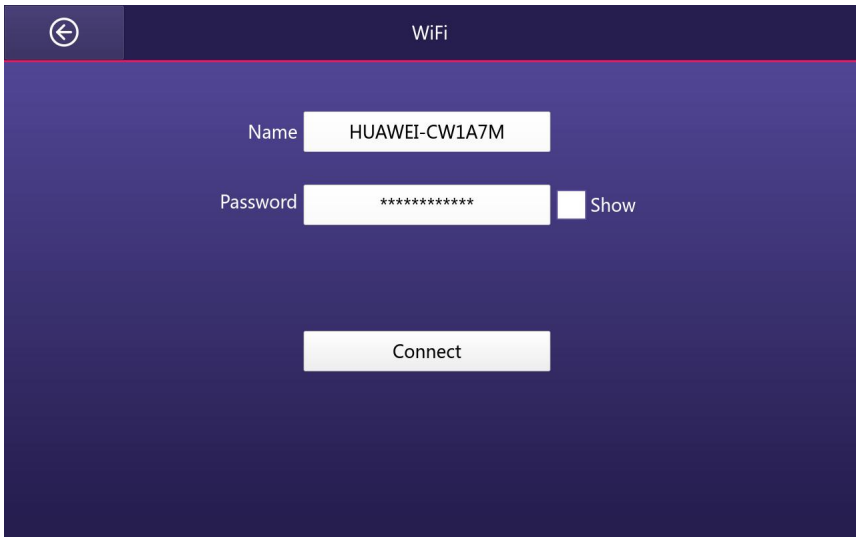
8.4.1 Set IP address:

When connecting the instrument to the computer through a network cable, set the IP address of the instrument and the computer to be the same network segment.
To set the IP address of the instrument.
1. In the Network screen, touch **IP Setting**.

2. Modify the IP address, subnet mask, and default gateway.

8.4.2 Set WiFi connection:

Before set WiFi connection, insert a USB wireless adapter (additional purchase) in the USB port of the instrument.
1. In the Network screen, touch **WiFi**.



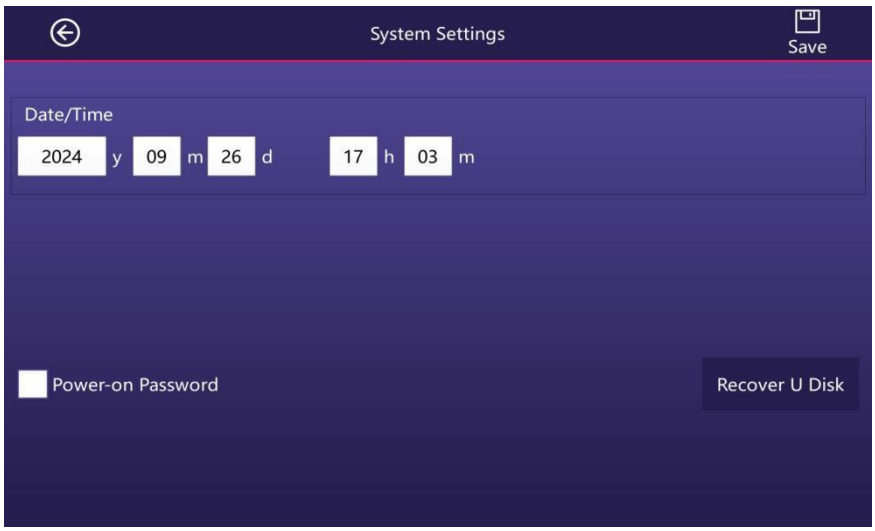
2. Enter a WiFi access hotspot name (case sensitive) and touch **Connect**. Enter the WiFi password if required.

8.5 System Settings

The System Settings is used to set system parameters.

To use System Set functions:

In the Tools screen, touch **System Settings** to open the screen:

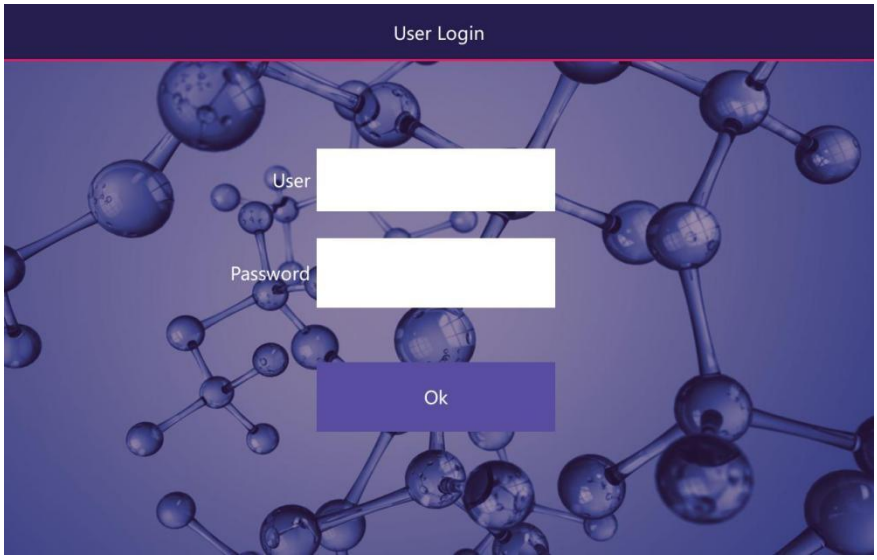


To set date/time:

1. In the System Settings screen, touch Date/Time field.
2. Enter today's date and current time in the pop-up keyboard.
3. Touch **Save** to accept changes and return to the System Settings screen.

To set Power-on Password:

1. In the System Settings screen, tick the box of Power-on Password and touch **Save**.
2. If Power-on Password is used, when the instrument is power-on, the user login screen is shown firstly.
3. Please refer to 8.1 if you want to change the power-on password.



Recover U Disk

Ensure the USB drive is recognized properly. If a USB folder is present in the All Program when no USB drive is plugged in, clicking **Recover U Disk** will remove the USB folder.)

8.6 Well Signal

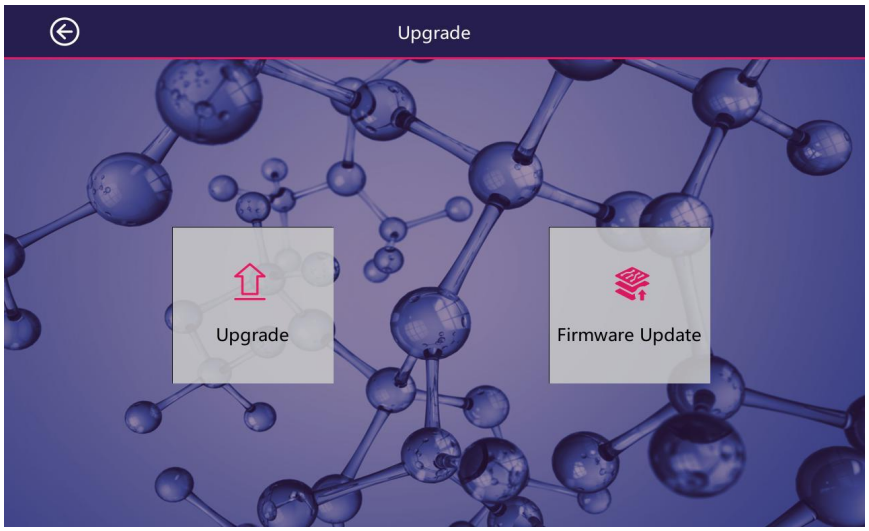
Use this function to view the fluorescence signal of each sample well.

8.7 Dye Calibration

The instrument has been calibrated for various dyes such as FAM and HEX at the factory. If you want to use other dyes in your experiment, you need to calibrate the new dye. Please consult us for the calibration process of new dyes.

8.8 Upgrade

When the instrument needs to be upgraded with software, insert the USB drive that has been copied into the software package, and click the Upgrade button to enter the upgrade interface, where you can upgrade the software and firmware.



8.9 Cloud

This feature requires authorization. Please contact our company if you need to use it.

[APPENDIX I]Troubleshooting

Problem	Problem	Possible Remedies
No display and no fan moving sound when power on	No line voltage	Wait for power restore
	Power cord unreliable	Check power cord and plug
Abnormal vibrating noise	Unstable bench	Unstable bench
	Uneven foot	Move to a stable foot
	Loose case screw	Fasten the screw
Normal display but can't heat or cool	Heat pump fails or no current is supplied	Shut off the power and call service
Sample block temperature (view via Wells screen of run status screen) is abnormal		
No display but fan is moving when power on	LCD fails or LCD related circuit fails	Shut off the power and call service
When power on, a message: "Power failure during running."	Lost power or power off the instrument when the last program is still running	Touch **OK** to cancel the message. Stop the last program
USB disk is not recognized	The USB disk is incompatible with the cycler	Try another USB disk.
Water accumulated in sample wells	The cycler is running under 4°C for a long time while the ambient humidity is high	Open the sample block and run the block temperature above 90℃ for at least 30 minutes. Recommended to raise the hold forever temperature to 10°C.
Tubes are deformed	Tubes are poor in quality, too soft or bad heat resistance.	Use good quality PCR tubes.
Sample losing because evaporate	Heated lid didn't work or the set temperature of lid is too low.	Turn on the heating of lid and set the temperature to above 105°C.
	Tubes, strips or microplate are poor in quality	Changes tubes, strips or microplate.
	Microplate is not sealed tighten.	Ensure tight seal on the microplate.
	Sample volume is too small.	Sample volume should above 10μl
System clock is abnormal	System clock should be reset	Adjust date and time via Tools>System Set screen
	The battery in the instrument should be changed	Shut off the power and call service
Warning message: "Instrument failure! Error code: xx"		Shut off the power and call service