

# ArtGene™ Thermal Cycler

## A100/A200

### User Manual

Document Version 1.4

# Contents

About This Manual	4
<b>A Instrument Overview</b>	
1. Instrument Components	5
2. Menu Overview	6
<b>B Getting Started</b>	
1. Install A100/A200 Thermal Cycler	7
1.1 Site Requirements	7
1.2 Unpack A100/A200 System	7
1.3 Power On and Power Off	7
1.4 Open and Close Lid	8
1.5 Block Module Exchange	9
2. Introduce the Home Screen	10
<b>C Manage Folder and Program</b>	
1. Manage Folder	11
1.1 Introduce the Program Library Screen	11
1.2 Add Folder	12
1.3 Rename Folder	12
1.4 Delete Folder	12
2. Manage Program	13
2.1 Introduce the View Program Screen	13
2.2 Rename Program	13
2.3 Copy Program	14
2.4 Delete Program	14
2.5 View Last Run Programs	14
<b>D Create and Edit Program</b>	
1. Create New Program	15
1.1 Introduce the Edit Program Screen	15
1.2 Set Temperature Control Mode and Lid Temperature	16
1.3 Add Step	17
Constant Temperature Step	17

Gradient Temperature Step . . . . .	19
1.4 Set Cycle . . . . .	19
1.5 Edit Step . . . . .	20
1.6 Delete Step . . . . .	20
1.7 Save Program . . . . .	20
2. Edit Program . . . . .	21
3. Program Wizard Function . . . . .	21

## E Perform Run

1. Load Samples into the Instrument . . . . .	23
2. Select Program to Run . . . . .	23
3. View Run State and Control Run . . . . .	24
3.1 View Run State . . . . .	24
Introduce the Run Screen . . . . .	24
View Run Timer . . . . .	25
View Bar Chart of Sample Block Temperature . . . . .	26
View Temperature Record Curve . . . . .	26
View Run Report . . . . .	26
3.2 Control Run . . . . .	26
Pause Run . . . . .	26
Skip Run Step . . . . .	26
Stop Run . . . . .	26
Run Program Again . . . . .	26

## F System Setting

1. Introduce the System Setting Screen . . . . .	27
2. About . . . . .	28
3. Incubation . . . . .	28
4. Gradient Calculator . . . . .	28
5. View Report . . . . .	29
6. Tm Calculator . . . . .	29
7. Check . . . . .	30
8. Configure Shortcut . . . . .	30
9. Admin Options . . . . .	31
9.1 Access Control . . . . .	31
9.2 Thermal Cycler Name/IP . . . . .	32
9.3 Set Date/Time . . . . .	33
9.4 Run-time Accuracy . . . . .	33
9.5 User Message . . . . .	33

## Please read the manual carefully before using the Thermal Cycler!

Purpose of This Manual	This manual provides instructions on how to set up and use A100/A200 Thermal Cycler.
iting	LongGene reserves the right to modify this manual at any time without prior notice.
Conventions	This manual uses the following conventions: <ul style="list-style-type: none"><li>• <b>Bold</b> text indicates user operation.</li></ul> For example: Touch <b>Ok</b> to accept changes and return to last screen. <ul style="list-style-type: none"><li>• <b>Note</b>: Provides instructions that draw your attention or may be helpful.</li></ul> 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. Failure to follow the information will possibly result in damage to the instrument or the user.

For example:

### IMPORTANT!

Turn the lid knob anticlockwise to loose the lid before opening the lid to prevent damage to the lid.

### IMPORTANT!

To prevent electric shock, please turn off the power and disconnect the power supply prior to cleaning.

SCP Technology	Note: This machine might have this function. SCP (Sample Cooling Protection) is used to maintain block at 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.
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Suggested  
Operation  
Gesture



Please refer to the best operation angle as per left figure.

Support

For the latest services and support information, go to <http://www.longgene.com>

## 1. Instrument Component



Figure 1 Front View of A100/A200 Thermal Cycler



Figure 2 Rear View of A100/A200 Thermal Cycler

Table 1 Functions of A100/A200 Thermal Cycler Components

Component	Function
Lid	Heats the top surface of reaction vessels to prevent reaction sample evaporation and condensation.
Lid Knob	Regulates the height and force of lid.
Lid Handle	Opens and closes the lid.
USB Port	Connects to a USB flash drive.
Touchscreen	Views and controls the instrument.
Air Vents	Lets 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	Connects up to 255 Thermal Cyclers to a computer.
RS232 Port	Connects the instrument to a computer.





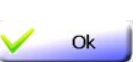


## 2. Menu Overview

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

### IMPORTANT!

Do not use any sharp object (e. g., a pencil) to touch the touchscreen in case of scratching.

Table 2 Buttons in the screens of A100/A200 Thermal Cycler

Button	Function
	Returns to the Home screen.
	Closes current screen and returns to previous screen.
	Moves between pages (i. e., Page Up and Page Down).
	Scrolls left or right to view graph or curve.
	Accepts present parameters setting and closes the screen.
	Close the screen without changing any parameters.
	Runs a selected program or incubation mode.

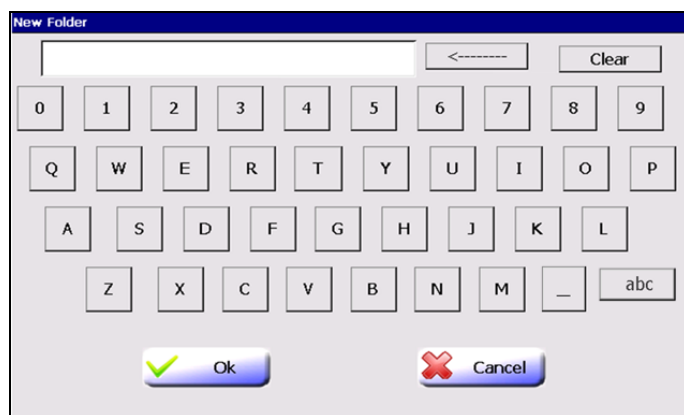







Figure 3 Virtual keyboard in the screens of A100/A200 Thermal Cycler

Texts are entered with the virtual keyboard:

To...	Touch...
Enter a number	A number button.
Enter a letter	A letter button. Touch  /  to change between lowercase letters and uppercase letters.
Join several words	Underscore character 
Delete the last character in an input field	
Erase all characters	

# 1. Install A100/A200 Thermal Cycler

## 1.1 Site Requirements

A100/A200 Thermal Cycler is intended for indoor use. Ensure that the installation site meets conditions below.

### Power supply

Power supply for the instrument must use the supplied power cable. The 3-prong plug with the power cable should be matched with a reliable grounded socket. The socket should be rated at 10A/(220±25%)VAC/50-60Hz. Make sure the rated load of the socket meets the instrument specifications. Universal AC (85VAC to 265VAC), which can be used in any existing power system in the world, is provided by request.

### 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%, noncondensing

Place A100/A200 Thermal Cycler on a flat table. 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 refrigerator or centrifuge. The recommended distance between the instrument and the back wall is 20 cm (7.9 in). Two thermal cyclers can be placed side by side.

## 1.2 Unpack A100/A200 System

1. Remove the packaging materials and store them in case you need to ship the instrument to LongGene for service.
2. Inspect the instrument for shipping damage.
3. Verify items according the packing list, for example:
  - ArtGene™ Thermal Cycler A100/A200 chassis and module
  - Power cable
  - ArtGene™ Thermal Cycler A100/A200 User Manual (this manual)
  - Certificate of quality

**IMPORTANT!** If the A100/A200 Thermal Cycler is damaged or some items are missing or damaged, contact LongGene or local distributor.

4. Move A100/A200 System to the desired installation site.

## 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 3-prong plug of the power cable to the socket. Make sure the power cable has connected to both power inlet and socket firmly.
- 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 set aside for a long time, disconnect the power cable from the socket.

## 1.4 Open and Close Lid

The lid of A100/A200 Thermal Cycler can move down to press to reaction vessels firmly and keep the top of reaction vessels at high temperature (e. g. 105°C) to protect reaction sample from condensation.

### IMPORTANT!

Temperature of the lid can be very high (105°C/221°F or higher).  
Never touch the inner surface of the lid when the temperature is above 43°C.

To open the lid:

1. Turn the lid knob anticlockwise (see the 'Loosen' arrow symbol on the top surface of the lid knob) to loose the lid.
2. Hold lid handle to let the handle clamp close to the lid handle.



3. Lift up the lid handle until the lid keeps opening vertically. You can then place reaction vessels on the sample block or take out the reaction vessels.

To close the lid:

1. Put reaction vessels into sample wells of the sample block.
2. Hold the lid handle and handle clamp, and then let the lid touch the chassis until you hear 'click ...' sound. The lid will be locked in place.
3. Turn the lid knob clockwise (see the 'Tighten' arrow symbol on the top surface of the lid knob) to reduce the lid height until you feel resistance. Then continue to turn the lid knob clockwise until you hear 'click ...' sound. Stop turning the lid knob now and the lid will give proper force to reaction vessels.



### 1.5 Block Module Exchange

Block module exchange can be performed within seconds without needing any tool.

**IMPORTANT!**

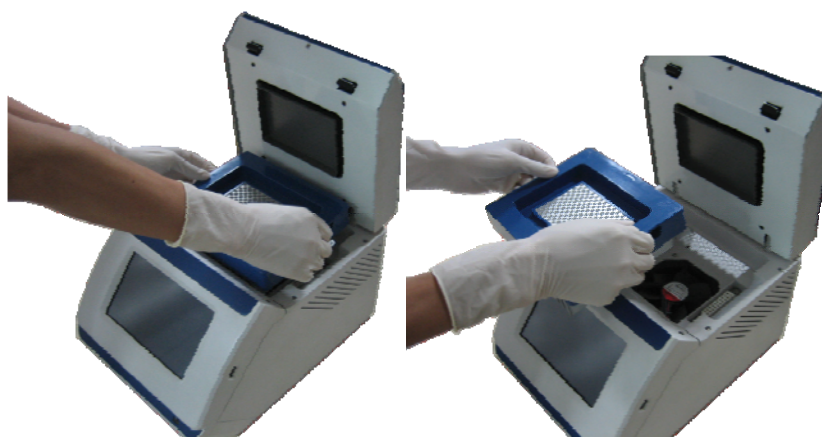
Please power off and disconnect the power cable from the socket before changing the block module.

To remove the block module:

1. Open the lid
2. Put your hand on the left and right side of the block module and lift it up.
3. Store the block module in a clean, secure box.

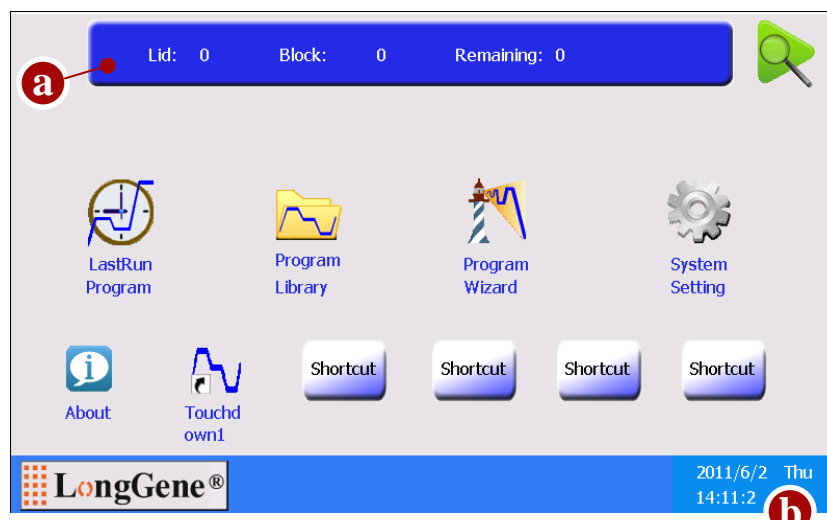
To insert the block module:

Put your hand on the left and right side of the block module, with the arrow on block module pointing to another arrow on the Thermal Cycler chassis, and place the block module into position in the Thermal Cycler.



## 2. Introduce the Home Screen

When the instrument powers on, the booting screen is displayed for several seconds. After that, the Home screen is displayed (see below).



Items in the Home screen:

- a. Information Bar: lid temperature, block temperature (when the instrument is idle or when running program which set temperature control mode as Block) or sample temperature (when running program which set temperature control mode as Sim-tube) and estimated remaining run-time.
- b. Shows date, week and time.

Buttons of  
Home Screen

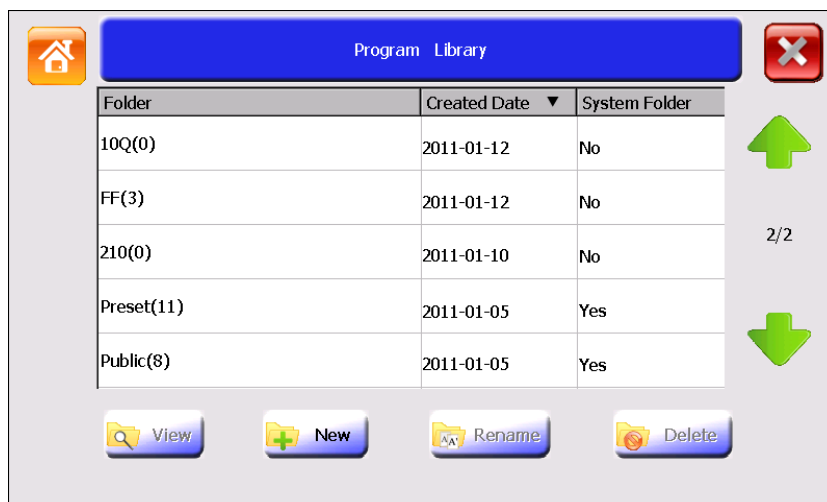
Button	Function
	When login is enabled, touch this button to logout the current user.
	Opens Run screen.
LastRun Programs	Go to list of the last run 10 programs.
Program Library	Go to list of folders, which contain all saved programs.
Program Wizard	Creates new program quickly.
System Setting	Sets instrument parameters and shows other tools.
Empty Shortcut	Configures shortcut for functions or programs.
Program Shortcut	Shows a selected program shortcut.
	Shows thermal cycler model and company information.

# 1. Manage Folder

## 1.1 Introduce the Program Library Screen

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

The Program Library screen opens.



The table lists all available folders. Folder names include the number of program in parentheses. Touch the header of the first or second column of the table to sort all folders. Touch (Page Up) and (Page Down) to move between pages.


The Preset folder contains eleven preinstalled programs:

- 3Step\_2000, 3Step\_1000, 3Step\_500: for amplifying less than 2kb, 1kb, 500bp nucleic acid templates using three-step PCR.
- 2Step\_PCR: two-step PCR.
- Gradient: for optimizing annealing temperature of PCR reaction. This program is only available with A200 Thermal Cycler.
- Touchdown1 and Touchdown2: Touchdown PCR.
- Long\_PCR: for amplifying of extra-long nucleic acid chain.
- RT\_PCR: for synthesizing DNA from RNA by reverse transcriptase.
- Ligation\_16C: for connecting segmental DNA with vector DNA at 16°C.
- Enzyme\_37C: for ordinary enzyme reaction at 37°C.





**Note:** Programs in the Preset folder are not allowed renamed or deleted. If you want to modify a program of Preset folder, you can edit the program and then save it to another folder (see [chapter D](#) for details). Or you can firstly copy the program to another folder (see [page 13 “2.3 Copy Program”](#) for details), and then modify it as an ordinary program.

The Public folder is another system folder and used as the default folder for saving programs.

**Note:** When login is enabled, all users can use programs saved in the Public folder.

When you plug a USB flash drive into the USB port, a USB icon  appears. Touch this icon to open the USB folder. The USB folder contains programs that stored in the USB flash drive. You can copy programs to and from the USB flash drive.

#### Buttons of Program Library Screen

Button	Function
 View	Shows programs of selected folder.
 New	Creates a new folder.
 Rename	Renames a selected folder.
 Delete	Deletes a selected folder.

#### 1.2 Add Folder

To add a folder:

1. In the Program Library screen, touch **New**.
2. In the New Folder screen, enter a folder name.
3. Touch **Ok** to accept changes and close the screen.

**Note:** The folder name is case insensitive.

#### 1.3 Rename Folder

To rename a folder:

1. In the Program Library screen, select a folder and then touch **Rename**.
2. In the Rename Folder screen, **Clear** the old folder name, enter a new name, and then touch **Ok** to accept changes.

**Note:**

The Preset folder, Public folder and USB folder are not allowed renamed.

#### 1.4 Delete Folder

To delete a folder:

1. In the Program Library screen, select a folder and then touch **Delete**. A pop-up window appears.
2. Touch **Yes** in the displayed pop-up window to delete the folder.

**Note:**

The Preset folder, Public folder and USB folder are not allowed deleted.

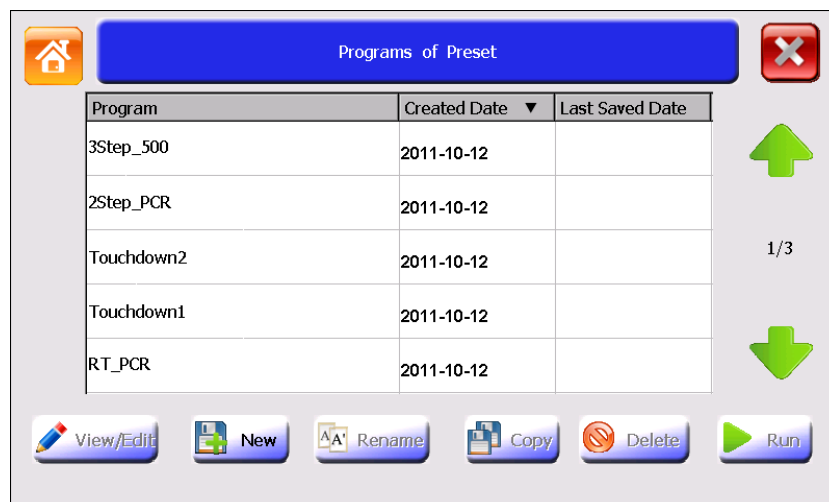
**IMPORTANT!**

When you delete a folder, all programs saved in the folder will be deleted at the same time.







## 2. Manage Program

### 2.1 Introduce the View Program Screen

1. In the Home screen, touch **Program Library**.
2. In the Program Library screen, select a folder and then **double click** it or touch **View** to open the View Program screen opens. Touch the header of the first or second column of the table to sort all programs.



#### Buttons of View Program Screen

Button	Function
 View/Edit	Views and/or edits program steps (see <a href="#">chapter D</a> for details).
 New	Creates a new program (see <a href="#">chapter D</a> for details).
 Rename	Renames a selected program.
 Copy	Copies program between folders.
 Delete	Deletes a selected program.
 Run	Runs a selected program (see <a href="#">chapter E</a> for details).

### 2.2 Rename Program

To rename a program:

1. In the View Program screen, select a program and then touch **Rename**.
2. In the Rename Program screen, **Clear** the old program name, enter a new name, and then touch **Ok** to accept changes.

**Note:**

The program name is case insensitive.

Programs in the Preset folder are not allowed renamed.

## 2.3 Copy Program

To copy a program:

1. In the View Program screen, select a program and then touch **Copy** to open the Copy Program screen.
2. In the Copy Program screen, select a Target Folder in the drop-down list box, and then touch **Copy** to copy the program.

If you want to:

- a. Rename the program before copy - Touch **Clear** to clear the old Program Name, and then enter a new name.
- b. Create a new target folder to copy the program to - Touch **New Folder** to open the New Folder screen, enter a folder name, and then touch **Ok** to return the Copy Program screen.
- c. Touch **Export** to copy the program to a USB flash drive.

## 2.4 Delete Program

To delete a program:

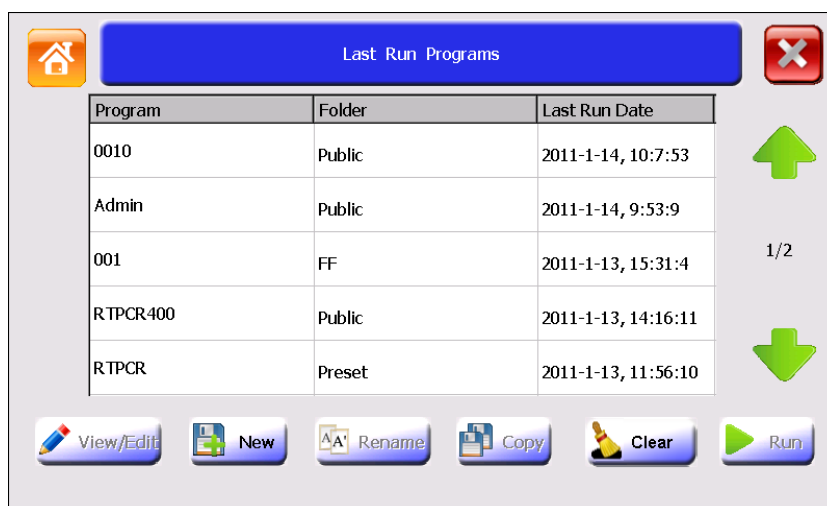
1. In the View Program screen, select a program and then touch **Delete**. A pop-up window appears.
2. Touch **Yes** in the displayed pop-up window to delete the program.

Note: Programs in the Preset folder are not allowed deleted.

## 2.5 View Last Run Program

In the Home screen, touch **LastRun Programs**.

The Last Run Programs screen opens.



The Last Run Programs screen has the same appearance as the View Program screen, but shows the recently run ten programs for quickly viewed and run again. You can touch **Clear** to clear program list.

Note:

The Rename and Copy buttons are not available in the Last Run Programs screen.

# 1. Create New Program

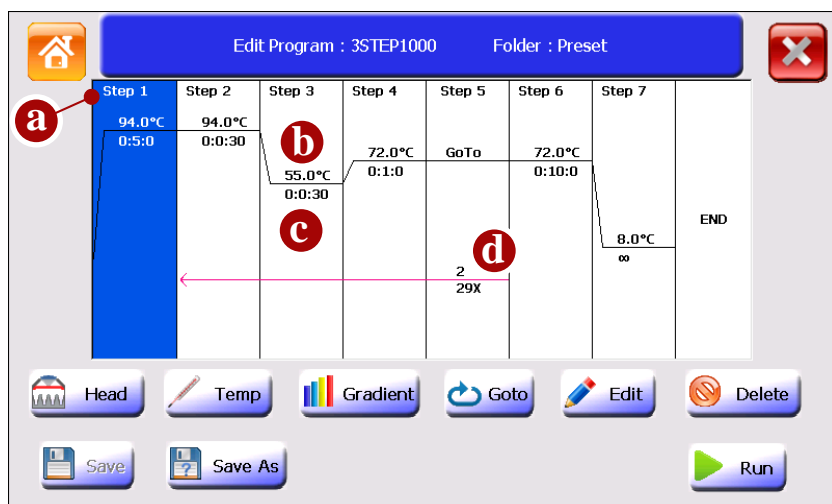
## 1.1 Introduce the Edit Program Screen

1. In the **Program Library**, select a folder and then **double click** it or touch **View** to open the View Program screen.
2. In the View Program screen, touch **New** to open the Edit Program screen.



Note: To open the Edit Program screen more quickly, you can put the New Program shortcut in the Home screen (see [page 29](#) “Configure Shortcut” for details).

The Edit Program screen is used to create, view and edit program. After you add several steps, the screen looks like below:












Items in the Edit Program screen:

- a: Step number.
- b: Temperature for a constant temperature step or highest and lowest temperature for a gradient temperature step.
- c: Step holding time (hour: min: sec).
- d: The start step number and amounts of additional repeats for cycles.

## Buttons of Edit Program Screen

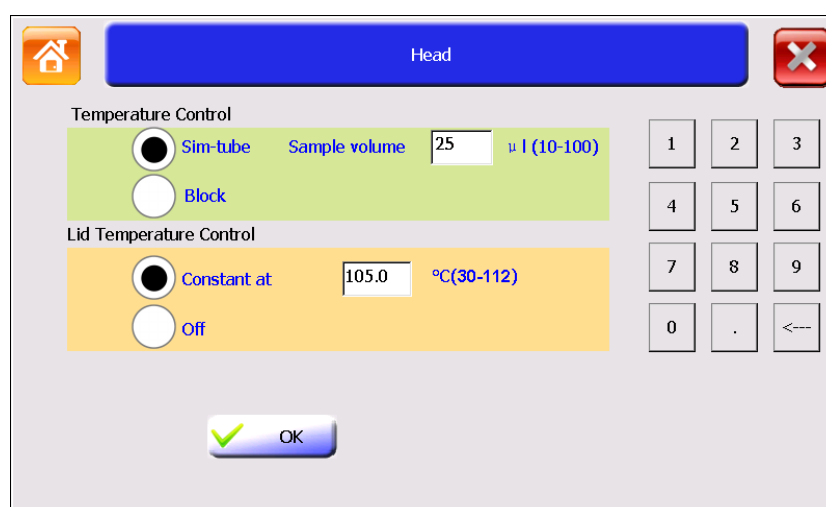
Setting steps of a program are carried out via the buttons:

Button	Function
 Head	Sets temperature control mode and lid temperature.
 Temp	Adds a constant temperature step.
 Gradient	Adds a gradient temperature step.
 Goto	Returns a former step and repeats additional numbers.
 Edit	Edits a step.
 Delete	Deletes a step.
 Save	Saves the created program.
 Save as	Saves another copy of the opened program.
 Run	Runs the program.

## 1.2 Set Temperature Control Mode and Lid Temperature

1. In the Edit Program screen, touch **Head**.

The Head screen opens.



2. Select temperature control mode and lid temperature control mode and then touch **Ok** to accept changes.



**Note:**

Because sample volume can affect heat exchange rate, the actual holding time of sample kept under the setting temperature will be considerably less than the setting holding time especially when the sample volume is large. The Sim-tube mode controls the process of heating the sample block to reach the setting temperature by considering sample volume factor while the Block mode does not consider sample volume factor.

When you perform PCR reaction that desires step time no more than 30 seconds for extension step, we recommend you select the Sim-tube mode.

For lid temperature control, we recommend you select a temperature five to ten Celsius above the highest temperature of the program steps (e. g., the pre-denaturation step) to protect sample from evaporation and condensation.

**Note:**

The lid heating will automatically turn off when block temperature below 30°C.

The lid will heat to the specified temperature before the actual program starting running. You should not set a lid temperature below room temperature otherwise your program will never get running!

## 1.3 Add Step

In A100/A200 system, a PCR program comprises several 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.

Constant  
Temperature  
Step

1. In the Edit Program screen, touch anywhere in the column for a step to select it. When the step is selected, the background becomes blue.
2. Touch **Temp** and the Temp Step screen opens.

**Temp Step 2**

Step

Temperature: 72.0 °C ☐ Pause

Time:  Hrs  Min  Sec ☐ Forever

Options

Increment Temp  +  °C

Increment Time  +  S

Slow Ramp   °C/S

Ok  Cancel

## 3. Edit Temperature and Time.

**Note:**

The allowable temperature range is from 0.0°C to 99.9°C, with 0.1°C interval.


The allowable time range is from 00:00:00 to 09:06:06 hour: min: sec.

- If you touch **Pause**, the program will automatic paused as soon as the desired step temperature reach the setting value and the instrument will beep for one time. Then you must touch **Resume** to resume the running. Pause can be used when you need to remove tubes or add reagents at a step.
- If you touch **Forever**, the program will hold forever after reaching this step until you stop it manually, and you can not add any step after a forever step.

## 4. You can also set options for a step.

- **Increment Temp**– Let the instrument increment the temperature in this step with each cycle.

To set the Increment Temp function:


Touch  to shift between “+” and “-” (to increase or decrease temperature for each cycle), and then enter the number of degrees of temperature in the textbox. The allowable temperature range is 0.1°C ~ 10.0°C.

**Note:**

You could not set parameters to let the temperature below 0°C or above 99.9°C after some cycles.

- **Increment Time** – Let the instrument increment the holding time in this step with each cycle.

To set the Increment Time function:

Touch  to shift between “+” and “-” (to increase or decrease time for each cycle), and then enter the seconds in the textbox. The allowable time range is 1 sec ~ 120 sec.

**Note:**

You could not set parameters to let the time below zero second after a certain cycle number.

- **Slow Ramp** – Let the instrument heat or cool from previous step temperature to the desired temperature for current step at a specified rate.

To set the Slow Ramp function:

Enter the value of ramp rate in the textbox. Input range is 0.1 ~ 6.0°C /sec.

**Note:**

The actual maximum ramp rate of heating and cooling varies with different instrument type and block module type. Refer to 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.

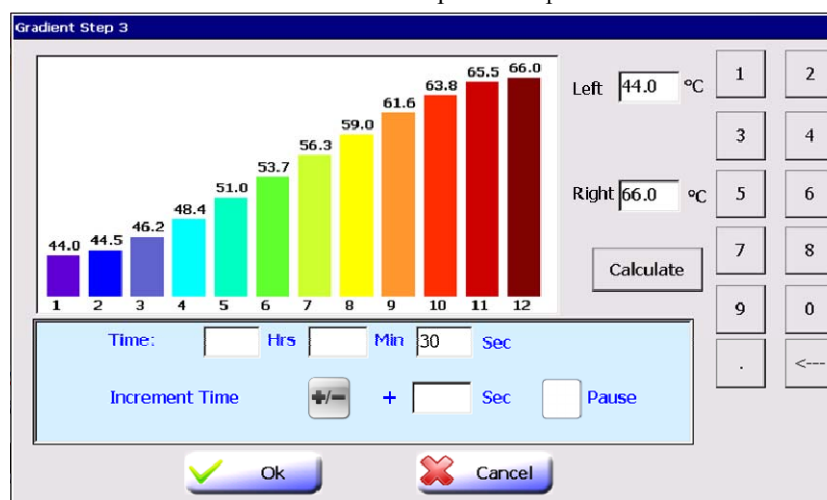
If you do not want to slow the running, leave this option empty.

5. Touch **Ok** to accept changes and close the screen.

## Gradient Temperature Step

Gradient Temperature Step is only available with A200 Thermal Cycler.

1. In the Edit Program screen, select a step after which you want to add the gradient temperature step.
2. Touch **Gradient** and the Gradient Step screen opens.



3. Touch **Left** and **Right** to enter temperature of the left (1st) and right (12th) column of sample block.  
The allowable temperature range:  $30.0^{\circ}\text{C} \leq \text{Left} < \text{Right} \leq 99.9^{\circ}\text{C}$   
Difference between the Left and Right:  $\leq 30^{\circ}\text{C}$ .
4. Touch **Calculate** to display calculated temperature gradient from the first column to the twelfth column.
5. Touch **Time** to edit the holding time. You can also set Pause or Increment Time as you need. The allowable increment time range is 1 sec ~ 120 sec.

## 1.4 Set Cycle

1. In the Edit Program screen, select a step that you want to set as the last step of a cycle.
2. Touch **Goto** and the Cycle Step screen opens.

3. From the Step drop-down list box, select the start step number of the cycle.  
The steps between the last step and the start step will run repeatedly for the specified cycle numbers.
4. Touch **Cycles** to add additional cycle numbers.

**Note:**

Allowable entered cycle numbers range: 1-100.

The actual cycle numbers will be 'N+1' where N stands for the entered cycle numbers. So if you would perform a PCR reaction with 30 cycles, then you should enter a number of 29.

5. Touch **Ok** to accept changes and close the screen.

## 1.5 Edit Step

1. In the Edit Program screen, select a desired step.
2. Touch **Edit** to edit the step parameters.
3. Touch **Ok** to accept changes and close the screen.

## 1.6 Delete Step

1. In the Edit Program screen, touch a step to select it.
2. Touch **Delete**. A pop-up window appears.
3. Touch **Yes** in the displayed pop-up window to delete the step.

## 1.7 Save Program

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

2. Program uses the current date and time as a default name. You can enter a new name. The name is case insensitive and can be up to 30 characters.

**Note:**

Default program name: 10 04 18 \_ 13 49

last two digits of year      month      day      hour      minute

3. From the Folder drop-down list box, select a folder to save the program to.
  - To create a new folder to save the program, touch **New Folder**, and enter a folder name of up to 30 characters.
4. Touch **Run** to both save and run the program.  
Or touch **Save** to save but not run the program.  
Or touch **Export** to save the program to a USB flash drive.

## 2. Edit Program

To edit a program:

1. In the Home screen, touch **Program Library**.
2. In the Program Library screen, select a folder and then **double click** it or touch **View**.
3. In the View Program screen, select a program to be edited and then **double click** it or touch **View/Edit**.
4. In the Edit Program screen, you can edit the program and then save and/or run it following the instructions described above.

## 3. Program Wizard Function

The Program Wizard function provides a quick method to create a standard three-step or two-step PCR program and perform running.

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

The Program Wizard screen opens. There are two screens, touch **Next** and **Last** to shift between them.

Program Wizard -1

Temperature Control

☒ Sim-tube Sample volume 25 µl (10-100)

☐ Block

Lid Temperature Control

☒ Constant at 105.0 °C(30-112)

☐ Off

Next

Program Wizard -2

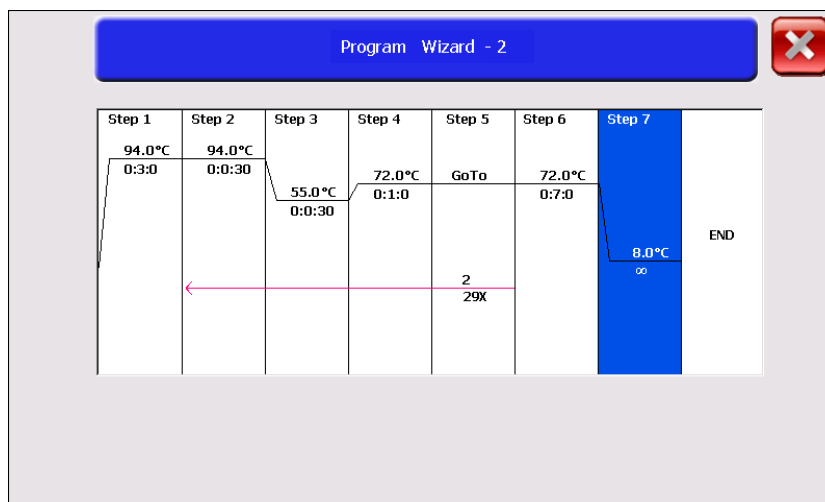
	Temp(°C)	Time( M : S )	
Pre-denaturation	94	3 :	
Denaturation	94	: 30	} 30 Cycle
Annealing	55	: 30	
Extension	72	1 :	
Post-extension	72	7 :	
Hold	8	:	<input checked="" type="checkbox"/> Forever

Last Graph Save Run

2. In the first screen, edit Temperature Control mode and Lid Temperature

Control mode. You can leave these parameters as default because the default parameters can meet most PCR occasions.

3. In the second screen, touch and edit parameters of each step. Keep parameters of a step empty to exclude the specified step. You can touch **Graph** to view the graphical representation of the program.



**Note:**

- Allowable temperature range: 0.0°C to 99.9°C.
  - Allowable time range: 00:00 to 99:59 min: sec.
  - Allowable entered cycle numbers range: 0-101.
  - The actual cycle numbers will be equal to the entered cycle numbers.
- So if you would perform a PCR reaction with 30 cycles, then you should enter a number of 30.

4. Touch **Save** to save program or touch **Run** and then select whether save the program before running according the displayed message in a pop-up window.

## 1. Load Samples into the Instrument

1. Place PCR tubes or microplate onto the sample wells of the sample block.

### IMPORTANT!

Do not touch the surface of the sample block or lid surface because they may be very hot (105°C/221°F or higher)!

### Note:

- The cap of tubes or film on microplate must be sealed tightly to prevent sample evaporation. Tubes or microplate should have heat resistance of up to about 120°C.

For 0.2ml PCR tube, we recommend the AXYGEN serial. For 0.5ml PCR tube, we recommend the EPPENDORF thin-walled 0.5ml PCR tube (EPPENDORF order number: 0030.124.0502).

- The sample wells of the sample block should keep clean.
- The height of tubes should be the same so that the lid can keep stable and gives even pressure on each tube.

2. Close the lid and turn the lid knob clockwise (see the 'Tighten' arrow symbol on the top surface of the lid knob) until you hear 'click ...' sound.

## 2. Select Program to Run

From the Home screen:

1. To select a last run program:

Touch **LastRun Programs**, select a program and then touch Run.

To select a program saved in a folder:

Touch **Program Library**, select the desired folder and then touch **View** to open the View Program screen. Select a program from the list and touch **Run**.

After you touch **Run**, the Set Run Options screen opens.

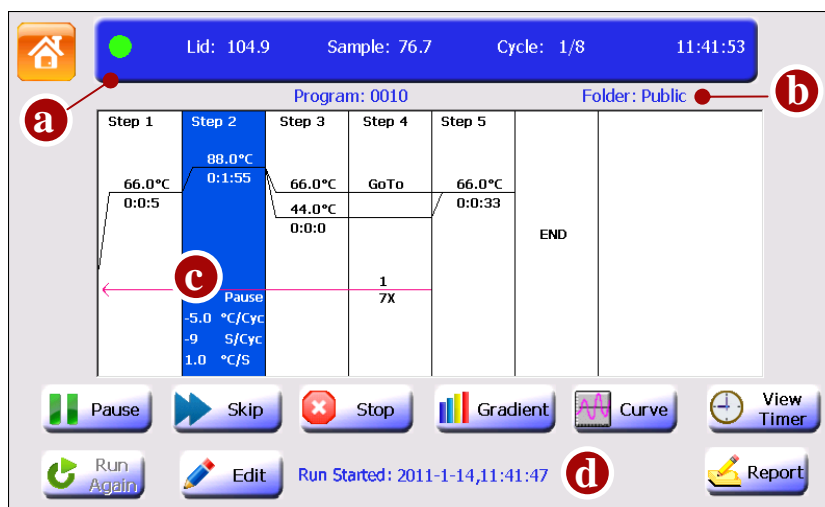
2. In the Set Run Options screen, edit Temperature Control and Lid Temperature Control.
3. Touch **StartRun** to begin the run. The Run screen opens.

### 3. View Run State and Control Run

#### 3.1 View Run State

Introduce the  
Run Screen

You can view the status of run using the Run screen below.



The items displayed on the Run screen:

- a: The colored status light (the colored status light keeps green during running, changes to orange after touching Pause button, changes to red when error arises and changes to white after stopping running).

and the run status:

‘Lid’: lid temperature;

‘Block’ or ‘Sample’: block temperature (when the instrument is idle or when temperature control mode is Block) or sample temperature (when temperature control mode is Sim-tube);

‘Cycle’: current cycle numbers / total cycle numbers;

‘11:41:53’: Current Time.

- b: Program/ Folder name (and Creator of program when login is enabled).

**Note:**

If you create a new program to run but did not save it, the program will be given a default name ‘Admin’ and will be saved in a temporary folder ‘Temp’. After run, the temporary program will not be recorded in the list of the Last Run Programs screen.

- c: Options of some step:

Pause: preset pause;

X °C/Cyc: Increment or decrement temperature;










X S/Cyc: Increment or decrement time;

X °C/S: Ramp rate.

- d: The recent run message.



Buttons on the Run screen:

Button	Function
 Pause/ Resume	Pauses and Resumes run.
 Skip	Skips run step.
 Stop	Stops run.
 Gradient	Views bar chart of sample block temperature.
 Curve	Views real-time temperature record curve.
 View Timer	Views run time.
 Run Again	Runs program again.
 Edit	Opens Edit Program screen to edit the program.
 Report	Views run report.

## View Run Timer


1. In the Run screen, touch **View Timer** to view run time:



- Time Elapsed shows the time (hour:min) since the run has started.
- Time Remaining shows the countdown remaining time (hour:min) for the running.

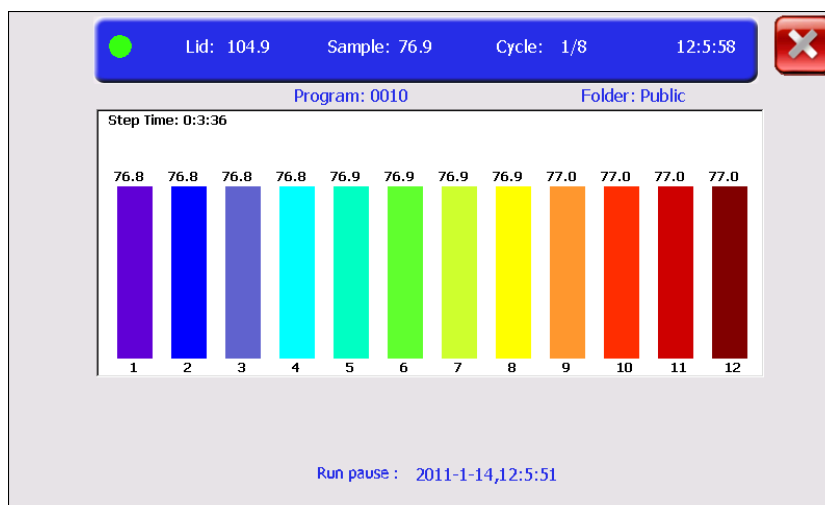
### Note:

The actual remaining time may slightly differ from the shown remaining time.

2. Touch  to return to the Run screen.

### View Bar Chart of Sample Block Temperature

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




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

2. Touch  to return to the Run screen.


### View Temperature Record Curve

### View Run Report

1. In the Run screen, touch **Curve** to view the temperature record curve.
2. Touch  to return to the Run screen.

1. In the Run screen, touch **Report** to open the Run Report screen.  
The report contains records of run start time, run stop time, and manual operations during running.

Touch **Export** to export the report in BMP format to a USB flash drive.

2. Touch  to return to the Run screen.

### 3.2 Control Run

### Pause Run

In the Run screen, touch **Pause** and the system will beep for two times.

#### 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 screen, touch **Skip** to skip the current running step and run the next step.

### Stop Run

In the Run screen, touch **Stop** and then touch **Yes** in the displayed pop-up window.

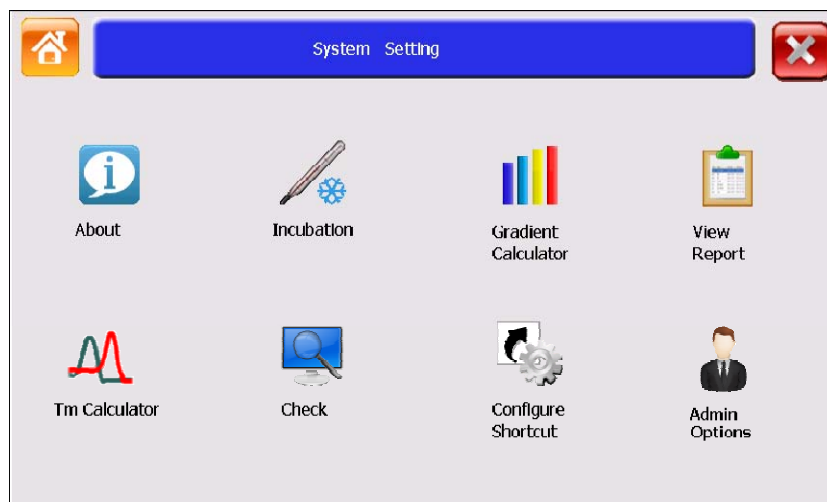
### Run Program Again

In the Run screen, if the running program stopped, touch **Run Again** to run it again.










### 1. Introduce the System Setting Screen

In the Home screen, touch **System Setting**.

The System Setting screen opens.



### Buttons of System Setting Screen

Button	Function
 About	Views product information about the A100/A200 Thermal Cycler.
 Incubation	Performs a constant temperature incubation experiment.
 Gradient Calculator	Calculates gradient temperature of each column of the sample block.
 View Report	Views stored run reports.
 Tm Calculator	Calculates Tm value of a primer pair.
 Check	This function is reserved for service.
 Configure Shortcut	Configures functions or programs shortcuts.
 Admin Options	Sets instrument parameters.
 Login Password	When a user other than "admin" login, the Admin Options icon will change to Login Password's icon. The user can edit his (her) login password using this function.

## 2. About

To view product information about A100/A200 Thermal Cycler:

1. In the Home screen, touch **System Setting**.
2. In the System Setting screen, touch **About** and the About screen appears.
3. When you finish, touch **Ok** to return to the System Setting screen.

## 3. Incubation

The Incubation function is used to perform a constant temperature incubation experiment such as DNA ligation or RNA digestion.

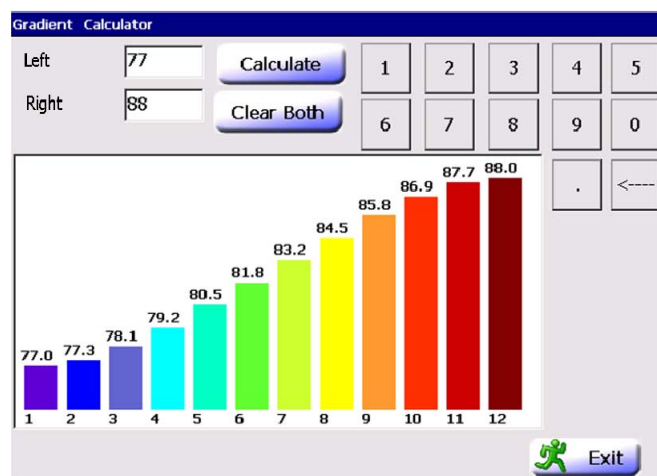
1. In the Home screen, touch **System Setting**.
2. In the System Setting screen, touch **Incubation**.
3. In the Incubation screen, enter the required incubation temperature. If you select **Lid On**, the lid will heat to reach 10°C above the incubation temperature by default.
4. Touch **StartRun** to run the Incubation program and the Run screen opens.
5. In the Run screen, you can view block temperature (by touching **Gradient**), view temperature record curve (by touching **Curve**) and run time (by touching **View Timer**). You can stop running by touching **Stop**.

**Note:** The Pause, Skip, RunAgain, Edit, Report buttons are not available in the Run screen under Incubation mode.

## 4. Gradient Calculator

This function is only available with A200 Thermal Cycler.

1. In the Home screen, touch **System Setting**.
2. In the System Setting screen, touch **Gradient Calculator**.  
The Gradient Calculator screen opens.
3. In the Gradient Calculator screen, touch **Left** and **Right** to enter the low-temperature and high-temperature of the left (1st) and right (12th) column of the sample block.  
The temperature range:  $30.0^{\circ}\text{C} \leq \text{Left} < \text{Right} \leq 99.9^{\circ}\text{C}$ .  
The difference between the Left and Right temperature:  $\leq 30^{\circ}\text{C}$ .
4. Touch **Calculate** to display calculated temperature gradient from the first column to the twelfth column.



5. After you finish, touch **Exit** to return to the System Setting screen.

## 5. View Report

1. In the Home screen, touch **System Setting**.
2. In the System Setting screen, touch View **Report** to open the screen:

Folder	Program	Run Started	Run Aborted
Public	Admin	2011-1-14, 9:53:10	2011-1-14, 10:7:44
Public	0010	2011-1-13, 16:54:2	2011-1-14, 9:46:43
Public	Admin	2011-1-13, 16:6:38	2011-1-13, 16:36:34
Public	0010	2011-1-13, 15:32:30	2011-1-13, 16:4:49
Public	0010	2011-1-13, 15:31:23	2011-1-13, 15:32:11

3. Select a report and **double click** it or touch **Show** to open the Run Report screen.
4. After you finished, touch to return to the View Report screen.
5. In the View Report screen, you can touch **Clear** to clear all reports.
6. After you finish, touch to return to the System Setting screen.

## 6. Tm Calculator

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

1. In the Home screen, touch **System Setting**.
2. In the System Setting screen, touch **Tm Calculator** to open the screen.

3. Enter the salt concentration and the primer concentration.
4. Enter each primer sequence and then touch **Calculate** to view the Tm value of each primer, the average Tm value and the Ta value.

**Note:**

In order to develop a successful PCR reaction, you may need to select a different Ta value from the value appeared on the screen.

5. After you finish, touch to return to the System Setting screen.

7. Check  
8. Configure  
Shortcut

This function is reserved for service.

Shortcuts appear on the Home screen and can access various functions or programs. When login is enabled, each user can configure different shortcuts.

To configure shortcuts:

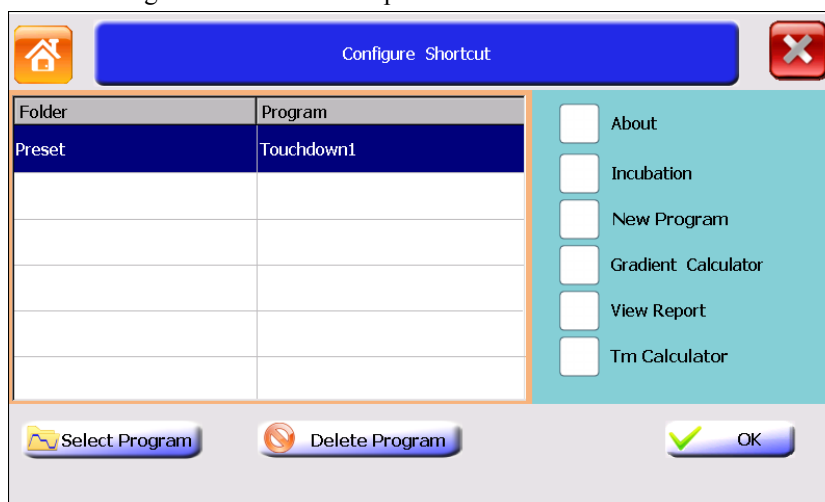
1. In the Home screen, touch:

- Any button labeled with 'Shortcut'

or

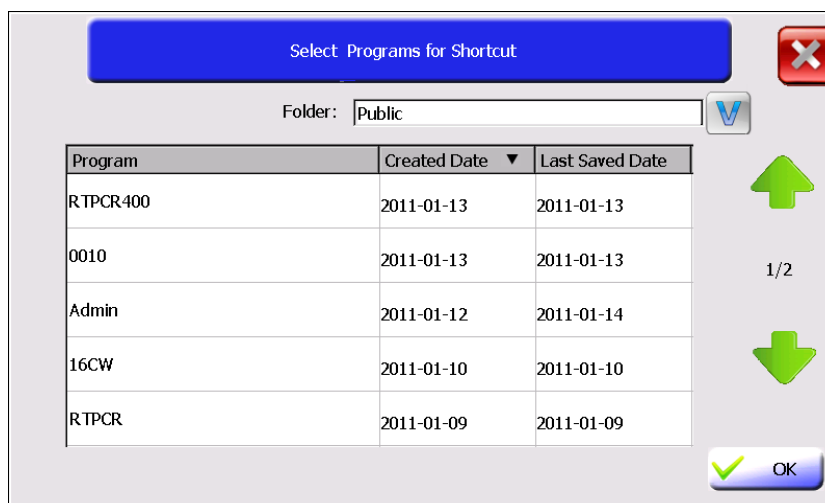
- System Setting, then Configure Shortcut.

The Configure Shortcut screen opens.



2. In the Configure Shortcut screen, touch a check box next to a function on the right of the screen to select a function as a shortcut.

3. If you want to select a program as a shortcut, touch **Select Program**.



4. In the Select Programs for Shortcut screen, select a folder from the Folder drop-down list box and programs of the selected folder will appear. Touch the header of the first or second column of the table to sort all programs. Touch a program to select it and then touch **Ok** to return to the Configure Shortcut screen. The program will appear in the left side list box.

5. When you finish, touch **Ok** to return to the Home screen.

The selected function or program will appear in the Home screen.


**Note:**

You can select no more than six functions and/or programs as Shortcuts.

To deselect a shortcut on the Home screen, you need to touch System Setting again, and then touch Configure Shortcut. In the Configure Shortcut screen, unselect the check box for deleting a function shortcut, or select the program from the program list and then touch Delete Program for deleting a program shortcut.

## 9. Admin Options

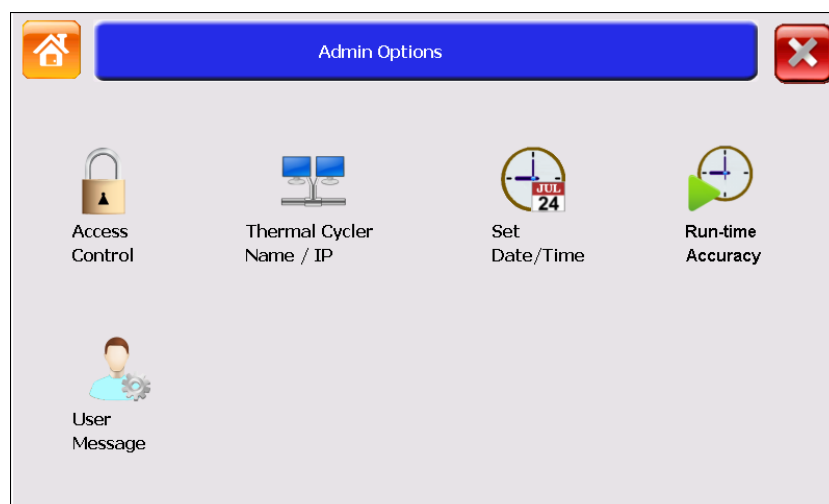
The Admin Options is used to control access mode, set thermal cycler name/IP address, set date/time, set run-time accuracy, and manage user accounts. When

login is enabled, only admin can see the Admin Options button .

To use Admin Options functions:

In the Home screen, touch **System Setting**, then Admin Options.

The Admin Options screen opens.



### 9.1 Access Control

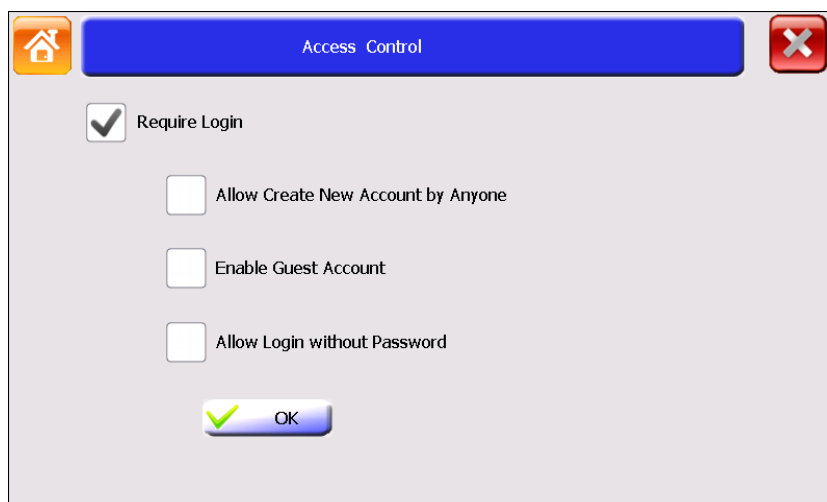
The Access Control is used to protect personal programs and folders and limit ordinary users to modify instrument parameters.

To enable the Access Control:

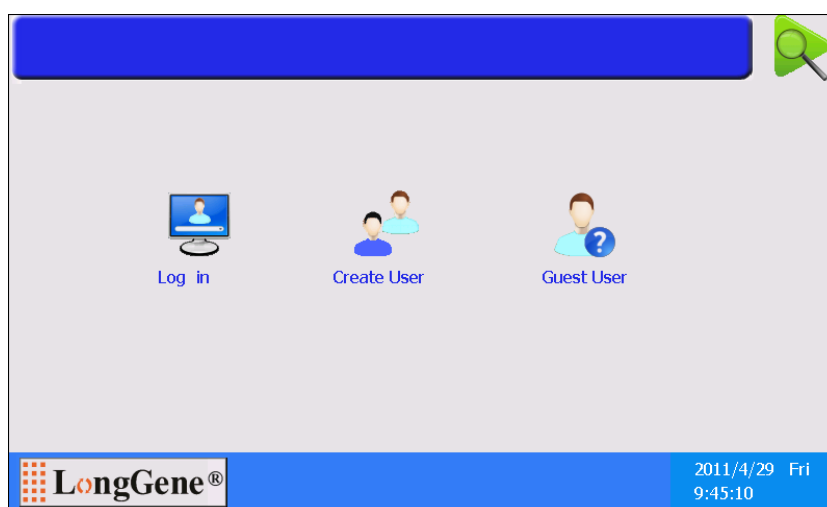
When login is enabled, log in as “admin”.

1. In the Home screen, touch **System Setting**.
2. In the System Setting screen, touch **Admin Options**.
3. In the Admin Options screen, touch **Access Control**.


The Access Control screen opens:



4. To enable the Access Control function, touch **Require Login**.
  - a. To allow anyone to create a new account in the Login screen, touch **Allow Create New Account by Anyone**.
  - b. To allow an anonymous user to login, touch **Enable Guest Account**.
  - c. To allow login without password, touch **Allow Login without Password**.
5. Touch **Ok**, and restart the instrument by powering off the power switch.  
After enabling the Access Control, you must login as a user on the Login screen (see below) before you can use the instrument.



## 9.2 Thermal Cycler Name/IP

6. After you finished experiment, touch  in the Home screen to logout.  
To enable network control function, you need to set the IP address and a unique Thermal Cycler Name for each instrument.  
When login is enabled, log in as “admin”.
  1. In the Home screen, touch **System Setting**.
  2. In the System Setting screen, touch **Admin Options**.
  3. In the Admin Options screen, touch **Thermal Cycler Name/IP**.
  4. In the Thermal Cycler Name/IP screen, set a unique Thermal Cycler Name and IP address. The name can be up to 30 characters.
  5. When you finish, touch **Ok** to return to the Admin Options screen.



### 9.3 Set Date/Time

The date and time appear on the Home screen and the Run screen.

To set Date/Time (When login is enabled, log in as “admin”):

1. In the Home screen, touch **System Setting**.
2. In the System Setting screen, touch **Admin Options**.
3. In the Admin Options screen, touch **Date/Time**.
4. In the Date/Time screen, enter today’s date and current time.
5. Touch **Ok** to accept changes and return to the Admin Options screen.

### 9.4 Run-time Accuracy

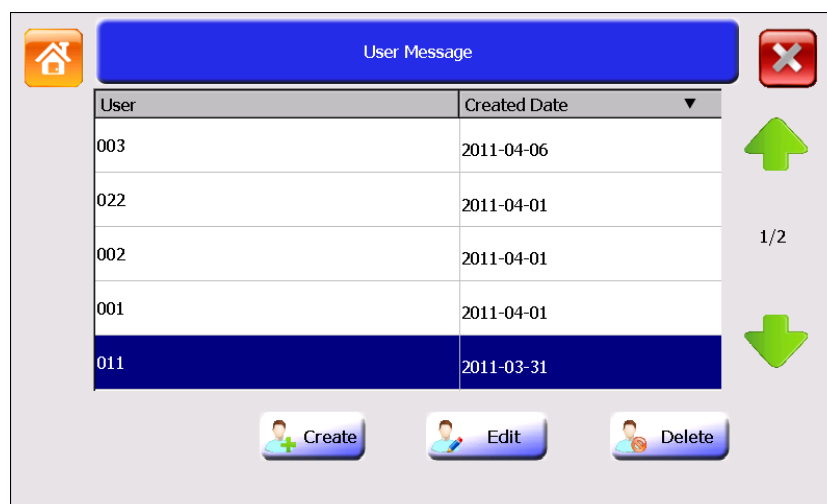
The Run-time Accuracy function is used to adjust coefficient of estimated remaining run time when the original estimated time is not accurate.

### 9.5 User Message

The User Message function is used to manage user accounts.

To manage user accounts (When login is enabled, log in as “admin”):

1. In the Home screen, touch **System Setting**.
2. In the System Setting screen, touch **Admin Options**.
3. In the Admin Options screen, touch **User Message**.
4. The User Message screen lists all accounts currently available.  
Touch the table column header to sort all users.



- “admin”: control all functions in the Admin Options screen. The default password for admin is admin.
- “Guest”: can create, rename, copy, modify, save, delete and run programs that stored in Public Folder, Guest Folder and USB Folder.
- All other users: can create, rename and delete non system folders; can create, rename, copy, modify, save, delete and run programs; can set his or her shortcuts; can modify his or her login password (in the System Setting screen after login).

In the User Message screen:

- a. To create a new user account, touch **Create** to open the Create User screen. Enter user name and password (case sensitive) of no more than 30 characters.
- b. To edit user password, select a user and then **double click** it or touch **Edit** to open the Edit Password screen. Enter new 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.



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