TC 9639 Thermal Cycler

User Manual

Document Version 1.4

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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 the Benchmark Thermal Cycler.

Benchmark reserves the right to modify this manual at any time without prior notice.

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. Failure to follow the information will possibly result in damage to the instrument or the user.

For example:

> **IMPORTANT!**
> **Turn the lid knob counterclockwise to loosen the lid before opening to prevent damage to the lid.**

> **IMPORTANT!**
> **To prevent electric shock, turn off the unit and disconnect the power supply prior to cleaning.**

Suggested Operation

Best Operating Angle

For optimum screen performance and visibility, the angle shown at the left is suggested for operation.

Support Information

For the service and support information, contact Benchmark Scientific by phone at 908-769-5555, or email, info@BenchmarkScientific.com.

A   [INSTRUMENT OVERVIEW]

1. Instrument Components

Figure 1   Front View of Thermal Cycler

- Lid Knob
- Lid
- Lid Handle
- USB Port
- Touchscreen
- Air Vent

Figure 2   Rear View of Thermal Cycler

- Air Vent
- Power Switch
- Power Inlet
- USB Slave
- Ethernet Port

Table 1   Functions of Thermal Cycler Components

Component	Function
Lid	Heats the top surface of reaction vessels to prevent 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	Allows air to circulate into and out of the instrument.
Power Switch	Powers on (1) and powers off (0) the instrument.
Power Inlet	Connects the instrument to power socket via supplied power cable.
Ethernet Port	Connects up to 255 Thermal Cyclers to a computer.
RS232 Port	Connects the instrument to a computer.
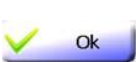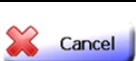
2. Menu Overview

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

> **IMPORTANT!**
> **To prevent damage, do not use sharp objects (such as a pencil) on the touch screen.**

Table 2 Buttons in the screens

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.
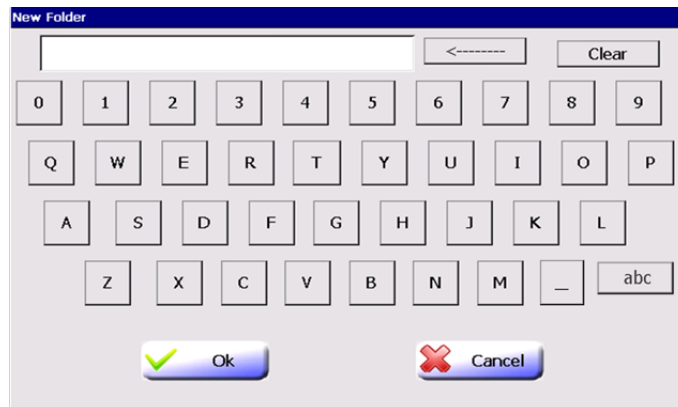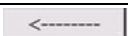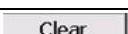
Figure 3 Virtual keyboard

Text is entered with the virtual keyboard:

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

B [GETTING STRATED]

1. Installation

1.1 Site Requirements

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

Power supply
: The Thermal Cycler has a universal, 85V-265V power supply and is supplied with a 3 prong plug. Be sure that the instrument is connected to a reliable power outlet that is rated to handle the load of the thermal cycler.

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 the Thermal Cycler on a level table or bench. Avoid placing the instrument adjacent to heaters, cooling instruments, sinks 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 Unpacking

1. Remove the packaging materials and keep in case of shipping damage to the unit.
2. Inspect the instrument for shipping damage.
3. Included in the box should be:
   • Thermal cycler with block
   • Appropriate power cord
   • User Manual (this manual)
   • Warranty registration card (to be completed and returned)

> **IMPORTANT! If the Thermal Cycler is damaged or some items are missing or damaged, contact Benchmark Scientific.**

4. Move to the desired installation site.

1.3 Power On and Power Off

1. Connect the power cord to the power inlet in the rear of the instrument.
2. Connect the 3-prong plug of the power cord to the wall socket. Make sure the power cord is 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 not used for extended periods of time, disconnect the power cord from the wall socket.

1.4 Open and Close Lid

The lid of the Thermal Cycler can be adjusted to come into contact with and apply pressure to the tops of the reaction vessels.   Heating of the lid protects samples 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 counterclockwise (see the 'Loosen' arrow symbol on the top surface of the lid knob) to raise the pressure plate.
2. Grasp the lid handle so that the handle clamp is pulled toward the lid handle.

3. Lift up the lid handle until the lid opens vertically. You can then place reaction vessels in the sample block or remove samples from the block.

To close the lid:

1. Place reaction vessels into the 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 resistance is felt. Then continue to turn the lid knob clockwise until you hear 'click …' sound. The lid is now pressing on the reaction vessels.

2. Home Screen

When the instrument powers on, the boot screen is displayed for several seconds. The Home screen is then displayed (see below).
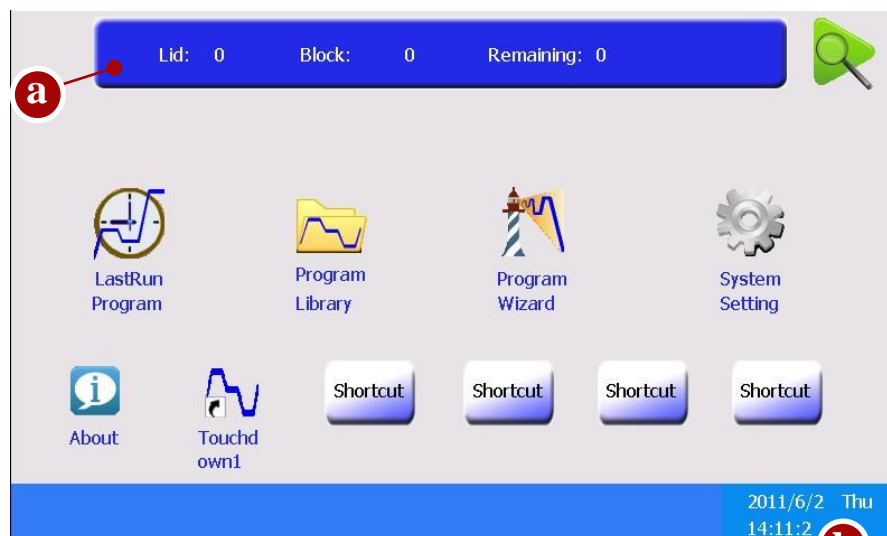
Items in the Home screen:

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, day and time.

Home Screen Buttons

| 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 10 run 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.
Shortcut Empty Shortcut	Configures shortcut for functions or programs.
Program Shortcut	Shows a selected program shortcut.

C [MANAGE FOLDER & PROGRAM]

1. Manage Folder

1.1 Program Library Screen

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

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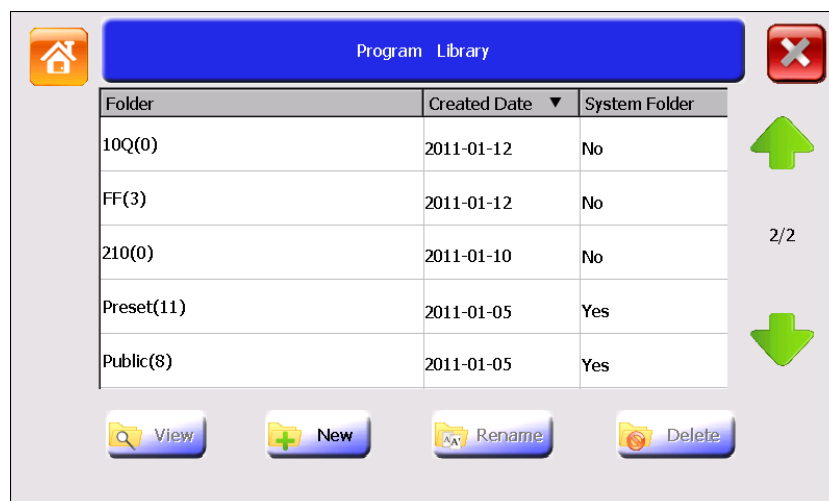
The table lists all available folders. Folder names include the number of programs in parentheses. Touch the header of the first or second column of the table to sort all folders. Touch ⬆ (Page Up) and ⬇ (Page Down) to move between pages.

The Preset folder contains ten 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.

• 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 cannot be renamed or deleted. To modify a program in the Preset folder, edit the program and then save to another folder (see chapter D). Or copy the program to another folder (see "2.3 Copy Program"), and then modify it.

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

> Note: When login is enabled, all users have access to the Public folder.

When plugging a flash drive into the USB port, a USB icon appears. Touch this icon to open the USB folder. The USB folder contains programs that are stored in the USB flash drive. Programs can be copied to and from the USB flash drive.

Program Library
Screen Buttons

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 not case sensitive.

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 cannot be 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 cannot be deleted.

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

2. Manage Programs

2.1 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.
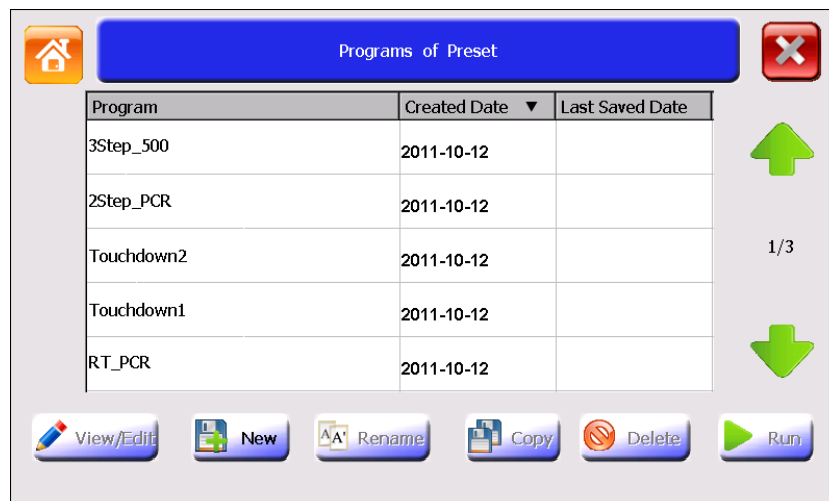
View Program Screen Buttons

Button	Function
View/Edit	Views and/or edits program steps (see chapter D for details).
New	Creates a new program (see chapter D for details).
Rename	Renames a selected program.
Copy	Copies program between folders.
Delete	Deletes a selected program.
Run	Runs a selected program (see chapter E 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 not case sensitive.
> Programs in the Preset folder cannot be 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 cannot be deleted.

2.5 View Last Run Program

In the Home screen, touch **Last Run Programs**.

The Last Run Programs screen opens.
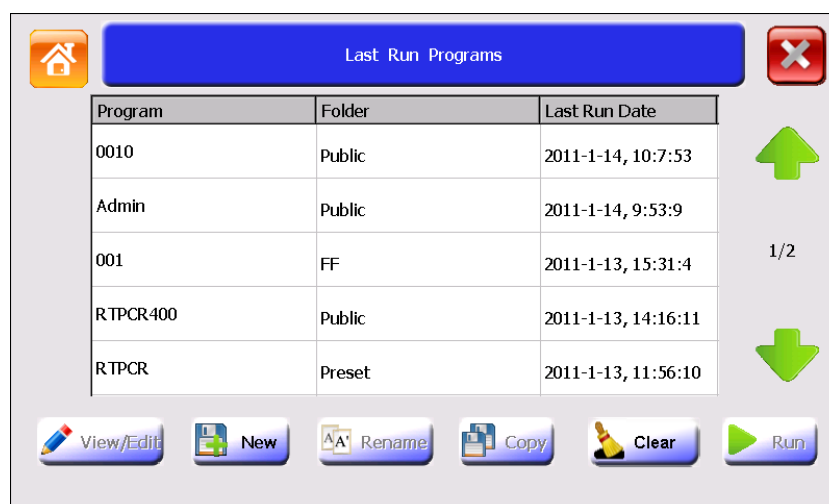
The Last Run Programs screen has the same appearance as the View Program screen, but shows the recently run ten programs for quick viewing and repeat runs.   Touch **Clear** to clear the program list.

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

D [PROGRAMMING]

1. Create New Program

1.1 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.
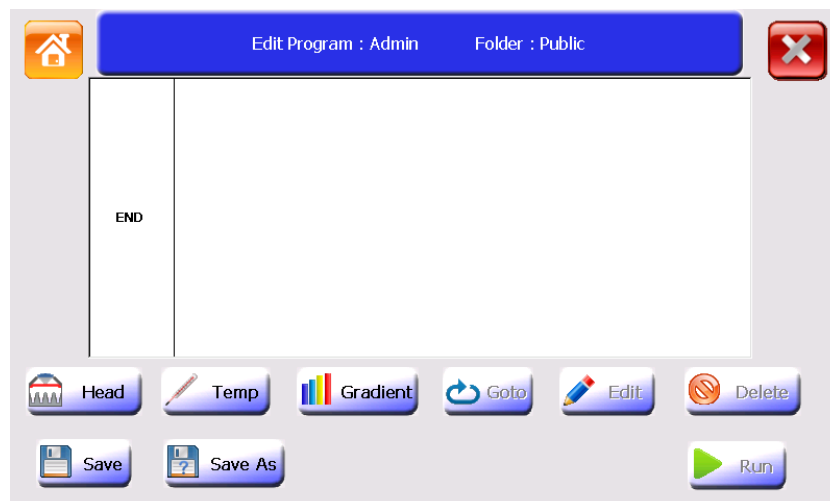
2. In the View Program screen, touch **New** to open the Edit Program screen.

> **Note:** To open the Edit Program screen more quickly, you can put the New Program shortcut in the Home screen (see "Configure Shortcut" for details).

The Edit Program screen is used to create, view and edit programs. After adding several steps, the screen looks like below:
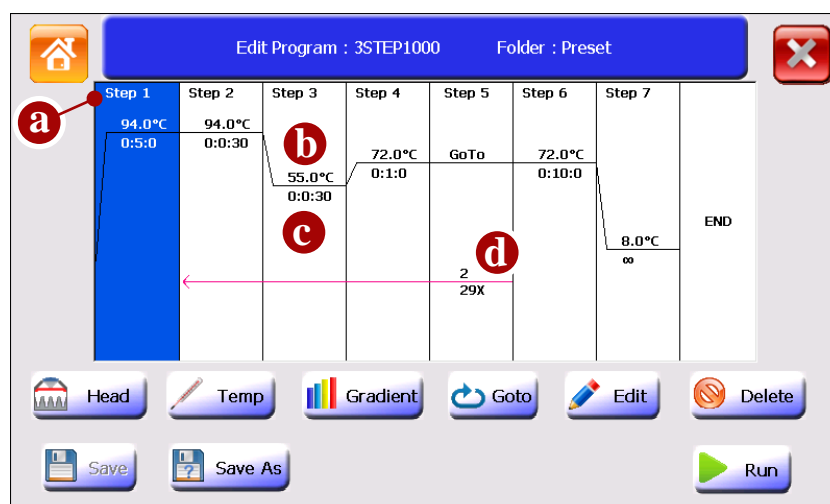
Items in the Edit Program screen:

a: Step number.

b: Temperature for a constant temperature step.

c: Step holding time (hour: min: sec).

d: The start step number and amounts of additional repeats for cycles.

Edit Program
Screen Buttons

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.
Goto	Return to a former step and repeat
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.
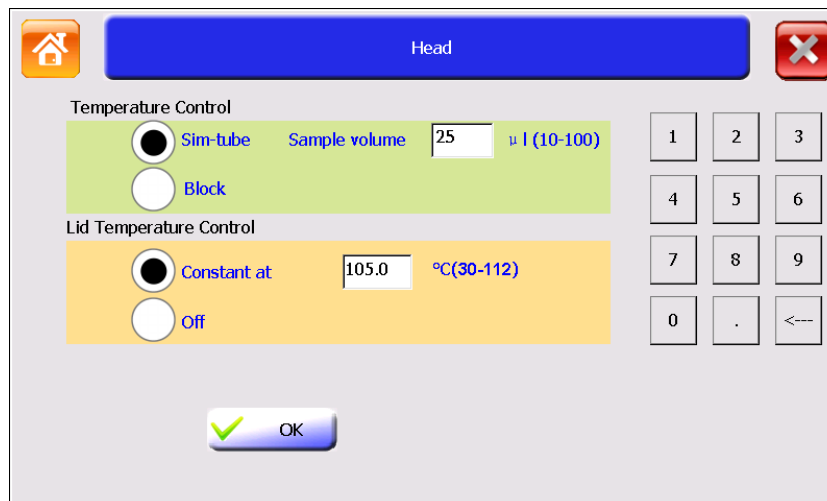
2. Select temperature control mode and lid temperature control mode and then touch **Ok** to accept changes.

> Note:
> The Sim-tube mode controls the process of heating the sample block to include the sample volume in the equation (ie a larger sample volume requires a longer time to reach temperature). Block mode does not consider sample volume and simply heats the block to the set temperature.

Sim-tube is the preferred control method, especially when reaction steps are 30 seconds less.   It is important to input sample volumes for the most accurate dwell times.   For lid temperature control, it is recommend to select a temperature five to ten degrees 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 is below 30°C.   The lid will heat to the specified temperature before the actual program starts running.   Setting a lid temperature below ambient will cause the program to stall.

1.3 Add Step

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.

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 automatically pause as soon as the desired step temperature is reached and the instrument will beep once. Touching **Resume** will continue the program running.   Pause can be used to add reagents (ie hot start) or when adding or removing tubes during a step.
• Touching **Forever** will cuase the program to hold indefinately after reaching this step until it is stopped manually.   Steps cannot be added after a forever step.

4. You can also set options for a step.

   • Increment Temp– adds temperature increments to 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:**
   >
   > Parameters cannot be set that would cause a step to fall outside of the operating range of the instrument (ie below 0°C or above 99.9°C).

   • Increment Time – Adds time increments to the holding time within the step for 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:**
   >
   > Parameters cannot be set that would allow the dwell time to fall below zero.

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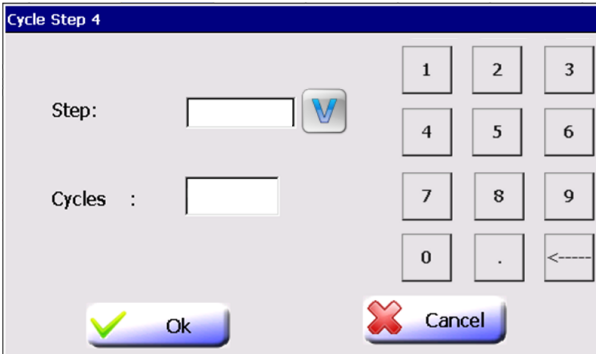
   > **Note:**
   >
   > The actual maximum ramp rate of heating and cooling varies with block module type. Refer to the instrument specifications for the maximum value. If a value larger than the block's maximum rate is entered, the block's maximum rate will be used.   If you do not want to slow the running,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

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

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. To 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. The current date and time are used as a default name. A new name can be entered. 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 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.

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 reactions.

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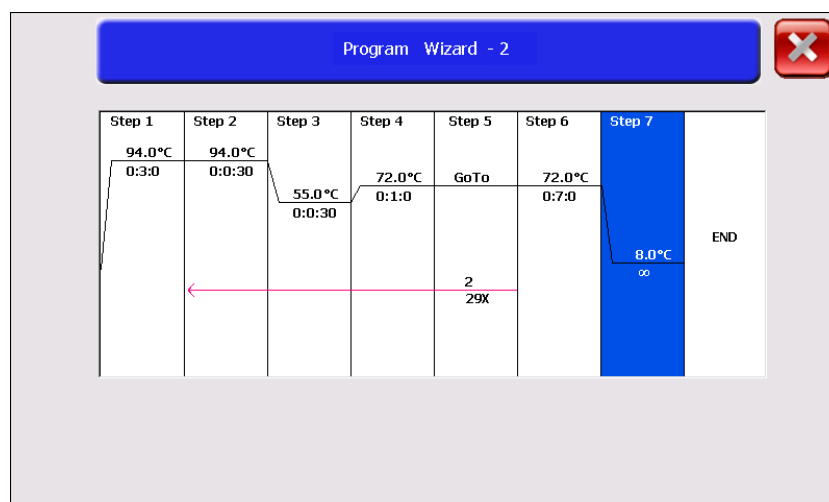
Note:
• Allowable temperature range: 0.0°C to 99.9°C.
• Allowable time range: 00:00 to 99:59 min: sec.
• Allowable number of cycles: 0-101.
• The actual cycle numbers will be equal to the entered cycle numbers. So if you would perform a PCR reaction with 30 cycles, then you should enter a number of 30.

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

E [RUN PROGRAM]

1. Load Samples

1. Place PCR tubes or a microplate in 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 caps of the tubes or film on the microplate must be sealed tightly to prevent sample evaporation. Tubes or microplates should have heat resistance of up to about 120°C. For best results, use thin walled tubes designed for PCR.
> •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.

3. 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 **Last Run 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.
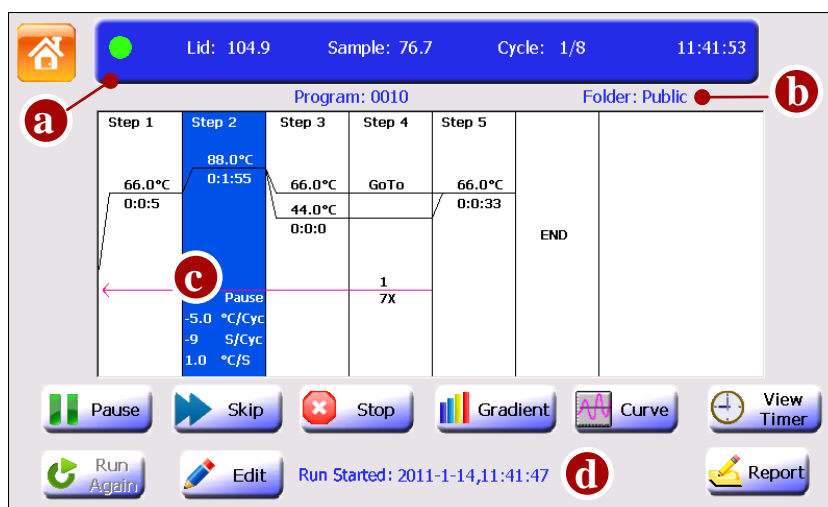

2. In the Set Run Options screen, edit Temperature Control and Lid Temperature Control.

3. Touch **StartRun** to begin the run. The Run screen opens.

3. View Run State and Control Run

3.1 View Run State

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

The items displayed on the Run screen:

a: In the top bar are the colored status light (the colored status light stays green during running, changes to orange after touching the Pause button, changes to red when an error arises and changes to white after stopping a run) 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:

   Pause: preset pause;

   X °C/Cyc: Increment or decrement temperature;

   X S/Cyc: Increment or decrement time;

   X °C/S: Ramp rate.

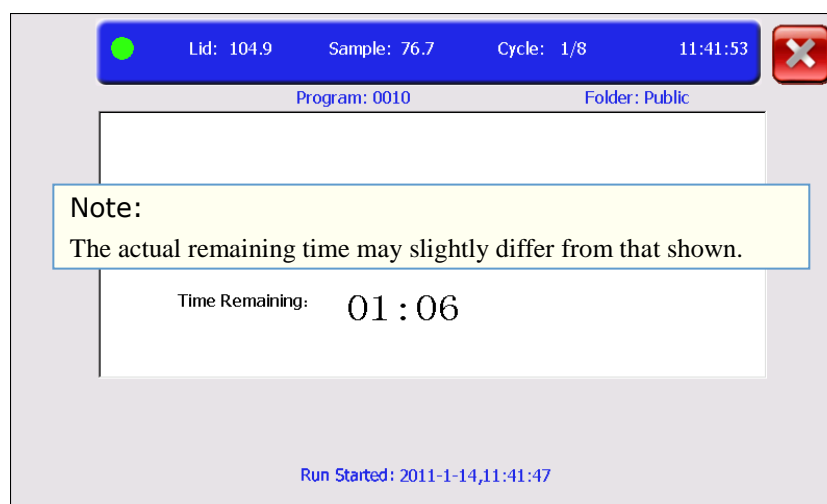d: The recent run message.

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 estimated remaining time (hour:min) .

2. Touch [×] to return to the Run screen.

Lid: 104.9   Sample: 76.7   Cycle: 1/8   11:41:53

Program: 0010   Folder: Public

Note:
The actual remaining time may slightly differ from that shown.

Time Remaining: 01 : 06

Run Started: 2011-1-14,11:41:47

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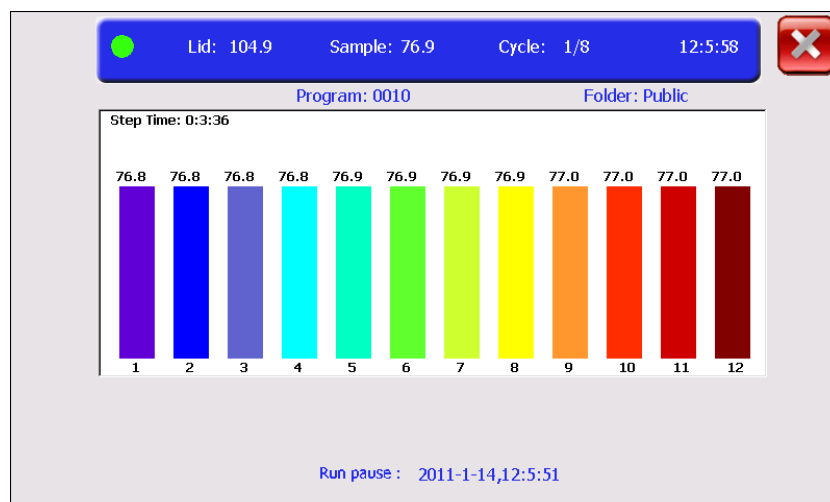
Step Time: the countdown holding time of the current step after the step temperature reached the setting value.

2. Touch [X] to return to the Run screen.

View Temperature Record Curve

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

2. Touch [X] to return to the Run screen.

View Run Report

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 [X] to return to the Run screen.

3.2 Control Run

Pause Run

In the Run screen, touch **Pause** and the system will 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 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

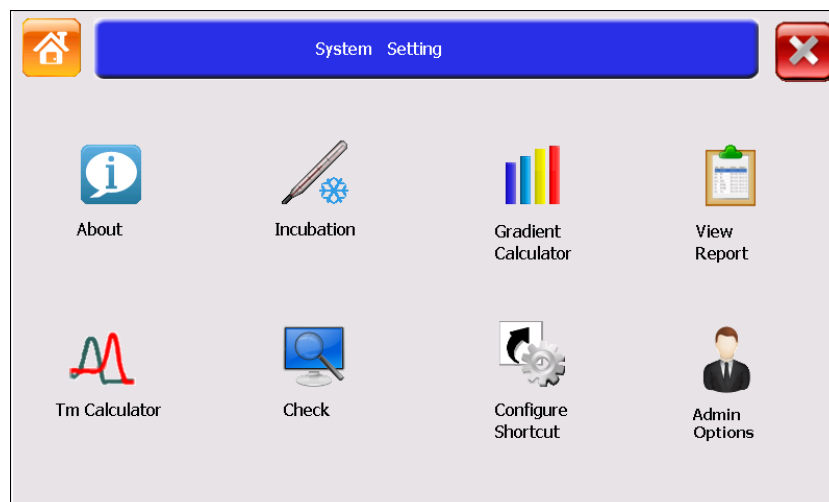In the Run screen, if the running program stopped, touch **Run Again** to run it again.

F [SYSTEM SETTING]

1. System Setting Screen

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

The System Setting screen opens.

System Setting Screen Buttons

Button	Function
About	Shows product information
Incubation	Performs a constant temperature incubation experiment.
Gradient Calculator	Non-functioning
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" is logged in, the Admin Options icon will change to Login Password icon. The user can edit their login password using this function.

2. About

To view product information about the 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 **Start Run** 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 button does not function.

5. View Report

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

2. In the System Setting screen, touch Vi℮w **Report** to open the screen:

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.

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

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Show   Clear

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, it may be necessary to select a different Ta value from the value on the screen.

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

7. Check

This function is reserved for service.

8. Configure Shortcut

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.

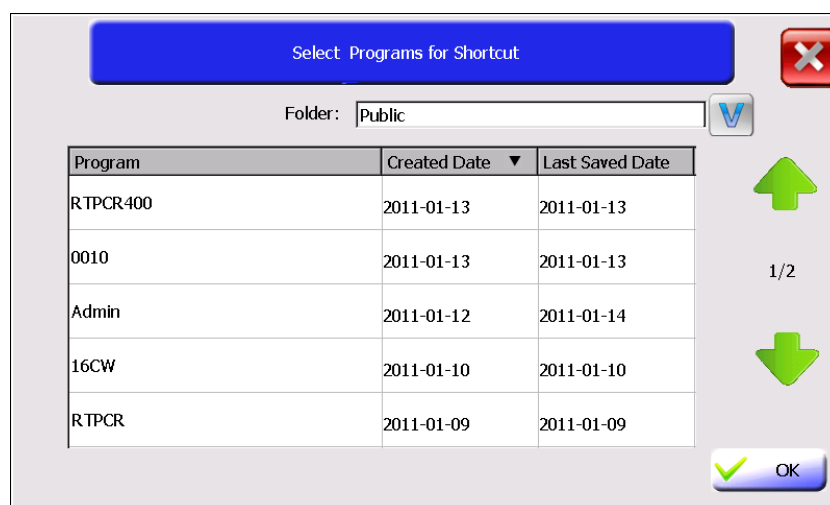2. In the Configure Shortcut screen, touch a check box next to a function on the right of the screen to select a function as a shortcut.

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

Select Programs for Shortcut		
Folder: Public		
Program	Created Date ▼	Last Saved Date
RTPCR400	2011-01-13	2011-01-13
0010	2011-01-13	2011-01-13
Admin	2011-01-12	2011-01-14
16CW	2011-01-10	2011-01-10
RTPCR	2011-01-09	2011-01-09

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OK

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.
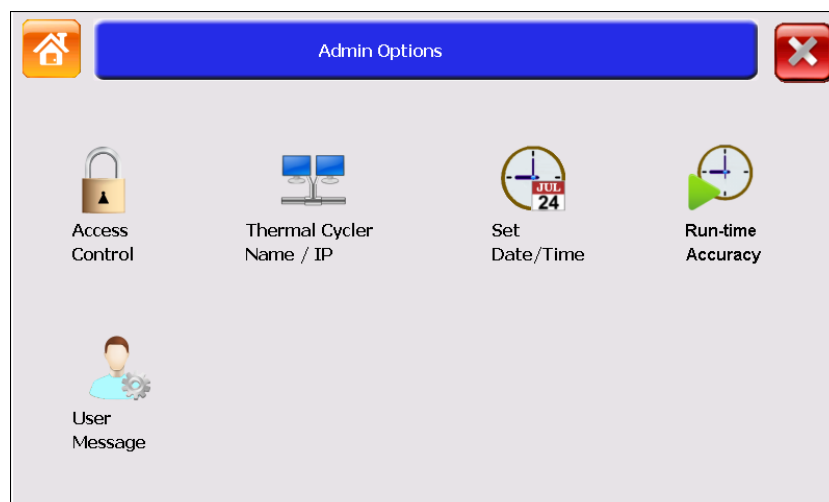
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9. Admin Options

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.
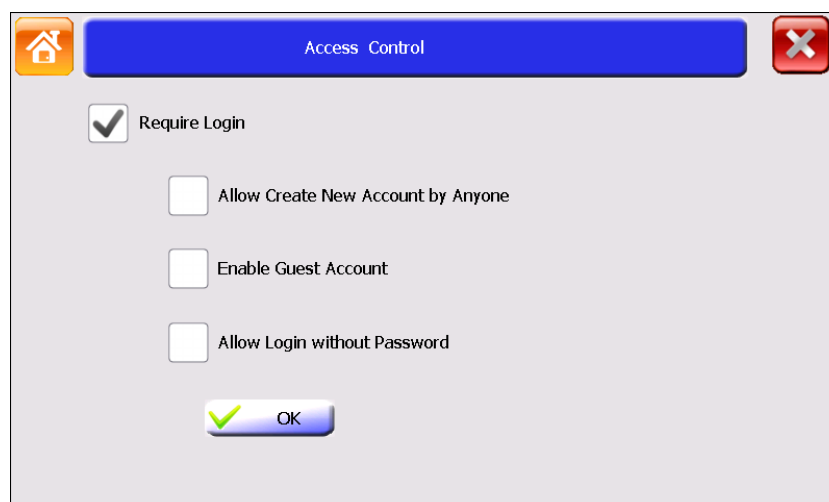
9.1 Access Control

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

To enable the Access Control:
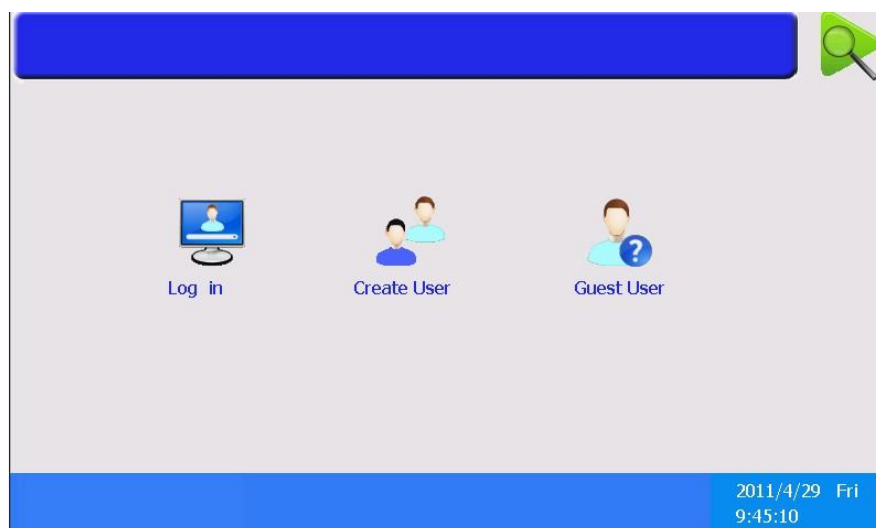
When login is enabled, log in as "admin".

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 turning 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.

6. After you finished experiment, touch [icon] in the Home screen to logout.

9.2 Thermal Cycler Name/IP	To enable network control function, you need to set the IP address and a unique Thermal Cycler Name for each instrument.

9.2 Thermal Cycler Name/IP

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

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.
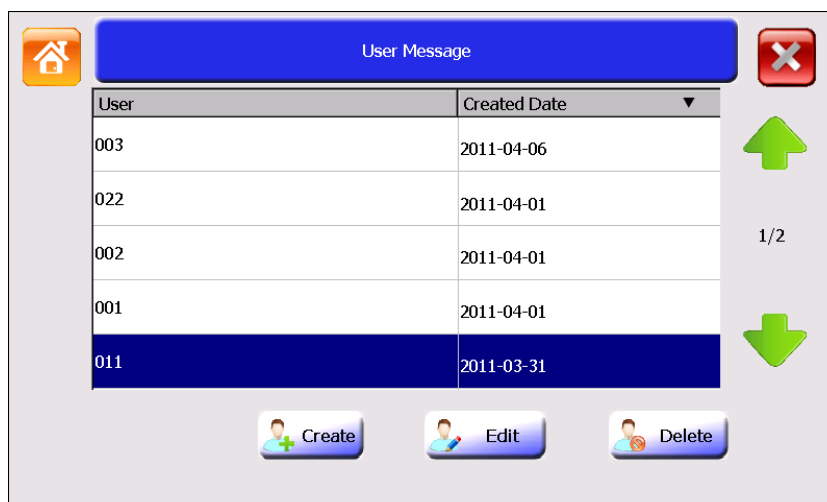
• "admin": controls all Admin Options screen functions. The default password for admin is admin.

• "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; create, rename, copy, modify, save, delete and run programs; set his or her shortcuts; 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.