A Geno Technology, Inc. (USA) brand name

PCR Machine, Mini

Cat. No. BT2202

1-800-628-7730 ♦ 1-314-991-6034 ♦ info@BTLabSystems.com

Thanks for choosing BT Lab Systems Mini PCR Machine. This operation manual describes the function and operation of the instrument. For proper use and to avoid any serious injuries, please read this manual carefully before operating the instrument.

IMPORTANT SAFETY INFORMATION

- This product is an indoor instrument which conforms to GB9706.1 standard
- These units are designed for laboratory use by people knowledgeable in safe laboratory practices.
- The operator should never open or repair the instrument. Opening or repairing the instrument will void the warranty and can cause accidents.
- Make sure the rated electrical outlet load is no lower than the demand. Power cord should be replaced with the same type if it is damaged. Make sure there is nothing else on the power line. Hold the jack when pulling out the power line. Do not pull the power line. Do not put the power line in a place where there is a tripping hazard.
- The instrument should be used in an area with low humidity, little dust, away from water, direct sunlight, and any strong light source. Area should have strong ventilation without corrosive gases or strong magnetic fields. Keep away from stoves and all other heat sources.
- Power off when not in use. If the instrument will not be used for a long period, unplug, and cover to protect it from dust.
- In case of the following, unplug the instrument at once and contact BT Lab Systems.
    - The instrument emits an abnormal sound or smell.
    - The instrument functions abnormally.

Incompatible Solvents

- Avoid contact with strong acids, alkalis, and most organic solvents. If contact occurs, clean immediately.
- Salt solutions may gradually corrode metal components and should be avoided.
- This device is not waterproof. Prevent liquids from entering the instrument.

INTRODUCTION

BT Lab Systems' Mini PCR Machine is an ultra-light; ultra-thin thermal cycler designed for gene amplification. It features a 5-inch TFT high-definition full-touch display with real-time program and curve visualization, intuitive parameter adjustment, and advanced semiconductor technology for precise temperature control, uniformity, and rapid ramp rates, ensuring reliable results. Its compact, portable design allows on-board use.

KEY FEATURES

- **Compact and lightweight design** with a modern interface for simple operation; ultra-thin construction
- **Advanced semiconductor technology** delivers excellent amplification performance and minimizes edge effects, ensuring superior temperature uniformity.
- **Precision aluminum-carved base** enhances durability and improves heat dissipation efficiency.
- **5-inch TFT full-touch HD color display** enables fast program editing, real-time temperature curve visualization, and intuitive operation with live system status monitoring.
- **User management and data security** with login control, permission settings, password protection, and storage capacity for over 100 programs.
- **Elastic heated lid design** accommodates tubes of varying heights for optimal experimental conditions.
- **Real-time temperature monitoring** for improved sample control.
- **Adjustable heated lid settings**, including temperature control, on/off function, and selectable tube or block temperature control modes to support diverse experimental needs.

TECHNICAL SPECIFICATIONS

Normal working conditions

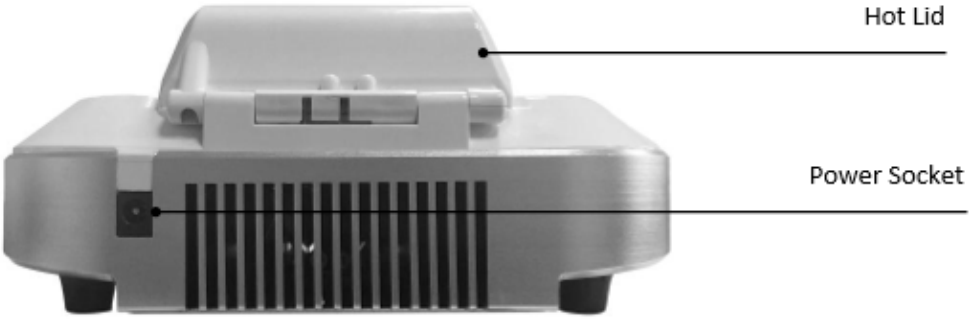
- Ambient Temperature: 5 – 30 °C
- Relative humidity: ≤70%
- Power supply: AC 100-220V, 50 Hz

Basic Parameters and Performance

Single-Step Time Range	1 – 59m59s; 0 is infinite
Temperature Range	4 – 99 °C
Sample Capacity	16 x 0.2 mL
Max. Heating Rate	5 °C/s
Max. Cooling Rate	4 °C/s
Temp. Uniformity	± 0.20 °C
Temp. Accuracy	± 0.10 °C
Temp. Display resolution	0.1 °C
Temp. Control Method	Block/Tube
Hot lid temp. range	30 – 110 °C
Max. Steps of the program	30
Program Max. # of Cycles	99
Time increment/decrement	-599/+599 s
Temp. increase/decrease	-9.9 – +9.9 °C
Program pause function	Yes
16 °C Insulation	Forever
LCD	5-inch, 800 x 480 pixel
Program storage quantity	>100
Communication Interface	USB 2.0 (extension)
Input power	12V, 9.9A
Dimensions (W x D x H)	200 x 230 x 85 mm
Net Weight	3.2 kg

STRUCTURE


Hot Lid Button
Power Switch
Vent Window
LCD Screen
MINI PCR


Hot Lid
Power Socket

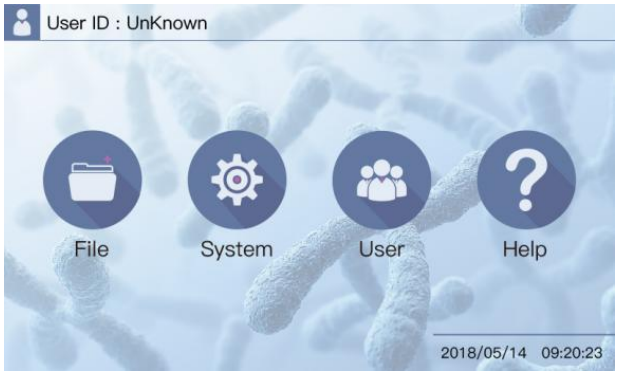
OPERATION GUIDE

Start up

After powering on the instrument, press the power switch. The LCD screen will illuminate and display the welcome screen (Figure 1), showing the product name. The system will then automatically enter the main menu interface (Figure 2).



(Figure 1)



(Figure 2)

Run File

A run file defines the PCR amplification program and consists of temperature steps and loop steps. Each file can include up to 30 steps.

1. File Library

Select the **"File"** icon on the main interface to open the file library. The left panel displays the file list, while the right panel shows detailed information and a preview of the selected file. Function buttons are located at the bottom.

Selected files can be **edited, renamed, or deleted** (see Figure 3).

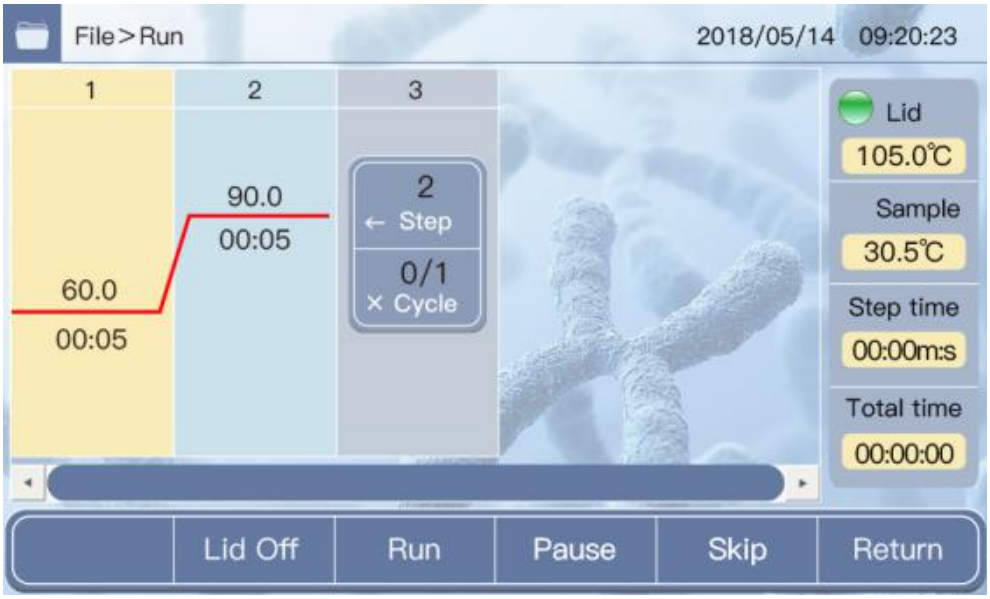
To export a file, insert a USB drive before powering on the instrument. The interface will display *USB Storage*. Select the desired file and press the export button to save it to the USB drive. Restart the instrument after completing the operation.



(Figure 3)

2. Creating a New File

Select **“New”** to open the program editing interface. The temperature curve displays temperature values above and time values below. Tap the temperature or time field to enter parameters using the numeric keypad (see Figure 4).



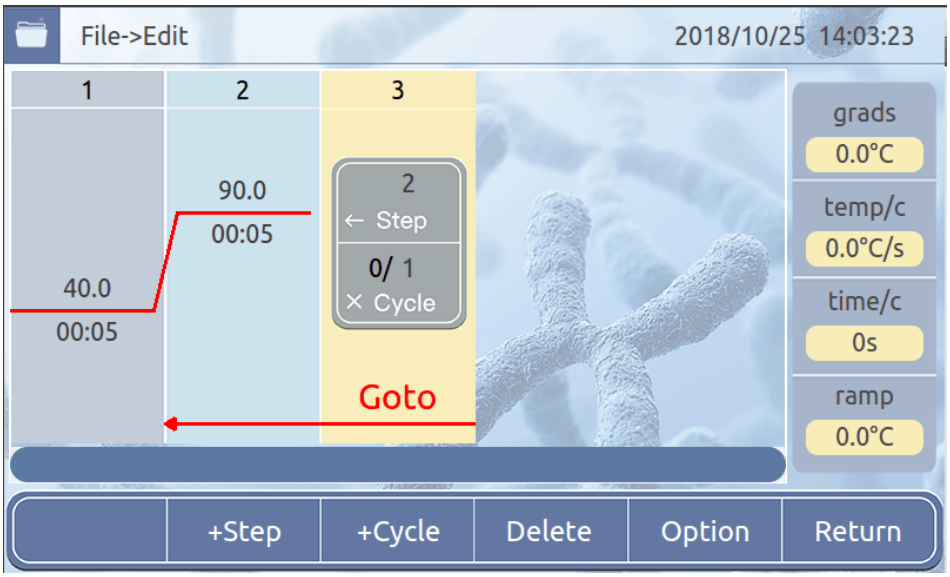
(Figure 4)

Use “+Step” to add temperature steps and “+Cycle” to add cycle steps. The program may contain a maximum of 30 steps.

After completing parameter settings, select **“Save”**, enter a file name, and press **“OK”** to return to the file library interface. The file is then successfully created

3. Edit File

In the file library, select the file to edit and click **“Edit”** to open the editing interface. The temperature curve displays temperature values above and time values below. Tap the temperature or time field to modify parameters using the numeric keypad (see Figure 5).



(Figure 5)

Use “+Step” to add temperature steps and “+Cycle” to add cycle steps. The program supports up to 30 steps.

Select a temperature step and click **“Option”** to set detailed parameters, including **Temp**, **Time**, **+Temp/c**, and **+Time/c**. After completing the settings, click **“OK”** to return to the editing interface (see Figure 6).



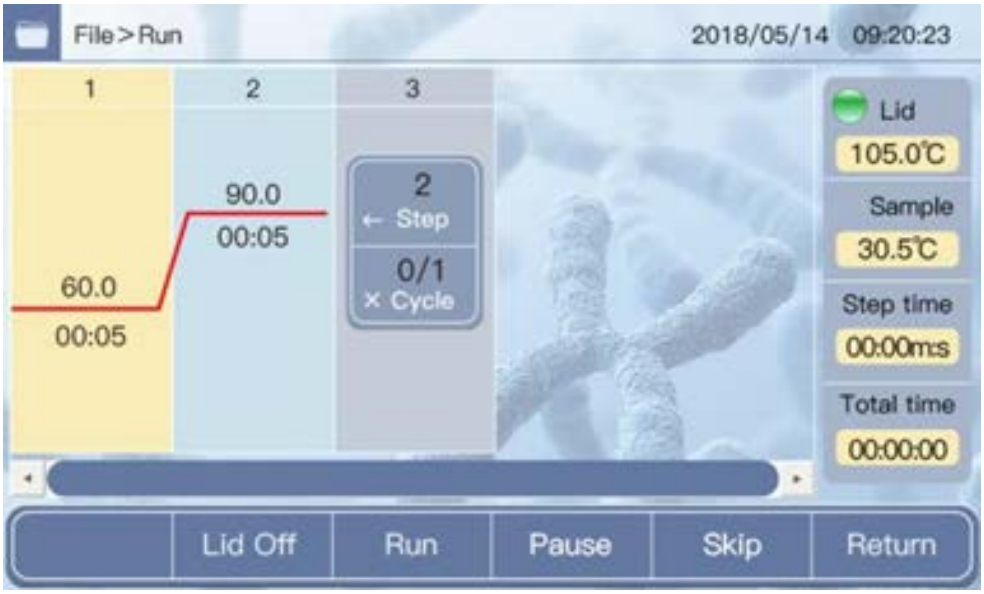
(Figure 6)

Select **“Return”** to go back to the file library interface. File editing is then complete.

4. Running a File

In the file library, select the desired file and click **“Run”** to open the running interface. Use **“Lid On”** or **“Lid Off”** to control the heated lid.

The panel beside the graph displays the hot lid temperature, module temperature, current step time, and total run time. Select **“Run”** to start the program (see Figure 7).



(Figure 7)

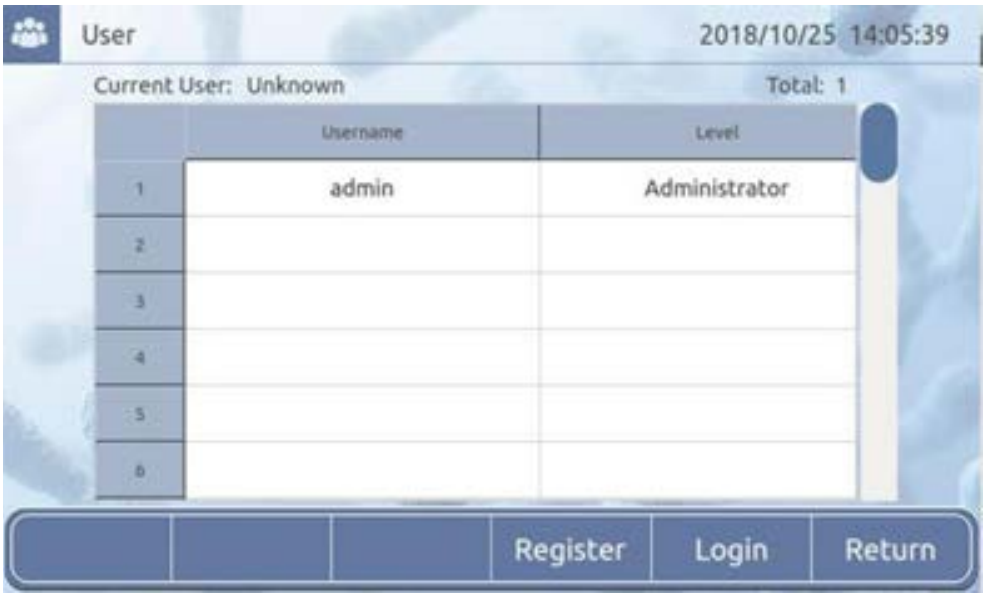
During program execution, the temperature curve flashes to indicate the active step.

- Select **“Stop”** to stop the run.
- Select **“Run”** to resume operation.
- Select **“Skip”** to move to the next step.
- Select **“Pause”** to temporarily pause the run.

After the program is completed, the instrument enters the cooling (cryostat) state and **Total Time** displays *Complete*. Select **“Stop”** to end the run.

User Management

Select the **“User”** icon on the main interface to open the user management screen and view the user list (see Figure 8).



(Figure 8)

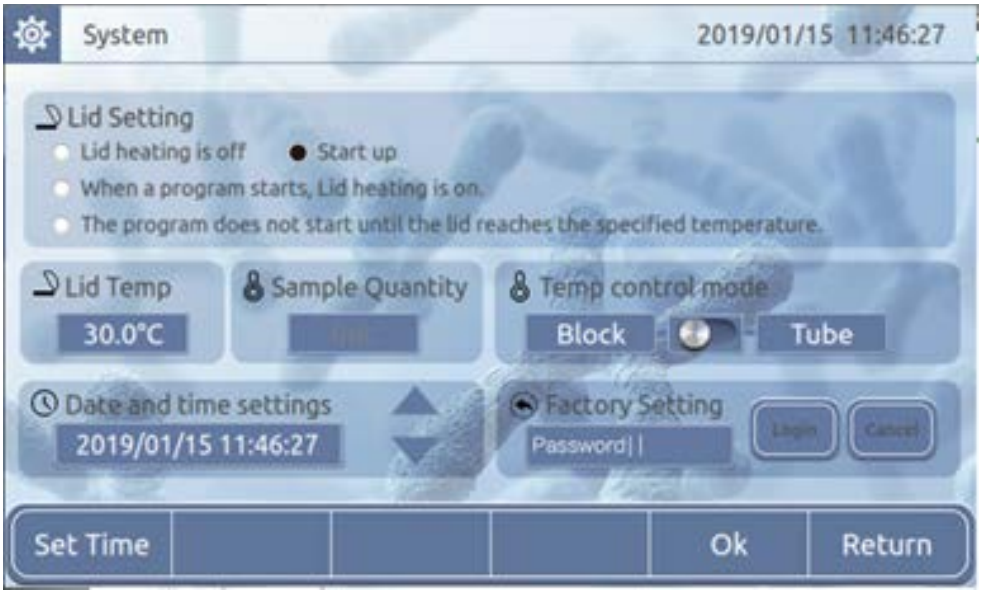
- Select **“Register”** to open the registration interface. Enter the username, password, and required information, then click **“OK”** to complete registration.
- Select **“Login”** to open the login interface. Enter the required credentials to log in.

Note: Users logged in as **Admin** can delete other user accounts.

System Settings

Select the **"System"** icon on the main interface to open the system settings screen (see Figure 9).

After adjusting settings, click **"OK"** to save or select **"Return"** to go back to the main interface.



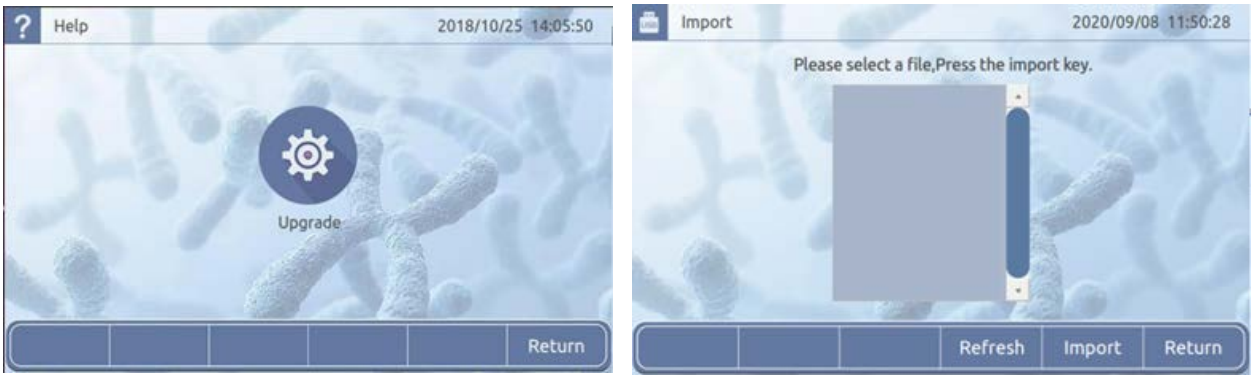
(Figure 9)

Help / File Import

Select the **"Help"** icon on the main interface to open the help screen (see Figure 10).

Insert a USB drive before powering on the instrument. The **Import File** button will appear. Select this button to open the import interface, choose the desired file, and click **"Import"** to import it to the current user account.

Select **"Refresh"** to update the file library. Restart the instrument after completing the operation.



(Figure 10)

MAINTENANCE

Clean the base holes using a neutral soap solution. Avoid strong bases, alcohol, or organic solvents.

Keep the area beneath the unit and the left and right ventilation openings clear. Dust may accumulate on the ventilation windows over time and should be cleaned regularly to ensure proper heat dissipation.

Clean the module frequently. Residue buildup in the module cavity may affect temperature performance, wipe regularly with a cotton cloth.

TROUBLESHOOTING

Issue	Potential Cause	Recommended Action
Error Display: Open: x / Short: x	Sensor open or short circuit detected	Contact BT Lab Systems
Display failure or abnormal operation	Hardware failure	Contact BT Lab Systems
Touch failure	Hardware failure	Contact BT Lab Systems
Power adapter indicator not lit.	Faulty power adapter or host unit	Contact BT Lab Systems
Block is not heated	Hardware failure	Contact BT Lab Systems
Block temperature is too high or too low	Hardware failure	Contact BT Lab Systems
Hot lid temperature is too high	Hardware failure	Contact BT Lab Systems
Fan not rotating	Hardware failure	Contact BT Lab Systems

WARRANTY

Our company guarantees that this unit is warranted against defective material and workmanship for a period of one year from the date of shipment. We will repair or replace the defective equipment returned during the warranty period free if the equipment has been used under normal laboratory conditions and in accordance with the instruction in this manual. The following defects are specifically excluded:

1. Damage caused by accident, misuse, or abuse.
2. Damage caused by disaster.
3. Repair or modification by anyone else without authorization.
4. Corrosion due to the use of improper solvent or sample.
5. Defects caused by improper operation.
6. Use of fittings or other spare parts supplied by different manufacturers.

This warranty does not apply to platinum wire and all the accessories.

A return authorization must be obtained from us before returning any product for repair on a freight prepaid basis.

For any inquiry or request for repair service, please contact BT Lab Systems via the email below.

E-Mail: info@BTLabSystems.com

TECHNICAL SUPPORT

BT Lab Systems offers technical support for all its products. If you have any questions about the product's use or operation, please contact BT Lab Systems at the following info.

E-Mail: info@BTLabSystems.com