Qamp$_{mini}$™

Thermal cycler

Operation Manual

Ver 1.1

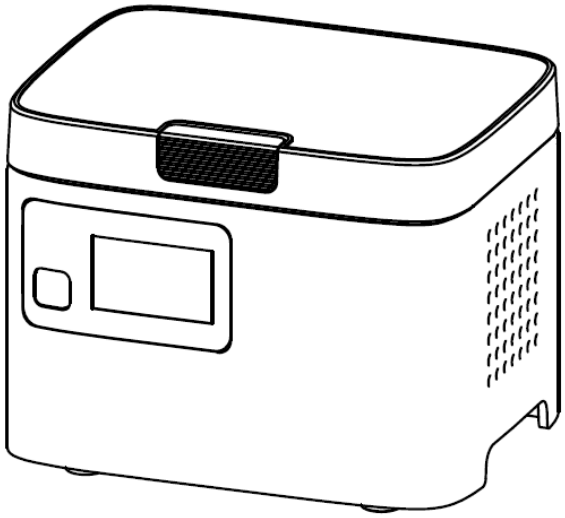


Table of Contents

1. Safety Precautions

Before using the $Qamp_{mini}$, please read this operation manual carefully and pay attention to the safety information. To guarantee problem free operation, please follow the instructions and safety precautions to ensure safe operation of the $Qamp_{mini}$. It is essential to observe the following:

1. Do not use the device in a potentially explosive environment or with potentially explosive chemicals.
2. Avoid the device in direct sunlight.
3. Choose a flat, stable surface capable of supporting the weight of the device.
4. Make sure the power source conforms to the required power supply specifications.
5. To avoid electric shock, make sure the device is plugged into a grounded electrical outlet.
6. Do not allow water or any foreign objects to enter the various openings of the device.
7. Switch off the device and unplug the mains cable before cleaning or performing service on the device, for instance when replacing the fuses.
8. Repairs should be carried out by authorized service personnel only.
9. Safety label

High Temperature Label: Please be aware of the heated components.

2. General Description

$Qamp_{mini}$ is a portable PCR thermocycler. It contains centrally positioned Peltier heating & cooling module for 1-8 samples. This design leads to accuracy in analysis and cost efficiency without sacrificing performance and quality. With the compact size and one start button to operate design, $Qamp_{mini}$ is the ideal instrument for laboratories or classrooms and in the fields of epidemiology, veterinary, food testing, pathogen detection, ecology, archaeology research, and others.

2.1 Features

- Compact size (10x 13x 10 cm)
- Lightweight; portable; modern design.
- 8 x 0.2ml PCR tube capacity.
- One touch to start.
- With heating platen to prevent the formation of condensation.
- Precise temperature control.

2.2 Product Overview

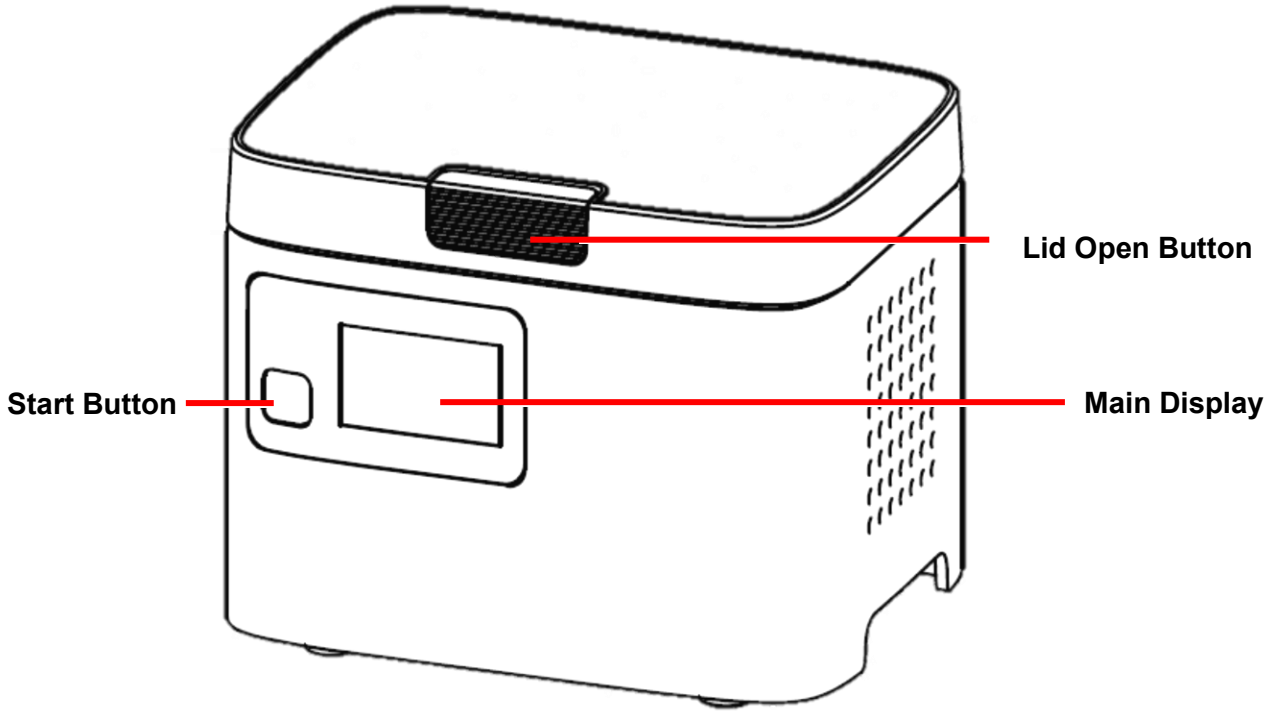


Figure 1. Front view

Table 1. Detailed description for front view

Name	Function
Main Display	For displaying the status, temperature and time.
Start Button	To start, stop the PCR program or switch the main display.
Lid Open Button	To open and close the lid.

Note
Please do not touch or press on the main display.

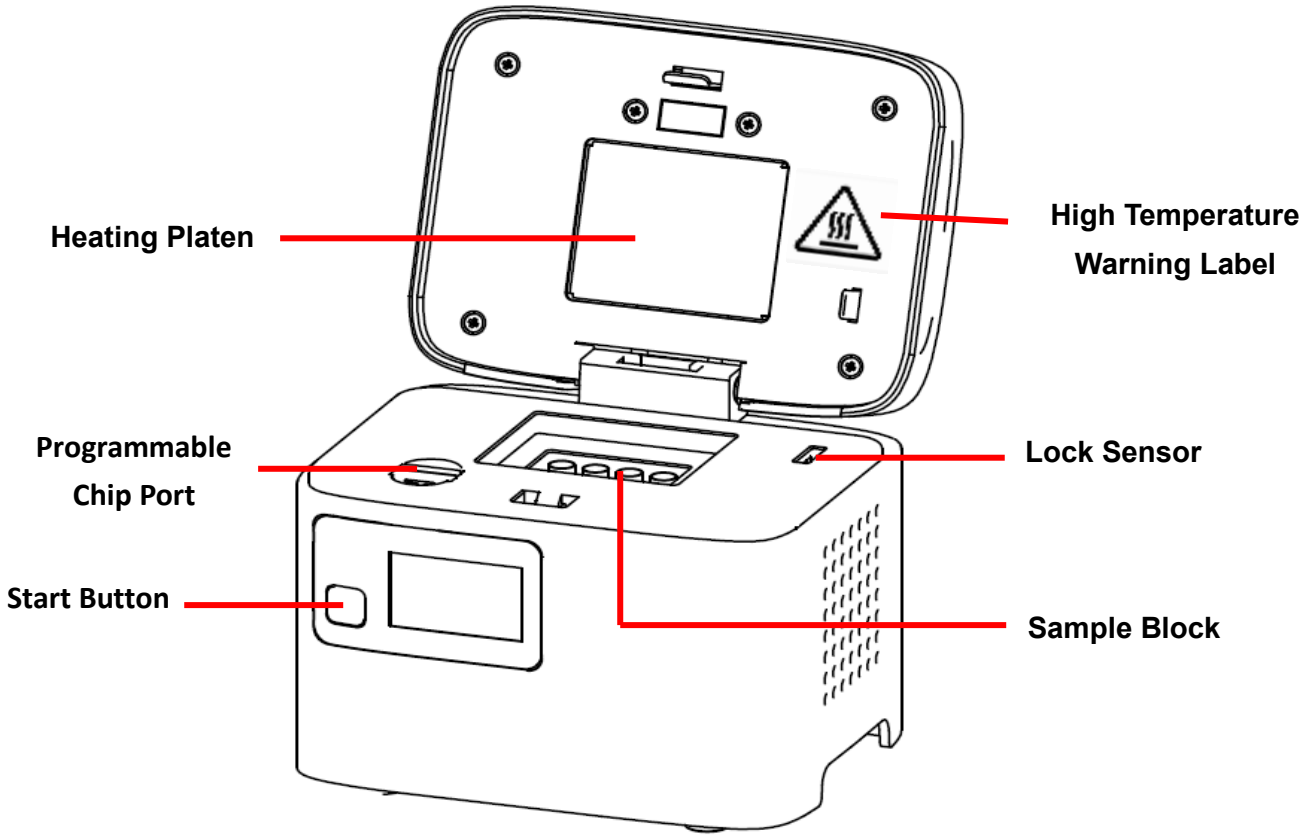


Figure 2. Front view with lid open

Table 2. Detailed description for front view with lid open

Name	Function
High Temperature Warning Label	Warning the high temperature of lid heated platen and the sample block.
Heating Platen	The heating platen is designed to prevent condensation inside the reaction vessels and to apply consistent pressure to the top of the reaction vessels. This ensures good contact between the reaction vessels and the sample block for better heat conduction. It will also help prevent the leakage of sample vapor caused by weak vessel caps or poor sealing.
Sample Block	The sample block holds the reaction vessels.
Program Chip Port	Insert the Programmable Chip in this port.
Lock Sensor	The lock sensor will detect the status of the lid. With lock sensor function: When lid open, the program will pause. Without lock sensor function: When lid open, the program will continue.

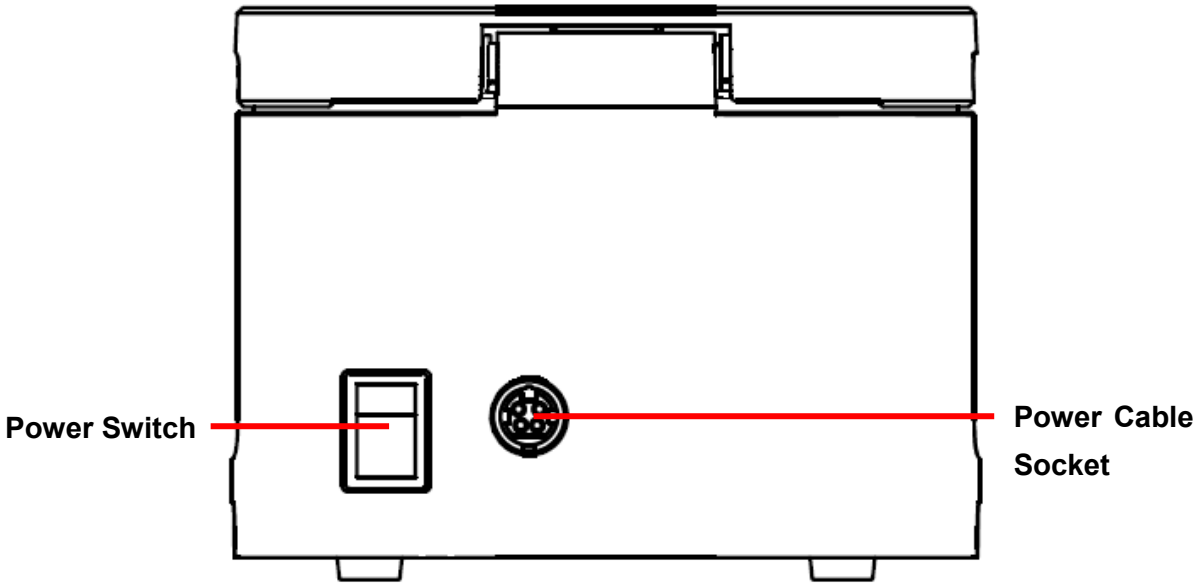


Figure 3. Rear view

Table 3. Detailed description for rear view

Name	Function
Power Cable Socket	Power cable socket compartment.
Power Switch	Power On/Off switch.

3. Unpacking

3.1 Unpacking List

Open the $Qamp_{mini}$ package and confirm that all the listed items are included:

- $Qamp_{mini}$ unit x 1
- Programmable Chip x 1
- Operation manual x 1
- Warranty card x 1
- AC power adapter x 1
- AC power cord x 1
- *Qamp* writer with USB cord (optional)

If there is any item missing, damaged, or incorrect in the package, please contact your distributor or sales representative.

4. Operation

4.1 Initial Operation

Place the device on a steady, flat table. Check the power source is compatible. Connect the power adaptor with $Qamp_{mini}$.

Turn on the power switch at the back of the $Qamp_{mini}$. The main screen will light up and the heated platen will begin to heat up. When the temperature reaches 60℃, the machine will make two beeps. Remember to switch off the device when not in use.

4.2 Lid Opening/Closing

To open the lid, push the lid open button inwards and lift the lid, as shown in Figure 4.

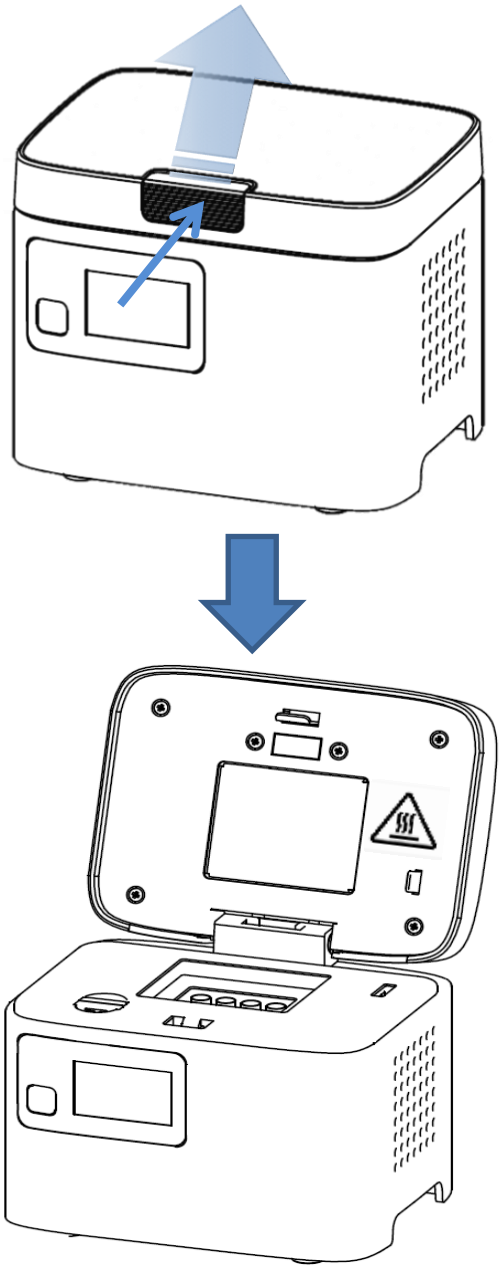


Figure 4. Opening the lid

To close the lid, push the lid downwards until it locked as show in Figure 5

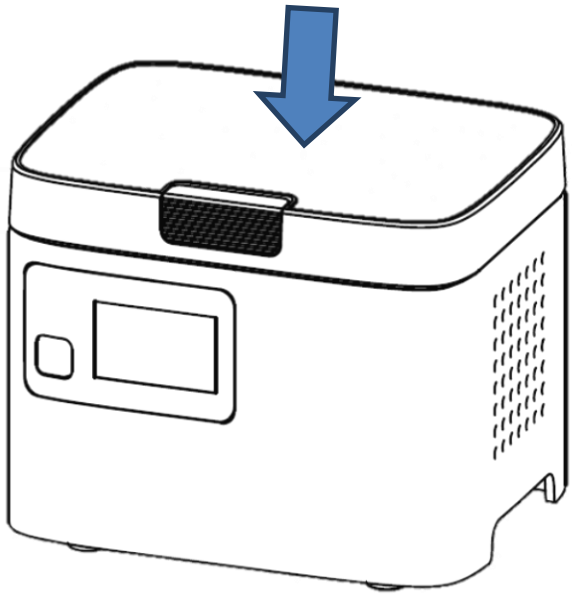


Figure 5. Closing the lid

4.3 Programmable Chip

The Programmable Chip is for saving PCR programs according to applications. The program details can be edited by *Qamp* writer (see Chapter 5) and will be recognized automatically when the Programmable Chip is inserted into the port

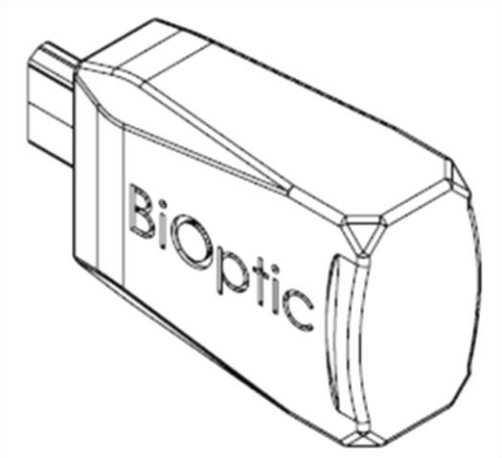


Figure 6. Programmable Chip

4.4 Heated Platen

The heated platen raises the temperature of the air in the upper part of the sample vessels to a higher temperature than the reaction mixture. This prevents condensation of the evaporated water vapor on the vessel walls and keeps the concentration of the reaction mixture unchanged during the heating and cooling cycles. The heated platen also applies pressure to the caps or sealing film on the vessels to prevent vapor loss and cross contamination between samples.

4.5 Loading the Reaction Vessel

For optimal performance of the $Qamp_{mini}$, the recommended sample volume for 0.2ml tubes is 20-50µl. Please make sure the tube cap is sealed tightly to prevent evaporation and overflow of liquid. Make sure the tube is pushed straight down into the well.

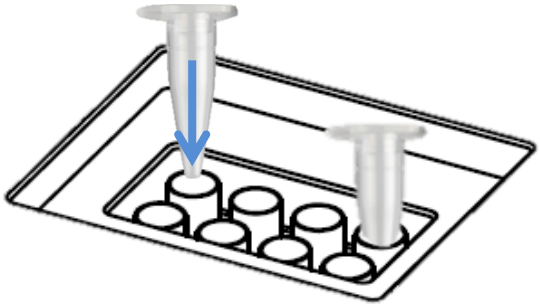


Figure 7. Loading the Reaction Vessel

4.6 Main Display

The information displayed on the **Main Display** will include the programmable number, the temperature of the heater and the remaining time as in the figure below.

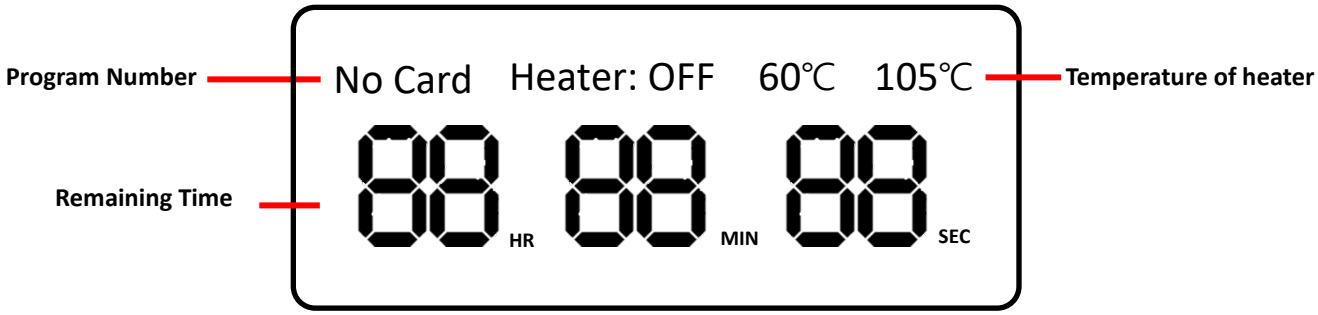


Figure 8. Main Display Overview

4.7 Start Running

After $Qamp_{mini}$ has recognized the program in the Programmable Chip, please push the start button to proceed the program. While the program is running, the Start Button acts as a change-over switch that toggles the main screen display between countdown time and heater temperature. If necessary, the Start Button can be pressed for 3 seconds to stop the program.

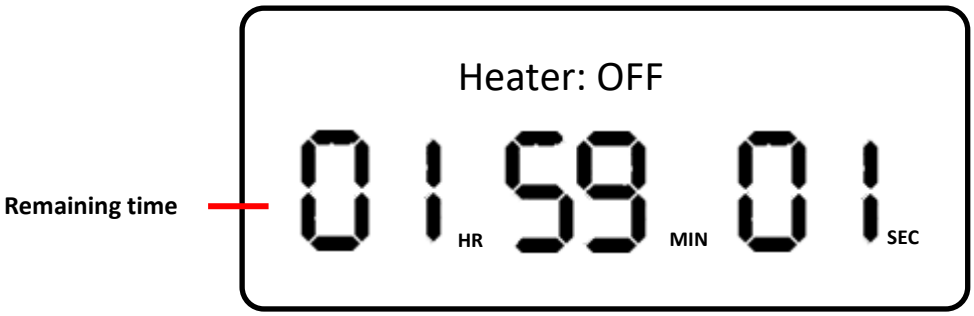


Figure 8. Main Display shows countdown time during running

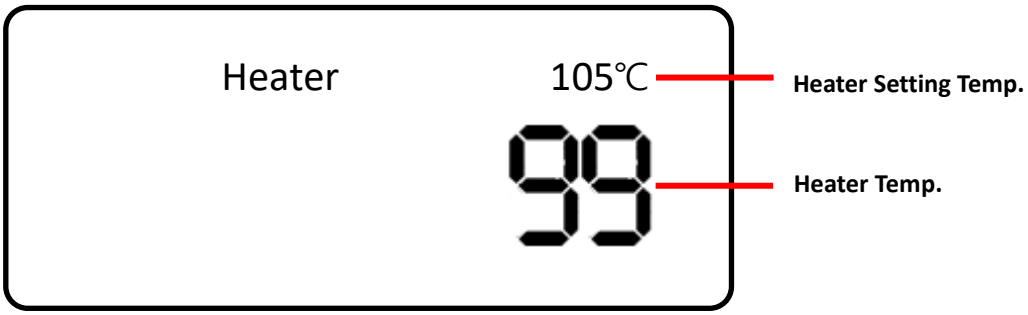


Figure 9. Main Display shows heater temperature during running

4.1 *Qamp* Master Software

4.2 *Qamp* Writer and Programmable Chip preparation

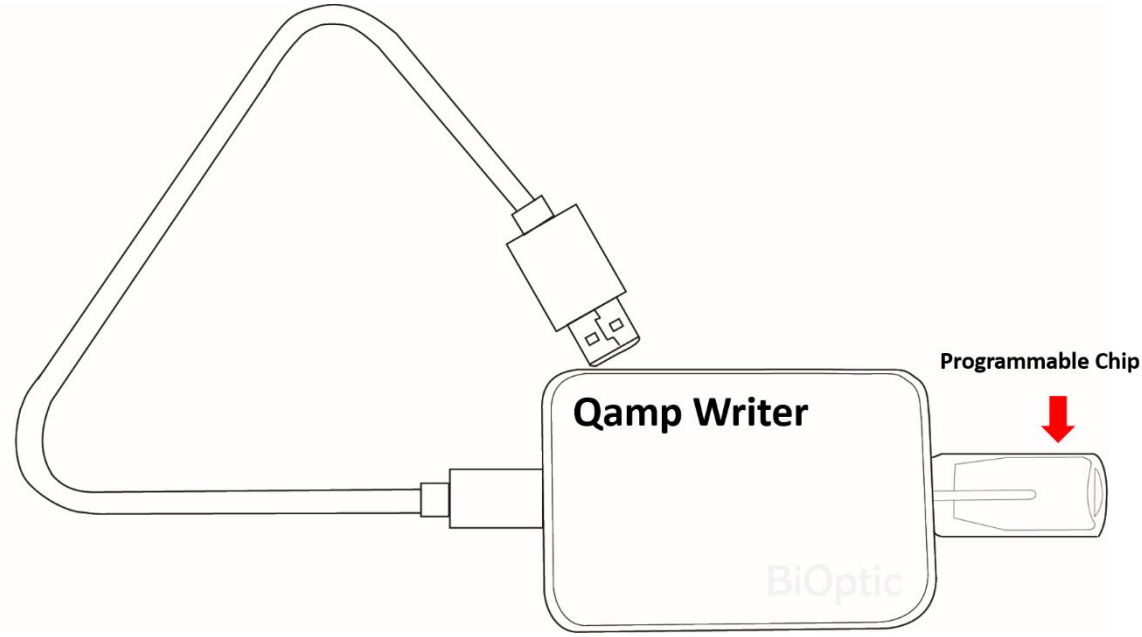


Figure 10. The *Qamp* Writer with Programmable Chip

Step 1. Install the software of *Qamp* Master in your PC or laptop. The software is stored in the USB drive which provided with $Qamp_{mini}$ Thermal cycler package (C310200).

Step 2. Plug the Programmable Chip (C315101) into the *Qamp* Writer, and connect with the PC by the USB cord.

Step 3. Double-click the icon on the desktop to launch the software.

4.3 Software interface

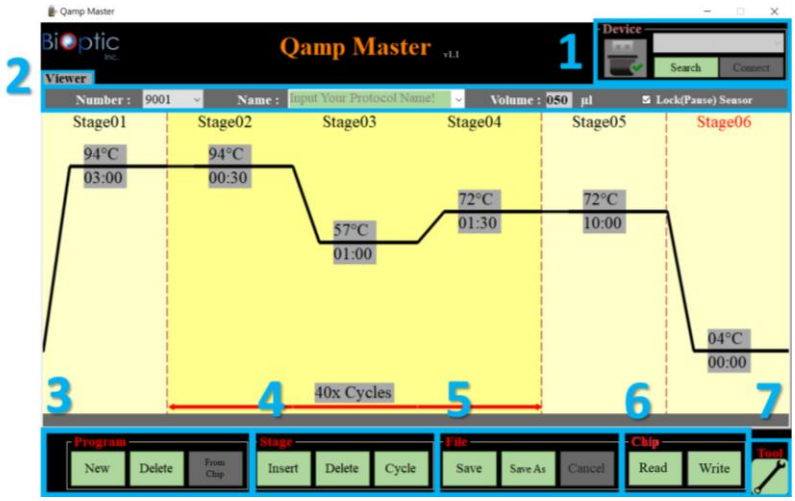


Figure 11. The main interface of *Qamp* Master

1. Device Connect:
   - **Search**: Search for the device (*Qamp* Writer).
   - **Connect/ Disconnect**: Connect and disconnect the device (*Qamp* Writer).
   - The *Qamp* Writer will be automatically recognized by *Qamp* Master if it is connected to PC before launching *Qamp* Master.
2. Information:
   - **Viewer/ Chip Tab**: Switch the view of program from database or the Programmable Chip (the chip tap only shows after reading the Programmable Chip) (Figure 12)
   - **Number:** Program number. Switch the programs from database by changing the program number.
   - **Name**: Edit the program name. Switch the programs from database by changing the program name.
   - **Volume:** Edit the PCR sample volume
   - **Lock (Pause) Sensor:** Check to pause the program or uncheck to keep running while lid opening.

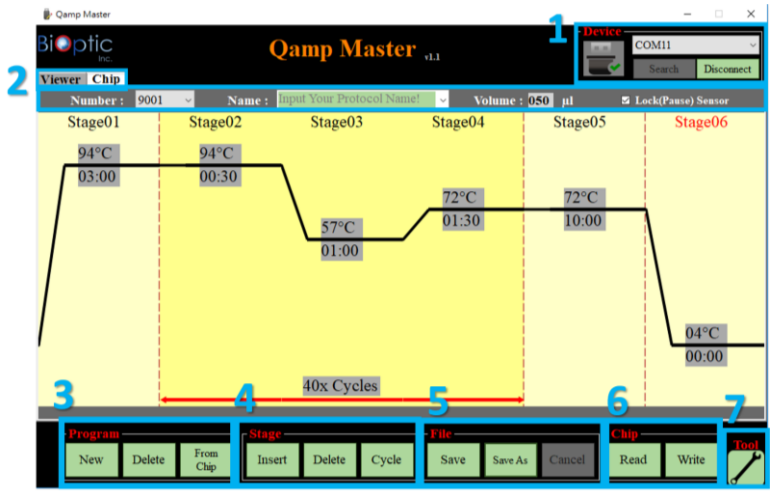


Figure 12. The main interface of *Qamp* Master after reading the Programmable Chip

3. Program:
   - **New:** Create a new program
   - **Delete:** Delete the program
   - **From Chip:** Read the program from Programmable Chip.
4. Stage:
   - **Insert:** Insert a stage to the program.
   - **Delete:** Delete the stage from the program.
   - **Cycle:** Edit the number of cycle from assigned stages.

5. File:
   - **Save:** Save the program.
   - **Save As:** Save the program which you edited as a new program.
   - **Cancel:** Close the program without saving.
6. Chip:
   - **Read:** Read the program from Programmable Chip.
   - **Write:** Write the program into Programmable Chip.
7. Tool:
   - Export or import database.

4.4 PCR program Editing

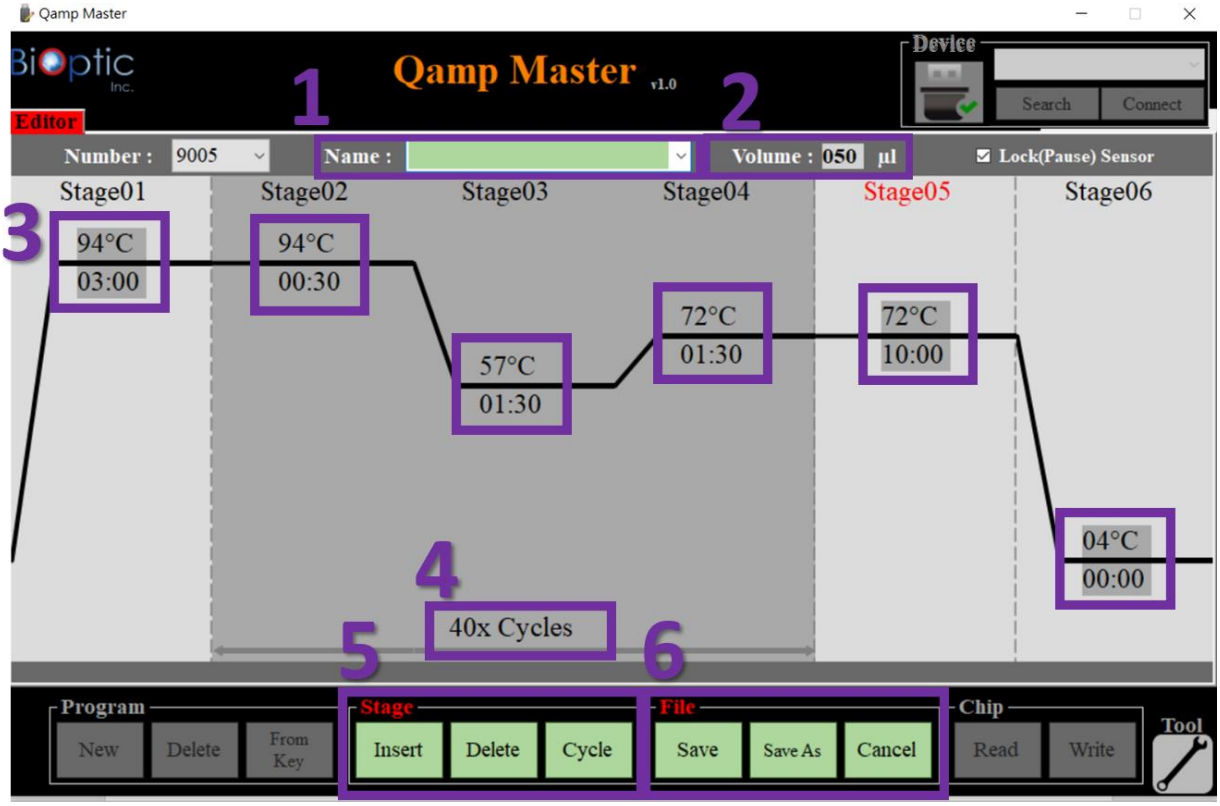
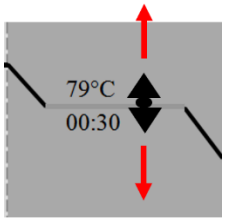
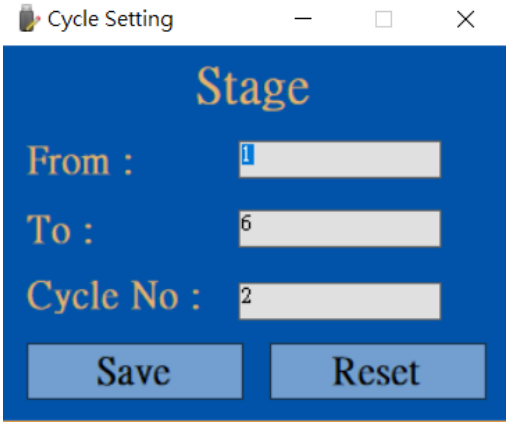


Figure 13. The interface of program editing

1. Edit the Program Name.
2. Input the PCR sample volume from 1 to 100µL (Recommended sample volume for 0.2ml tubes is 20-50µl).
   - The temperature control algorithm will estimate the sample temperature based on the block temperature and the sample volume.
3. Adjust the temperature and time
   - Input the number to adjust temperature and time (00:00 represent the infinite time).
   - The temperature also can be adjusted by dragging the black line.



4. Cycle number setting
   - Enter the number to change cycle number.
5. Insert and delete the stage and cycle number
   - The selected stage can be deleted or a new stage can be inserted in next.
   - User can change the cycle number of assigned stage.
     - Reset: Reset the column content.
     - Save: Save the setting.



6. Save/Save As/Cancel the edited program
   - **Save:** Save the program.
   - **Save As:** Save the program which you edited as a new program.
   - **Cancel:** Close the program without saving.

Example of program:

Stage	Number of cycles	Step	Temperature	Time
1	**1**	**Initial denaturation**	95°C	10 minutes
2	**35-40**	**Denaturation**	95°C	30 seconds
		Annealing	57°C	30 seconds
		Extension	72°C	15-30 sec/kb
3	**1**	**Final Extension**	72°C	5-10 minutes
		Holding	14°C	

5. Maintenance

5.1 Cleaning the Unit

Please ensure that no liquid is spilled onto or inside the unit. In addition, periodically use a soft lint-free cloth and a little de-ionized water to wipe the unit and remove dust or other residue.

5.2 Cleaning the Heating Platen

Turn off the $Qamp_{mini}$, unplug the power adaptor and wait for the unit to cool. Use a mild detergent to clean any material residue. A Kimwipe™ with 70% ethanol will also help to remove residue from the marker paint on the tube cap. Make sure the heated platen is completely dry before replacing the power cable.

6. Troubleshooting

6.1 General Error

Problem	Cause	Action
The display remains off even when power is switched on.	Power is not reaching the system.	Check power source voltage.
	The power adaptor is not properly plugged into the socket.	Reconnect the power adaptor.
	Faulty power switch.	Return the unit for service.
Lid cannot be opened or closed.	Foreign object between heated platen and sample block.	Remove the foreign object or matter.
	Faulty lid lock mechanism.	Return the unit for service.
The display goes off.	Faulty backlight.	Return the unit for service.
	Faulty LCD panel	Return the unit for service.
Cycle time is too long.	Operating environment temperature may be unsuitable.	Make sure the temperature of the operating environment is between 15 and 30°C.
	The electronic cooling element may be damaged or old.	Return the unit for service.
	Faulty temperature sensor.	Return the unit for service.
Heated platen does not work.	Sensor problem.	Return the unit for service.
Error messages.	Refer to the list of error messages in ***Section 6.2*** below.	Check the nature of the error and take the suggested action.

6.2 Error Messages

The instrument might show an error message on the main screen and stop working until the problem has been solved, see the table below.

Message	Cause	Action
Er01- Heater overheat	Heater over 120˚C	Reboot the unit.
Er02- Heater cannot reach the setting temperature.	Faulty heater.	Reboot the unit.
Er03- Heater has lost temperature accuracy	The heater temperature has been over ±3 ˚C for 30 seconds.	Reboot the unit.
Er04- Heater temperature	Heater temperature sensor problem.	Reboot the unit.

sensor error.		
Er05- Block temperature sensor error.	Block temperature sensor problem.	Reboot the unit.
Er06- Block temperature abnormal	Cannot reach set temperature in 1 minute.	Reboot the unit.
Er07- Block overheat.	The block temperature is 20°C over the set temperature.	Reboot the unit.
Er08- Block has lost temperature accuracy.	The block temperature has gone over ±3.0°C for 10 seconds.	Reboot the unit.
Er09- Cannot read the program even when Programmable Chip is properly inserted.	Faulty Programmable Chip.	Return the Programmable Chip for service.
	Programmable Chip is not properly plugged into the port.	Unplug and replug the Programmable Chip.
Er10- Abnormal interruption of power supply.	Instrument shut down while a program was running.	Push the start button to reset the program.
	Power supply was interrupted while a program was running.	

If the same error message appears after rebooting, please return the unit for service.

7. Appendix A: Technical Specifications

Sample Block	
2 X 4 Well Block	0.2 ml PCR tube /w flat or dome cap
Block Temperature	
Block Temperature Range	4°C to 99 °C
Max Heating Rate (°C/sec.)	4.6 °C/sec
Max Cooling Rate (°C/sec.)	3.4 °C/sec
Temperature Accuracy	+/- 0.4 °C
Temperature Uniformity Across Block	+/- 0.4 °C
General	
Display	LCD
Heated Platen	fixed 105 °C (pre-heat to 60°C)
Footprint Dimensions	(HxWxD) 104mm x 136mm x 102mm
Weight	1 kg
Adapter	VAC 100-240, 50/60 Hz, 120 W
Operating Temperature	15°C ~ 30°C
Operating Humidity	65% or less RH

8. Appendix B: CE Declaration

CE

BiOptic Inc
4F, No. 108-3, Minquan Rd,
Xindian Dist, New Taipei City 23141,
Taiwan (ROC)

Declaration of Conformity

Product Name: Thermal Cycler

Model Names: $Qamp_{mini}$

All models comply with the following European standards:

EMC: EN 61326 (Group 1, Class A)

Safety: EN 61010-1 and EN 61010-2-101

To the best of my knowledge and belief, these units conform to these standards.

Name: Allen Chi

Position: R&D Director

Issue Date: January 4, 2018

BiOptic Inc

Website: www.bioptic.com.tw E-mail: service@bioptic.com.tw

Tel: +886-2-2218-8726 Fax: +886-2-2218-8727

Add: 4F, No.108-3, Minquan Rd., Xindian Dist., New Taipei City 23141, Taiwan (R.O.C)

P/N: 401-mpbo00-00