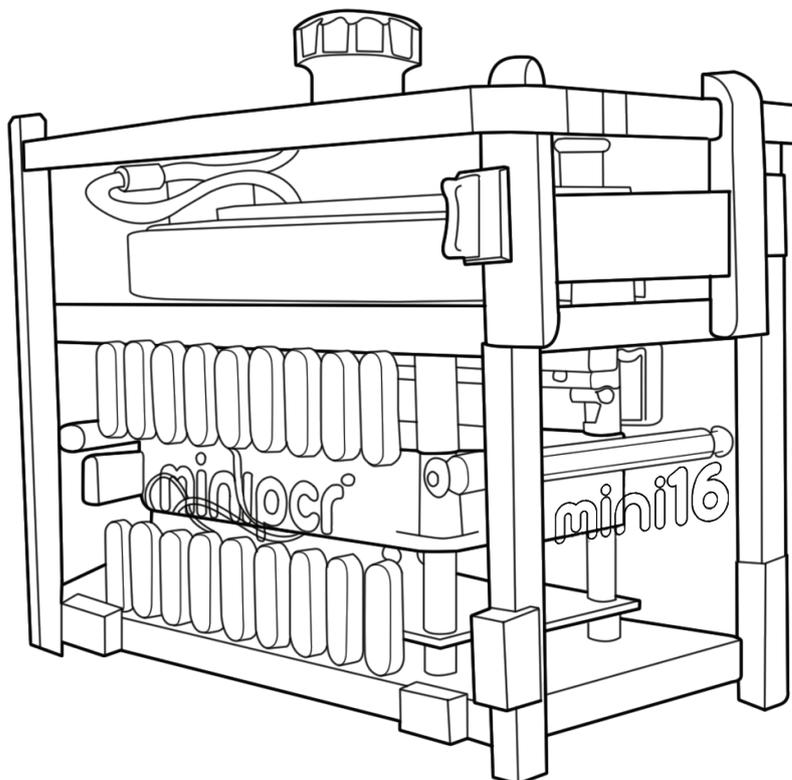




# mini16 thermal cycler

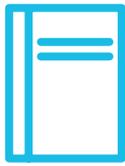
User's guide

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# QUICK START GUIDE

- 1 – Download** software from [minipcr.com/downloads](https://minipcr.com/downloads)
- 2 – Connect** mini16 to your device using USB or Bluetooth® > **Devices tab** 
- 3 – Create**  a PCR, heat block, linear ramp or FLEX program > **Library tab** 
- 4 – Run** by clicking the play  symbol to upload the program and start the run
- 5 – View status** > **Monitor tab** 



# WARRANTY

This Limited Warranty covers defects in materials and workmanship for a period of 24 months from the date of purchase under the following conditions:

This 24-month warranty is valid from the date of purchase of miniPCR thermal cyclers (the “Product”).

This Limited Warranty covers the original purchaser of the Product and shall not extend in its validity to third parties without the written agreement of Amplyus LLC (“Amplyus”).

This Limited Warranty covers only the Product and any original accessories provided with it. It excludes software, documentation, consumables, or related items.

This Limited Warranty will maintain its validity only as long as the Product is operated in the manner, conditions, and with the care described in its User’s Guide or Manual.

This Limited Warranty will be voided by improper or unauthorized maintenance of the Product, or by improper attachment of electrical adapters and power supplies not supplied by Amplyus or its authorized representatives.

This Limited Warranty will be voided by any failure to meet requirements for the operation of a thermal cycler in laboratory conditions as described in the User’s Guide.

Amplyus will repair or replace any defective items upon factory inspection of the item claimed. Amplyus will cover shipping charges if the claim is initiated within 30 days from purchase. After 30 days from the date of purchase, end users of the Product will be responsible for shipping charges to and from the Amplyus facility for assessment and repair under the terms of this Limited Warranty.

This Limited Warranty does not cover wear and tear to components resulting from normal use of the Product, nor does it cover failures caused by incorrect use, negligence, alterations, or damage caused by intentional or accidental misuse of equipment. This Limited Warranty also excludes damage caused during any shipment/transport/movement of the product following its initial receipt by the customer.

Amplyus’ sole liability, under this Limited Warranty, for failure to repair or replace miniPCR thermal cyclers after a reasonable number of attempts, is limited to the replacement of the Product or, at Amplyus’ sole discretion, the refund of the original purchase price of the Product.



# OVERVIEW

## FEATURES

- Dual Bluetooth® and USB connectivity
- Programmable via Windows, Mac, iPhone, iPad, Android and Amazon Fire
- PCR, touchdown PCR, heat block, linear ramp and FLEX programming modes
- FLEX mode allows for user-defined combinations of up to 15 programming steps
- Portable and durable construction
- 16 x 0.2 ml PCR tube capacity (strip compatible)
- On-device microprocessor runs autonomously
- Universal voltage power adaptor 100-240V
- Compatible with Battery/solar power operation for full autonomy (not included)

## TECHNICAL SPECIFICATIONS

- **Sample format:** 16 x 0.2ml PCR tubes (8-strip compatible)
- **Max Heating Ramp Rate:** 3°C / sec
- **Heated Lid:** Independent lid heater up to 120°C, PID control
- **Max Cooling Ramp Rate:** 2°C / sec
- **Program Sharing and Backup:** Unlimited libraries, .plf file
- **Temperature control:** Resistive Heating; assisted cooling
- **Device Connectivity:** Dual USB and Bluetooth® Low-Energy (BLE)
- **Programming Modes:** PCR, Linear Ramp, Heat Block, and FLEX

---

## TECHNICAL SPECIFICATIONS (Cont.)

- **Control System:** Embedded thermistors, adaptive PID algorithm
- **Temperature Range:** Ambient - 99°C
- **Dimensions:** 2" x 5" x 4" (5.1 cm x 12.7 cm x 10.2 cm)
- **Weight:** 1 lb. (450 g) approx.
- **Internal Memory:** Stores current program
- **Power Supply:** AC 100-240 V, 50-60 Hz, 90 W
- **Battery:** Optional Li-Ion miniPCR™ Power Pack (not included)
- **Adjustable Lid:** Compatible with flat or domed caps
- **CE Conformity Mark**

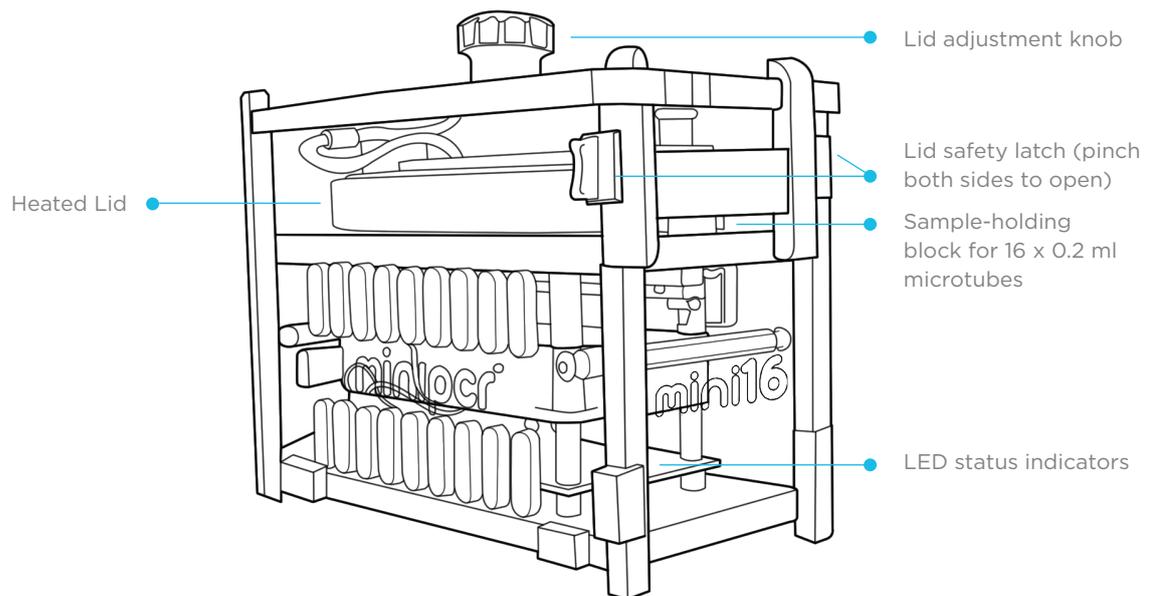
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## WHAT'S INCLUDED

- miniPCR® mini16 thermal cycler
- Universal voltage power adapter (2AA73)
- US-style AC cord (QP-1000-07)
- 6 ft USB Cable (QP-1000-09)
- Drawstring travel pouch (QP-1000-12)

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## COMPONENTS



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## OPTIONAL ACCESSORIES

- miniPCR™ Power Pack, 20,000 mAh Li-Ion Battery (QP-1000-13)
- Portable solar panel (contact [team@minipcr.com](mailto:team@minipcr.com))



# GETTING STARTED

## DOWNLOAD THE miniPCR® APP (FREE DOWNLOAD)

miniPCR App v2.0 or higher is needed to run mini16.

- 1 – Visit [www.minipcr.com/downloads](http://www.minipcr.com/downloads) and select your platform of choice (Windows, Mac, iOS, Android, Amazon Fire). Minimum system requirements are listed on the website.

**iOS users:** visit Apple App Store.

**Windows 10 users:** unzip the file and run the miniPCR installer.

**Mac OS users:** Double click and move App to the folder of your choice. If the operating system will not let you open the software “miniPCR can’t be opened because it was not downloaded from the Mac App Store”, you will need to authorize installation in Security and Privacy setting in your system preferences

**Android users:** visit the Android Play Store.

**Amazon Fire users:** click on ‘Get app’ from the Amazon web store.

**Chromebook users:** install the Chromebook Beta version (available through Google Play only).

- 2 – Open the App by double-clicking or tapping on the miniPCR icon 

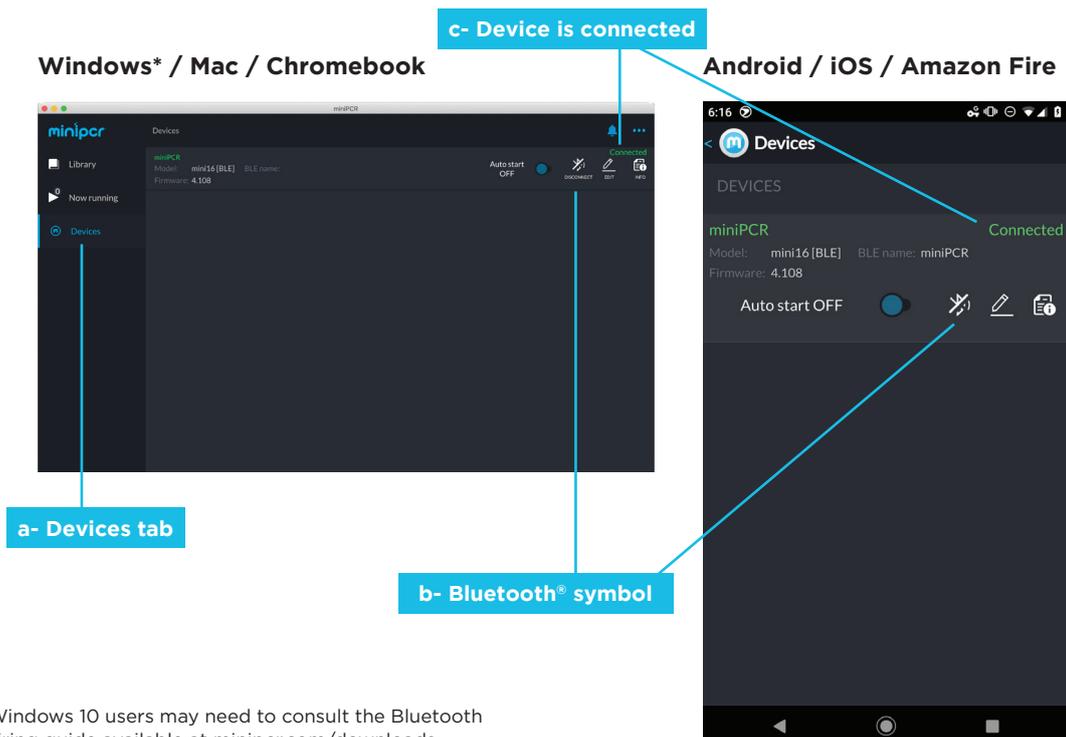
## CONNECT

### Establishing a Bluetooth® (BLE) connection (iOS, Windows, Mac, Android, Amazon Fire and Chromebook)

Note: make sure Bluetooth® is turned on on your device.

- 1 – Turn on the mini16 using the on/off switch on the back of the unit. A flashing blue LED on the front of the mini16 indicates that it is ready to connect to your device.
- 2 – Click the Devices tab (Win/Mac) or the  icon (mobile, top center of the screen). mini16 units within BLE range will be listed. Click on the BLE symbol  of the mini16 unit you would like to connect to.
- 3 – Successful pairing is indicated in the App “Devices” tab by green text “Connected” and and by the blue LED staying on solid.

**You are ready to use your miniPCR® thermal cyclers.**



\* Windows 10 users may need to consult the Bluetooth pairing guide available at [minipcr.com/downloads](https://minipcr.com/downloads)

## CONNECT (continued)

### Establishing a USB connection (Windows, Mac, Android and Amazon Fire)\*

\* USB connection not supported for Chromebook.

- 1 – Using: USB-A** USB-A to USB-A cable supplied

Connect the miniPCR supplied USB cable to the computer and the back of the mini16.

- Using: USB-C** USB-C OTG adapter required.

#### Android

1. With software closed, connect the mini16 to your Android using a USB-C OTG adapter and the original USB cable provided with the miniPCR.

2. The App will open and the mini16 will connect automatically. If the software fails to recognize the mini16, close the App and open it again.

#### Win / Mac

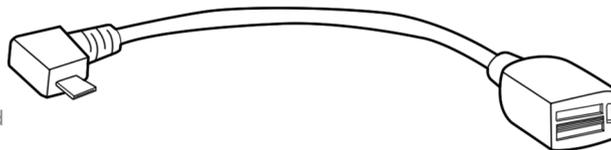
Connect the mini16 to your computer, using a USB-C to USB-A adapter and the original USB cable provided with the miniPCR. The mini16 will connect automatically and be ready to use.

- Using: micro-USB** OTG ('On the go') adapter required.

#### Android and Amazon Fire

1- First connect the OTG into your device and only then connect the miniPCR USB cable into OTG adapter and the mini16 unit.

1st. Connect  
OTG to Android  
device



2nd. Connect OTG  
to miniPCR  
USB Cable

2. The mini16 will connect automatically.

- 2 –** The three LEDs on the front of your miniPCR® machine will blink several times during two seconds.
- 3 –** The mini16 will be listed under the Devices or  tab of your software.

**You are ready to use your miniPCR® thermal cycler.**

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## OPTIONAL CONFIGURATIONS

### Establishing connections to multiple miniPCR units

This procedure works for both BLE and USB connections.

- 1 –** Go to Devices to see the list of available mini16 units. Note: it is possible to connect mini8 and mini16 units simultaneously\*.
- 2 –** All units connected through USB will automatically appear as 'Connected' and be ready to program.
- 3 –** To connect multiple units over BLE follow the steps in the [Establishing a Bluetooth® \(BLE\) connection](#) on page 9.

### Changing device name (optional)

- 1 –** The default name of your miniPCR is its serial number located on the back of the device.
- 2 –** Navigate to the Devices tab or  screen and click on the  icon of the device's name to edit. Press Save.

\* Feature not available for Chromebook.



# SOFTWARE OPERATION

miniPCR App v2.0 or higher is needed to run mini16\*.

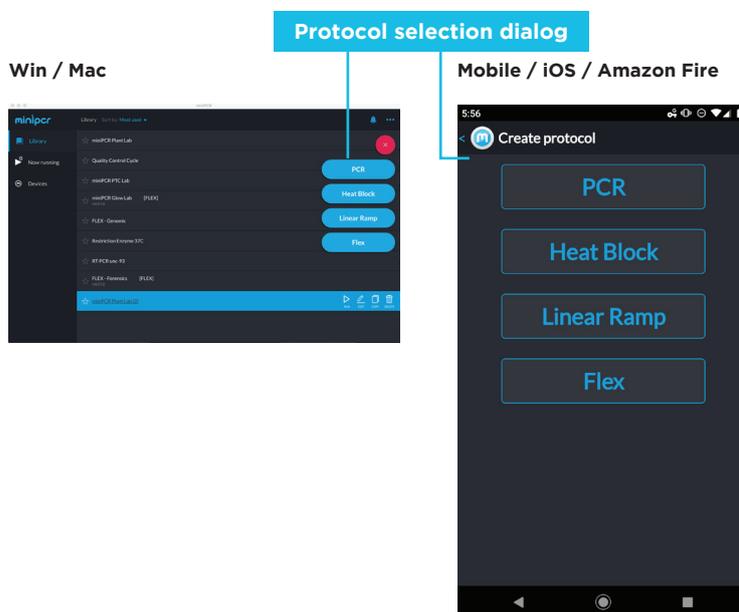
\* Chromebook users: Beta version available on Google Play.

## CREATING AND SAVING PROTOCOLS

You can program mini16 in four different modes: PCR, heat block, linear ramp and FLEX (includes touchdown PCR)

- 1 – Open the miniPCR™ App in your device and remain on the “Library” tab.
- 2 – Click on the  button on the top right corner.
- 3 – Select the “Protocol Type” from the menu on the top of the right pane (Win/Mac/Chromebook) or screen (Android / iOS / Amazon Fire).

- PCR: for thermal cycling reactions
- Heat Block: for incubations
- Linear Ramp: for heating or cooling reactions at a steady rate
- Flex: touchdown PCR and any combination of the above



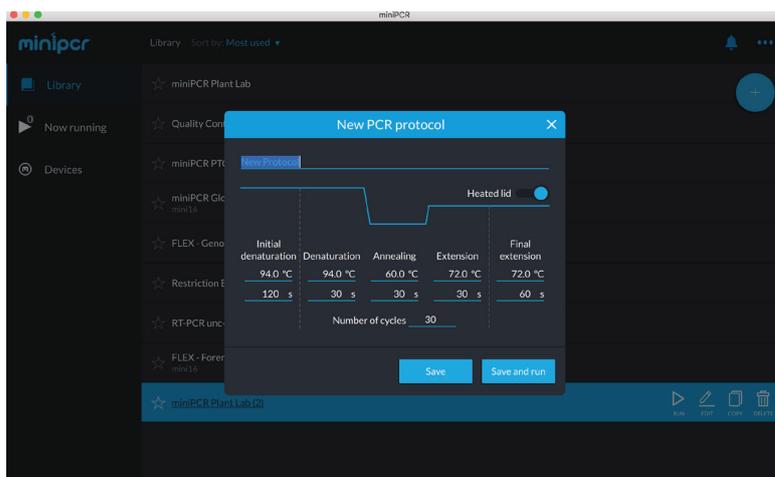
- 4 – Enter a protocol name; for example “GeneX PCR”.
- 5 – Enter protocol parameters (Read below for details on protocol inputs.)
- 6 – Click “Save” or “Save and Run” to store your new protocol
  - Your protocol is now ready to use and available in the Library.
  - Tip: clicking “Save and Run” instead of “Save” will bring up a dialog in which you can select the miniPCR machines to which you will upload the program. Run will start immediately.

## CREATING AND SAVING PROTOCOLS (cont.)

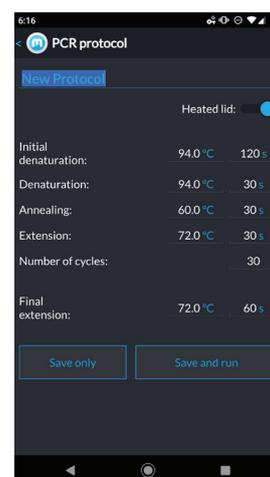
### PCR mode

Input temperatures up to 99 °C, step times up to 9999 and cycles up to 99. Heated lid is turned on by default. This setting maintains the lid at approximately 105 °C to prevent condensation on the caps of the tubes.

#### Win / Mac



#### Mobile / iOS / Amazon Fire



### Heat block mode

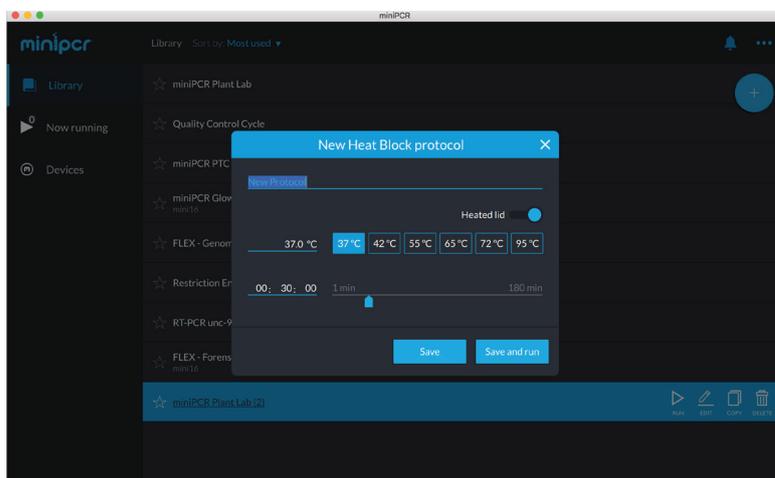
Input temperatures up to 99 °C and time up to 167 hours.

Select from preset temperatures (37 °C, 42 °C, 55 °C, 65 °C, 72 °C, 95 °C) or use the dialog box to enter any temperature between 30 °C and 99 °C.

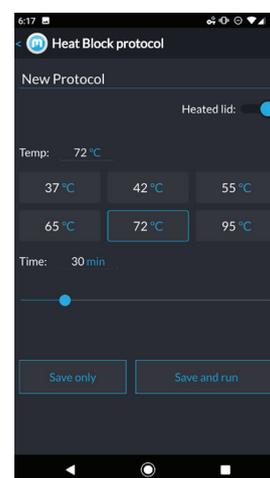
Use the slider to select times between 1 and 180 minutes or the dialog box to input any number between 1 and 9999 minutes (mobile), or 166 h 59 m, 59 s.

Heated lid is turned on by default. This setting maintains the lid at approx 10 degrees above the target temperature to prevent condensation on the caps of the tubes.

#### Win / Mac



#### Mobile / iOS / Amazon Fire

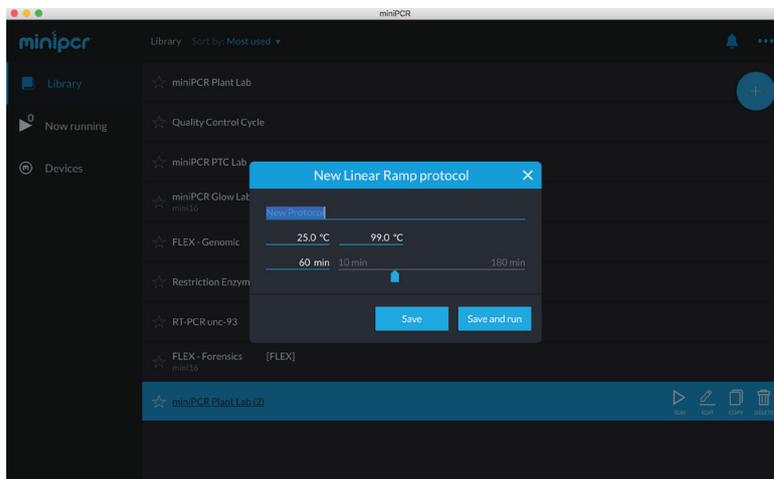


## CREATING AND SAVING PROTOCOLS (cont.)

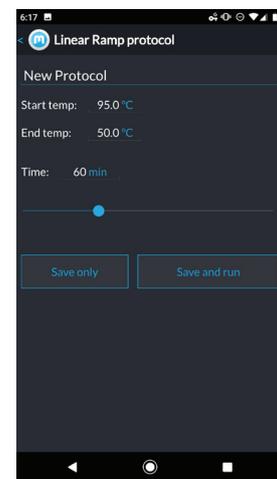
### Linear ramp mode

Select the initial and final temperatures and the ramp time between the two. A heating or cooling ramp can be programmed. Heated lid is turned on by default. This setting maintains the lid at approximately 10 degrees above the current temperature.

#### Win / Mac



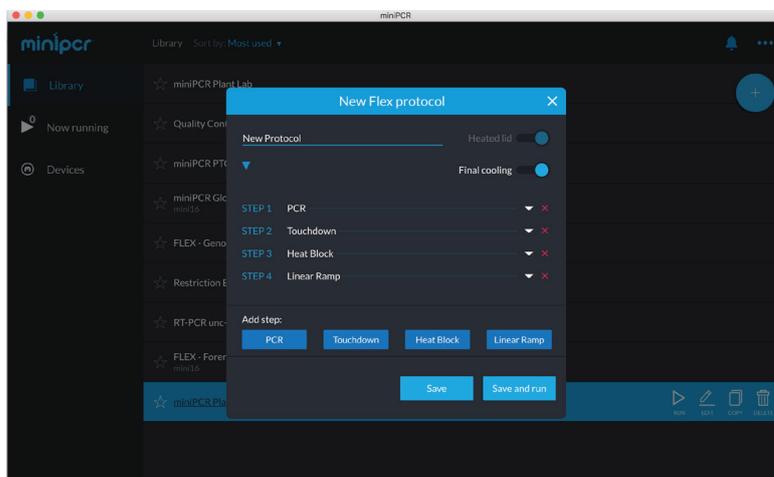
#### Mobile / iOS / Amazon Fire



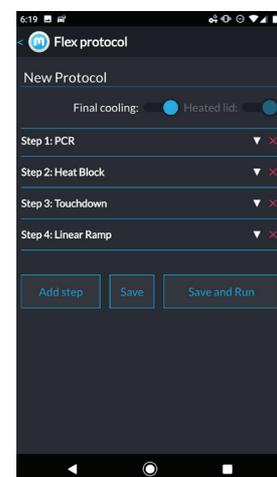
### Flex Mode

In FLEX mode, you can create a program containing a combination of PCR, heat block, linear ramp and touchdown PCR steps. Heated lid is turned on by default.

#### Win / Mac



#### Mobile / iOS / Amazon Fire



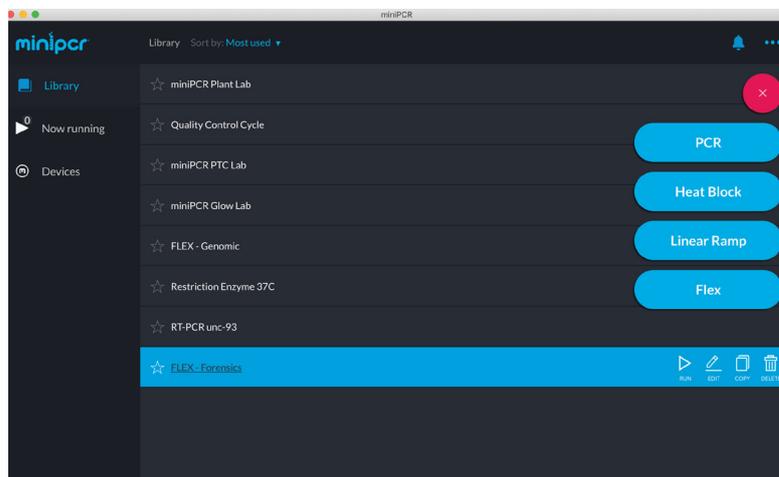
Note: PCR, heat block and linear ramp protocols have a cool down step that brings the block to 37 °C. When creating a FLEX program, the final cooling step can be toggled on and off.

## PROTOCOL OPTIONS

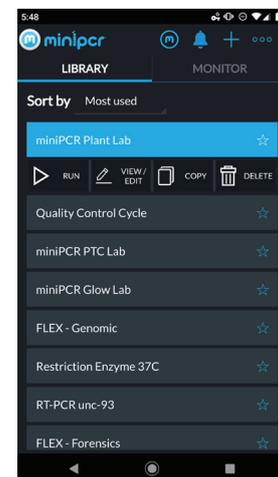
### Editing protocols

- 1 – Click or tap on the desired protocol from your Library to show available options: Run, View/Edit,  Copy,  Delete . Click View/Edit.

#### Win / Mac



#### Mobile / iOS / Amazon Fire



- 2 – Update protocol parameters (e.g. change the number of cycles, temperature, etc.)
- 3 – Click “Save Only” to store the updated protocol parameters or “Save and Run” to store changes and start the protocol.

### Copying protocols

You can create a copy of an existing protocol by clicking “Copy”. A new protocol will be created (“Protocol Name (2)”). The original protocol will be preserved.

### Deleting protocols

Press the  icon to delete the protocol.

*Warning: this action cannot be undone.*

## RUNNING AND MONITORING

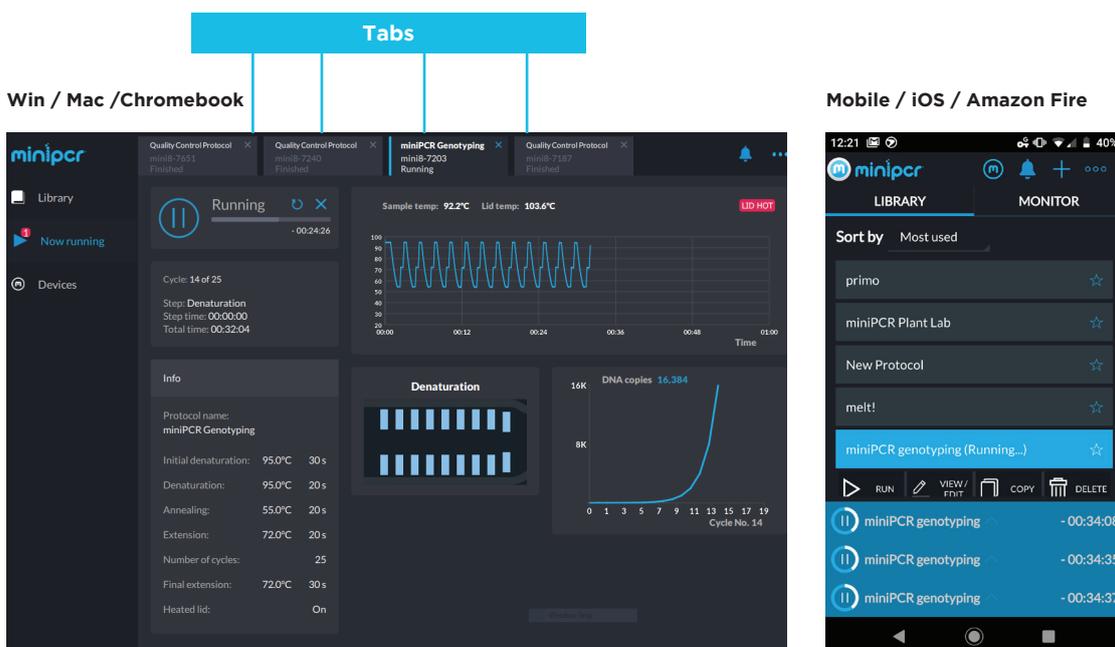
### Starting the run

- 1 – Set the Auto Start on or off according to your needs (see ‘Auto Start feature’ section below).
- 2 – Move the power switch on the back of the mini16 to the ON position.
- 3 – Connect your miniPCR® thermal cycler via USB cable or Bluetooth®.

*Tip: You can simultaneously monitor multiple miniPCR machines with one device. Each miniPCR® will appear as a separate tab in the “Now running” (Mac/Win) or “MONITOR” (mobile) tab.*

*Tip: If using a USB connection, external power is not needed at this step; the power switch may remain in the OFF position.*

In Windows and Mac each miniPCR will appear as a separate tab in the Monitor tab. In Android, iOS, or Amazon Fire each miniPCR will appear highlighted as a blue bar at the bottom of the Library tab.



- 4 – Select the desired protocol from your Library. Click the “Run” button. The run will automatically begin, signaled by the green LED turning on.

## Auto Start feature

The Auto Start feature controls whether a run will start automatically when the power switch is flipped to the ON position. This feature is set for each mini16 unit in the Devices tab. The Auto Start selection remains in the mini16 memory until it is changed from the software.

### Auto Start OFF (default)

- A program run will only start once RUN is clicked in the Library tab. Connection to a device is required. This is the suggested setting for routine laboratory use.

### Auto Start ON

The run will start immediately after the power switch is flipped to the ON position. This the suggested setting for field use or when a programming device is not readily available.

- From power OFF position: Connect to AC power, turn the power switch ON. The last protocol that was programmed in the mini16 will immediately start. Connection to software is not required.
- From power ON position: Cycle the power switch OFF, then ON. Your last protocol will begin automatically.

## Autonomous run feature

- It is not necessary to maintain a USB or Bluetooth® connection during a run. The miniPCR will keep running the protocol while the power switch remains in the ON position.

*Tip: The end of a run will be signaled by the green, yellow and red LEDs staying ON.*

## Monitoring the run

1 — Click on “[miniPCR name]” tab (Windows/Mac) or the highlighted active protocol in the Library tab (iOS, Android, Amazon Fire) to monitor run status.

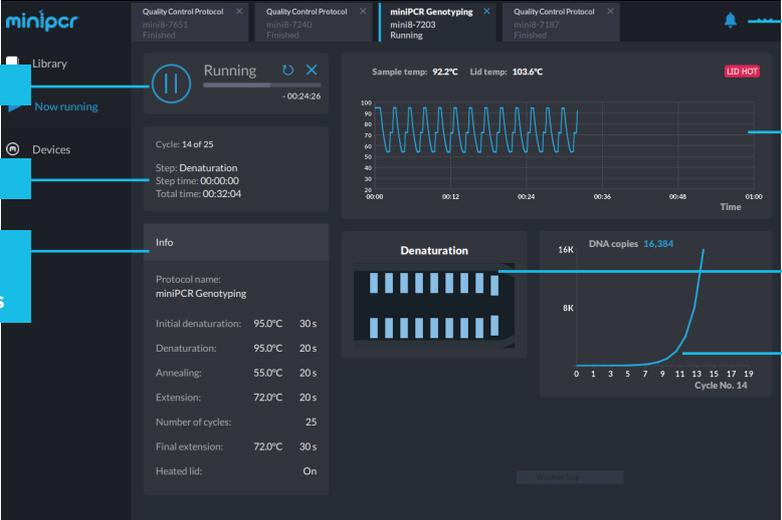
- Protocol name and parameters
- Status: Running, Stopped, Paused, Cool down, Finished and No power.

Note: If status ‘No power’ is indicated please turn the switch on the back of the unit to the ON position and make sure that the LED indicator on the power supply is turned on.

- Current step, cycle, and time in step
- Elapsed time (left), remaining time (right)

You can Pause , Stop  or Restart  your reaction at any time

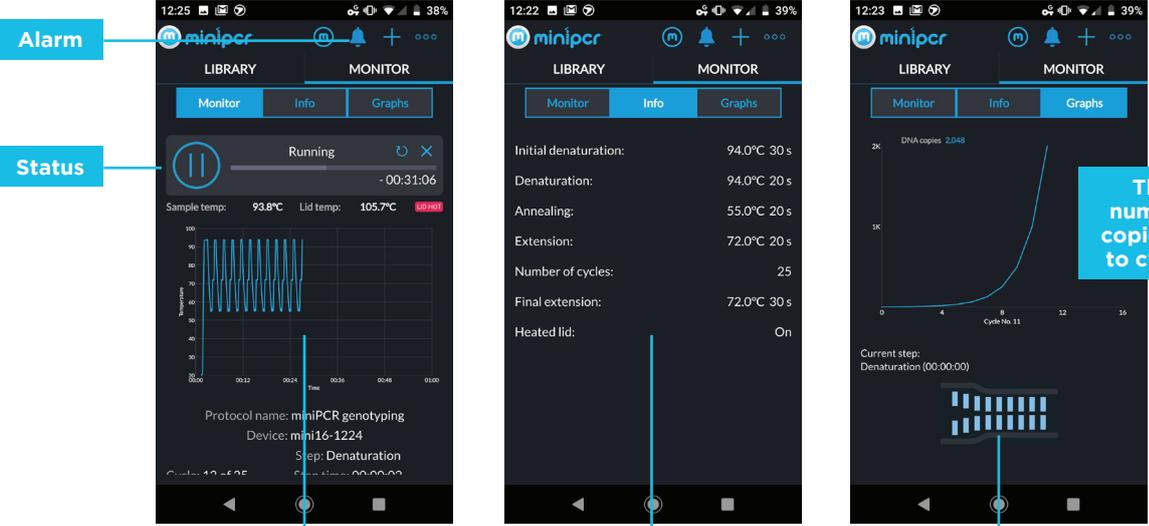
### Win / Mac / Chromebook



The desktop interface displays a running protocol for 'miniPCR Genotyping'. Key features include:

- Status:** A large 'Running' indicator with a pause button and a close button.
- Progress:** A progress bar showing 'Cycle 14 of 25' and 'Step: Denaturation'.
- Protocol name and parameters:** A list of parameters including initial denaturation (95.0°C 30s), denaturation (95.0°C 20s), annealing (55.0°C 20s), extension (72.0°C 20s), number of cycles (25), final extension (72.0°C 30s), and heated lid (On).
- Temperature vs time plot:** A graph showing temperature fluctuations over time, with a 'LID HOT' warning.
- Animation corresponding to current step:** A bar chart showing the denaturation step.
- Theoretical number of DNA copies according to cycle number:** A graph showing exponential amplification, with '16K DNA copies 16,384' at cycle 14.
- Alarm:** A bell icon in the top right corner.

### Mobile / iOS / Amazon Fire



The mobile application interface is divided into three main sections:

- Alarm:** A bell icon in the top right corner of the mobile app.
- Status:** A large 'Running' indicator with a pause button and a close button, similar to the desktop version.
- Temperature vs time plot:** A graph showing temperature fluctuations over time, with a 'LID HOT' warning.
- Protocol parameters:** A list of parameters including initial denaturation (94.0°C 30s), denaturation (94.0°C 20s), annealing (55.0°C 20s), extension (72.0°C 20s), number of cycles (25), final extension (72.0°C 30s), and heated lid (On).
- Theoretical number of DNA copies according to cycle number:** A graph showing exponential amplification, with '2K DNA copies 2,048' at cycle 11.
- Animation corresponding to current step:** A bar chart showing the denaturation step.

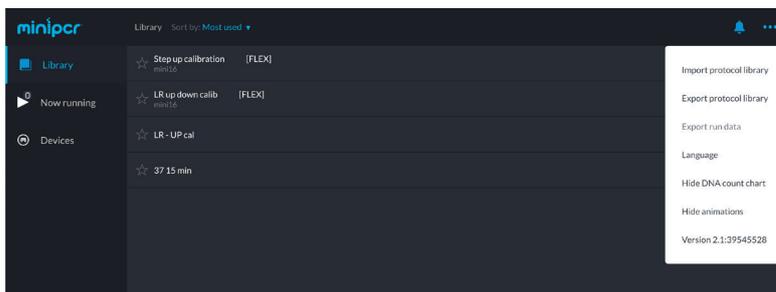
## IMPORT / EXPORT LIBRARY - EXPORT DATA - LANGUAGE

Import / export data. The protocol library includes all saved protocols and can be shared among users and devices by exporting and importing it. The libraries are stored with extension '.plf'.

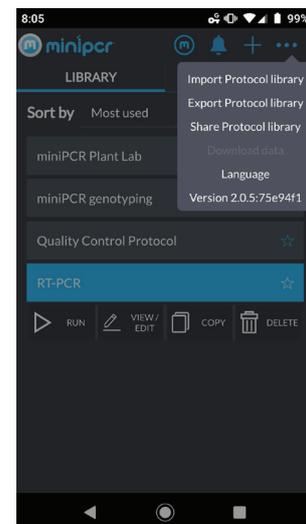
Export data. Run data (temperatures and times) can be exported to a CSV file.

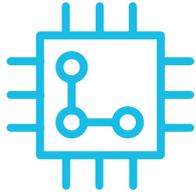
Language. The language dialog presents the available languages. Restarting the application is required for the change to go into effect.

### Win / Mac / Chromebook



### Mobile / iOS / Amazon Fire

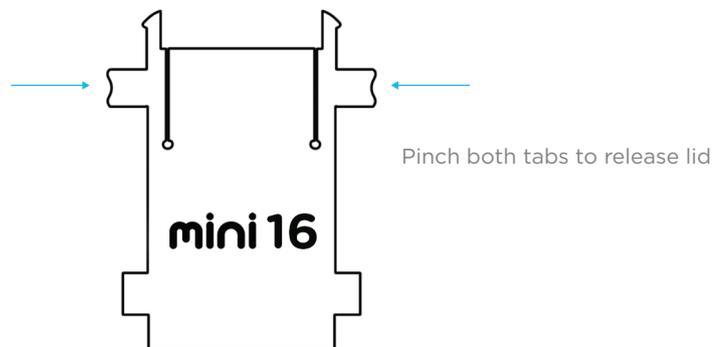




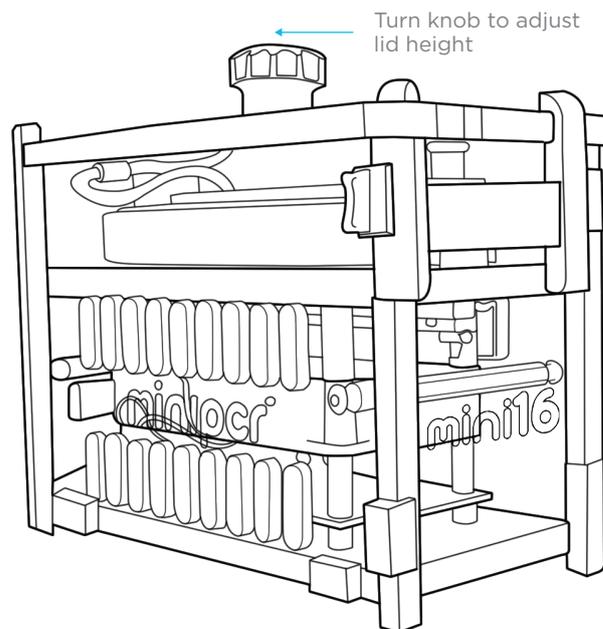
# HARDWARE OPERATION

## LOADING YOUR SAMPLES

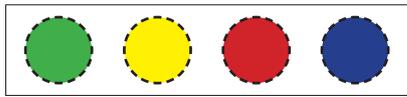
- 1 – Open the lid by pinching the side tabs on the front plate of your miniPCR<sup>®</sup> machine (indicated by arrows). Use your thumb and index fingers to pinch, and lift the lid with your other hand. Load the PCR tubes in the metal block.



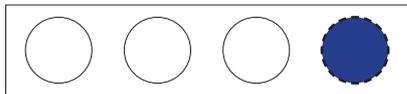
- 2 – Fully untwist (counterclockwise) the adjustment knob and press the lid down until the lid clicks shut. Tighten the adjustment knob (clockwise) until you feel light resistance from the tube caps. Be careful not to over-tighten.



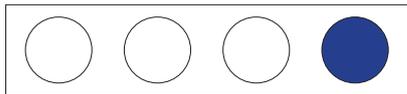
## QUICK GUIDE TO LED INTERFACE



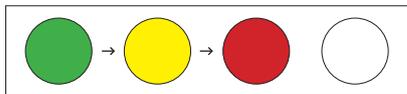
All LEDs flashing: protocol uploaded or device initializing



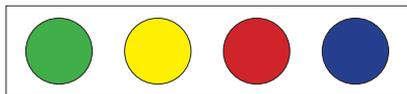
Blue LED flashing: mini16 available for Bluetooth® pairing



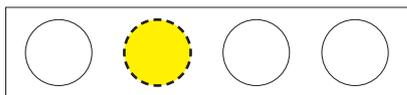
Blue LED on: mini16 paired via Bluetooth®



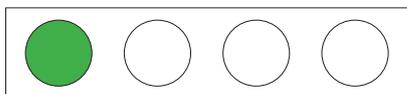
Green, Yellow, and Red LEDs cycling: mini16 ready for protocol run. Press “Run” to start



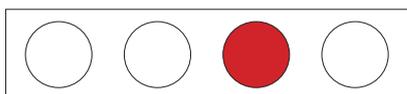
Green, Yellow, and Red LEDs on: protocol complete



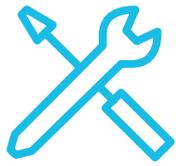
Yellow LED flashing: error, reinitialize device or contact support



Green LED: intermittent, lid heating; solid on, sample block cooling



Red LED on: sample block heating



# TROUBLESHOOTING AND MAINTENANCE

## TROUBLESHOOTING

Lid won't latch: ensure tubes are properly inserted into block and lid is at maximum height (turn knob counterclockwise).

Run won't start: ensure power supply is plugged into AC outlet and the power supply LED is on. Check miniPCR power switch is in the ON position. Ensure protocol uploads and LEDs blink.

miniPCR started too soon: miniPCR run will begin as soon as a protocol is uploaded or power is switched ON. Maintain power in the OFF position during protocol upload if you do not wish to start immediately.

I left my samples in the miniPCR overnight after a run: PCR product is stable in PCR buffer at room temperature for >72h. There's no need to refrigerate samples immediately after a run.

I cannot find my mini16 on the Devices tab: ensure miniPCR power is on and Bluetooth®. LED is flashing. A solid blue LED indicates active pairing via Bluetooth®; make sure your miniPCR is not already paired to another computer or smart device. Powering mini16 off and on will reset the connection. If this fails, connect via USB.

If you need to contact miniPCR bio:

Phone: 781-990-8PCR

Email: [support@minipcr.com](mailto:support@minipcr.com)

Mail: 1770 Massachusetts Ave., Suite 167  
Cambridge, MA 02140

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## CARE & MAINTENANCE

miniPCR® thermal cyclers do not require regular maintenance. They can be cleaned using water or an acrylic cleaning agent. They should not come into contact with organic solvents or corrosive solutions. Ensure that no liquid enters the device. For safety reasons, the device must be switched off and disconnected from the power supply before cleaning.

The device may only be opened by qualified service personnel. The miniPCR Limited Warranty will be voided in the event of damage caused by unauthorized servicing.

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## OPERATING CONDITIONS

miniPCR® thermal cyclers are designed to be safe to operate under the following conditions:

- Indoor use
- Altitude up to 2,000 m
- Temperature 9 °C to 40 °C
- Maximum relative humidity 80% for temperatures up to 31 °C, decreasing linearly to 50% relative humidity at 40 °C
- Main supply voltage fluctuations not to exceed 10% of the nominal voltage
- Electrical supply by provided adapter, AC 100-240 V, 50-60 Hz, 90 W or higher
- Protection from accidental spills

Other use conditions will impinge on safety and performance and will void the Warranty.