

# Microcycler™

8-Well Thermal Cycler

## **User Manual**



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#### Introduction

This manual describes the operating instructions for the Microcycler<sup>™</sup>. It includes installation, operation, and maintenance.

#### Description

The Microcycler<sup>™</sup> offers a cost-effective solution for polymerase chain reaction (PCR)-based assays commonly used to amplify specific target DNA sequences. The lightweight and portable design of this thermal cycler makes it practical for use in a laboratory setting or on-site testing.

The instrument consists of an 8-well heat plate and heat lid with temperatures programmable between 30°C and 105°C with  $\pm$  0.2°C precision. The resistive heating and air-forced cooling systems are controlled by a PID algorithm for accurate and precise thermal cycling of the heat plate. To ensure optimal performance, every Microcycler<sup>TM</sup> unit is pre-calibrated and tested prior to release .

This portable Microcycler<sup>™</sup> is a stand-alone instrument and may also be connected to a computer via WiFi and HDMI cable. The Microcycler<sup>™</sup> is compatible with any laptop, desktop, and Android / IOS phone. Multiple units of Microcycler<sup>™</sup> may be operated simultaneously on one display using SSH via wireless or ethernet connection.

### Safety and Regulatory Compliance

#### Safety warning labels

Warning symbols are affixed on the instrument and listed in this manual to inform the User of potential sources of harm. The warning labels are listed below:

Symbol	Meaning
$\overline{\mathbb{N}}$	CAUTION: Risk of danger!
	CAUTION: Risk of electrical shock!
III Warning III Burn Hazard Hot Metal Surface Do Not Touch	CAUTION: Hot surface! This symbol identifies components that pose a risk of personal injury due to excessive heat if improperly handled.

#### Set up

- The Microcycler<sup>™</sup> package includes one Microcycler<sup>™</sup> (Figure 1), one power supply (19V, 4.7A), and a User manual. Note: Monitor, mouse, HDMI cable, PCR kits and other materials are not included with the Microcycler<sup>™</sup>.
- Remove all packaging materials and place the Microcycler<sup>™</sup> on a flat, dry surface with sufficient cool airflow to run properly.



Figure 1. Microcycler<sup>™</sup> external parts



Figure 2. Microcycler<sup>™</sup> internal parts

- The Microcycler<sup>™</sup> can be operated wirelessly or with an HDMI cable.
  - For WiFi connection, use Remote Desktop Connection.
  - For HDMI connection, insert an HDMI cable into the HDMI port and the mouse and keyboard into the USB ports of the Microcycler<sup>TM.</sup> Connect the power supply to an electrical outlet. **Note: Insert the HDMI cable before turning on the power supply!**
- After selecting the type of connection, turn on the power supply located at the back of the Microcycler<sup>™</sup>. The Microcycler<sup>™</sup>'s desktop screen will appear. In case the Microcycler<sup>™</sup> does not automatically log in or a user logs out, use the following username and password to log back in:
  - Username: PCR
  - Password: ieh

#### Operation

- Select the **Microcycler<sup>™</sup>** icon (located on the top left corner of the desktop) to access the program menu as shown below:



Figure 3. Start Microcycler<sup>™</sup> program

- Open the Microcycler<sup>™</sup> by unscrewing the front knob in counterclockwise direction and gently lift the lid until it locks to the back plate at ~ 105° angle.
- Place the 8-tube test strip into the wells, and gently push the strip/tubes down to ensure that the strip/tubes firmly come into contact with the heat plate.
- Close the lid until the magnets. If the lid does not close properly, do not force it closed. Rotate the middle knob counterclockwise to raise the knob up.
- Lock the lid by rotating the front knob in clockwise direction.
- Adjust the middle knob until the knob comes into contact with the heat lid.
- To select the desired cycle, click "Select Program" and choose the desired program.

Wilcrocycler •	10111.0.1.0	10.13311111	10191000		· ^	
Finished In: Lid Temperature: 23. Start Time:: Total Cycles:	A 3°C Plate Curre Curre	At: Temperatu nt Time: 2 nt Cycle:	: ure: 24.2°C 017-08-01 <sup></sup>	0:19:15	5	
Select Program BSMT Calibration Campy DEFAULT ES6 Inc37 L35 L5 MARD	Run		Stop			
MASU 31 QC 30 5 - 28 5 - 28 5 - 28 0 - 28 5 - 28 0 -	200	300	400	500		
Figure 4. Program selections						

- Click "Run" to start running the selected program.

	1.0 ID:133FFFFFF07916CB _ • ×
Finished In: 1:05:39 At: Lid Temperature: 42.0°C	2017-08-01 11:27:15 Plate Temperature: 99.6°C
Start Time: 2017-08-01 10:21:06	Current Time: 2017-08-01 10:21:35
Total Cycles: 1	Current Cycle: 1
	Run Stop
Program.ES6 liot emperature 105C number cycles.1 <b>temperature hold 950.4m 00s</b> cycles.1 number cycles.34 temperature hold 95C 0m 10s temperature hold 63C 0m 35s	
	00018 00023 00028

Figure 5. Program running

- PCR is completed when current cycle reports "Complete".
- The program can be aborted by selecting "Stop".
- To re-run the program, select "Run".
- Open the lid of the Microcycler<sup>™</sup> and carefully remove the strip/tubes. The thermalcycling is complete, and the contents of the tubes can be further analyzed by electrophoresis or dipstick testing.

Note: Do not open the lid if the Microcycler<sup>™</sup> is running a program.

Finished In: 0:00:01 At: 2 Lid Temperature: 94.6°C Start Time: 2017-08-0110:21:06 Total Cycles: 34	017-08-01 11:34:51.618201 Plate Temperature: 51.0°C Current Time: 2017-08-01 11:35:14 Current Cycle: Complete
ES6 - R	un Stop
number cycles:1 temperature hold:95C 4m 00s cycles:1 number cycles:34 temperature hold:95C 0m 10s temperature hold:63C 0m 35s temperature hold:72C 0m 40s	

Figure 6. Program completed



Figure 7. Program aborted

#### **Edit Program**

-To edit or create new programs, go to the programs folder located at "home/PCR.programs".

-To edit a program or create a new program, right click on the program to be edited and select **"SciTE Text Editor"**.

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Figure 8. Editing a pre-existing program

- Follow the existing program format to modify only the temperature, time, and cycles.
- If you wish to add more steps in a cycle, follow the format and add the line "temperature hold XXC YYs" where XX is temperature in °C and YY is number of seconds.

Note: Modification of the program format will result in the Microcycler<sup>™</sup> program not functioning. For assistance, please call Microbiologique Inc.



Figure 9. Modification of a pre-existing program

- Go to File, click on "Save As" and type the new program's name. Click on "Save".
  - Re-select the program in the **Select Program** tab of the Microcycler<sup>™</sup> program to load the customized program.

#### Data Log

- The Microcycler<sup>™</sup> monitors the temperature in the wells and creates a temperature data log file for each run. To access, open the data log records, then open the "data" folder located at "PCR/data".

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	mpcr_2017-07-07_12_22_24.data	plain text document 223 bytes 07/07/2017 12
	pcr_2017-07-07_12_22_07 data	plain text document 447 bytes 07/07/2017 12
	mpcr.2017-07-07_12_21_57.data	plain text document 167 bytes 07/07/2017 12
	m pcr.2017-07-05,14,26,25 data	plain text document 166 bytes 07/05/2017 14
	m pcr_2017-07-05_14_20_08.data	plain text document 278 bytes 67/05/2017 14
	pcr_2017-06-19_07_07_40 data	plain text document 1.4 K/8 06/19/2017 07
	III pcr.2017-06-16_15_05_54 data	plain text document 2.3 MiB 06/17/2017 03
	m pcr, 2017-06-16, 15, 03, 43 data	plain text document 1.5 Ki8 06/16/2017 15
	pcr_2017-06-16_08_13_17.data	plain text document 1.1 M/B 06/16/2017 14
	pcr_2017-06-16_07_58_04 data	plain text document 727 bytes 06/16/2017 07
	[] pcr_2017-06-15_15_09_32 data	plain text document 2.3 MiB 06/16/2017 03

Figure 10. Data log record

- Right click on the log file and select "SciTE Text Editor". This will open the temperature records for the run.

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File Edit S	earch View	Tools	Options	Language	Buffers	Help	
1 pcr_201	7-07-07_18_3	1_08.da	ta				
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Figure 11. Example of records of temperature

#### LED Message

Color	Meaning
Blue	Program running
Green	Cold
Red	Hot
Yellow	Error
Blinking Red & Blue	PCR is running, hence the plate is hot.
Blinking Blue & Green	Plate is cool & program is ready to run.
Blinking Blue & Yellow	Error occurred while running the PCR.
Blinking Green & Red	In the process of cooling but still hot.

#### Troubleshooting

If an error occurs while running the Microcycler<sup>TM,</sup> e.g. temperature spike or display abnormality, etc., please contact customer support (page 12) for further information.

### Product Specifications

Model	Microcycler <sup>™</sup> 8-well
Dimensions (W x D x H)	74 mm x 130 mm x 137 mm
Weight	680 g
Supply Voltage	19V
Supply Current	4.7A
Rated Load	80W
Reaction Volumes	10-50 μL
Runtime	≤ 40 min for 3-step 40-cycle PCR
Sample Format	8-well plates, 8-tube strips
Thermal Cycling System	Resistive Heating, Forced-Air Cooling
Programmable Plate Temperature range	30-105 °C
Programmable Lid Temperature range	30-105 °C
Temperature Accuracy	± 0.2 °C of programmed target temperature
Maximum Ramp Rate Heating	3.75 °C/s
Maximum Ramp Rate Cooling	1.40 °C/s
Temperature Uniformity	Range (max-min) ± 0.5 °C
Networking	10/100 Ethernet, 2.4 GHz 802.11n wireless
Bluetooth	Bluetooth 4.1 Classic, Bluetooth Low Energy
Internal Storage	2 GB
Port	HDMI, 2x USB, Ethernet, 5.5 mm power socket
Operating Conditions	15-35 °C, protect from moisture
Storage Conditions	15-35 °C, protect from moisture

#### **Customer support**

For technical support and orders, please contact:

Microbiologique, Inc.

Telephone:(206) 525 0412Technical Support:tech@microbiologique.comOrders:orders@microbiologique.com

#### Disclaimer

Warranty Disclaimer. Microbiologique, Inc. ("Microbio"), makes no warranties on its Microcycler<sup>™</sup> device(s), whether express or implied, including not limited to the implied warranties of merchantability and fitness for a particular purpose. Microbio does not warrant against damages or defects arising out of the use of the Microcycler<sup>™</sup> device(s); against defects or damages arising from improper use; or against defects in the Microcycler<sup>™</sup> device(s) or its components. No warranty of any kind, expressed or implied, is made regarding the safety of the Microcycler<sup>™</sup> device(s). The entire risk as to the quality performance of the Microcycler<sup>™</sup> device(s) is with the purchaser.

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