

Microcycler™

8-Well Thermal Cycler

User Manual



Table of Contents	1
Introduction	2
Description	2
Safety and Regulatory Compliance	3
Safety warning labels	3
Set up	4
Operation	6
Edit Program	8
Data Log	9
LED Message	10
Troubleshooting	10
Product Specifications	11
Customer support	12
Disclaimer	12

Introduction

This manual describes the operating instructions for the Microcycler[™]. It includes installation, operation, and maintenance.

Description

The Microcycler[™] 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 MicrocyclerTM unit is pre-calibrated and tested prior to release .

This portable Microcycler[™] is a stand-alone instrument and may also be connected to a computer via WiFi and HDMI cable. The Microcycler[™] is compatible with any laptop, desktop, and Android / IOS phone. Multiple units of Microcycler[™] 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
$\underline{\mathbb{N}}$	CAUTION: Risk of danger!
	CAUTION: Risk of electrical shock!
III Warning II Burn Hazard Hot Metal Surface De 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[™] package includes one Microcycler[™] (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[™].
- Remove all packaging materials and place the Microcycler[™] on a flat, dry surface with sufficient cool airflow to run properly.



Figure 1. Microcycler[™] external parts



Figure 2. Microcycler[™] internal parts

- The Microcycler[™] 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^{TM.} 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[™]. The Microcycler[™]'s desktop screen will appear. In case the Microcycler[™] 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[™]** icon (located on the top left corner of the desktop) to access the program menu as shown below:



Figure 3. Start Microcycler[™] program

- Open the Microcycler[™] 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.

wicrocycler	version 1.0.1.0	0.10011111	110191000		· ^
Finished In: Lid Temperature: 23 Start Time: Total Cycles:	.8°C Plate Curre		: ure: 24.2°C 2017-08-01	10:19:18	5
Select Program BSMT Calibration Campy DEFAULT ES6 Inc37 L35 L5	Ru	n	Stop)	
31 MA30 31 QC 30.5 22.5 28.5 28.0 28.5 0 28.5 28.5 28.5 28.5 28.5 28.5 28.5 28.5	200	300	400	500	
Figure 4	I. Progr	am sel	ections		

- 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
ES6 - F	Run Stop
Program.ES6 liot emperature 105C number cycles.1 temperature hold 950.4m 00s cycles.1 number cycles.34 temperature hold 95C 0m 10s temperature hold 63C 0m 35s	
	000018 000023 000028

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[™] 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[™] 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°0 Current Time: 2017-08-01 11:35:14 Current Cycle: Complete
ES6 - R	Run 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"**.

							prog	jrams			
File Edit View Bookmarks Go Too	ls Help										
陷 🎡 🖌 💮 😤 菌 /home/PCR	/programs										
Directory Tree 🗸 🗸								1			
🕀 🥅 corrlib	Calibration. pcr	QC.pcr	Inc37.pcr	BSMT.pcr	L5.pcr	MA30.pcr	L35.pcr	ES6.pcr	Campy.pcr	DEFAULT.pc	
🗉 🥅 data										Open	
🗉 🗐 Desktop										MICROCYCLER	
🗉 🙆 Documents										Text Editor	
🗉 🖻 Downloads										SciTE Text Editor	
🗄 🛄 log										Open With.	our source files
🗄 阃 Music											
Pictures										Compress	
= 🔲 programs										Cut	
<no subfolders=""></no>										Copy Move to Trash	
🗉 🗑 Public										Copy Path(s)	
Templates										Rename	
⊕ 🖾 Videos											
H 🛄 /										Properties	

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[™] 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[™] program to load the customized program.

Data Log

- The Microcycler[™] 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".

10 (v) () () hor	ne/PCR/data	
Directory Tree	· Name	Description Size Modified
GI PCR	pcr, 2017-08-01, 10-11-06-4ete	plain text document 39.9 KiE CB/01/2017 103
- Contib	Dpen_2017-07-07	plain fext document 15.3 KiB 07/07/2017 183
a adata	pcr.2017-07-07 MICROCYCLER	plain text document 43.6 KiB 07/07/2017 182
<no subfolders=""></no>	pcr_2017-07-07 Text Editor	plain text document 44.3 Ki8 07/07/2017 186
E BB Desktop	per_2017-07-07 UbreOffice Write Edityce source free	plain text document 44.5 Ki8 07/07/2017 17:4
· I Documents	pcr_2017-07-07 Open With	plain text document 2.6 Ki8 07/07/2017 17:2
	pcr_2017-07-07 Compress.	plain text document 20.9 KiB 07/07/2017 16 5
	per_2017-07-07	plain text document 14.9 Ki8 07/07/2017 163
«No subfolders»	pcr_2017-07-07 Cut	plain text document 2.5 KiB 07/07/2017 16:2
· · · Music	por_2017-07-07 Copy Move to Teach	plain text document 95 9 Ki8 07/07/2017 161
1 Im Pictures	pcr.2017-07-07 Copy Path(s)	plain text document 2.2 KiB 07/07/2017 130
D programs	m pcr_2017-07-07 Bename	plain text document 62 bytes 07/07/2017 12:
E BR Public	per_2017-07-07	plain text document 447 bytes 07/07/2017 12:
• I Templates	Properties Properties	plain text document 279 bytes 07/07/2017 123
· El Videos	pcr_2017-07-07_12_25_41.data	plain text document 223 bytes 07/07/2017 122
CI /	pcr_2017-07-07_12_24_18 data	plain text document 279 bytes 07/07/2017 122
	pcr.2017-07-07_12_22_42 data	plain text document 706 bytes 07/07/2017 122
	pcr.2017-07-07.12.22.31.deta	plain text document 222 bytes 07/07/2017 122
	pcr_2017-07-07_12_22_24 data	plain text document 223 bytes 07/07/2017 12:2
	pcr_2017-07-07_12_22_07 data	plain text document 447 bytes 07/07/2017 12.2
	pcr_2017-07-07_12_21_57.deta	plain text document 167 bytes 07/07/2017 122
	pcr.2017-07-05.14.26.25.data	plain text document 165 bytes 07/05/2017 142
	pcr_2017-07-05_14_20_08.data	plain text document 278 bytes 67/05/2017 142
	pcr_2017-06-19_07_07_40 data	plain text document 1.4 K/B 06/19/2017 07:0
	por_2017-06-16_15_05_54 data	plain text document 2.3 MiB 06/17/2017 033
	m pcr.2017-06-16,15,03,43 data	plain text document 1.5 Ki8 06/16/2017 15:0
	pcr_2017-06-16_08_13_17.data	plain text document 1.1 M/B 06/16/2017 143
	pcr_2017-06-16_07_58_04.data	plain text document 727 bytes 06/16/2017 075
	pcr_2017-06-15_15_09_32.data	plain text document 2.3 MiB 06/16/2017 033
57 items	McroCycler Version	Free space: 21.0 G/B (Total 28.4 Gi

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.

						08.data - Sci		-	×
File	Edit	Search	View	lools	Options	Language	Butters	Help	 _
1	pcr_2	017-07-0	7_18_3	1_08.da	ita				
						nmand, Param	eters		e
					emperature perature ho	,105C ld,95C 4m 00s			1
2	017070	7 18:31:1	1,21.8,2	1.8,tem	perature ho	ld,95C 4m 00s	6		1
						ld,95C 4m 00s ld,95C 4m 00s			1
2	017070	7 18:31:1	4 33 3 2	3.5.tem	perature ho	ld,95C 4m 00s			1
2	017070	7 18:31:1	5,37.8,2	4.4,tem	perature ho	ld,95C 4m 00s	6		1
						ld,95C 4m 00s			1
						ld,95C 4m 00s ld,95C 4m 00s			
						ld,95C 4m 00s			
2	017070	7 18:31:2	0,60.6,2	8.9,tem	perature ho	ld,95C 4m 00s	6		
						Id,95C 4m 00s			
						ld,95C 4m 00s ld,95C 4m 00s			
						ld,95C 4m 00s			
						ld,95C 4m 00s			
						ld,95C 4m 00s			
						ld,95C 4m 00s ld,95C 4m 00s			
						ld,95C 4m 00s			
						ld,95C 4m 00s			
						ld,95C 4m 00s ld,95C 4m 00s			
						ld,95C 4m 00s			
2	017070	7 18:31:3	5,98.2,3	8.6,tem	perature ho	ld,95C 4m 00s	6		
						ld,95C 4m 00s			
						ld,95C 4m 00s ld,95C 4m 00s			
						ld,95C 4m 00s			
2	017070	7 18:31:4	0,96.0,4	1.6,tem	perature ho	ld,95C 4m 00s	6		
						ld,95C 4m 00s			
						ld,95C 4m 00s ld,95C 4m 00s			
						ld,95C 4m 00s			
2	017070	7 18:31:4	6,94.9,4	4.2,tem	perature ho	ld,95C 4m 00s	6		
						ld,95C 4m 00s			
						ld,95C 4m 00s ld,95C 4m 00s			
2	017070	7 18:31:5	0,95.0,4	6.1,tem	perature ho	ld,95C 4m 00s	6		
2	017070	7 18:31:5	1,95.0,4	6.6,tem	perature ho	ld,95C 4m 00s	5		
						ld,95C 4m 00s ld,95C 4m 00s			
						ld,95C 4m 00s			
2	017070	7 18:31:5	5,95.0,4	8.4,tem	perature ho	ld,95C 4m 00s	6		
2	017070	7 18:31:5	6.95.0.4	8.8.tem	perature ho	ld,95C 4m 00s	5		10

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^{TM,} e.g. temperature spike or display abnormality, etc., please contact customer support (page 12) for further information.

Product Specifications

Model	Microcycler [™] 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[™] 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[™] device(s); against defects or damages arising from improper use; or against defects in the Microcycler[™] device(s) or its components. No warranty of any kind, expressed or implied, is made regarding the safety of the Microcycler[™] device(s). The entire risk as to the quality performance of the Microcycler[™] device(s) is with the purchaser.

Limitation of Liability and Indemnification. Microbio disclaims liability of potential injury or other damage that may result from use of the supplied Microcycler[™] device(s). Purchaser shall indemnify and hold harmless Microbio and its directors, officers, employees, agents, stockholders, affiliates, contractors, subcontractors and employees from and against all allegations, claims, actions, suits, demands, damages, liabilities, obligations, losses, settlements, judgements, costs and expenses (including without limitation attorney's fees and costs) which arise out of, relate to or result from the use of the supplied Microcycler[™] device(s). Purchaser's sole remedy for defective Microcycler[™] device(s) is replacement. In no event shall Microbio be liable for any direct, indirect, punitive, incidental, special consequential damages of any nature whatsoever or expenses arising out of or connected with the misuse of the Microcycler[™] device(s)

Manufactured by Microbiologique, Inc 8315 Lake City Way NE Seattle, WA 98115 USA