

pic label	ID code	Name	count	Primary Link	Second link	Model / Part # (mcmaster ca	Description / notes
LAB CONTROL UNIT							
01	MC-WNT	Wire connectors		link	link2	8904T3	Used to connect wires in the Control Module rather than soldering. The 65-pack in the second link is enough to make 2 – 3 Microlabs.
04	RX-TMP	Thermistor	1	link			Used to monitor the temperature in the reaction chamber.
11	MC-SCR	Touch screen	1	link			Linked screen is to a raspberry pi 4. Be sure to select a touchscreen that fits your Raspberry Pi or Libre Computer
12	MC-RLY	Relay hat / relay board	1	link	link2		
13	MC-RPI	Raspberry Pi	1	link	link2		Primary link is to a 4 - 3b+'s seem hard to come by. We also have experimental support for Le Potato by Libre Computer
14	MC-SD32	Micro SD card, 32GB	1	link			32GB is the minimum. If you make a new image on a larger card, you can use PiShrink to remove empty space from the disk image.
15	MC-MDR	Motor drivers for CNC hat	4	link			Link includes UNO and 4988
16	MC-CNC	Arduino CNC hat	1	link			
17	MC-UNO	Arduino UNO	1	link			
28	MC-A2B	USB A/B cable for rPi to Arduino	1	link			
	MC-FVP	5v 4A power supply	1	link			NOTE: A Raspberry Pi typically requires a minimum of 2.5A. The linked power supply provides 4A. This may be excessive, but it provides capacity to add additional 5v items. The linked power supply also has a barrel plug interface. You may wish to use a standard USB interface compatible with your Pi.
	MC-TVP	12v 2A power supply	1	link			NOTE: Consider using a power supply that provides more than 2A.
		Extension cord	1	link			This provides power for the 5v and 12v circuits in the LAB CONTROL UNIT. The heaters that run on mains power are powered separately.
		Velcro / hook-and-loop straps	1	link			Optional, but useful for assembly and affixing components to the case
		Stepper Motor Cables					Most stepper motors will come with these
		Corrugated plastic					Optional, but provides a durable, easily worked material to build the housing
TEMPERATURE CONTROL UNIT							
WARNING! This module handles mains power and if improperly wired can shock you or the end user of the Microlab.							
03	TC-PMP	Circulating pump	2	link	link2		Operational limits to pumps in terms of capacity and temperature have not been determined.
	TC-HOU	2-Gang electrical housing	1	link			NOTE: Ideally this should be "weather-proof" and support grounding
	TC-FPL	2-Gang electrical plate	1	link			
		Decora blanks	1	link			Optional, but seals the power box and makes it look nicer
	TC-GFO	GFCI outlet	1	link			NOTE: GFCI outlets are HIGHLY recommended to reduce the risk of electrical shock
	TC-SBH	Submersible heater	2	link			
	TC-JAR	6oz canning jar		6oz link			
	TC-RLY	Relay		link			NOTE: Any relay can work but it MUST support mains power.
	TC-IPM	Inlet power module with fuse		link			NOTE: This is optional but HIGHLY RECOMMENDED! Safety third!
	TC-ETP	Electrical tape					NOTE: You are a cute bag of mostly water that is highly sensitive to electricity. We recommend THOROUGHLY taping over all exposed mains power components.
	TC-TWC	Three-wire connector		link			Connectors with 5v +/- and the control line for the relay
	TC-APC	AC power cord		link			This provides mains power for the heaters. The LAB CONTROL UNIT is powered separately.
	TC-PWC	Quick disconnect connectors		link			Optional, but highly recommended for connecting to the inlet power module
	TC-COZ	Coozie					Any "coozie" drink insulator designed for a 12oz can, folded over
REAGENT PUMP UNIT – Linear Syringe Pumps							
NOTE: Consider using peristaltic pumps instead. They work with the same stepper motor interface and require very little assembly.							
06	SP-SLD	Syringe slides	4	link			
06A	SP-DRV	M5 threaded drive rod	3	link			appropedia calls for 200mm, thread pitch not specified
18	SP-TAB	Plunger holder tab (Linear Actuator V0	3	link			
19	SP-BDY	Body holder (Linear Actuator V0 5)	3	link			
20	SP-PGR	Plunger holder base (Linear Actuator V	3	link			

21	SP-END	Motor end (Linear Actuator V0 1)	3	link		
22	SP-CAR	Carrriage (Linear Actuator V0 4)	3	link		
23	SP-IDL	Idler end (Linear Actuator V0 2)	3	link		
25	SP-MTR	Stepper motors	3	link	link	6627T91
26A	SP-M5B	625Z Ball Bearing (5mm x 16mm x 5mm)	3	link		6153K15
29	SP-SYR	Syringes	3	link		25mL luer slip tip in video, 20 or 30mL are standard sizes. luer lock will also work
02	SP-TB4	4mm x 6mm vinyl tubing (1/8")		link		
REAGENT PUMP UNIT – Peristaltic Pumps						
Note: This is a replacement for the Linear Syringe Pumps – you only need one or the other.						
	SP-PSP	Peristaltic pumps	3	link		
29	SP-SYR	Syringes	3	link		25mL luer slip tip in video, 20 or 30mL are standard sizes. luer lock will also work
		M3 Screws and plywood				See MISCELLANEOUS section below. These are used to mount the pumps
REACTOR UNIT						
07	RX-MXM	Mixing motor	1	link		This link is to a 100 RPM 12v motor. You can also buy a faster motor and use a PWM control
08	RX-PDL	Mixing paddle	1	link		Mixing paddle needs to be coated / PTFE. Stainless steel may react.
	RX-MXC	Mixing paddle coupling		link		NOTE: the motor mount is still under development and this coupling is not optimal
09	RX-TB5	Tubing 5-6mm x 8mm (1/4")	1	link		pump outlet – Purchase tubing compatible with your circulation pumps!
09B	RX-TB8	Tubing 8mm x 12mm				pump inlet – Purchase tubing compatible with your circulation pumps!
09C	RX-RED	Reducing fitting				might be needed – Purchase tubing compatible with your circulation pumps!
10	RX-TEE	Barbed tee fittings for 6mm tubing	2	link		2429K55 Purchase tubing compatible with your circulation pumps!
24	RX-LID	Reactor manifold	1	printed		NOTE: the manifold can be a tight squeeze to pass through the mouth of the large mason jar, especially if your printer over-extrudes even slightly. Post-processing (i.e.: sand paper) may be necessary.
	RX-MMM	Mixing motor mount	1	printed		NOTE: the motor mount is under development and does not exactly fit the linked motor
	RX-RUC	Reactor collar	1	printed		
27	RX-COR	4/6 oz mason jar for core chamber	1	link	6oz link	
31	RX-OUT	1qt wide mouth mason jar for outer jack	1	link		
MISCELLANEOUS						
26	SP-M310	M3x10mm screw		link		Amazon assortment contains all needed sizes and wrench
	SP-M320	M3x20mm screw				
	SP-M340	M3x40mm screw				
	SP-M3N	M3 nut				
30		Hex wrench for syringe pump, M3	1			
		18g wire				For miscellaneous connections
		Barrel plug connectors		link		Optional, but good for modularity
		Barrel plug wires		link		Optional, but good for modularity
		12v button and lights		link		Optional, but nice for viewing the reaction chamber. Any 12v lights can be used.
		Velcro / hook-and-loop straps				See the entry in the CONTROL UNIT for details – useful for assembly of the housing
		Split loom		link		This is optional but is very helpful for cable management!
		Thin plywood		link		Used to build the housing for the Reactor Unit and as support for the pumps
		Corner supports				Reinforcements for rear corners of the housing. We used upcycled shipping corners.
		Packing tape				Used to make a transparent door for the Reactor Unit housing
		Paint and stickers				Have fun with it! Make the Microlab yours!
		Hard case	2	link		Optional, but good for storage and shipping