ELMYRA 2 HW v3

by neutral labs

Build Guide

Note: This version of the build guide covers the v3 hardware. You will find the hardware version identified on the back of the PCB.

Elmyra 2 comes with all SMD components presoldered, and as such it is a very straightforward build. Due to the large number of front panel components, it will take some time though (1-3 hours depending on level of experience). Some of the soldering will be in close proximity to SMD parts, so care must be taken. The kit is intended for builders of medium or advanced skill level, but can be completed by a motivated and careful beginner (with some previous soldering experience). **Please read and follow the guide thoroughly!**

Component List (common parts for Eurorack + desktop)

Part ID	Count	Type	Polarity matters?
J3	1	10-pin power header	no
J5, J8-J46	40	Thonkiconn TS 3.5 mm switching socket + nut	-
J47	1	Thonkiconn TRS (stereo) 3.5 mm socket + nut	-
J6-J7	2	long-legged 5-pin header (panel ports)	no
D9, D10, D39, D40	4	LED 3 mm orange (orange body)	yes
D3, D13, D16, D19	4	LED 3 mm orange superbright (clear body)	yes
D41	1	LED 3 mm green (green body)	yes
D42	1	LED 3 mm red (red body)	yes
D43	1	LED RGB 4-pin (white square body with dome)	yes
SW1-SW9	9	SPST momentary button	no
RV1-RV6	6	100 kΩ linear potentiometer + nut (metal shaft)	-
RV7-RV31	25	100 kΩ linear potentiometer (plastic shaft)	-
C71, C72	2	470 µF electrolytic capacitor	yes
_	8	button cap black	-
_	1	button cap red	-
_	8	stainless steel touchpads M3	-
_	8	plastic washers M3	-
_	8	brass nut M3	-
_	5	brass spacer M3	-
_	6	knobs for RV1-RV6	-
_	1	“Pets” set of 4 preset cards	-

Component List (desktop kit only)

Part ID	Count	Type	Polarity matters?
J4	(1)	XH header	yes
_	4	hex panel screw	-
_	4	square nut for hex panel screw	-
_	1	USB-C to USB-A cable	-
_	(1)	(optional set of 2 light blocking clips)	-

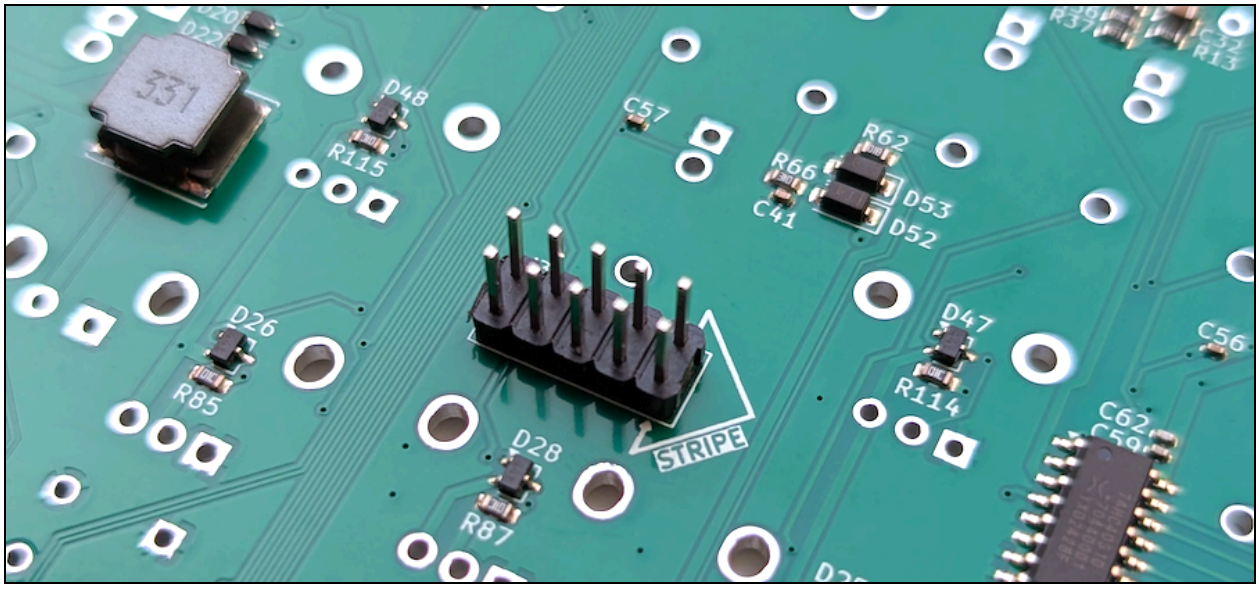
Component List (Eurorack kit only)

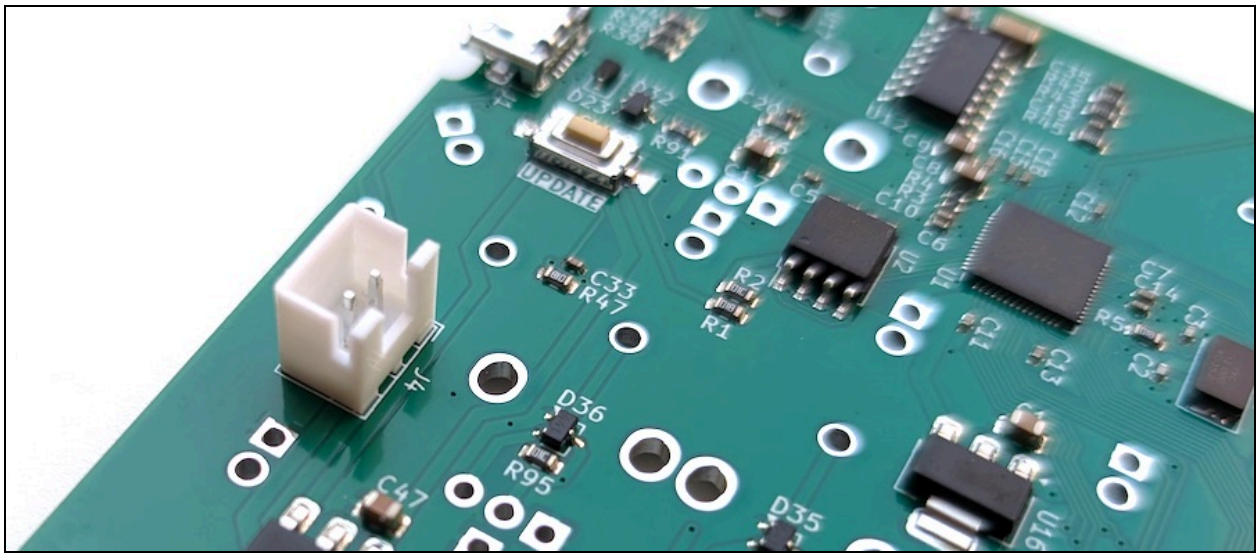
Part ID	Count	Type	Polarity matters?
_	4	panel screw	-
_	1	Eurorack power cable	-

Step-by-step instructions

Put the 8 plastic washers onto the 8 touchpad screws. Insert the screws into the holes on the bottom part of the front panel and secure them from the back as follows: Each upper row screw is attached with a brass spacer, and the bottom row screw of voice 1 (on the left side when viewed from the front of the panel) as well. The remaining 3 bottom row screws are simply attached with a brass nut each. Tighten the spacers and nuts well, as they’re also making electrical contacts.

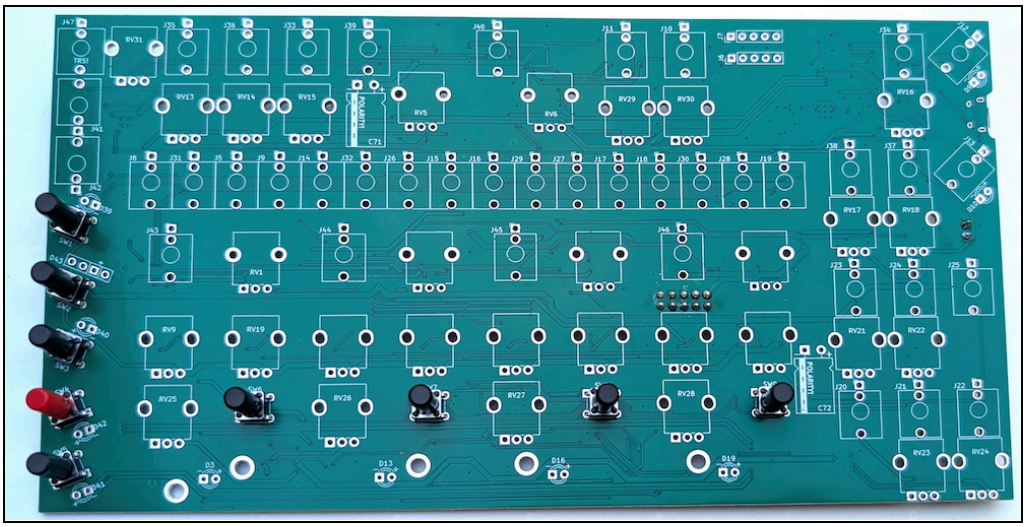
Now on to the PCB. Insert the 10-pin Eurorack power header (J3) and solder from the other side. This header is part of both the Eurorack and desktop version of the kit, as desktop version users may want the option to rack their Elmyra 2. It’s best to solder 1 pin first, correct the angle slightly if necessary, then solder the remaining pins.



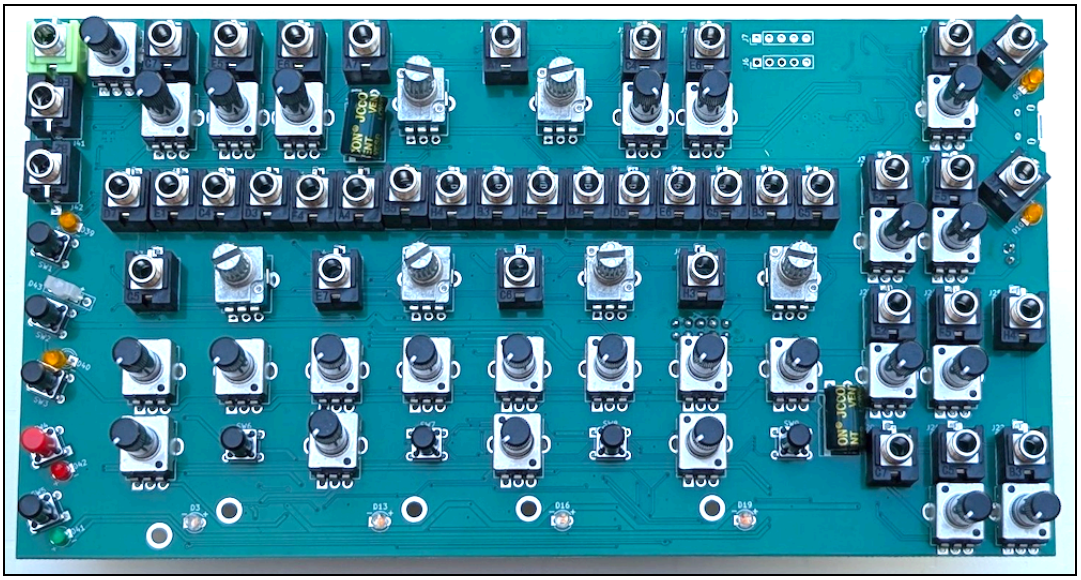


Only the desktop version has an XH connector for USB power (J4). Put it in place and solder. **Double check the orientation!** The open slot goes on the side towards the middle of the PCB, as indicated on the silkscreen print.

Now flip the PCB over and put in the 9 switches (SW1-SW9) and their button caps **without soldering yet!** The red cap goes on SW4, all others receive a black cap.

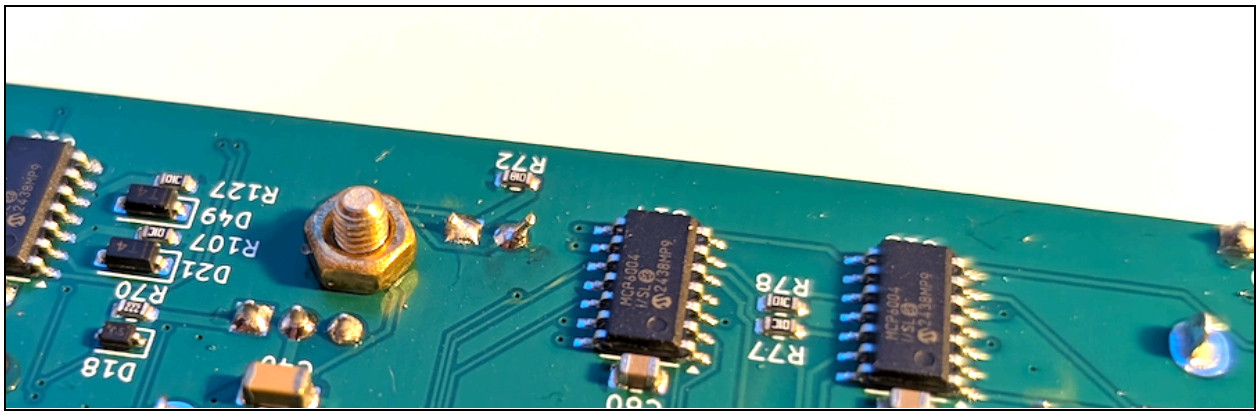


Insert the Thonkiconn sockets and pots. It is best to do this row by row, so you have enough space around the components. RV1 to RV6 are green metal pots, all other pots are black plastic minipots. Hold the PCB on the edges or place it on supports, so you do not accidentally move the components before soldering. Also the capacitors (C71, C72) – **mind their polarity!** Then insert all the LEDs as described below. **The long legs of the LEDs go on the side marked on the PCB with a "+". Double check the orientation!**



The orange LEDs go into D9-D10, D39, D40. The red one goes into D42 and the green one into D41. The 4-legged RGB LED goes into D43. One of its legs is longer than the others, **that one goes into the hole marked with a "+".** The 4 clear LEDs are a super bright orange type used to light up your fingers from below the touchpads, and they go into the 4 LED footprints at the bottom of the PCB. **Do not solder anything yet!**

Now that all the components are in place, it's time to combine front panel and PCB. Make sure all inserted components are standing up straight and carefully place the front panel onto the PCB, keeping both of them parallel to each other and making sure all the components find their way through the holes. The spacers behind the touchpad screws need to go through the holes on the PCB. Don't worry about the two 5-pin headers at this time, they will be inserted later. Once everything fits together neatly, secure RV1 to RV6 with nuts from the top. Flip everything over and attach the 5 remaining brass nuts to the 5 spacers protruding through the PCB. Tighten them well, as they make electrical contacts, but **be careful not to damage any SMD components while securing the nuts!**



Place the front panel face down onto some sort of support on the sides. If you're building the desktop version, you can simply lay it face down into the case. This is to make sure that all Thonkiconn sockets will sit close to the front panel. Now solder **all pins on the Thonkiconn sockets and switches**, but **do not solder any pins on the pots or LEDs yet!** While soldering, pay close attention to those areas that have a high concentration of SMD parts. There is always enough space to solder the pins even with a standard tip, but **care must be taken not to accidentally move the iron and desolder, move or damage an SMD part.**

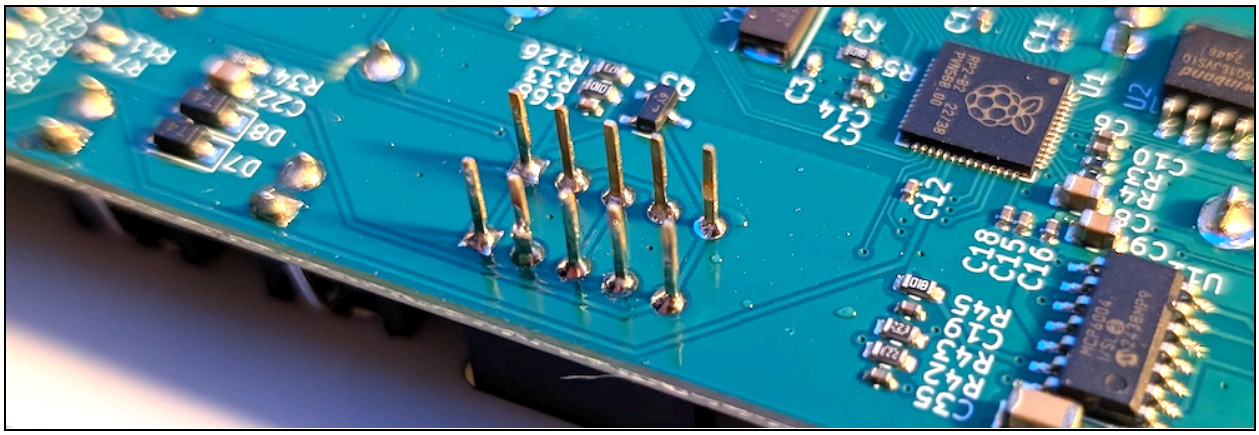
Remove the module from the supports or case and lay it face down on an evenly flat surface. This ensures that the plastic pots are pushed back against the PCB. Solder the pins of **all the pots** now (both metal and plastic pots).

For D3, D13, D16, D19 (the clear LEDs between the touchpads), pull up their leads as far as they will go and bend them apart, about 45 degrees to the sides. This should set the LED body flush with the PCB, so it is **as far away from the front panel as possible**. Now solder those legs and snip them off with a wirecutter. Make sure the LED bodies are pointing straight up.

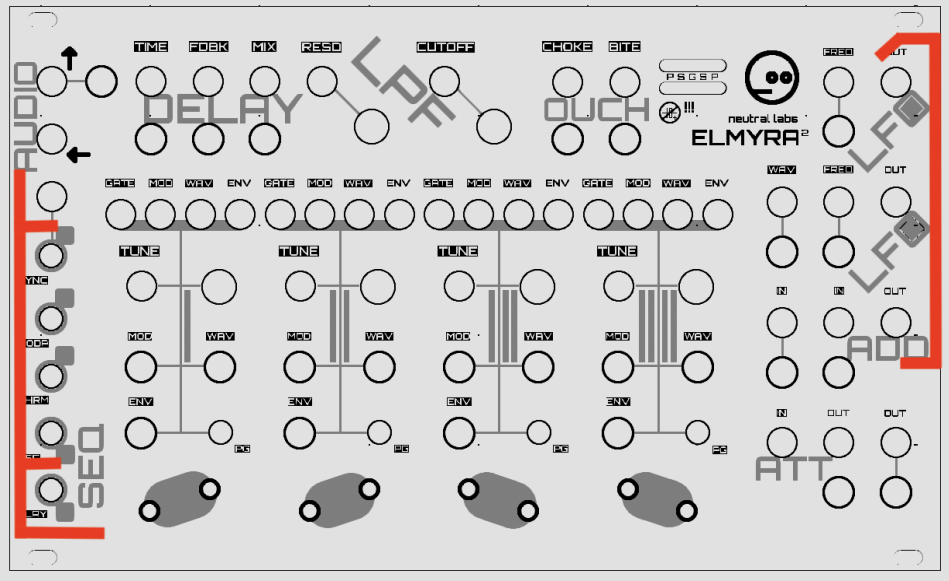
Attach and tighten all the Thonkiconn socket nuts, or at least those that are close to any LEDs and the 5-pin headers (J5-J6). **This ensures a constant distance between PCB and front panel which is important for soldering the LEDs and 5-pin headers.**

All other LEDs should now sit **as close as possible to the front panel.** Each also needs to be positioned in the middle of the viewport on the front panel, pointing towards it. The best way to ensure that is as follows: Make sure the LED and legs are oriented perpendicular to the front panel. Apply some solder to only one of the LED legs and its solder pad (**not longer than about 2 seconds at a time or the LED might take damage**). Grab the LED body from the side with a pair of tweezers and move the LED into place, carefully pushing it against the front panel and centering it behind the viewport. Reheat and reposition if needed. Once you're satisfied with the position, solder the other leg(s) of the LED normally. Cut the LED legs after you're done.

Now push the two 5-pin headers (J5-J6) into the slots on the front panel, so that the 5 pins go into the holes and the top sits flush with the panel. This may take some wiggling. Put some tape over the slots from the front side before turning it over. Solder **only the middle pin** of each. Remove the tape to check the positioning. If there is an angle in one of the headers, reheat the solder and readjust. Put the tape back on and solder the remaining pins. You may then snip off the protruding part of the legs, but it's not necessary.



For the desktop version, your kit may contain the optional set of 2 light blocking clips which can be used in order to prevent stray light from the LEDs shining through the small gaps on the left and right sides of the module. If it does and you want to use them, clip them in from the sides, between the PCB and panel, into the positions shown below.



(If your kit doesn't contain them, feel free to reach out by email for the STL files to 3D print them, or simply use electrical tape to achieve the same effect.)

Now plug in and test your module. For the Eurorack version, use the provided Eurorack power cable. For the desktop version, insert the XH cable from the case into the XH header (J4) on the back of the module, and power the case via the USB-C cable.

If something's not right upon power-up, it may be best to unplug the module from power immediately so as not to damage it (or the PSU), even though that's pretty unlikely.

Make sure to test the functions of all the potentiometers and buttons. Refer to the manual if needed.

Most problems can be easily fixed by reheating all your own solder joints so the solder can reflow. Also visually inspect joints and see if you can spot accidental solder bridges.

When everything is working correctly, you can now put the knobs on the shafts of RV1 to RV6.

You may want to check the website for firmware upgrades before putting the device to use. The firmware upgrade procedure is described in the manual.

For the desktop version, secure the module with the 4 black hex screws in the corners of the desktop case, or any other M3 screws (such as those commonly used for Eurorack).

There is a 1V/octave pitch calibration routine outlined in the manual. In most cases, you'll simply want to set the defaults for either the desktop version (using code 213) Eurorack version (code 214).

Congratulations, you've now completed the build. Go and make some beautiful noise! If there are any questions or issues, feel free to reach out anytime at admin@neutral-labs.com.