

Appendage Advanced Ribbon Controller Eurorack *Adapter* PCB



Board Build Instruction Manual

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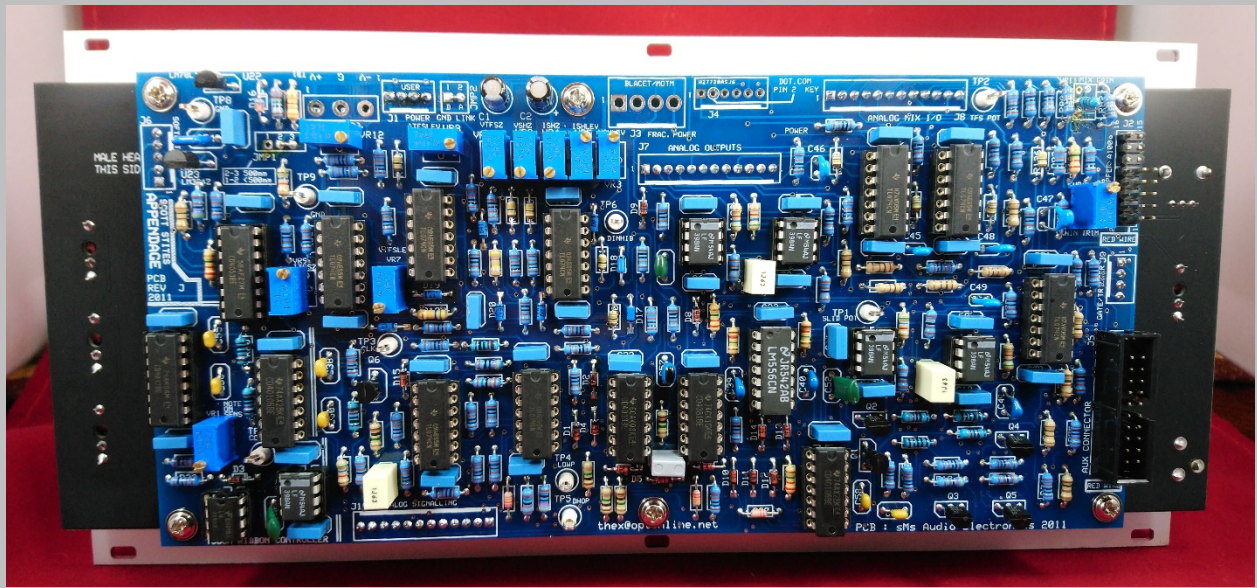
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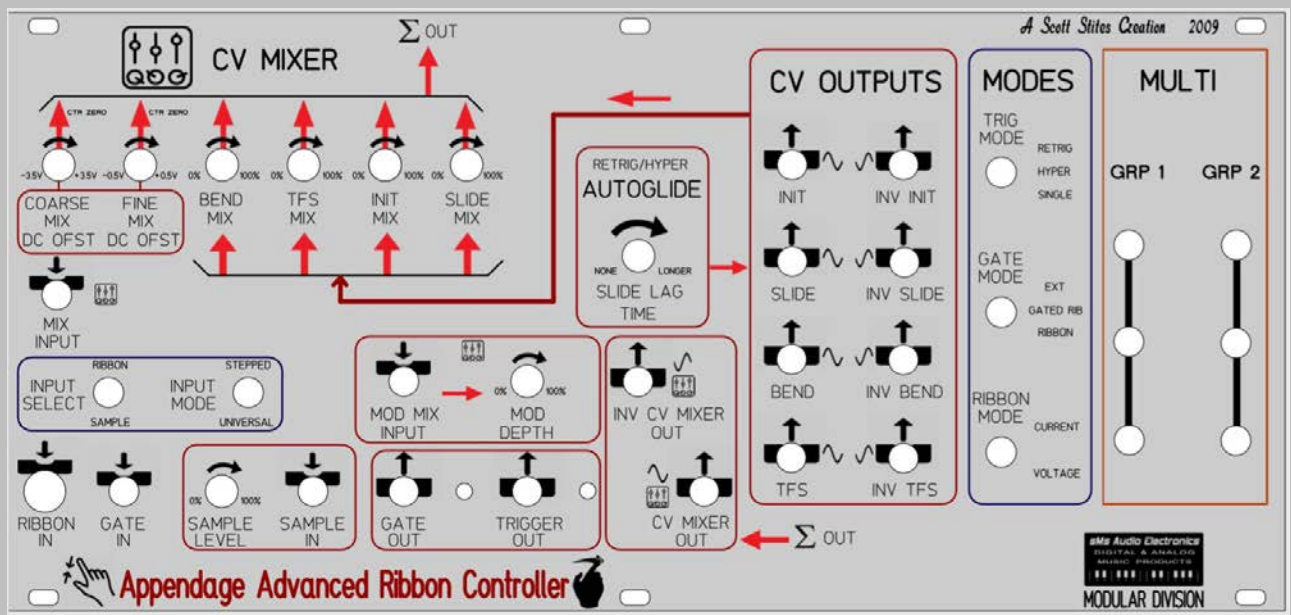
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Adapter PCB Overall Description and Photographs:

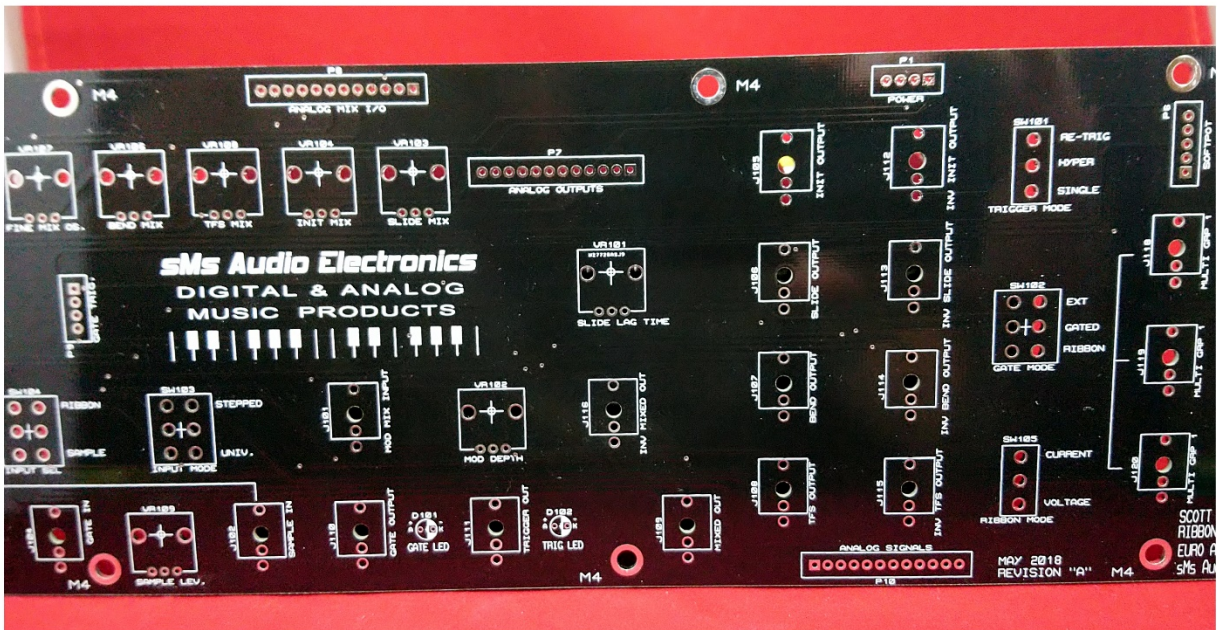
The Appendage EURO adapter PC board is designed to allow the legacy appendage printed circuit board to be housed and powered within the eurorack synthesis environment or in a standalone enclosure. The adapter PCB is the interface between the front panel and any appendage PC board. The adapter accepts all the front panel switches, jacks, potentiometers and connects to the Appendage PCB via header connectors thus eliminating hours of cable fabrication and front panel wiring. The adapter PCB is secured to the appendage PCB via six 11mm standoffs, and twelve 3mm screws creating a sturdy and reliable module assembly. See photo section for example build. The adapter is not only good for new builds but also for those who haven't built their appendage PCB's yet because of the large panel wiring job. It's a design whos time has finally come!



View from behind a completed module.



Most recent front panel design.



Views of bare adapter PCB, and standoff installation.



Parts Checklist:

Remove all the parts and fastener hardware from the packaging and check that you have everything you need to build the adapter PC board. As you check each part type, put a check next to that item. Place all the parts in small bins so they are not lost during the build.

NOTE: I found that checking the operation of your switches, jacks, potentiometers, and LED's can save time troubleshooting later. All you need is an ohmmeter and an LED tester. Some ohmmeters will even light an LED in the low ohms mode of operation as long as the leads are correctly positioned!

List Start -----

LED's CHECK ()

QTY	CHECK	PART-REF	DESCRIPTION	PART NUMBER
2	___	D101-D102	DIODE-LED	3 MM ANY COLOR YOU WANT

RECOMMENDED: LIGHTHOUSE LED FLAT TOP 3MM LED

Link to LED's :

<https://lighthouseleds.com/led-component-lighting/clear-top-dip-leds/3mm-led-flat-top.html>

JACKS CHECK ()

QTY	CHECK	PART-REF	DESCRIPTION	PART NUMBER
22	___	J101-J116 J118-J123	JACK, 3.5 MM	WQP-PJ301M-12 (Wenzhou QingPu Electronics) OR SYNTHCUBE / THONK PJ301M-12
1	___	J117	3.5 MM STEREO	161-MJ355W-EX (Kobiconn)

CONNECTOR HEADERS CHECK ()

QTY	CHECK	PART-REF	DESCRIPTION	PART NUMBER
2	___	P1,P9	PIN HEADER 0.1", 4 POSITION	synthcube
1	___	P6	PIN HEADER 0.1", 5 POSITION	synthcube
3	___	P7,P8,P10	PIN HEADER 0.1", 12 POSITION	synthcube

Link to Pin Headers:

<https://synthcube.com/cart/synth-diy/parts/pin-headers-and-sockets/0-1-2-54mm-pitch-single-row-pin-header>

QTY	CHECK	PART-REF	DESCRIPTION	PART NUMBER
2	_____	P1,P9	PIN SOCKET 0,1", 4 POSITION	synthcube
1	_____	P6	PIN SOCKET 0.1", 5 POSITION	synthcube
3	_____	P7,P8,P10	PIN SOCKET 0.1", 12 POSITION	synthcube

Link to Pin Sockets:

<https://synthcube.com/cart/synth-diy/parts/pin-headers-and-sockets/pin-header-socket-female-0-1-2-54mm-pitch-single-row>

SWITCHES CHECK ()

QTY	CHECK	PART-REF	DESCRIPTION	PART NUMBER
1	_____	SW101	SWITCH, ON-OFF-ON SPDT PC MT	7103SYCQE (C&K Switch)
1	_____	SW102	SWITCH, ON-OFF-ON DPDT PC MT	7203SYCQE (C&K Switch)
2	_____	SW103-SW104	SWITCH, ON-ON DPDT PC MT	7201SYCQE (C&K Switch)
1	_____	SW105	SWITCH, ON-ON SPDT PC MNT	7101SYCQE (C&K Switch)

POTENTIOMETERS CHECK ()

QTY	PART-REF	DESCRIPTION	PART NUMBER
9	VR101-VR109	POTENTIOMETER 100K, LINEAR 25 mm Shaft with White Pointer.	synthcube

Link to Potentiometers:

<https://synthcube.com/cart/synth-diy/parts/potentiometers/9mm-trimmer-pots>

Misc. Items CHECK ()

QTY	CHECK	DESCRIPTION
6	_____	M3 Female to Female Threaded Screw Brass Standoff Hex, 11mm Length
12	_____	M3 Cap or Panhead Screws with Lock and Flat Washers

1 _____ Eurorack Power Ribbon Cable 30 CM

Link to Cables: <https://synthcube.com/cart/synth-diy/cables/eurorack-ribbon-power-cables>

6 _____ M3 Eurorack Knurled Panel Screws

Link to Panel Screws: <https://synthcube.com/cart/befaco-knurlies?search=screws&description=true>

List End -----

Tools Required:

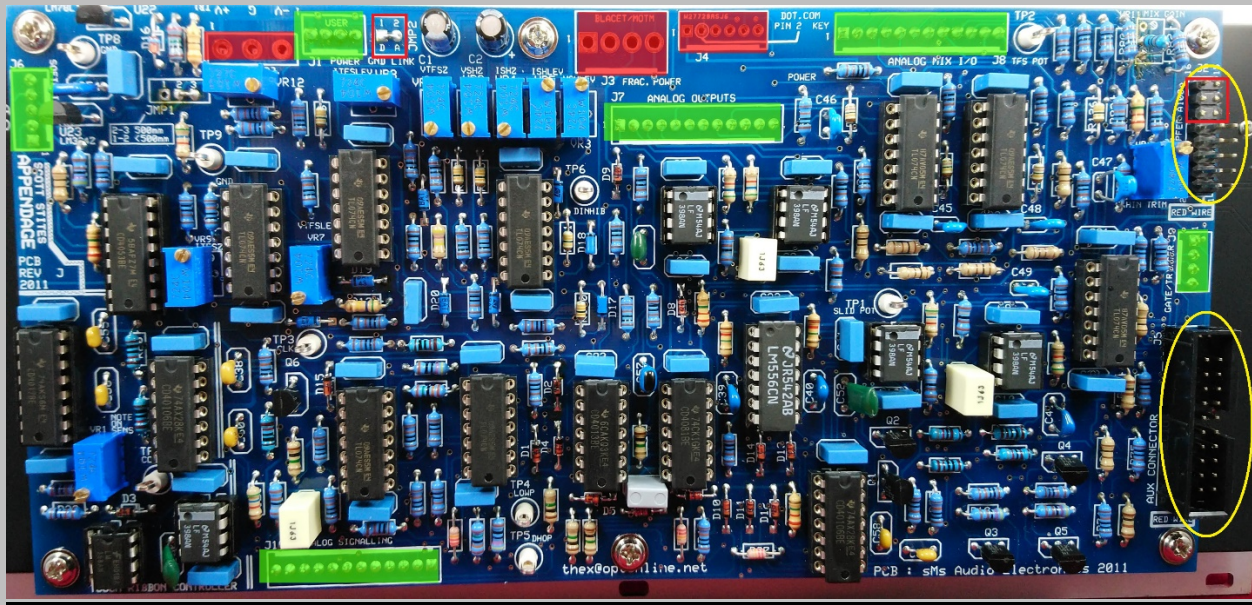
Solder Iron and suitable tip, Tin/Lead Solder, RMA Flux, Flush Cutters, Philips Screwdriver #1, Alcohol or Flux Remover, Felt Tips, Air Duster.

Appendage PCB build Prep Notes:

When you build your Appendage PCB, **do not** install any of the connector headers. The areas highlighted in **RED** never get populated. In the areas highlighted in **GREEN**, install the female header sockets that came with your adapter parts kit. In some kits, you may receive 10 and 2 position pin sockets. Just gang them together to make the 12 pin socket. Some sanding at the header edges will be required but is easily accomplished. Insert the sockets from the solder side of the appendage PCB and be sure they are straight. You can see from the photo that the solder is applied on the component side of the board. Also note that in the upper right of the photo, cut the top 6 pins flush with plastic housing. Be sure to be careful and not get the pins in your eyes when snipping them. **Eye protection is a good idea here.** In the bottom right of the photo, be sure to install the 20 pin shrouded header (J5 AUX). This is an expansion connector for future euro modules and will expand the Appendage capabilities such as MIDI interfacing. One last thing is to add the jumper on JMP2 GND LINK located top and left on the PCB.

To Summarize the appendage PCB preparation:

- Do not install original headers that came with the PCB kit
- Install Pin Sockets
- Cut top 6 pins on power header
- Install the expansion connector
- Install JMP2 ground link jumper.



Appendage PCB Preparation Diagram

Building the Appendage Adapter PCB:

Prepare the adapter board in a well ventilated by cleaning it with alcohol or flux remover. This will remove any manufacturing oils or finger print oil. Use an air duster to blow any remaining debris off the board. Use the air duster in an upright position or else the propellant will stain the board with white residue.

Work in a well lighted area when soldering your board to avoid eye strain. The board is composed of all through hole components so no special soldering tools are required. This makes the adapter board very easy and enjoyable to build. I do caution to **not** dwell the soldering iron too long when soldering the switches as you will melt the switch potting and destroy the switch or cause latent failures.

NOTE : Reference the following Parts Layout Diagram when building the board.

Jack Installation:

Insert mono jacks J101-J116 & J118-J123 and stereo jack J117. Place the front panel onto the jacks and secure some of the jacks with a nut so that the front panel lays flush against the jacks. This will insure proper alignment with the panel. Now solder all the jacks. After soldering remove the panel for the next components to be installed. Check all your solder joints and be sure that every jack has been soldered.

QTY	CHECK	PART-REF	DESCRIPTION	PART NUMBER
22	___	J101-J116 J118-J123	JACK, 3.5 MM	WQP-PJ301M-12 (Wenzhou QingPu Electronics) OR SYNTHCUBE / THONK PJ301M-12
1	___	J117	3.5 MM STEREO	161-MJ355W-EX (Kobiconn)

Potentiometer Installation:

Insert all the 100K potentiometers. Place the front panel onto them and secure with a nut so that the front panel lays flush against the potentiometers. This will insure proper alignment with the panel. Now solder all the potentiometers and then remove the front panel once again. Check all your solder joints and be sure that every potentiometer has been soldered.

POTENTIOMETERS CHECK ()

QTY	PART-REF	DESCRIPTION	PART NUMBER
9	VR101-VR109	POTENTIOMETER 100K, LINEAR 25 mm Shaft with White Pointer.	synthcube

Switch & LED Installation:

Insert all the switches. It is essential that the switches be the correct type so please use the correct part number corresponding with the switch part reference.

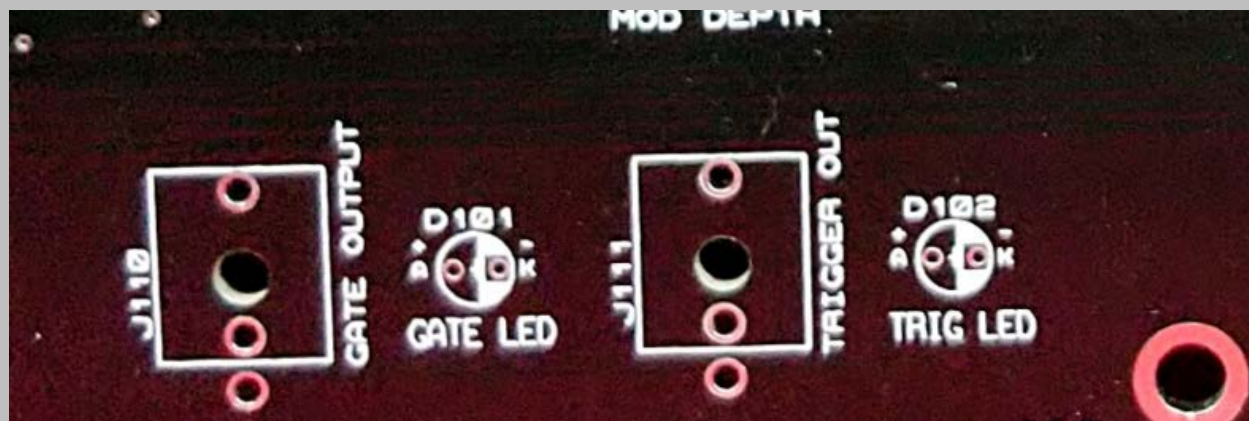
Insert the GATE and TRIG LED's with the longer lead placed in the "A(+)" locations as shown below in the photo. Push the LED's slightly down into the board and

then place the front panel back over the board and make sure all controls, switches, and jacks are flush with the panel. Place some of the nuts to hold the panel in place. Now push the LED's into the panel holes. I like using the flat top style LED's from lighthouse so I usually put tape over the LED hole on the panel then push the LED so the LED top sticks to the tape. The LED top will now be flush with the panel which gives it a very professional look. Once the LED's are secure in the holes solder them in place making sure the LED's did not slip down. Cut the excess leads on solder side of the board with flush cutter. Solder all the switches at this time. Check all your solder joints and be sure that every switch and LED has been soldered. Remove the front panel once again. Be careful not to bend the LED leads.

QTY	CHECK	PART-REF	DESCRIPTION	PART NUMBER
1	___	SW101	SWITCH, ON-OFF-ON SPDT PC MT	7103SYCQE (C&K Switch)
1	___	SW102	SWITCH, ON-OFF-ON DPDT PC MT	7203SYCQE (C&K Switch)
2	___	SW103-SW104	SWITCH, ON-ON DPDT PC MT	7201SYCQE (C&K Switch)
1	___	SW105	SWITCH, ON-ON SPDT PC MNT	7101SYCQE (C&K SWITCH)

QTY	CHECK	PART-REF	DESCRIPTION	PART NUMBER
2	___	D101-D102	DIODE-LED	3 MM ANY COLOR YOU WANT

RECOMMENDED: LIGHTHOUSE LED FLAT TOP 3MM LED



NOTE : By now all the adapter board components have been installed except the pin headers. Please recheck all your work to make sure all components are placed and properly soldered.

Header Pin Installation:

By now, your Appendage PCB should be completed and its socket pins installed during board preparation. This step will now take you to completion of the adapter PCB by installing the pin headers. Take each pin header in your parts kit and push the longer pins into each pin socket on your appendage PCB. Now hold the appendage adapter board with all your front panel components facing you, lay the board onto all the pins that are inserted on the appendage PCB. Very small adjustments may have to be done to allow for all pins to protrude. Make sure every hole is populated and that the boards are parallel to each other. Now solder all the pins into the adapter PCB.

Standoff and Front Panel Installation:

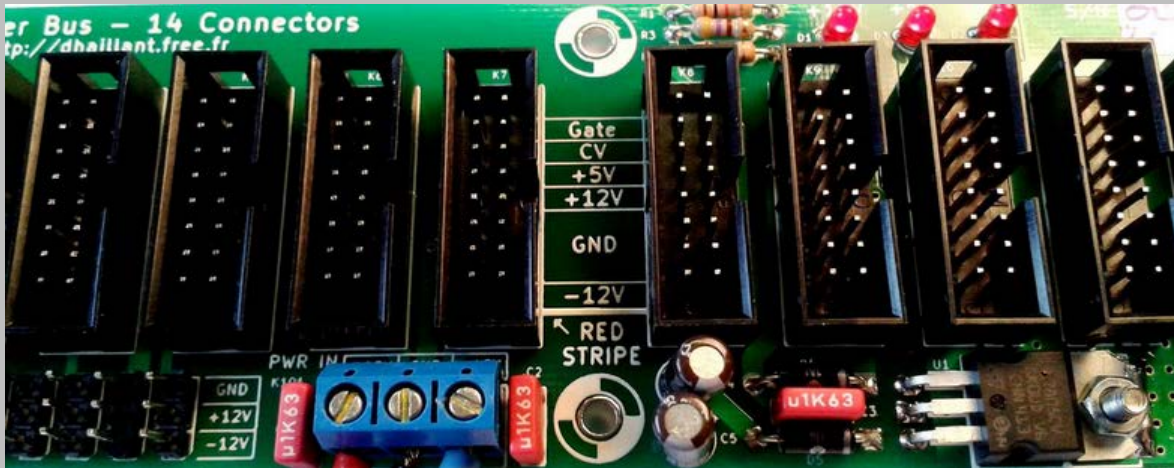
Insert all 6 standoffs between the two circuit boards and line the PCB holes with the standoff's. Insert and tighten the screws for each standoff. Do not over tighten. Now install the front panel and place all the nuts to secure the board to the panel. Be careful to not scratch the panel graphics when installing.

Calibration of the Appendage:

Follow the instructions in the Appendage Build Manual for calibration.

Before connecting the power cable, make sure the power source in your Eurorack case is OFF. Use the 30 centimeter ribbon cable for the calibration of your appendage. This length cable will allow you to place your powered module in a location where you can get to the PCB test points and get to the front panel jacks and switches. Connect the 10 pin side of the ribbon cable to the module making sure to place the ribbon cable's red wire at the location labeled "RED WIRE" on the PCB. Connect the 16 position end of the cable to the case power connector making sure alignment is correct and is in the correct orientation. Most case power connectors are keyed like the ones below so no orientation mistakes can

be made. When everything is connected properly, turn the power ON and let the Appendage module amplifiers stabilize for at least 20 minutes. Proceed to calibrate your module in the original build manual for the Appendage PCB.



Typical Eurorack Case Power Connector

After calibration, mount the module into your case using the recommended 3 mm black knurled screws from Synthcube. It really adds a nice touch to the look of your module !

Congratulations ! Your Appendage Ribbon Controller Module is now Ready to Use !!

A schematic diagram of the appendage adapter PCB has been provided at the end of this document to aid in troubleshooting in case things do not work. If something doesn't work, don't be disappointed. It's a good chance to troubleshoot and learn! My e-mail address is printed on the cover sheet of this document so if you need to ask any questions, I will answer them.

