DIY Assembly Manual

for the LPZW.modules PO-Series Adapter

Version 2.0

Introduction

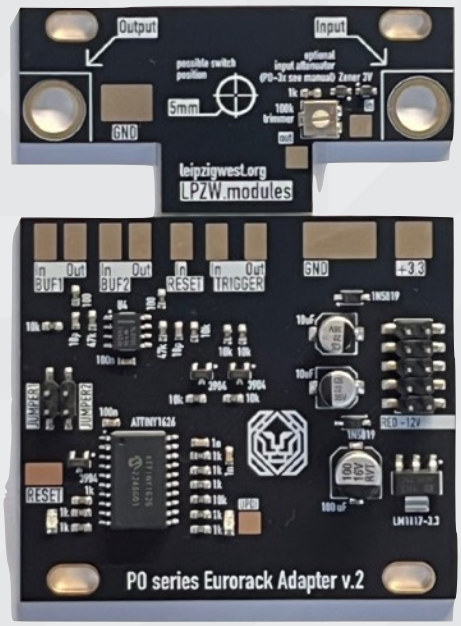
The LPZW.module PO-Series Adapter has five functions:

- hold the PO in your Eurorack
- supply power to the PO from bus-power
- route the I/O 3.5mm jacks to the front
- divide incoming 16th-note clock to a 8th-note clock used by the PO
- amplify the output signal

New additional features:
- External reset for the PO
- Automatic reset after idle clock input
- Attenuation and protection (clipping) circuit for external inputs

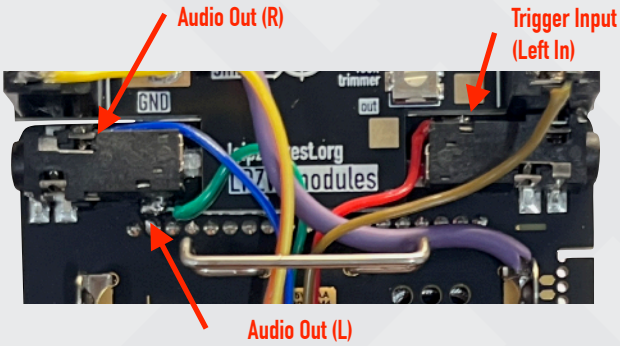
It is up to you to decide which of those functions you want to use. Read this manual carefully and completely first and decide for yourself.

Content



Assembly step-by-step

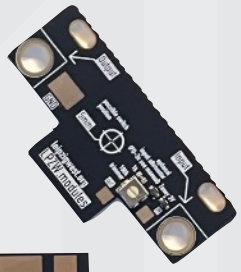
Step 1: Remove the stand bracket from the PO.

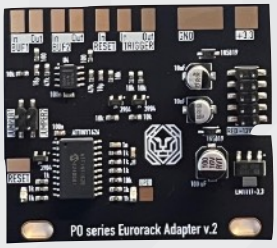


Step 2: Solder wires to the PO's 3.5mm jacks. **This is easier without the adapter in place** (contrary to the picture here). The top part of the adapter will sit tightly next to the pads of those jacks, so be careful not to solder on their sides but on top of the pins!

In this picture the wire in question are blue & green for the audio output of the PO and the red one for the clock input.

Step 3: Break the adapter into the top and bottom piece. There is a notch so this is easy and you shouldn't need to much force to do it.





Step 4: Attach the adapter to the PO with the adapter's blank side towards the back side of the PO. There is a line on the bottom part that marks the alignment for the PO and the handle is marked on the top part. Try first before you permanently attach it!
You can use thin double sided tape if you want to be able to remove the adapter in the future or you can use super glue, which is a more solid solution for transport.

Step 5: Wire the GND from the bottom part to the top part and also to the negative pole battery clip. Make sure to use the correct one since the two batteries are in series, so only one of the clips is actually GND.
It is easier to remove solder from the clip than from the pad under the clip. So if you want to be able to remove the adapter, try soldering this cable to the clip.

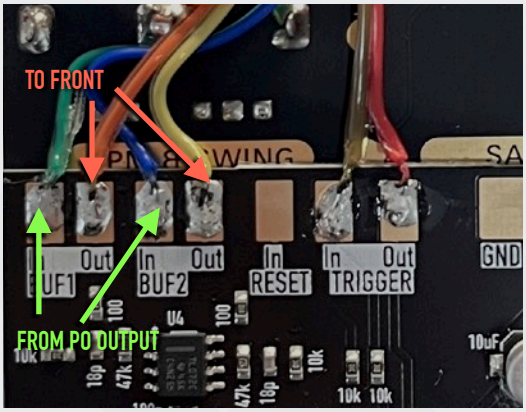
Step 6: Connect 3.3V to the positive clip. Again: only one clip is correct!

Step 7: connect the wire from the PO input jack left channel to the Trig Out pad of the adapter.

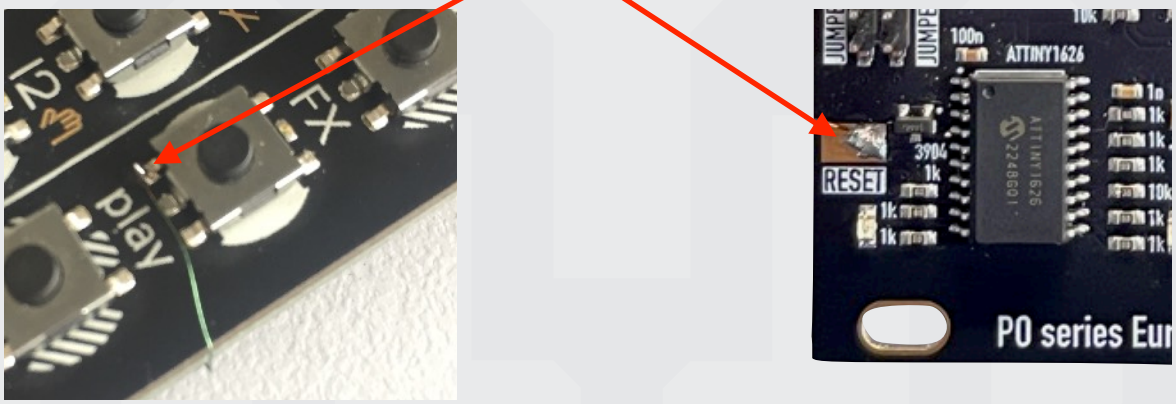
Step 8: connect the Trig In pad to the new input jacks tip connector.

Step 9: connect left and right output of the PO to the BUF1 and BUF2 In of the adapter. This will boost output levels of your audio.
You could also just do BUF1 if you plan to use the PO in mono anyway.

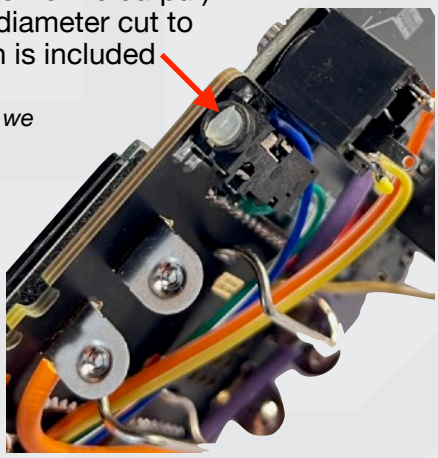
Step 10: connect the BUF1 and BUF2 Out to the tip and ring of the new output jack. Try to route left to the tip and right to the ring pin of the new output.



Step 11: The PO only recognises the rising edge of the clock, but there is no start/stop signal for synchronisation. So we need an additional signal from the “play” button, to reset the state of the clock signal. Connect the "play" button of your PO with the asynchronous preset of the adapter’s clock divider.
THIS IS THE ONLY WIRE THAT WILL WRAP AROUND TO THE FRONT OF THE MODULE! Consider fixing it with tape or glue. If you use very thin wire you can wrap around right there, the gap between two modules in Eurorack is usually way wider. Alternatively you can route thru the cutout in display area of the PO.



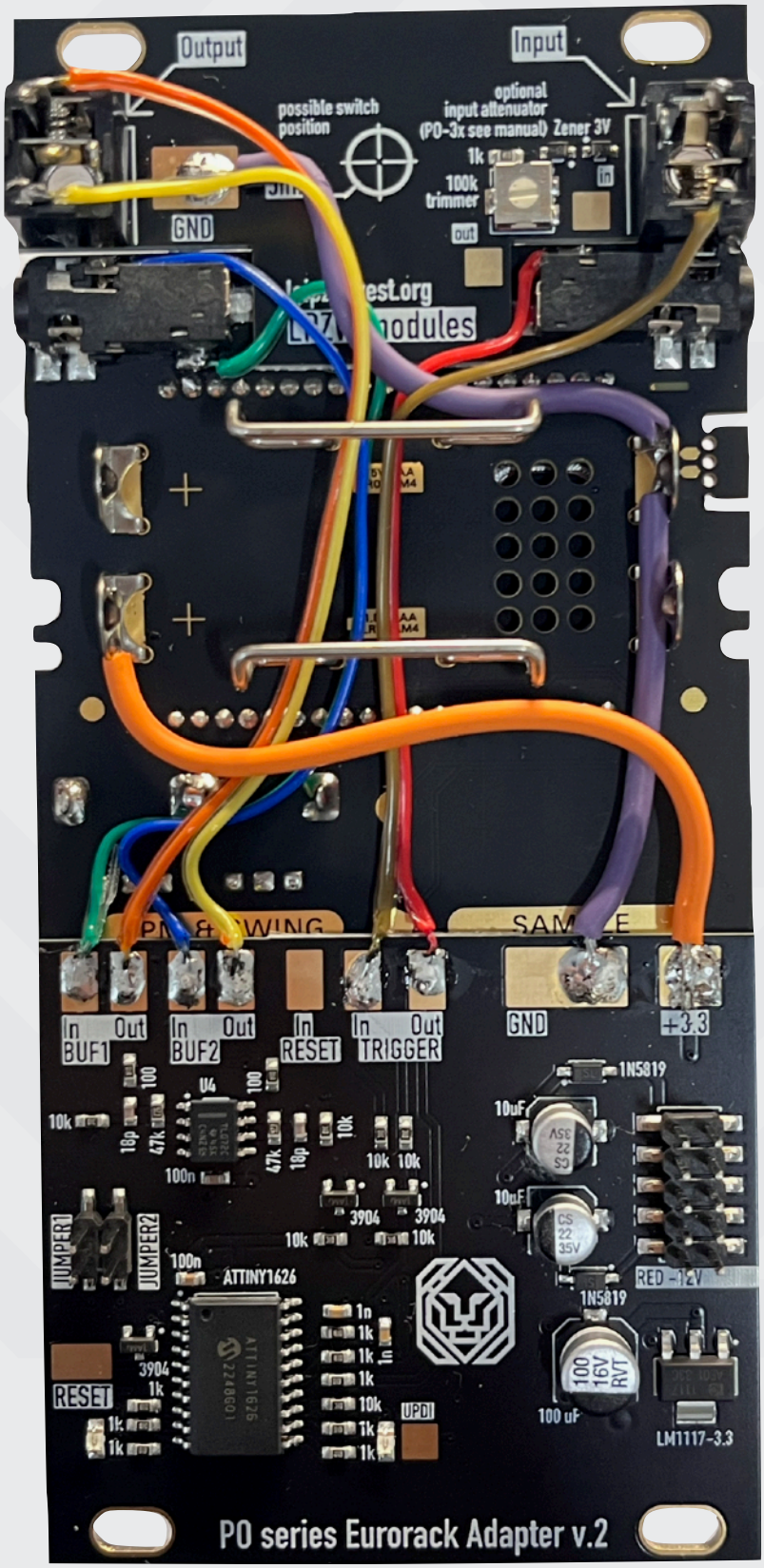
Step 12: Stick some non-conducting ca. 3.5mm thick round thing into the PO’s I/O jacks to break the normaled conditions. (GND to the input; speaker to the output).
A M3.5 nylon screw or a round plastic stick with 3.5mm diameter cut to length (ca. 16mm) opens all normaled connectors. Which is included in the kit.
(Alternatively you can desolder the original PO jacks altogether which we wouldn't recommend.)



Step 13: connect the PO+adapter to your Eurorack. Make sure you align the red line with the marking on the adapter and the bus boards -12V!

Step 14: set the PO to sync mode SY2 or SY4.

Finished mod:



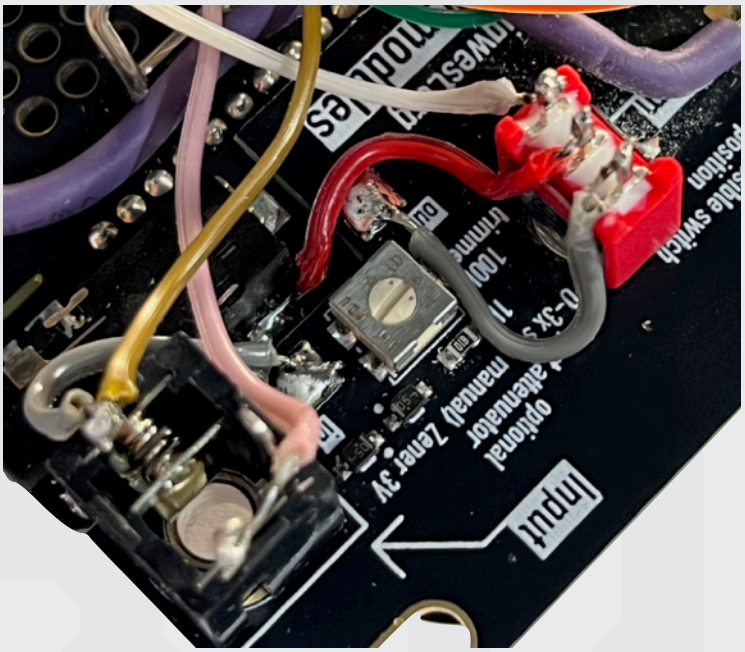
Remarks regarding clocking the PO series

The PO series clock on the rising edge of a 1/8th note clock. Our clock divider divides a more common 16th note clock to a 1/8th note clock.
The POs seem to calculate the distance between the clock pulses for the intermediate steps. This works accurately down to approximately 50BPM. This means you can clock the PO with half speed in standard BPM ranges without artifacts.
When you go below that (clock at quarter notes) or want to send single triggers with larger interval, the PO will asynchronously step an intermediate 16th note further. This will give you a polyrhythmic structure that we strongly encourage to explore!

New optional and wonky features of Version 2.0

Input Attenuator:

Since there are now a couple of POs that regularly need an audio input for features like sampling, tone data upload or voice analysis, the new version of the PO adapter has an optional input attenuator and protection (clipping) circuit. You can feed external audio from the front panel through this small trimmer and attenuate it to taste. You can send the output to the right channel of the PO and use sync mode SY4 on the PO-32/33/35 and stop the clock while uploading data or sample audio.
Alternatively ..



Switch position marker:

.. you could also safely drill thru the adapter and PO at the marked position and use a subminiature toggle switch to select if the output of the clock divider or the attenuator should go to the left channel input of the PO. Wire the input coming from the input jack on the front to the TRIG Input of the clock divider and the input of the attenuator in parallel. Connect both outs to the switch and use the centre pin to go to the PO input jack.

Superstar option: use an On-On-On toggle switch and also connect the POs microphone to this switch. You can find the microphone signal at the normal right channel pin at the input jack.

If you want just want to use the mic and non of the feature above, just connect the right channel pin and its normaling pin on the PO-32/33/35's input jack.
In that case you have to use sync mode SY4 on the PO-32 and stop the clock while uploading data!

External Reset and Auto Reset

In the new version of the PO adapter, the adapter can actually reset the PO by using that thin enamel wire connection to the play button. It basically mimics a push of this button.
Since the scan rate of the buttons is relatively slow it is sadly not quite possible to reset (stop and start by pushing twice) between two 16th notes. You will get a gap of one 16th at “normal” speeds.

For this feature to work the adapter needs to know if the PO is playing or being stopped. It senses your button presses for that.

Auto Reset

The adapter will reset the PO to step 1 when there is no clock coming in for a certain amount of time.
This feature is default disabled after each power cycle. You definitely want to have this disabled when the PO is free running and not clocked externally.

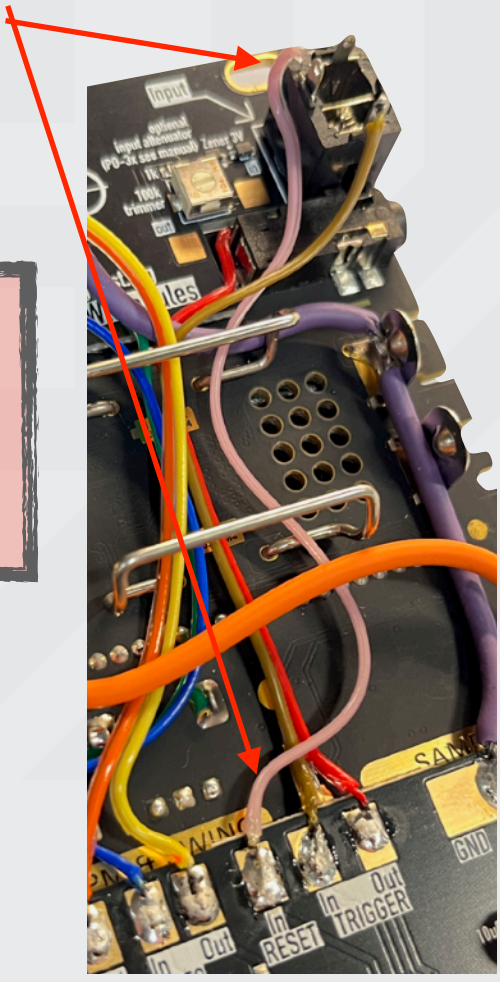
To enable Auto Reset you have to start the PO and keep holding the start button for about 5 seconds. You have to do that when starting the sequencer not when stopping, because this is how the adapter knows the PO is actually running. It will then sense your button presses, so you will have to do that only once.
You can disable Auto Reset the same way.
If you never want to use Auto Reset you can permanently disable it by setting the jumper 1.

External Reset

There is a new solder pad for a external reset which you can connect to the right channel (ring position) of the input jack for instance. You can then use a stereo to dual mono adapter to feed clock and reset signal to the PO.

As previously described the adapter need to know if the sequencer is running or not, do this by starting the sequencer and then keep holding the play button for approximately 5 seconds.

There are two LEDs on the adapter to debug/learn to use this feature.
The left is showing you the state of the clock signal to the PO (LED on on every odd step and off on every even step).
The right LED shows you if the adapter “thinks” your PO’s sequencer is running or not. LED on means running, off means stopped.



Firmware

Version 2 is now based on a micro processor ATTiny1626, while version 1 was a D-Flipflop logic IC for the clock divider.

The Firmware for the adapter written in C will be available on GitHub under a non-commercial license, the repository will be linked on our website.

Upload to the uC is done via UPDI. There is a marked pad close to the uC on the adapter.

LPZW.modules
LEIPZIGWEST.org
2025

If you find faults or inconsistency in the manual's steps or unbearable grammar mistakes, please contact us at info@leipzigwest.org.