

**LjunggrenAudio RYO VC Sequencer Trig Expander:**  
an Individual output expander for the RYO VC Seq

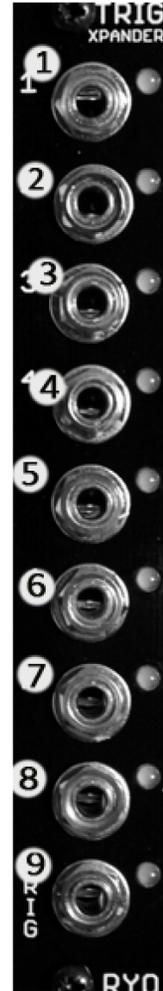
**Quickstart - what is the Trig Expander and how do I get going?**

This will give your VC Sequencer 8 individual outputs, one for each step, outputting either a trigger or a gate [selectable with a jumper on the PCB], and a 9th output that gives you a trigger for each step progression.

# Trig Xpander (for RYO VC Sequencer)

- ① Step 1 individual output.
- ② Step 2 individual output.
- ③ Step 3 individual output.
- ④ Step 4 individual output.
- ⑤ Step 5 individual output.
- ⑥ Step 6 individual output.
- ⑦ Step 7 individual output.
- ⑧ Step 8 individual output.
- ⑨ Common output (gives a trig/gate for each step progression.)

Width: 4hp



## Installation

To begin installation, please make sure that:

- you have a standard pinout eurorack bus board
- you have +12V and -12V power rails on that bus board [no +5V supply is required]
- the power rails are not overloaded

**!!!Before installing this module disconnect the power from your system!!!**

- Double check the polarity of the ribbon cable - The red stripe should be aligned with the -12V rail, on both the module and on the bus board

*[we use shrouded headers but it's still possible a cable has been assembled with the stripe on the wrong side of the shroud so always double check!].*

Also make sure when using busboards without shrouded headers that the pins aren't transposed a row vertically or horizontally - all pins should insert into holes on the cable.

*Although we use both PTC fuses and schottky diodes to provide reverse polarity and excess current protection, we do not take any responsibility for damages caused by wrong power supply connection!*

After you have connected everything, double checked it and ensured your case is closed such that no power lines can be touched by your hand or any stray cables drop into holes, turn on your system and test the module

The Trig Expander is a novice-friendly project, it is a low part count, build that only requires the most basic experience in PCB soldering and module assembly:

The individual outputs can be set to output either gates or triggers via a jumper on the PCB [*gates are high for the full duration of each step*].

Along with the basic gate out option the trig option has a greater degree of flexibility; on board is a trimmer for setting the trigger length to your liking (approx 1-20 ms) if you choose to have triggers sent at each individual output. Although usually you'd want to set this as low as possible to operate at higher sequencer clock rates, whilst still triggering the desired output module successfully.

Different trig lengths can give different sounds when pinging filters or striking low pass gates. Some vintage hardware synths, drum-machines and sequencers also require longer trig lengths.

The outputs are diode isolated to allow for passive mixing of the outputs using multiples/stackcables/IV cables, or switched multiples/OR combiners such as the Doepfer A-182 or Low-Gain Short Bus.

The Trig Xpander can be chained to more Trig Xpanders or other as yet unavailable, planned future expanders.

Also, i'm setting up a website to hold these documents for download and this will have every resource you need to design your own expansions and modifications.

**Dimensions**

Height:	<b>3U</b> (128.5mm)
Width:	<b>4HP</b> (20mm)
Depth:	<b>45mm</b> (with cable attached)
Weight:	35g (approx w/cable)

**Current consumption**

+12V rail	<b>12mA</b>
-12V rail	<b>0mA</b>
+5V rail	<b>no +5V</b> supply required

**Basic specifications**

total frequency controllable range	dc to 50kHz
max output signal	0 to +5V/0 to +8V
CV input range	n/a
Max gain	n/a

**Nominal impedances**

Audio signal input:	n/a
Audio Signal output:	1k ohm
CV input:	n/a

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### **Patch ideas:**

Although uses of trigger and gate sources in patch examples and ideas are found readily online and in some books, and similarly those familiar with using logic modules, perhaps such as the RYO Boolean Logics, there are many other less obvious ways to use the trig expander in patches in your modular rig:

below i've included some inspiring words to show the patches that can be used that are less evident; and, as ever, experiment - RYO modules are designed with all necessary protection and fail-safes so you can just start plugging in patch cables and see what happens!

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#### **Trigger other sequencers:**

Use the triggers to trigger other sequencers as master/meta overall clocks and resets to give large scale complex sequences and patterns.

#### **Combine with a sequential switch at audio rate:**

Put various outputs through a sequential switch, use to trigger a sequential switch or combine both to get weird trigger patterns, sequences and drum pattern triggers.

#### **Variable sequence lengths:**

patch an output to the reset input of VC SEQ to make shorter sequences. This can allow you to create odd step numbers, useful for creating polyrhythms, ever-evolving variation, or bit-reduced oscillations when clocked at audio rate.

#### **Trigger envelopes per step:**

using the bottom-most trigger output, or any OR'd combination of outputs, you can trigger envelopes, samples, etc. in time with the sequence

#### **Drum sequencing:**

combine multiple outputs with RYO (N)OR to trigger drums in time with the sequence

#### **Sync VCOs:**

a single trigger to a VCO or set of VCOs will reset their phase - great for creating swells per step or set of steps through phase differences caused by detuning of separate VCOs!