OR

Logical OR / Gate Combiner

Manual Revision: 2018.03.28

Installation

This module is designed to be mounted within any standard Eurorack-compatible case. It requires only 2HP of width, and because it's a passive module, it requires no power.

Operation

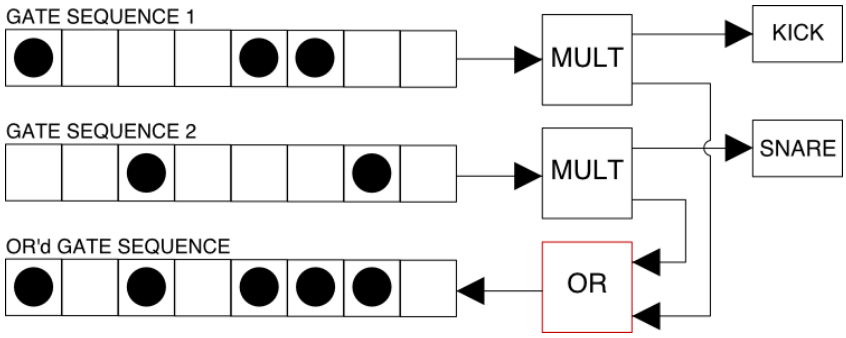
At its most basic, an OR circuit looks at two or more incoming signals, and if the voltage of at least one of those signals is high, then the voltage at its output is also high. In Boolean logic terms, only one input needs to be "true" in order for the output to be "true."

Intellijel's OR is divided into two sections — upper and lower. Each section is its own 3 IN x 1 OUT OR circuit. Plug up to three triggers, gates or waveforms into the upper section's top three jacks **[1]** and OR sends the OR'd result out the upper section's bottom jack **[2]**. Similarly, triggers, gates or waveforms patched into the bottom section's top three jacks **[3]** are OR'd out the bottom jack **[4]**.

The output **[2]** of the top section is normalled to the first input on the bottom section. So if nothing is plugged into the top section's output jack **[2]**, then OR acts as a 6 IN x 1 OUT OR circuit, where all three top inputs **[1]** and all three bottom inputs **[3]** are OR'd to a single output **[4]**.

Usage Example: Logic Functions

Logic operations are the most common use for OR circuits. Assume one gate sequence triggers a kick sound, and a second gate sequence triggers a snare sound. If you run each of those gate sequences through OR, you'll get a third gate sequence that contains a trigger every time *either* the kick *or* the snare sounds.



You could then use this OR'd output to trigger an envelope for your bass synth sound. That way, no matter how you changed your kick or snare pattern, the bass would always remain rhythmically locked to the changes.

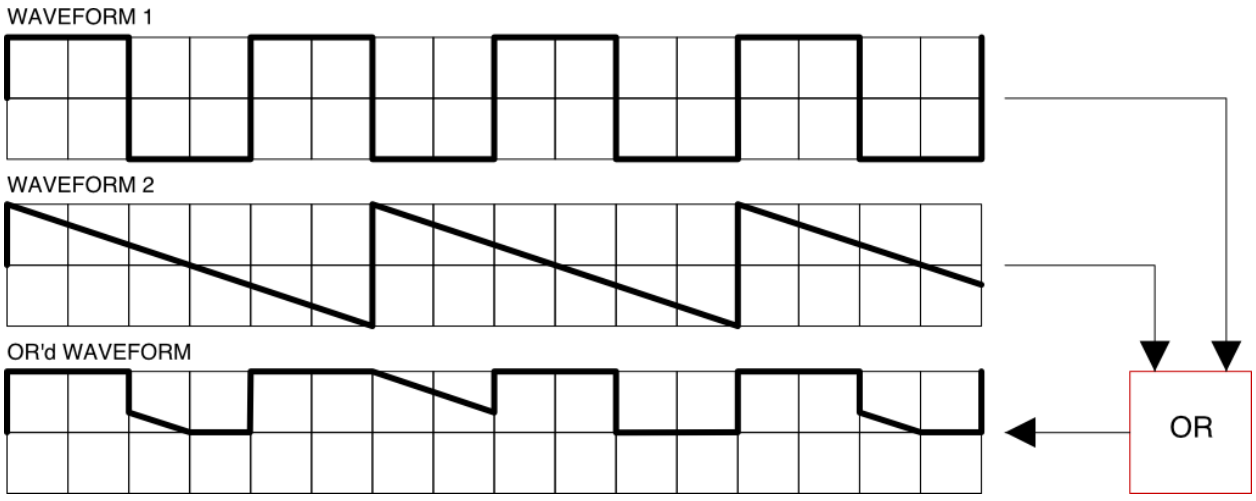
This is a very pedantic example, but through clever use of some very simple OR logic, you can quickly obtain some wonderfully complex results. If you send phase-shifted or unsynchronized triggers into an OR gate, you'll get all manner of interesting polyrhythms, curious syncopations and stuttering, chaotic madness from the OR'd output.

Usage Example: Waveforms

An equally valid (though often less explored) use of OR circuits is to combine two (or more) waveforms to create a half-wave rectified peak waveform. These can be used for interesting and evolving unipolar LFOs, or can even be applied at audio rates.

(NOTE: Because OR employs passive diode logic, there is approximately a 0.7V drop from input to output. So if absolute voltage values matter, you might want to run the output through a Triatt or Quadratt to boost the voltage back up.)

The following illustration shows what happens when you run two waveforms into OR — one a bipolar square wave, and the other a bipolar sawtooth wave at a slower frequency.



Technical Specifications

WIDTH: 2 hp | MAXIMUM DEPTH: 18mm | CURRENT DRAW: None