Swiss Army Mixer

Utility Module

User Manual

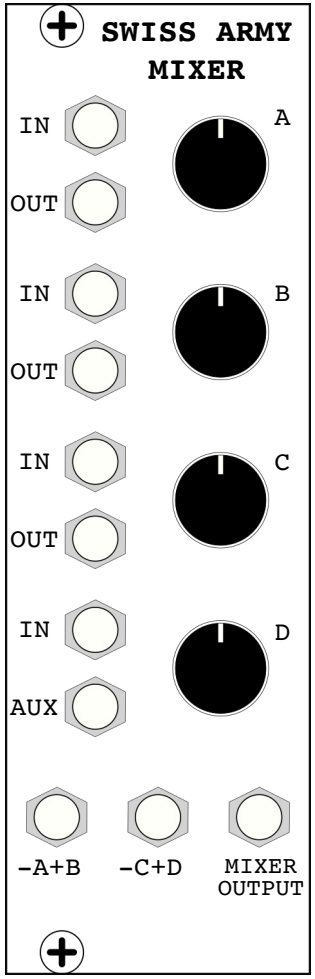


Table of Contents

Installation..... 2
Tech Specs & Power..... 2
Overview..... 3
Controls & Inputs..... 4
Outputs..... 5
Diff Amp Info..... 6

Installation

Make sure your system power is switched off. Carefully attach the floating 16-pin end of the ribbon cable from the module to your power bus. **The red stripe should match up with the -12V side of your power bus.** All Noise Reap modules are reverse voltage protected and will simply not turn on if they are accidentally installed with the opposite polarity. No harm will befall the module or your system.

Tech Specs

- Width 8hp (40.3mm)
- Depth 22mm from back of panel
- Input Impedances ~100K
- Output Impedances ~1K

Power

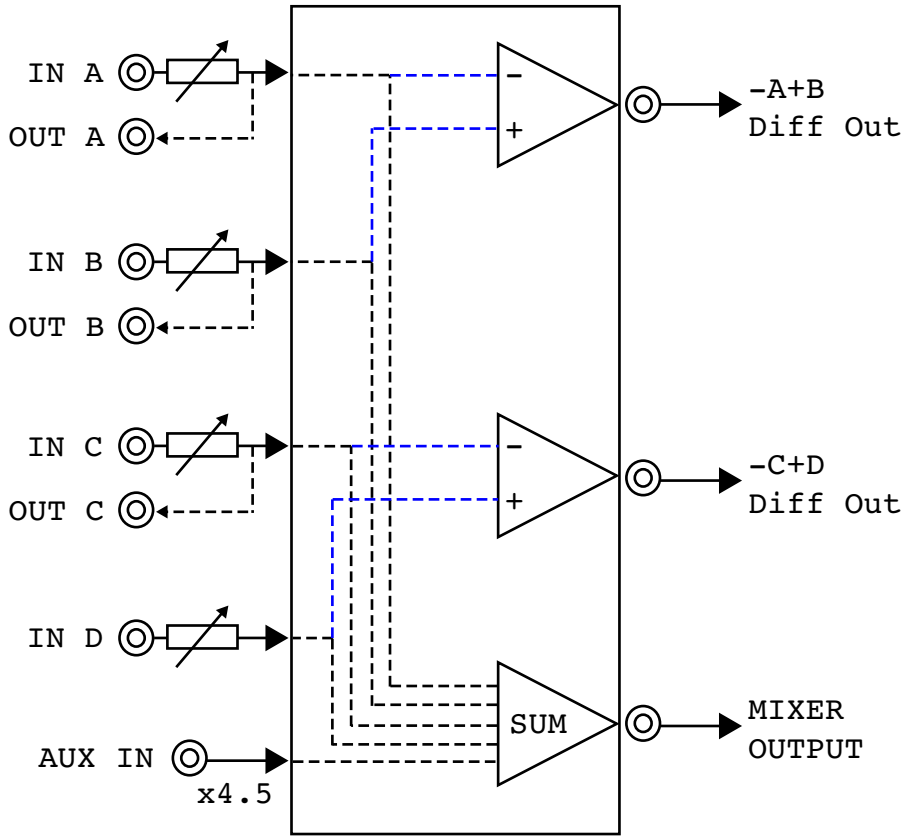
- Reverse Voltage Protected
- Current Draw 10mA @ +12V
- Current Draw 10mA @ -12V

Overview

A versatile utility mixer suitable for **audio** or **CV** signals.

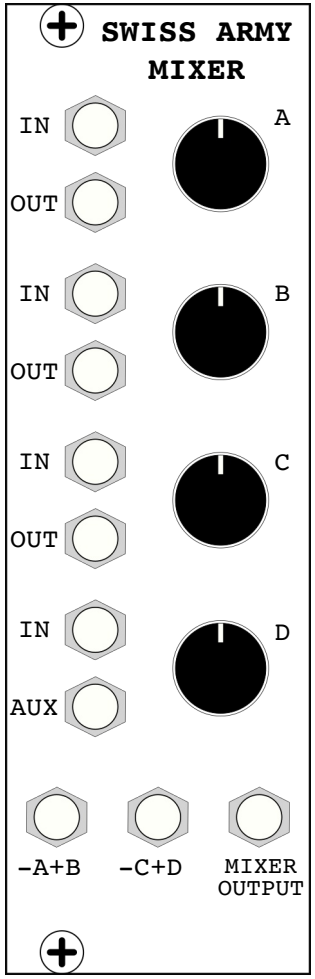
It's most basic application is to mix five inputs together.

It also serves as a triple **attenuator bank.** A dual **difference amplifier.** And a line level to eurorack level auxillary input.



Controls

A - D
Four attenuators correspond to inputs A through D. Fully counterclockwise the signal is completely muted. Fully clockwise and the signal passes through at unity gain.



Inputs

IN (x4)
Four inputs corresponding to attenuators A through D. These are equally suited for audio or CV signals.

AUX
This is an auxillary input with a fixed gain of about 5. Generally, this should be enough gain to make external synths/samplers/drum machines usable as audio sources anywhere within your eurorack system.

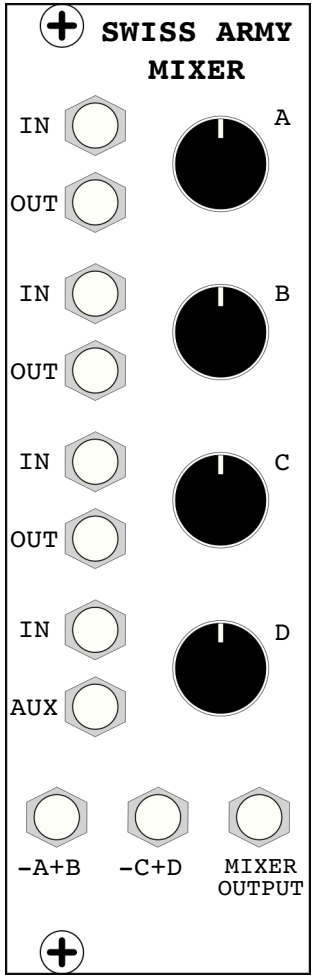
Outputs

Out (x3)
Patching a cable here will **pull the channel from the mix** for use as a simple passive attenuator.

Mixer Output
Main mixer output of all five inputs.

-A + B
Difference amp output. Inputs A and B are mixed by subtraction. Input A in inverted.

-C + D
Difference amp output. Inputs C and D are mixed by subtraction. Input C is inverted.



What is a difference amp?

The **-A+B** and **-C+D** outputs are the mathematical *difference* between the input voltages at any give time.

For example, if two 5V gates were patched to inputs A and B. The **-A+B** diff amp output would remain at **0V**. Input A gets subtracted from input B, and since the two signals are equal, they simple cancel out.

How do you use this musically? With **CV signals**, if you mix different sources together (LFOs, envelopes, gates, etc) then the MIXER OUTPUT and the diff outputs will offer related but different mangling of the CV inputs.

In the absence of a signal at B and/or D. Then A and C inputs function as simple **inverters**.

If you have a static voltage somewhere in your system, such as a gate held HIGH. You could mix that with another signal for a **DC offset**. For example, to convert a +/-2.5V LFO signal to a 0-5V.

With **audio signals** the sum and diff outputs will sound virtually identical. But the diff outs are perhaps still helpful for submixing.

Things becomes a bit more interesting when the audio inputs are *in phase*.

Consider that a triangle and square both contain only odd harmonics. But the square has *more* odd harmonics (and so sounds richer). If you mix a triangle and square together from the same VCO, their shared harmonics *cancel out*.

Basically, this removes the fundamental and some low integer harmonics from the mix, and lets the upper harmonics pass. Now you've got a non-resonant **highpass filter**!