

Unity Mixer

Dual 3:1 / 6:1 Unity Gain Mixer
(For CV or Audio)



Compliance



This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Intellijel Designs, Inc. could void the user's authority to operate the equipment.

Any digital equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.



This device meets the requirements of the following standards and directives:

EMC: 2014/30/EU

EN55032:2015 ; EN55103-2:2009 (EN55024) ; EN61000-3-2 ; EN61000-3-3

Low Voltage: 2014/35/EU

EN 60065:2002+A1:2006+A11:2008+A2:2010+A12:2011

RoHS2: 2011/65/EU

WEEE: 2012/19/EU

Installation

Intellijel Eurorack modules are designed to be used with a Eurorack-compatible case and power supply. We recommend you use Intellijel cases and power supplies.

Before installing a new module in your case, you must ensure your power supply has a free power header and sufficient available capacity to power the module:

- Sum up the specified +12V current draw for all modules, including the new one. Do the same for the -12 V and +5V current draw. The current draw will be specified in the manufacturer's technical specifications for each module.
- Compare each of the sums to specifications for your case's power supply.
- Only proceed with installation if none of the values exceeds the power supply's specifications. Otherwise you must remove modules to free up capacity or upgrade your power supply.

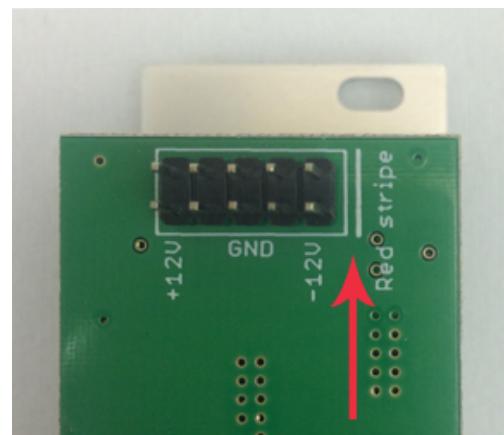
You will also need to ensure your case has enough free space (hp) to fit the new module. To prevent screws or other debris from falling into the case and shorting any electrical contacts, not leave gaps between adjacent modules, and cover all unused areas with blank panels. Similarly, do not use open frames or any other enclosure that exposes the backside of any module or the power distribution board.

You can use a tool like [ModularGrid](#) to assist in your planning. Failure to adequately power your modules may result in damage to your modules or power supply. If you are unsure, please [contact us](#) before proceeding.

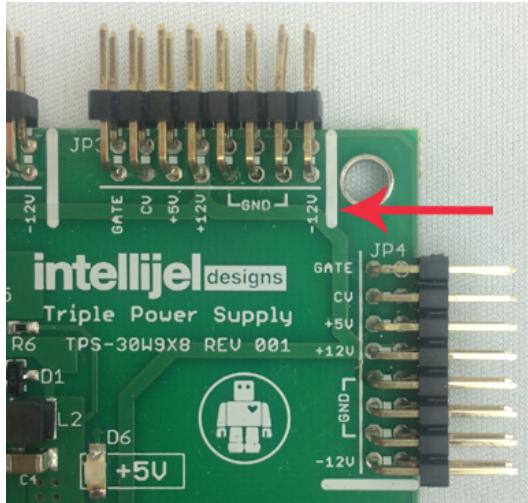
Installing Your Module

When installing or removing a module from your case always turn off the power to the case and disconnect the power cable. Failure to do so may result in serious injury or equipment damage.

Ensure the 10-pin connector on the power cable is connected correctly to the module before proceeding. The red stripe on the cable must line up with the -12V pins on the module's power connector. The pins are indicated with the label -12V, a white stripe next to the connector, the words "red stripe", or some combination of those indicators.



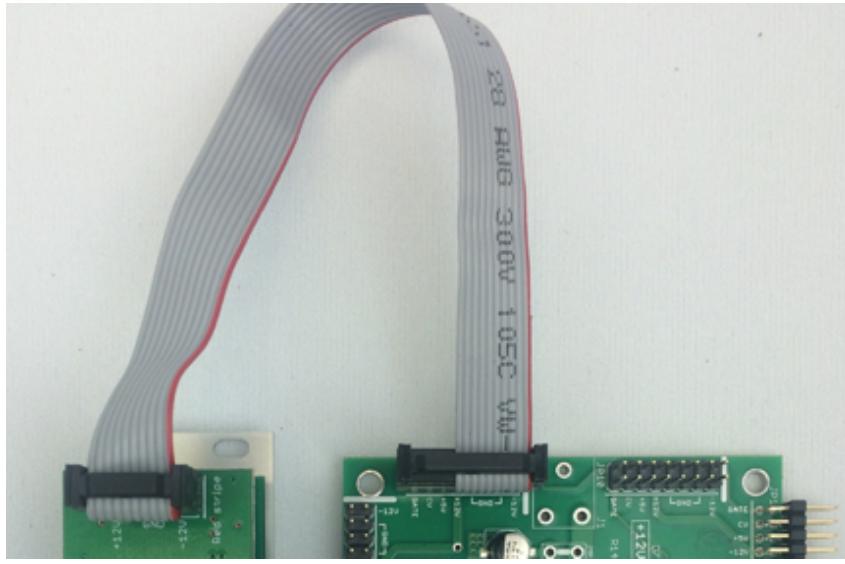
Most modules will come with the cable already connected but it is good to double check the orientation. Be aware that some modules may have headers that serve other purposes so ensure the cable is connected to the right one.



The other end of the cable, with a 16-pin connector, connects to the power bus board of your Eurorack case. Ensure the red stripe on the cable lines up with the -12V pins on the bus board. On Intellijel power supplies the pins are labelled with the label “-12V” and a thick white stripe:

If you are using another manufacturer’s power supply, check their documentation for instructions.

Once connected, the cabling between the module and power supply should resemble the picture below:



Before reconnecting power and turning on your modular system, double check that the ribbon cable is fully seated on both ends and that all the pins are correctly aligned. If the pins are misaligned in any direction or the ribbon is backwards you can cause damage to your module, power supply, or other modules.

After you have confirmed all the connections, you can

reconnect the power cable and turn on your modular system. You should immediately check that all your modules have powered on and are functioning correctly. If you notice any anomalies, turn your system off right away and check your cabling again for mistakes.

Operation

Signals arriving at inputs [1], [2] and [3] are summed together and sent to output [4]. The input signals are neither boosted nor attenuated; they are merely summed (as if you used a typical mixer with all faders set to 0dB). For example:

If $IN\ 1 = 2v$, $IN\ 2 = 4v$ and $IN\ 3 = 3v$ then $OUT\ 4 = 9v$ ($2v + 4v + 3v$)

Similarly, signals sent to inputs [5], [6] and [7] are summed together and sent to output [8], giving you two independent 3:1 mixers in a 2HP module.

If nothing is patched into the top output [4], then the sum of the top three inputs is passed through to the bottom mixer, which means Unity Mixer becomes a 6:1 mixer (rather than a dual 3:1 mixer), with the final summed output appearing at output [8].

Both outputs are phase correct, so no signal inversion takes place, and you may use Unity Mixer with either audio or CV signals.

Unity Mixer has a maximum output voltage of 10.5v. So if the sum of your inputs exceeds 10.5v, then the output will clip. There is a pair of attenuating jumpers on the rear circuit board, which will apply -6dB of attenuation to the top and bottom mixers, creating additional headroom should you need to sum high amplitude sources, such as raw VCO outputs. See [Setting the Attenuation Jumpers](#) to learn how to access and configure these jumpers.

Note that each mixer (top and bottom) has its own attenuation jumper. If you set the top jumper to enable -6dB of attenuation, you're halving the summed output at [4]. For example:

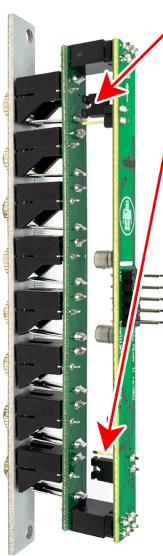
If $IN\ 1 = 2v$, $IN\ 2 = 4v$ and $IN\ 3 = 3v$ then $OUT\ 4 = 4.5v$ (half of $2v + 4v + 3v$).

If both jumpers are set for -6dB attenuation, and you use Unity Mixer in 6:1 mode, then it's important to remember that the bottom half of the mixer will further attenuate the feed from the top half. If this isn't what you want, simply set the bottom mixer's jumper for full unity gain — the attenuated sum of [1], [2] and [3] will then be mixed into the bottom mixer at unity gain.

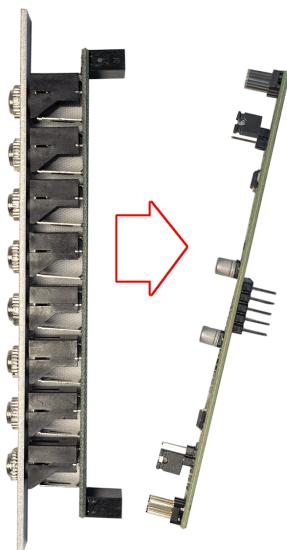


Setting the Attenuation Jumpers

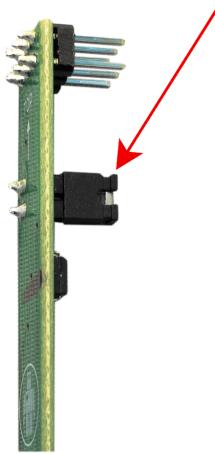
1. These are the jumpers for the top and bottom mixers — each can be jumpered independently



2. To access the jumpers, carefully disconnect the back circuit board by pulling it out of the two sockets connecting it.



3. Connect a jumper to both pins to attenuate the mixer by 6dB.



4. Connect a jumper to only one pin (essentially disconnecting it) for no attenuation.



5. Each of the two mixers (top and bottom) has its own jumper, so you can set them independently.

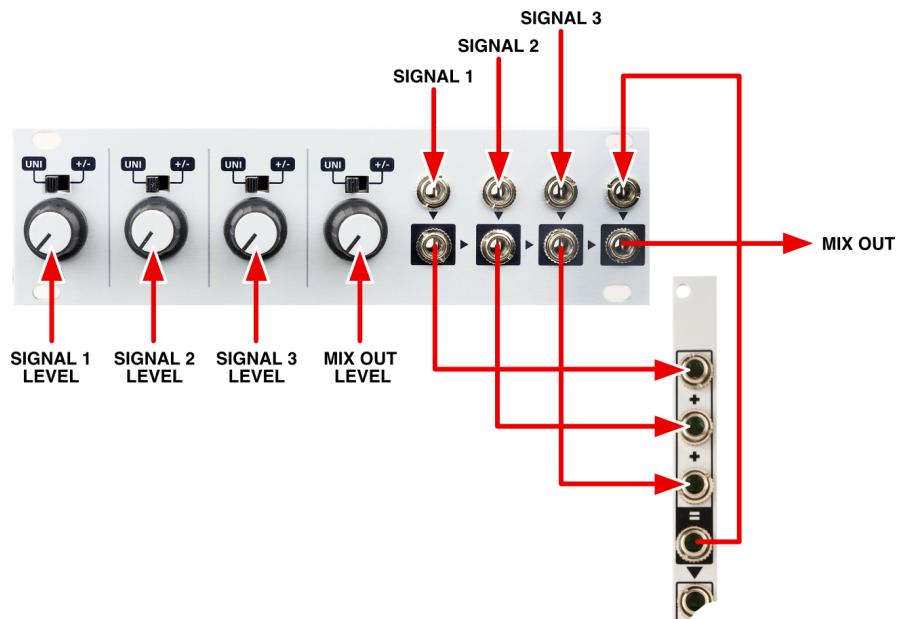
6. Reconnect the circuit board, making sure the TOP label and arrow points to the top of the module.

In Use

The Unity Mixer is ideal for combining two or more signals for which you don't need independent level control. It's also useful for mixing signals that have already had attenuation applied elsewhere in the signal path.

The Unity Mixer pairs particularly well with the Intellijel Triatt and Quadratt modules, giving you a wealth of flexible routing options.

For example, using a Quadratt, you could patch its first three attenuator outputs into the top three inputs of the Unity Mixer, then patch the top mixer's output into the 4th input of the Quadratt to get a 3:1 mixer with master volume. With this combo you would still have half the Unity mixer available for patching other things.



Technical Specifications

Width	2 hp
Maximum Depth	39 mm
Current Draw	11 mA @ +12V 14 mA @ -12V