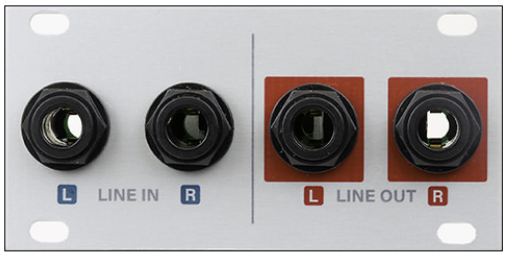
Audio I/O 1U System

Dual Balanced Line Audio Input and Balanced Line Audio Output

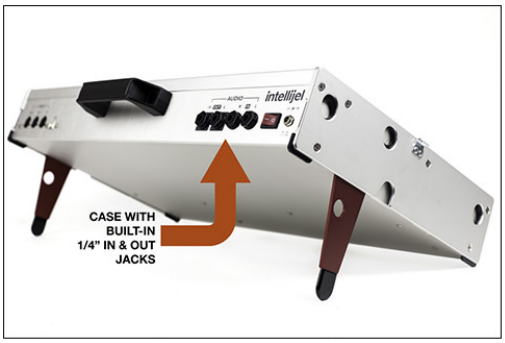
Audio I/O 1U

+



Audio I/O Jacks 1U

OR



Case w/Built-In 1/4” Jacks

Manual Revision: 2019.02.05

Table of Contents

Compliance

Overview

Features

- System

Installation

- Before Your Start
- Installing Your Module
- Connecting to the Audio I/O Jacks 1U Module
- Connecting to the TRS Jacks on a 7U Case

Front Panel (Audio I/O 1U)

- Controls
- Inputs & Outputs

Front Panel (Audio I/O Jacks 1U)

- Inputs & Outputs

Technical Specifications

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

Overview

Use the Audio I/O 1U system to connect Eurorack modular-level signals to the balanced line level (+4 dBu) signals used by professional audio gear. With this system, you can send audio to and return audio from external FX units; patch in external line-level instruments like synths and drum machines, output your modular audio to DAW; and much more.

The Audio I/O 1U system comprises two halves: an Audio I/O 1U module (for connecting to your modular gear), and either an Audio I/O Jacks module or a 7U case with built-in ¼” audio jacks (for connecting to your external studio gear).

Features

- 2 x Balanced TRS 1/4″ to Eurorack modular level input paths
- 2 x Eurorack modular level signals to Balanced TRS 1/4″ output paths
- 4 x two-stage LED VU meter to monitor all inputs and outputs simultaneously
- Uses high quality THATCorp balanced line drivers and receiver ICs.
- Input path has up to 20 dB of gain which allows you to patch in low level consumer level signals and boost them. 0 dB = 10 Vpp (nominal Eurorack level)
- Output path steps a nominal Eurorack level (10 Vpp) down to +4 dBu with up to +6 dB gain.
- The Audio I/O 1U module connects to the Audio I/O JACKS module via the included ribbon cable. The same ribbon cable can be used to connect to the rear-mounted audio jacks of the 7U performance cases.

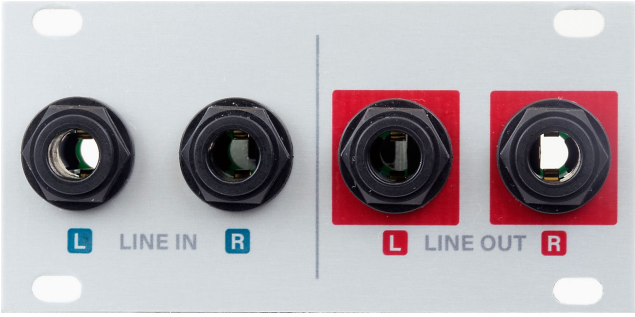
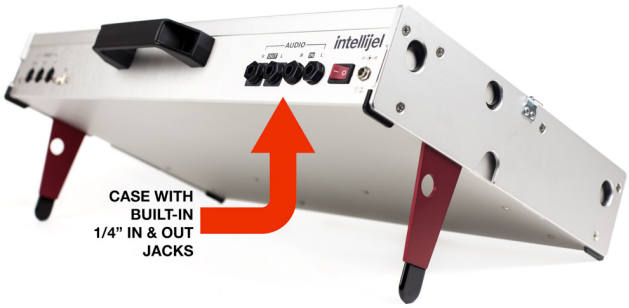
System

A complete eurorack Audio I/O solution requires the purchase of two components:

- An **Audio I/O 1U** module

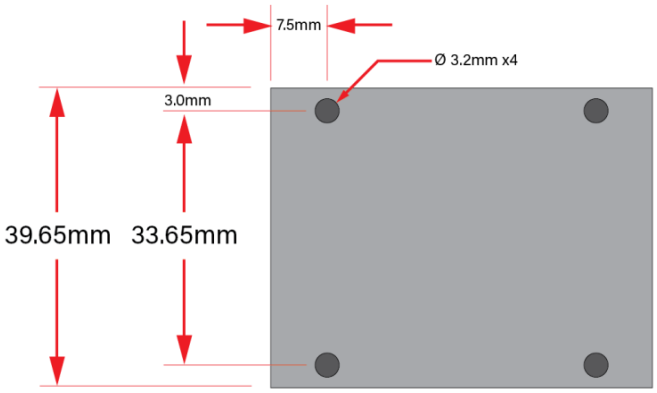
	The **Audio I/O 1U** module houses all the necessary line drivers, VU meters and gain control circuitry, along with the ⅛” jacks required to interface with eurorack modules. It also includes the ribbon cable for connecting to either the **Audio I/O Jacks 1U** module or an Intellijel **7U case** as outlined below.

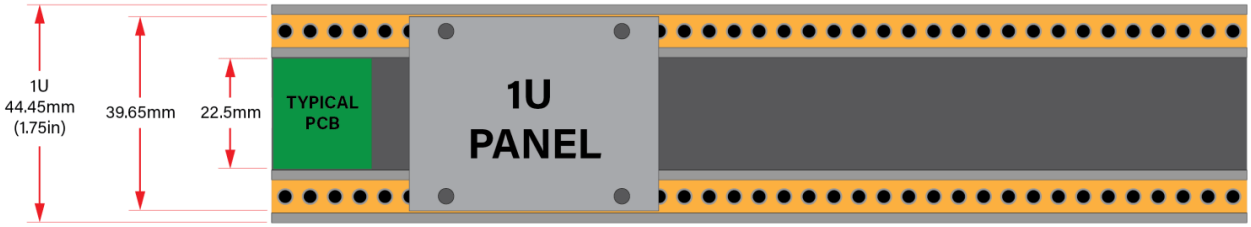
- Either an **Audio I/O Jacks 1U** module or an Intellijel **7U Case** with built-in ¼” TRS audio jacks.

	**Audio I/O Jacks 1U Module** If you don’t own an Intellijel 7U case, then you need to purchase an **Audio I/O Jacks 1U** module, which connects via ribbon cable to the **Audio I/O 1U** module to provide ¼” TRS in/out jacks for interfacing with studio gear.
	**7U Case** If you own an Intellijel **7U case**, then you can connect the **Audio I/O 1U** module directly to the case using the ribbon cable included with the Audio I/O 1U module.

Installation

This module is designed for use within an Intellijel-standard 1U row, such as contained within the Intellijel 4U and 7U Eurorack cases. Intellijel's 1U specification is derived from the Eurorack mechanical specification set by Doepfer that is designed to support the use of lipped rails within industry standard rack heights.





Before Your Start

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:

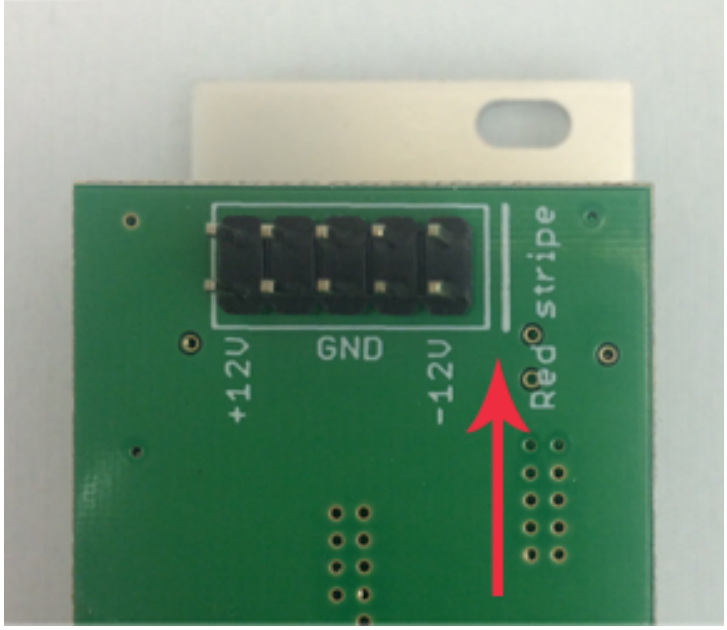
- Sum up the specified +12V current draw for all modules, including the new one. Do the same for the -12 V and +5V current draw. The current draw will be specified in the manufacturer's technical specifications for each module.
- Compare each of the sums to specifications for your case's power supply.
- 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.

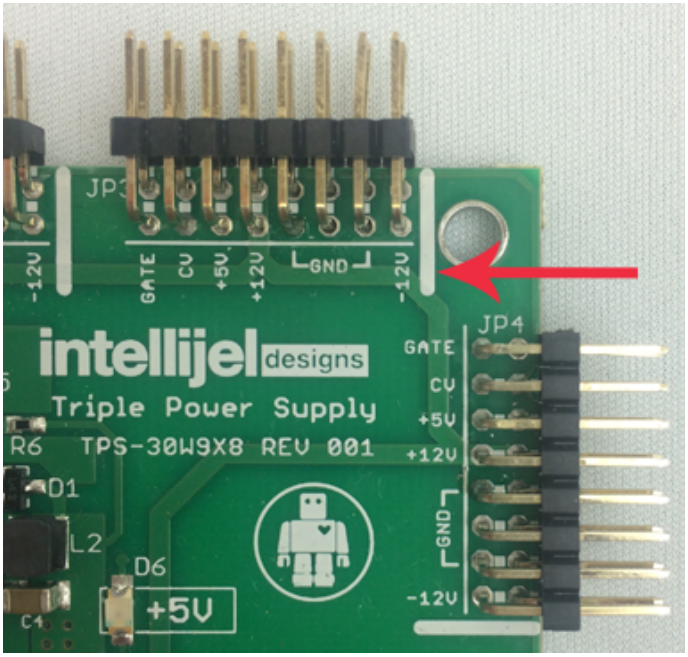
Installing Your Module

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.

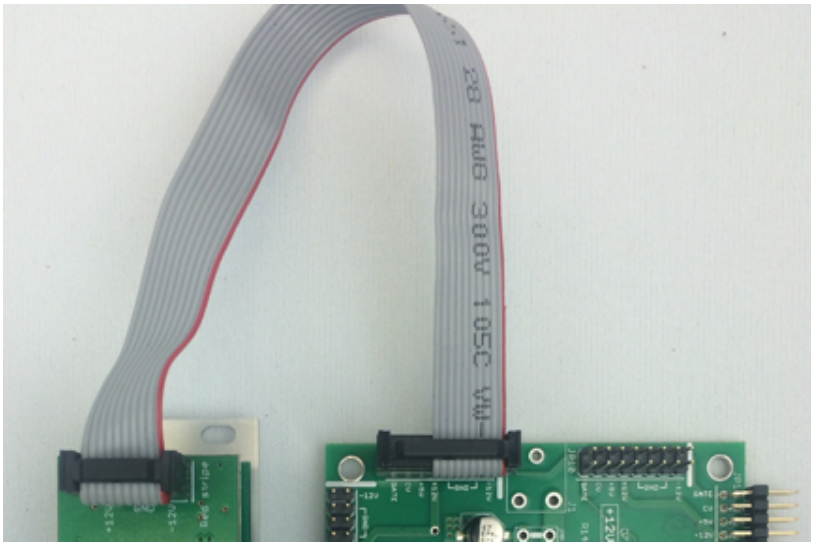
Most modules will come with the cable already connected but it is good to double check the orientation. Be aware that some modules may have headers that serve other purposes so ensure the cable is connected to the right one.



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.

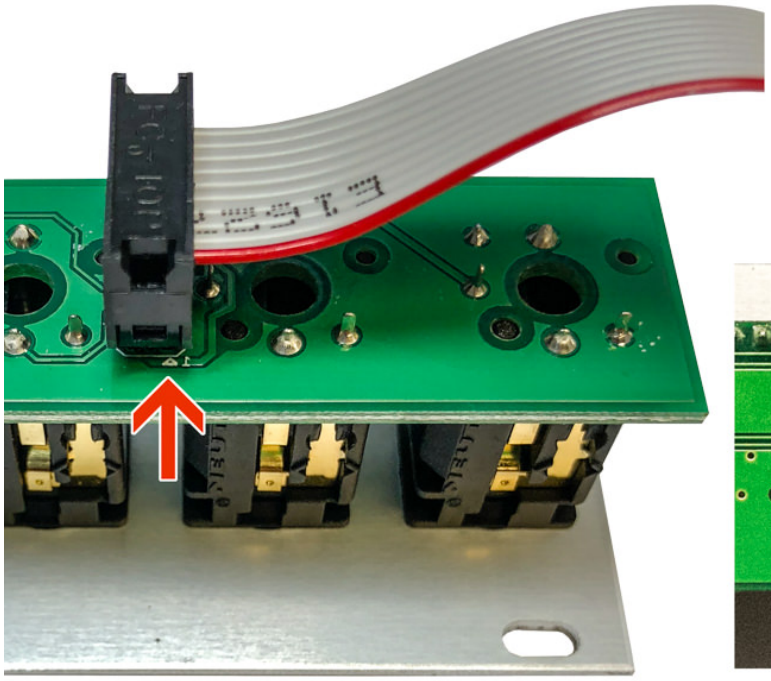
Connecting to the Audio I/O Jacks 1U Module

The main *Audio I/O 1U* module ships with a ribbon cable for connecting to a set of ¼” TRS audio jacks — either those built-in to the *Intellijel 7U case* or those contained within the separately available *Audio I/O Jacks 1U* module. To connect the *Audio I/O 1U* module to an *Audio I/O Jacks 1U* module:

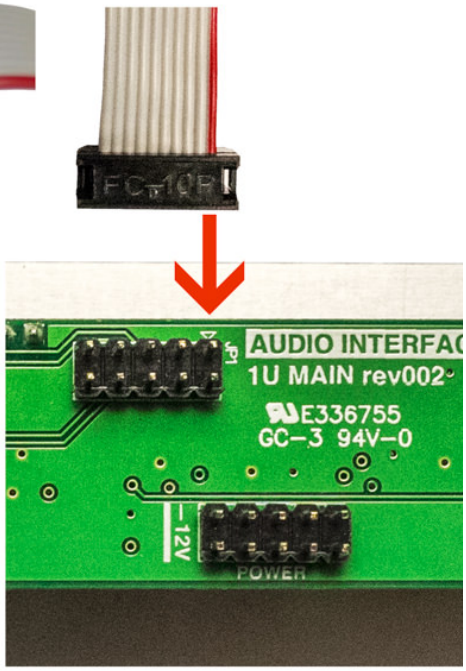
1. Make note of the small triangle icon pointing to a pin on each circuit board.
2. Plug one end of the ribbon cable into the *Audio I/O 1U* module such that the red stripe aligns with the pair of pins indicated by the triangle.

   IMPORTANT: Do not connect this jack to a power supply.

3. Plug the other end into the *Audio I/O Jacks 1U* module, again making sure to align the red strip with the pair of pins indicated by the triangle.



Audio I/O Jacks 1U Module



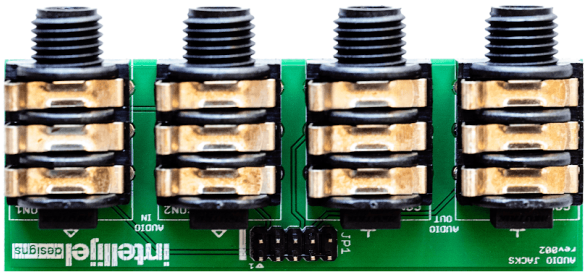
Audio I/O 1U Module

Connecting to the TRS Jacks on a 7U Case

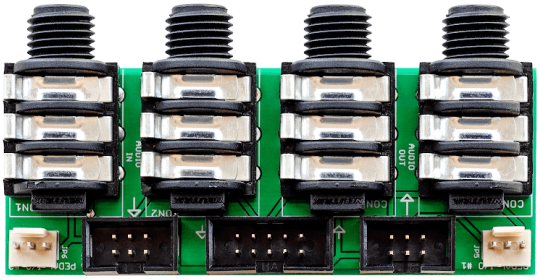
The main *Audio I/O 1U* module ships with a ribbon cable for connecting to a set of ¼” TRS audio jacks — either those built-in to the *Intellijel 7U case* or those contained within the separately available *Audio I/O Jacks 1U* module. To connect the *Audio I/O 1U* module to an *Intellijel 7U case*:

1. Determine whether your case uses a first or second generation Audio Jacks Board.

   1st generation boards (included with cases built before early 2019) have a single connector along the bottom. 2nd generation boards have a large shrouded header flanked by two smaller shrouded headers, flanked by two link connectors.



1st GENERATION AUDIO JACKS

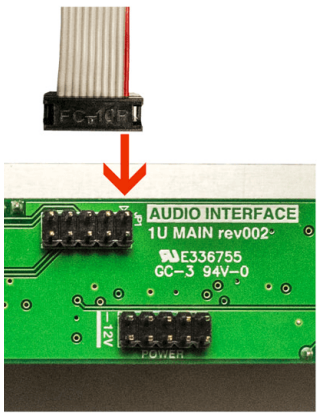


2nd GENERATION AUDIO JACKS

2. Connect one end of the supplied ribbon cable to the Audio I/O 1U modules, such that the red stripe aligns with the pins indicated by the triangle.

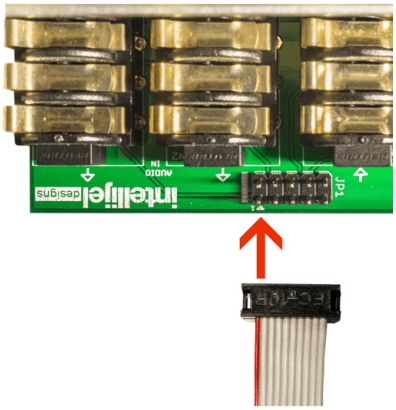
   IMPORTANT: Do not connect this jack to a power supply.

3. If your case has a 1st generation audio board, plug the other end of the ribbon cable into its lone connector, aligning the red stripe with the indicated triangle.



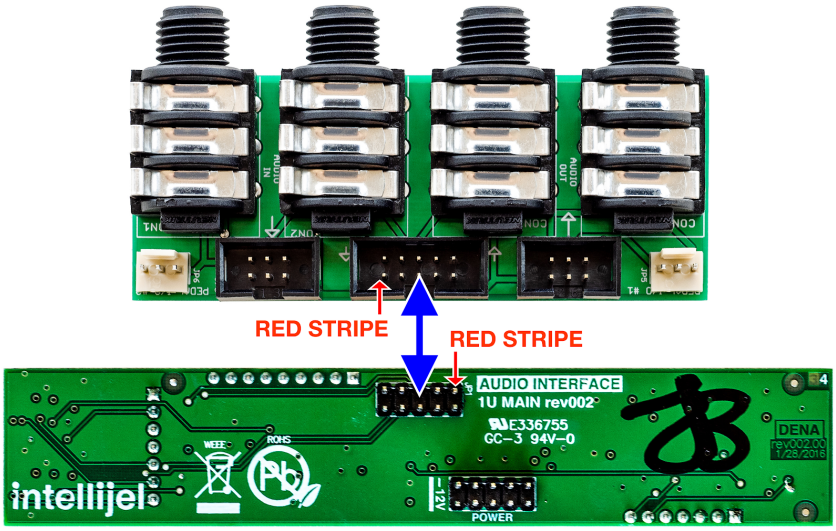
Audio I/O 1U Module

7U Case
1st Generation Audio Jacks Board

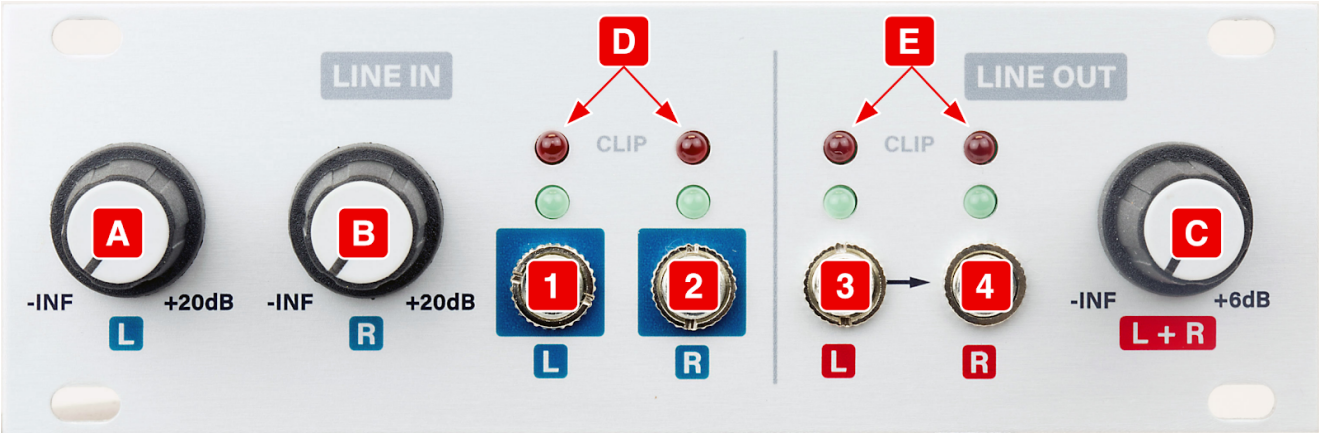


4. If your case has a 2nd generation audio board, plug the other end of the ribbon cable into the large central shrouded header.

   The connector is keyed, so that it fits only one way. Make sure (particularly if you're using a ribbon cable from another supplier) that the red stripe is positioned as indicated in this illustration.



Front Panel (Audio I/O 1U)



Controls

A. LINE IN GAIN (L) knob - Adjusts the level of the signal coming into the modular via either the *7U Case's* left ¼" input jack or the *Audio I/O Jack 1U* module's left ¼" input jack.

This knob has up to 20 dB of gain, which allows you to patch in low consumer level signals and boost them. 0 dB = 10V p-p (nominal Eurorack level).

B. LINE IN GAIN (R) knob - Adjusts the level of the signal coming into the modular via either the *7U Case's* right ¼" input jack or the *Audio I/O Jack 1U* module's right ¼" input jack.

This knob has up to 20 dB of gain, which allows you to patch in low consumer level signals and boost them. 0 dB = 10V p-p (nominal Eurorack level).

C. LINE OUT GAIN (L+R) knob - Adjusts the level of the signal going out of the modular via either the *7U Case's* left/right ¼" output jacks or the *Audio I/O Jack 1U* module's left/right ¼" output jack.

This knob steps a nominal Eurorack level (10V p-p) down to +4 dBu (with the knob roughly at 12:00), but allows for up to +6 dB of gain.

D. INPUT VU LEDs - This pair of LEDs monitors the signal level coming into the modular from an external source. The green LED lights around 300mV rms, and indicates the presence of a healthy signal. The red LED indicates that the signal is clipping the input and comes on at 9V peak (6.2V rms) with a 1kHz sine). If the red light comes on, you need to back off on your input levels.

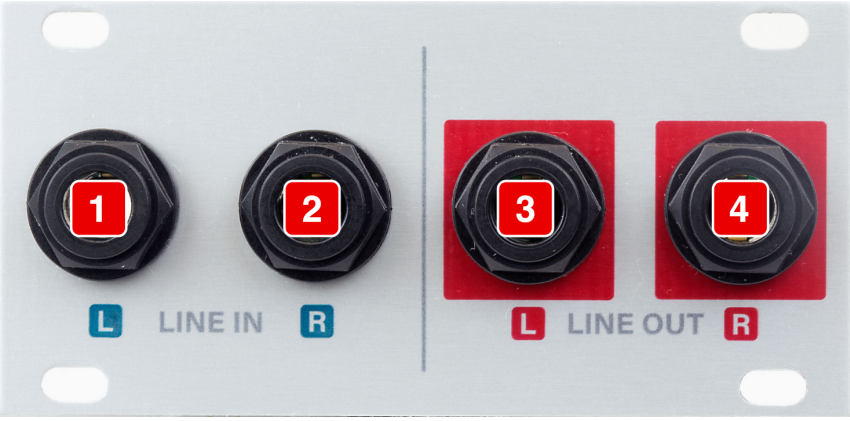
E. **OUTPUT VU LEDs** - This pair of LEDs monitors the signal level going out of your modular. The green LED lights around 600mV rms (with a 1kHz sine), which indicates a decent signal level is present. Red indicates that the signal is clipping the output and comes out when the output is 6.2V rms. If the red light comes on, you need to back off on your levels.

Inputs & Outputs

1. **LINE IN (L)** - The audio present at this jack is a eurorack-compatible (0 dB = 10V p-p) version of the audio signal coming into the modular via either the *7U Case's* left ¼" input jack or the *Audio I/O Jacks 1U's* left ¼" input jack. The actual level present at this jack is set by the corresponding **LINE IN GAIN (L)** knob, and you can monitor this level with the **INPUT VU LEDs** immediately above it. This jack enables you to route external audio signals to various eurorack modules for processing.
2. **LINE IN (R)** - The audio present at this jack is a eurorack-compatible (0 dB = 10V p-p) version of the audio signal coming into the modular via either the *7U Case's* right ¼" input jack or the *Audio I/O Jacks 1U's* right ¼" input jack. The actual level present at this jack is set by the corresponding **LINE IN GAIN (R)** knob, and you can monitor this level with the **INPUT VU LEDs** immediately above it. This jack enables you to route external audio signals to various eurorack modules for processing.
3. **LINE OUT (L)** - Any eurorack-level audio sent to this jack will be scaled down to professional studio-standard +4 dBu levels and sent out of your modular via either the *7U Case's* left ¼" output jack or the *Audio I/O Jacks 1U* module's left ¼" output jack. This enables you to send eurorack audio directly into your mixer, DAW, or external effects. You can adjust this level using the **LINE OUT GAIN (L+R)** knob, and you can monitor the LEFT channel output level with the 2-stage **OUTPUT VU LEDs** immediately above this jack.

   *NOTE: The **LINE OUT (L)** jack is normalled to the **LINE OUT (R)** jack, so if nothing is connected to the **LINE OUT (R)**, then one signal will feed both of the ¼" output jacks (either from the* 7U Case, *or from the* Audio I/O Jacks 1U *module, whichever you've connected).*
4. **LINE OUT (R)** - Any eurorack-level audio sent to this jack will be scaled down to professional studio-standard +4 dBu levels and sent out of your modular via either the *7U Case's* right ¼" output jack or the *Audio I/O Jacks 1U* module's right ¼" output jack. This enables you to send eurorack audio directly into your mixer, DAW, or external effects. You can adjust this level using the **LINE OUT GAIN (L+R)** knob, and you can monitor the RIGHT channel output level with the 2-stage **OUTPUT VU LEDs** immediately above this jack.

Front Panel (Audio I/O Jacks 1U)



Inputs & Outputs

1. **LINE IN (L) -** Connect the output of any external pro-level audio source to this ¼” TRS jack for processing within your eurorack modular. The signal present here will be amplified to eurorack levels by the *Audio I/O 1U* module and made available at that module’s LINE IN (L) ⅛” jack.

   NOTE: This is a balanced ¼” TRS jack, but the Audio I/O 1U *circuitry readily supports the use of unbalanced TS cables, and it can boost instrument- and consumer-level signals to eurorack levels.*

2. **LINE IN (R) -** Connect the output of any external pro-level audio source to this ¼” TRS jack for processing within your eurorack modular. The signal present here will be amplified to eurorack levels by the *Audio I/O 1U* module and made available at that module’s LINE IN (R) ⅛” jack.

   NOTE: This is a balanced ¼” TRS jack, but the Audio I/O 1U *circuitry readily supports the use of unbalanced TS cables, and it can boost instrument- and consumer-level signals to eurorack levels.*

3. **LINE OUT (L**) - The scaled output of your *Audio I/O 1U’s* LINE OUT (L) ⅛” jack appears at this ¼” TRS jack for mixing with other studio-level gear or for recording in your DAW. This output supports both professional, balanced +4 dBu equipment and consumer, unbalanced -10 dbV level gear.

4. **LINE OUT (R)** - The scaled output of your *Audio I/O 1U’s* LINE OUT (R) ⅛” jack appears at this ¼” TRS jack for mixing with other studio-level gear or for recording in your DAW. This output supports both professional, balanced +4 dBu equipment and consumer, unbalanced -10 dbV level gear.

Technical Specifications

Audio I/O Width Audio I/O Jacks Width	24 hp 16 hp
Audio I/O Maximum Depth Audio I/O Jacks Maximum Depth	36 mm 38 mm
Audio I/O Current Draw Audio I/O Jacks Current Draw	39 mA @ +12V I 28 mA @ -12V 0 mA (passive module)