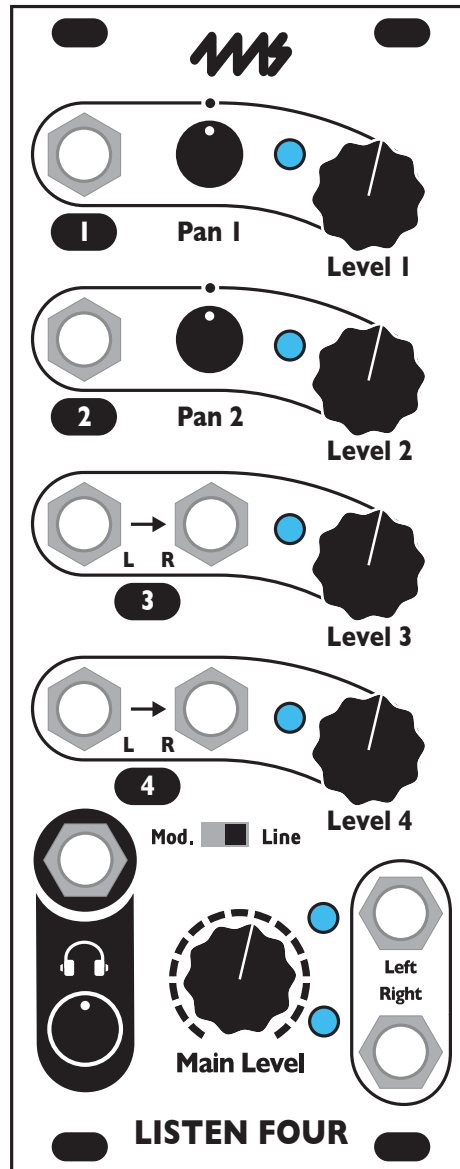


Listen Four 4ms Company

User Manual 1.0 – Dec 31, 2018



The **Listen Four** is a four channel stereo mixer with line, modular, and headphone outputs. Two mono channels with **Pan** knobs and two stereo channels with dual inputs provide optimal compatibility with both stereo and mono signals. The **Listen Four** can be daisy-chained to other **Listen** modules to create a larger mixer with sub-mix outputs. **Listen Four** features include:

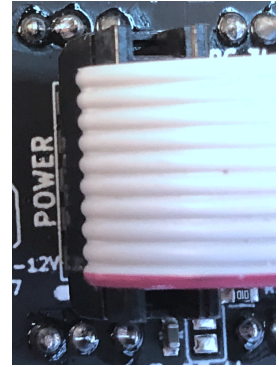
- Four input channels (two with stereo inputs, two with mono inputs and a **Pan** knob)
- Headphone and main 1/8" outputs, each with separate **Level** knob
- Line level output driver with zero impedance, capable of driving long cables
- Output can be switched between line and modular level
- Low noise, cross-talk, and bleed-through
- Anti-pop feature that silences pops and thumps when the power is turned on
- Headers in back allow for connecting to other **Listen Four** or **Listen Four Quarters** modules to create a mixer with 8, 12, 16, or more channels and multiple sub-mix outputs
- Connects via headers to **WAV Recorder** module for recording final mix without using patch cables
- Signal lights for each channel and output mix
- Clipping lights with adjustable level

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Setting up your Listen Four

1. Power off your Eurorack system.
2. Connect the free end of the included power cable to a 16-pin Eurorack power header on your power supply distribution system. The red stripe should match the white line or -12V marking on the power distribution board. The other end of the power cable is a 10-pin connector which should already be connected to the **Listen Four** with the red stripe on the power cable orientated towards the bottom of the module. *Note: The Listen Four is reverse-polarity protected, but incorrectly connecting any module can damage any other on the power bus.*
3. Using the included screws, securely attach the **Listen Four** to the rails of your case.
4. Power on your Eurorack system.



Inputs

The **Listen Four** has four input channels on the front. A fifth stereo channel can be accessed through a header on the back.



Level I

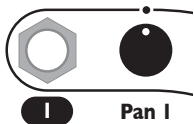
Level Knobs

All four channels have a **Level** knob. This knob sets the volume which will appear on the outputs. The **Listen Four** is very quiet, so turning the knob all the way down will completely mute the channel (over -100dB of attenuation, typically).



Channel Signal Lights

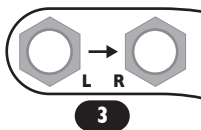
All four channels have a signal light which gets brighter as the signal gets louder. The color of the light indicates the stereo content: blue displays the signal on the left channel, and green displays the signal on the right channel. The signal light shows the signal post-fader (after the **Level** knob). These lights are useful for determining which channels are active at any given moment. However, they should not be used as precision indicators. For example, the green lights will appear dimmer than the blue lights at low audio levels and brighter than the blue lights at louder levels.



Channels 1 and 2: Panning

Channels 1 and 2 each have one input jack and a **Pan** knob. These channels accept a mono signal. Turning the **Pan** knob to the left or right will place the signal in the stereo field by fading it between the left and right outputs. The **Pan** knob has a small detent in the center position so you can find the center by feel.

The panning curve has been carefully designed to achieve the perception of a sound source being a consistent distance from the listener as it pans around.



Channels 3 and 4: Stereo inputs

Channels 3 and 4 each have left and right input jacks. Patching a stereo signal into these jacks will accurately maintain the stereo image as the signal is mixed into the outputs. If you patch a mono signal into the left jack and nothing into the right jack, the mono signal will appear on both left and right outputs.

Channel 5: INS header

See **INS header** section below

Main Outputs



Main Level

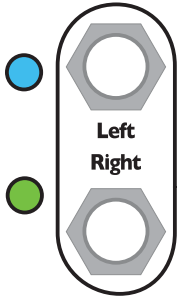
Main Level Knob

The **Main Level** knob controls the volume of the main left and right output jacks. When knob is turned fully to the left, the outputs are muted. Turning the knob to the right increases the volume. The maximum volume depends on the setting of the **Mod/Line** switch.

Left and Right Output Jacks

The main outputs of the module are the left and right output jacks. The signal level on these jacks is controlled by the **Main Level** knob as well as the **Mod/Line** switch. These jacks have a zero-impedance line driver circuit capable of driving long cables. They also can be patched to other modules or an external DAW interface. The jacks are mono 1/8" (3.5mm).

While it is safe to use an adapter to convert to 1/4" (6.35mm), consider using the **Listen Four Quarters** module, which has balanced 1/4" outputs.



Output Signal Lights

The two lights near the output jacks indicate the signal level present on these jacks. The top light turns blue more brightly as the left channel output gets louder. If the left channel clips, a bright red light will add to the blue, creating purple. The lower light turns green more brightly as the right channel output gets louder. If the right channel clips, a red light will add to the green, creating yellow. The clipping level can be set with the trim pot on the back of the module (see **Trim Pot** section). When the switch is set to Line, no clipping can occur and these lights will never turn yellow or purple.

Note: The signal lights only indicate relative dynamics. Pulsing lights often indicate beats or throbbing sounds. It's normal that the blue lights are brighter than the green lights at softer volumes.

Mod/Line Switch

The **Mod/Line** switch selects what type of output occurs on the main output jacks. When set to Mod, modular level signals are output (+/-12V). When set to Line, line level signals are output. To protect your speakers, power off the Listen Four or disconnect the speakers before flipping this switch.

Mod. Line

Headphones Output

Headphones Jack

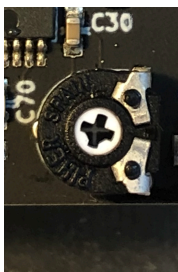
The headphones jack is a stereo 1/8" jack (3.5mm) designed for outputting to headphones. Any headphones can be used, though 8 to 32 ohms is recommended. The jack can also be used as an additional output to connect to an external device that requires a TRS stereo signal. However, use the main outputs if possible because the frequency response and noise specifications of the headphones output are not as good as the main output jacks, and this output does not have the anti-pop circuitry.

Headphones Level Knob

This knob sets the headphones volume. It's independent of the **Main Level** knob and the **Mod/Line** switch.



Trim Pot (Clipping Light Level)



A small trim pot on the back of the module adjusts the level at which the clip lights turn on (see **Output Signal Lights** section above). The factory default setting is for the lights to turn bright yellow or purple when the output signal exceeds about 20V peak-to-peak. When the trim pot is turned all the way counter-clockwise, the clip lights will almost never turn on, even though substantial clipping may be occurring. By turning the trim pot further clockwise, the clip level can be adjusted as low as 13.3V (-4.4dB).

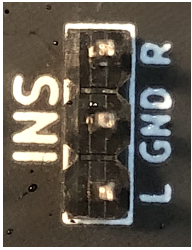
To adjust the clipping level, use a #1 Phillips-head screwdriver and gently turn the inner shaft of the trim pot. If you feel any resistance, stop turning immediately: the trim pot can be easily damaged.

Turning clockwise will decrease the level (clip light turns on sooner). Turning counter-clockwise will increase the level.

The trimpot only adjusts the visual feedback from the clipping lights. It does not change the actual clipping.

Tip: After adjusting the trim pot, make sure the switch is set to Mod when you test the new level: no clipping ever occurs with the switch set to Line!

INS Header

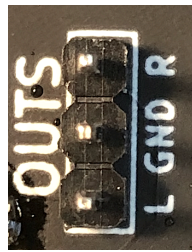


A three-pin header labeled **INS** on the back of the **Listen Four** allows you to connect another module as an auxiliary stereo input. Whatever signal is fed into the header will appear on the outputs without any attenuation. The **INS** header has pins for the left channel (bottom pin), right channel (top pin), and ground (center pin). The input impedance is 47k.

A typical use would be to daisy-chain multiple **Listen** modules to create a mixer with eight or more channels. To do this, the **OUTS** header on one module is connected to the **INS** header on the other module. See the **Daisy-chaining** section for details.

Another use would be to connect a 1/4" (6.35mm) adaptor module such as the **Listen Up**. This would allow you to use a stereo signal on two 1/4" cables as a fifth stereo input channel.

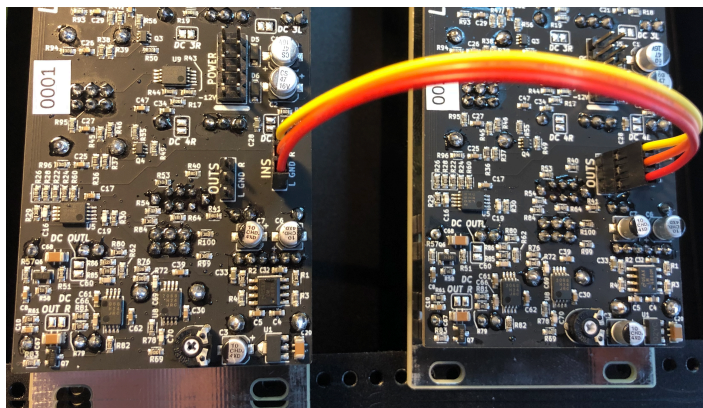
OUTS Header



A three-pin header labeled **OUTS** on the back of the module allows you to send the main output mix to another module with a compatible header. The pin order and pin dimensions of this header are the same as the **INS** header (see previous section). The output impedance is 1k. It will not damage the circuitry if the pins are shorted to ground.

The **Main Level** and **Mod/Line** switch will effect the level on the **OUTS** header. If you're connecting to another **Listen** module, it's recommended to flip the switch to **Mod**. If you're connecting to a 1/4" adaptor module and you require line-level outputs, flip the switch to **Line**. The **Main Level** knob acts as a volume knob. The main outputs and headphone outputs will still be active and are unaffected by the use of the **OUTS** header.

Daisy-chaining



Multiple **Listen** modules can be connected to form a large mixer. For example, connecting two **Listen Four** modules creates an eight channel stereo mixer: the four inputs of the first **Listen Four** are added to the four inputs of the second **Listen Four** (see photo on the left).

You can daisy-chain as many modules as you want. Connecting a **Listen Four Quarters** after the two **Listen Fours** in the example above will create a 12 channel mixer with 1/4" balanced outputs, and two sub-mix outputs.

You can also connect a **WAV Recorder** module to the end of a chain of **Listen** modules, allowing you to record the main outputs without using patch cables.

How to Daisy-chain

To daisy-chain two modules, use a 3-pin cable to connect the **OUTS** header of one module to the **INS** header of another. You can continue to connect more modules in the same way, **OUTS** to **INS**.

A suitable connecting cable can be purchased from 4ms Company or many of our dealers. You also can find or create your own cable. The cable must fit a single row of three pins with a pin spacing of 0.1" (2.54mm). The pins are 0.2" tall (5mm), which is the same spacing, size and length as the pins on standard Eurorack power headers. Make sure the same color wire is on top on both sides of the connecting cable. If one side is reversed, the left and right channels will be reversed (though no damage or malfunction will occur).

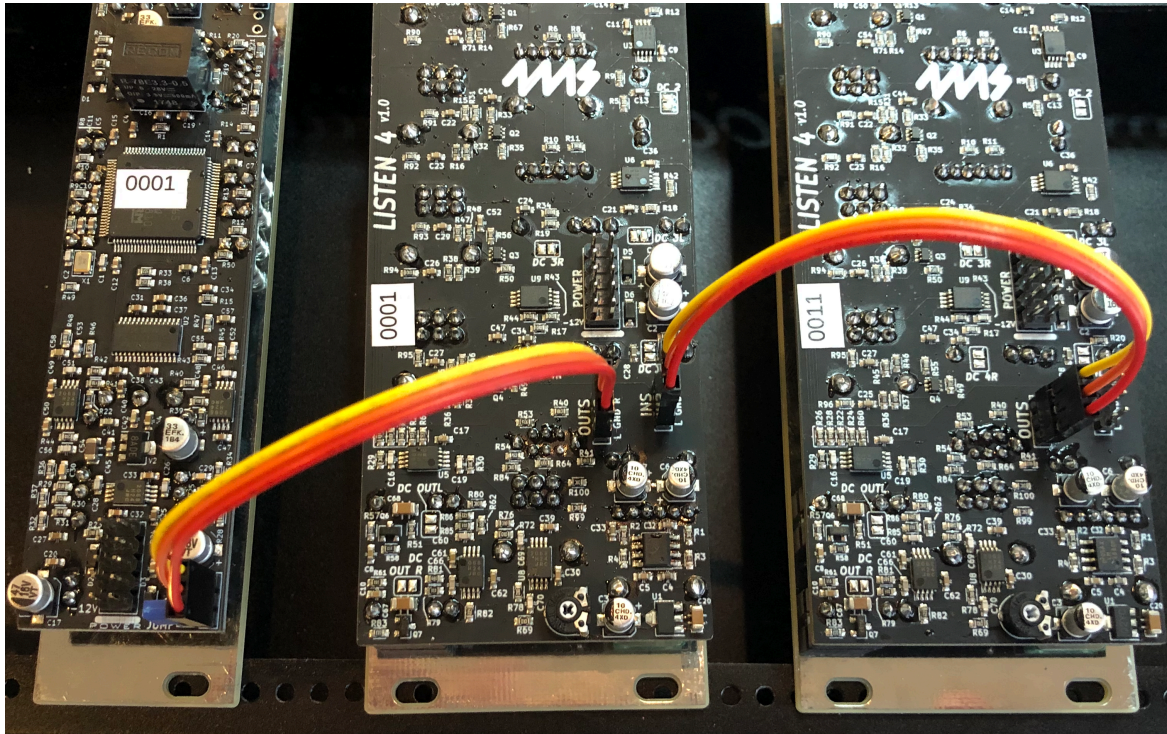
Main Mixes and Sub-mixes

The **Main Level** knob controls the level that's passed to the next **Listen** module via the **OUTS** header. By patching related signals into the same **Listen** module, you can create sub-mixes with a single knob for level control.

For example, see the photo above. Two **Listen Four** modules are connected such that one module's **OUTS** header connects to the other module's **INS** header. Let's say you patch some polyrhythmic drum sounds into the first **Listen Four**, and patch some processed field recordings into the second **Listen Four**. The output jacks on the second **Listen Four** will be a mix of everything (the drums and field recordings), and the **Main Level** knob will control the overall level. The output jacks on the first **Listen Four** will be a sub-mix of just the drums, and its **Main Level** knob will control just the level of the drums in both the sub-mix and the overall mix.

Connecting to the WAV Recorder

The **WAV Recorder** just has an **INS** header, and so it can only be connected at the end of a daisy-chain. This is useful for making a recording of the main mix. Since the **WAV Recorder** can accept line or modular level signals, the **Listen Four's** switch can be set to either Line or Mod. The **Input Gain** knob on the **WAV Recorder** can be adjusted to the maximum recording level without clipping. Adjusting this knob will not effect the output level of the **Listen** modules.



In the photo above, two **Listen Fours** and a **WAV Recorder** are daisy-chained by connecting the **OUTS** to **INS** headers. This creates an eight channel mixer with a stereo recording of the main mix.

The photo on the right shows a twelve channel mixer with stereo recording of the main mix. Patching into any of the twelve channels will pass the signal to the 1/4" outputs, as well as the **WAV Recorder**. No cables need to be patched between modules. Each **Listen** module's **Main Level** knob controls the sub-mix level of its four channels plus the module to the left of it. The sub-mix can be taken simply by patching into the Left and Right output jacks on the **Listen Four** modules. The headphone jack on these modules can also be used to cue or monitor the sub-mix.



Twelve channel mixer with two four-channel sub-mixes, 1/4" balanced stereo outputs and stereo recording directly from the main mix. Each sub-mix has a headphone jack with independent level for cueing.

Anti-pop circuitry

The **Listen Four** has a special feature that prevents the main outputs from popping or thumping when the power is turned on. This avoids a common problem that happens when the power is accidentally turned off and back on again while connected to a PA or powered speaker system, or the power is turned on after the speakers are turned on. When using most mixers, the result is a loud pop that can damage the speakers (and frighten anyone nearby!). The **Listen Four** automatically mutes the outputs during power-on, thus avoiding any pops.

Electrical and Mechanical Specifications

- 10HP Eurorack format module
- 0.98" (25mm) maximum depth (includes power cable)
- 10-pin Eurorack power header
- **Power consumption**
 - Maximum values without using headphones jack:
Main outputs shorted to ground, headphones jack not used, maximum signal levels on all channels
 - +12V: 70mA
 - -12V: 62mA
 - Maximum values in worst-case conditions:
All outputs including headphone jack shorted to ground, maximum signal levels on all channels
 - +12V: 200mA
 - -12V: 62mA
- **Main outputs**
 - Output type: zero-impedance, compensated for electrolytic capacitor distortion
 - Frequency Response: +/-0.2dB max deviation, 10Hz - 20kHz
 - Maximum output level: 22.2V peak-to-peak
 - Maximum gain of channels 1 and 2: 8.0dB (hard-panned), 3.1dB (center-panned)
 - Maximum gain of channels 3 and 4, and INS header: 4.9dB
 - Channel bleed-through (Main Level attenuation):
Test conditions: Test signal input into each channel with Level knob at 100%. Frequencies from 20Hz to 20kHz tested. Result given as a ratio of the signal measured on main output jacks with Main Level knob at 0%, to the signal measured with Main Level knob at 100%. Worst-case results for any channel and frequency reported.
 - Left output jack: -102dB
 - Right output jack: -90dB
 - Channel bleed-through (channel attenuation):
Test conditions: Test signal input into each channel with Level knob at 0% and Main Level knob at 100%. Frequencies from 20Hz to 20kHz tested. Result given as a ratio of the signal measured on main output jacks with channel Level knob at 0%, to the signal measured with channel Level knob at 100%. Worst-case results for any channel and frequency reported.
 - Left output jack: channel 4: -90dB at 20kHz; all other channels -110dB
 - Right output jack: channel 4: -84dB at 20kHz; all other channels -110dB
 - Channel cross-talk:
Test conditions: Test signal input into each channel. Level knob at 0%, and other channel Level knobs at 100%. Main Level knob at 100%. Frequencies from 20Hz to 20kHz tested. Measured signal subtracted from signal with all Level knobs at 0%, and result given in dB as a ratio to output signal with test channels' Level knob at 100%. Worst-case results for any channel and frequency reported.
 - Left output jack: -110dB
 - Right output jack: -102dB
- **Headphones jack**
 - Frequency response: -0.2dB at 20Hz; 0dB at 100Hz to 20kHz (driving 32Ω headphones)
 - Maximum voltage (peak-to-peak): 5Vpp