

Ultrawave User Guide



Welcome

Thank you for purchasing the Source Audio Ultrawave Multiband Processor. The Ultrawave is the first of its kind: a flexible multiband processing toolbox. Through the combination of band splitting, exotic distortion curves, multi-band tremolo, compression, morphing, and flexible stereo processing, the Ultrawave opens doors to a wide range of new sounds for guitar, bass, synth, and other musical instrument applications. The Neuro Desktop and Mobile editors provide an intuitive graphical environment to unlock the power of the Ultrawave, allowing users to create and share a growing library of sounds.

At the core of the Ultrawave is multiband separation, distortion, and EQ. In the 1970s music technologist Craig Anderton created a 4-band distortion tool. It was noted for lessening intermodulation artifacts when playing complex chords, but the concept was left largely unexplored. In 2007 Bob Chidlaw took the basics of multiband processing and added cutting-edge foldback distortion curves, which were relatively unknown at the time. When implemented on a powerful Analog Devices DSP chip, the Source Audio Multiwave Distortion pedal was born. The Ultrawave starts where the Multiwave left off and leverages more than a decade of Source Audio know-how and dramatic increases in DSP power. The Ultrawave is the ultimate expression of multiband processing in a pedal. We hope you will enjoy our creation, and that it will provide years of inspiration and fun.

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Feature Overview

37 Different Band-Splitting Options: Band Splitting options including single, 2, 3, 4, 8, and 10 bands. Each band splitting option includes several sub-sets with different band splitting frequency points.

44 Different Distortion Types: Choose from distortion/overdrive/fuzz types that include Tube, Diode, Foldback, Negative Flip Diode, Octave Up, and more.

Dual Channel Compressor/Expander: Compressor features Input Gain, Threshold, Ratio, Attack, Release, and Output Gain controls with a detailed graphic monitor. Use the dual channel capabilities to isolate compression to specific frequencies. Place the compressor/expander before or after the overdrive module.

A Growing Library of Published Presets: For quick and easy access to a world of great tones, try sampling sounds from a vast collection of published presets created by the Source Audio team and the ever-growing Ultrawave Neuro Community.

Stereo Ins and Outs: Create two entirely different presets and run them in series, parallel or run each to a separate output. Stereo options also apply to the Multiband Tremolo - use the Channel 1/Channel 2 Sync options or the Phase Offset control to create stereo ping-pong, tremolo effects.

Detailed LFO Controls: Use the LFO module to control the Ultrawave's Tremolo, Morphing or Ring Mod features. Choose between a standard Sine Wave or use the Attack/Release controls to create highly customized LFO shapes.

Sound Morphing: Change from one sound to another with an expression pedal, envelope follower or LFO.

Extreme Tonal Control including an 8-band graphic equalizer, a 3-band parametric equalizer, a configurable HPF & LPF, and an adjustable noise gate.

Assignable Knobs: Reassign all four of the Ultrawave's knobs to the parameters most useful for making quick, on-stage changes. Save a different set of knob assignments for every preset.

External Expression Pedal Control: Make simultaneous, on-the-fly changes of up to three parameters with an external expression pedal.

6 Toggle Switch Accessible Presets: Quickly access up to 6 pedal presets with the Ultrawave's toggle switch.

MIDI Capable — Connect the Ultrawave to the Source Audio Neuro Hub or a USB-MIDI Host and access up to 128 presets with MIDI Program Change (PC) messages. Control many of the pedal's parameters with MIDI Continuous Controller (CC) messages or assign LFO modulation speed with MIDI Clock.

USB Port - Class compliant USB-MIDI allows the Ultrawave to work as a plug-and-play device with recording software running on Mac and Windows. The USB port offers connectivity to the Neuro Desktop Editor providing access to deep editing possibilities and pedal firmware updates.

Compact Design – The durable, anodized aluminum housing has a small footprint and sturdy hardware.

Universal Bypass™ – Select either analog buffered or relay based True Bypass.

* * *

Connecting the Pedal

Power

To power the unit, connect the included 9V DC center-negative power supply (at least 150mA required) to the jack labeled **DC 9V** on the back panel.

Warning: Using a non-Source Audio supply, especially an unregulated supply, could damage the unit. A power supply with insufficient current levels may also cause noise or other unpredictable behavior. Please be very cautious when using 3rd-party power supplies and refer to the power supply requirements in the [Specifications](#) section of this guide.

Connections

Guitar/Audio Connections

Using standard ¼" mono (TS) cables, connect your guitar, bass, or other instrument to the INPUT 1 jack and your amp (or the next audio device in the signal chain) to the OUTPUT 1 jack. If you have a second amp, connect it to OUTPUT 2.

When the power and audio connections have been made, Ultrawave is ready for use.

Input Side Connections



INPUT 1

INPUT 1 is the primary input for guitar, bass, or other instruments. It can also accept line-level inputs and will work in your amp's effect loop. Connect it to your instrument or other audio source using a mono (TS) 1/4" cable. Details about the appropriate signal levels are available in the [Specifications](#) section.

INPUT 2

Use the secondary audio input for stereo sources or as the data connection to your mobile device when using the Neuro App.

- *INPUT 2 as an Audio Input:* The tip contact on INPUT 2 acts as a secondary input for guitar, bass, or other instruments. Connect your instrument (or the previous effect in the signal chain) using a mono (TS) 1/4" cable. The Ultrawave will automatically configure itself for stereo audio input. Other routing options are available using the Neuro App. For more information about stereo routing, refer to the [Stereo Operation](#) section.
- *INPUT 2 as a Neuro App Data Input:* The ring contact on INPUT 2 acts as a data connection for the Neuro Mobile App. The Neuro App sends data to the pedal using your mobile device's headphone jack. Connect it to your mobile device using the included stereo (TRS) 1/8" to 1/4" cable. It can also accept daisy-chained Neuro data from another Neuro-compatible pedal in the chain, provided that a TRS cable is used. The audio signal (if applicable) will be on the tip contact of the plug, and the Neuro App data will be on the ring contact. This allows audio and Neuro data to flow on the same cable.

Output Side Connections



OUTPUT 1

This is the primary audio output. Connect it to your amplifier, recording interface, or the next device in your effects signal chain using a mono (TS) ¼" cable.

OUTPUT 2

OUTPUT 2 can act either as an audio output or a daisy-chain data connection for the Neuro App.

- *OUTPUT 2 as an Audio Output:* The tip contact on OUTPUT 2 acts as the secondary audio output. It carries an audio signal when the Ultrawave is configured with a signal routing that uses stereo outputs. Connect it to your amplifier, recording interface, or the next device in your effects signal chain using a mono (TS) ¼" cable.
- *OUTPUT 2 as a Neuro App Data Daisy-Chain Output:* The ring contact on OUTPUT 2 acts as a data connection for the Neuro App, passing data from the Ultrawave to the next Source Audio effect in your signal chain. You can daisy-chain the Neuro App data regardless of whether OUTPUT 2 is configured to output audio or not. Connect OUTPUT 2 to the next device's Neuro App Data input (usually INPUT 2) using a stereo (TRS) 1/4" cable. The audio signal (if applicable) will be on the tip contact of the plug, and the Neuro App data will be on the ring contact. This allows audio and Neuro data to flow on the same cable.

Power and Control Connections



DC 9V (Power)

Connect to the included 9 Volt DC power supply. If you would like to use a 3rd-party supply, the power supply must be **regulated** at 9 Volts DC (direct current), able to source at least 150 mA (milliamps) of current, and the plug should have a center-negative polarity.

USB

Connect your computer or mobile device (Windows or Mac) to the Ultrawave's USB port (denoted by the icon) using a standard USB mini-B cable. The Ultrawave is a class compliant USB device, meaning that it does not require any custom drivers. For more information about the Ultrawave's USB capabilities, refer to the [USB Section](#) of the User's Guide.

CONTROL INPUT

The 3.5 mm CONTROL INPUT port connects to external control devices such as the Source Audio Tap Tempo Switch, Source Audio Dual Expression Pedal, and the Neuro Hub. For more information, refer to the [Expression Pedal Input](#) and [Neuro Hub](#) sections of the User's Guide.

Controls



Note: The four top-level knob controls (Drive, Level, Sustain, and Treble) can be reassigned in the Neuro Mobile App and Neuro Desktop Editor from a list of many possible parameters.

Footswitch

Click the footswitch to engage or bypass the pedal. Press and hold the footswitch down while the pedal is bypassed to bank to Red LED (ALT) Mode for more presets.

Control Input / ALT Button

This small button located at the top of the pedal is used to enable or disable external control. It also is used to control the ALT parameters on the surface of the pedal. Press and release the ALT button; while the Control LED is flashing, turning the SUSTAIN or TREBLE knobs will access their alternate parameters, Bass level and Mid level.

ON/OFF LED

The ON/OFF LED indicates whether the effect is bypassed or engaged. In ALT Mode, the LED becomes red.

DRIVE Knob

Adjusts the distortion level. Turn clockwise for more distortion and saturation, or turn counterclockwise for cleaner sounds.

LEVEL Knob

Adjusts the overall output volume. Turn clockwise for more volume, or counterclockwise for less volume. Note: Due to the varying nature of the presets and band-splitting options, the overall output level may change for each preset, adjusting the range of this control. Because of this, there is no hard-set “unity gain” point on the knob.

SUSTAIN/BASS Knob

Adjusts the sustain of the distortion by manipulating the input gain before the compressor. Turn clockwise for more sustain and a bit more saturation. Turn counterclockwise for less sustain and a more open sound/feel.

In ALT mode, this knob controls the amount of bass frequencies present in the outgoing signal. Turn clockwise for more low end, and turn counterclockwise for less low end.

TREBLE/MID Knob

Controls how bright or mellow the overall effect is. Turn clockwise for a more top end bite, or turn counterclockwise for a darker sound with attenuated high frequencies.

In ALT mode, this knob controls the amount of midrange present in the distortion. Turn clockwise for a more warm, classic sound, and turn counterclockwise for a more scooped, modern sound.

Preset Selector Toggle

Use the Ultrawave’s three-position toggle switch and two preset banks to easily access six different presets. **First Preset Bank (indicated by the green center LED):** default the center toggle switch selects between three presets stored in the first bank of presets. **Second Preset Bank (indicated by the red center LED):** Pressing the ALT button on the topside of the pedal opens access to the second bank of presets. After pressing the ALT button, the small LED at the top of the pedal’s face will start to blink, indicating that the second preset bank is accessible with the toggle switch. Upon moving the toggle switch the center LED will turn red indicating the current preset is drawn from the second bank.

Controls (Bass)



Note: The four top-level knob controls (Drive, Level, Mix, and Treble) can be reassigned in the Neuro Mobile App and Neuro Desktop Editor from a list of many possible parameters.

The only main difference in Controls on the Ultrawave Bass is that a MIX knob replaces the SUSTAIN knob on the guitar version. The MIX control is a dry to wet crossfade control. Fully clockwise on the knob is full “wet”, meaning no clean signal is present, only signal distorted or manipulated by the Ultrawave will be heard. At noon, there is a 50/50 clean mix, and at fully counterclockwise, the signal is fully clean (no distortion).

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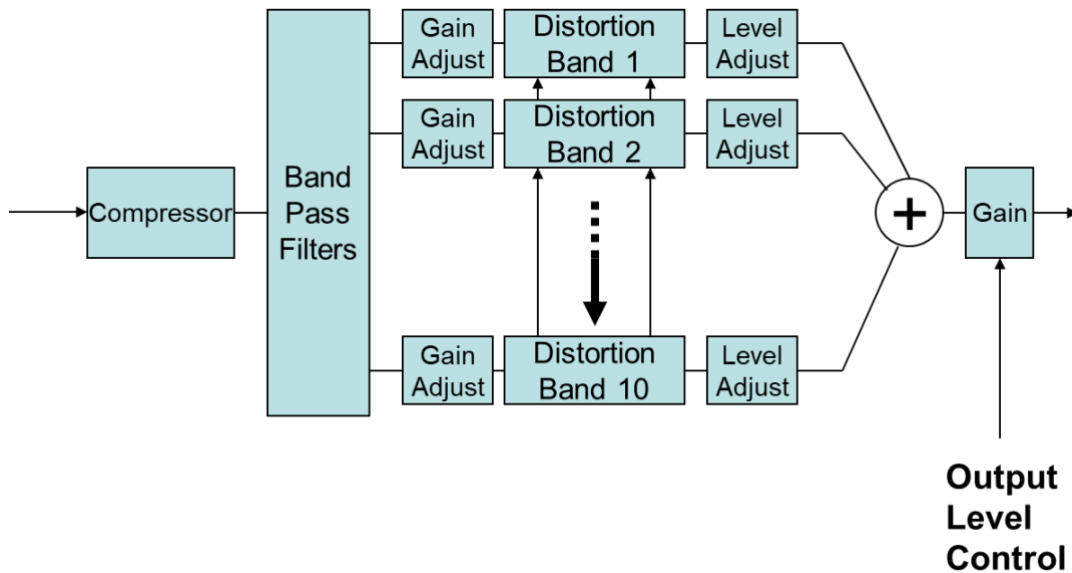
Theory of Operation

A graphic or parametric EQ is a simple and common form of multiband processor. In that case, the signal is split into separate frequency bands, levels in each band are set, and then the signal is recombined. By controlling the levels in each band, a wide variety of tones can be created. The Ultrawave takes this basic concept of multiband processing to a much higher level in the following ways:

- applying varying levels and types of distortion.
- applying optional tremolo and phase offsets to each band.
- applying compression before or after the multiband processing.

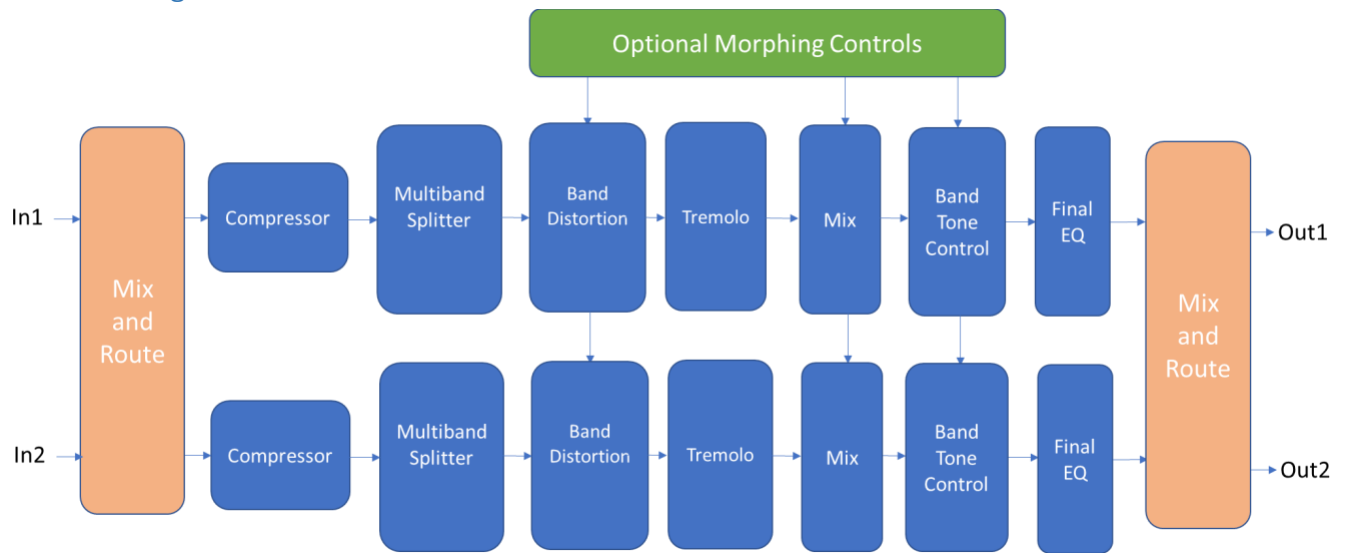
- applying EQ where necessary to shape the tone.
- allowing for a complete set of alternate states to be defined in the multiband processor and then “morph” between both states via LFO), envelope, or expression.
- creating 2 complete signal paths with routing options for parallel processing, cascading, placement of the effect in 2 locations of a pedal board, and the creation of complex stereo images.

Simplified Multiband Distortion Example



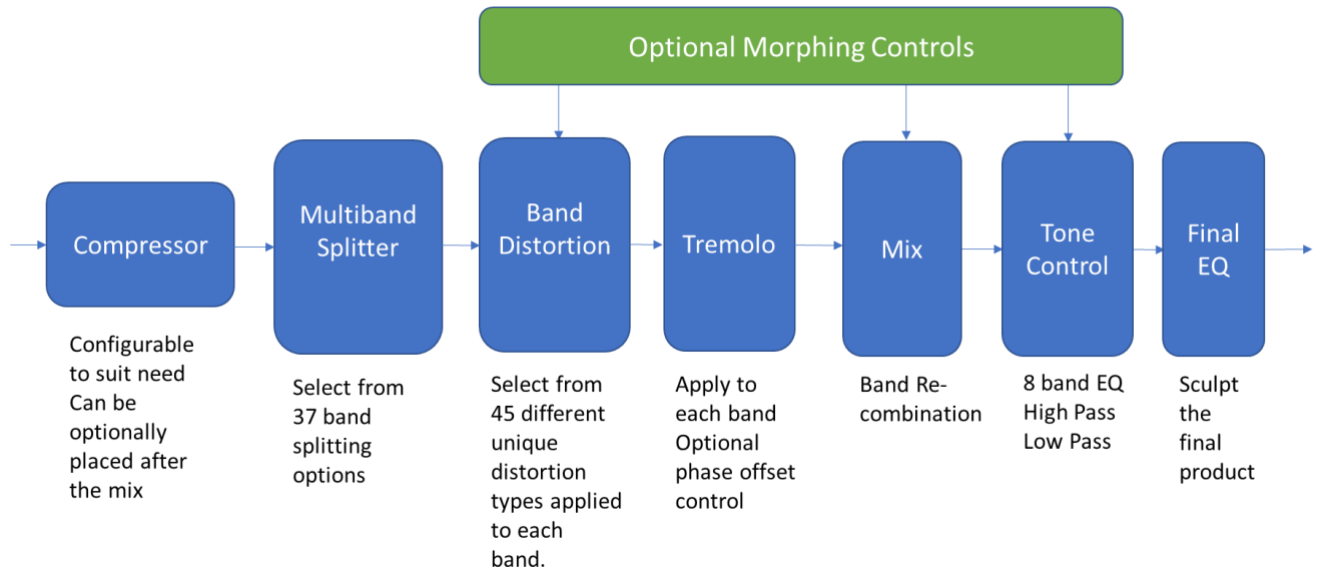
The diagram above shows the Ultrawave in a classic multiband distortion application. Following a gain/compression stage, the signal is then split into ten separate bands. Each band then passes through dedicated and separate level setting and distortion stages. Finally, the ten bands are summed together to form the output signal. There are many interesting consequences of passing the signal through the ten bands rather than a traditional single band distortion stage. Firstly, the distortion tone is significantly more harmonically complex. Secondly, it is possible to play complex chords with more clarity. This occurs because each guitar string tends to find its own path through one of the ten bands and is not “stepped on” by the harmonics of a neighboring string. The net result is a distortion sound palette that is not found on the thousands of common distortion pedals that are on the market.

Ultrawave Signal Path



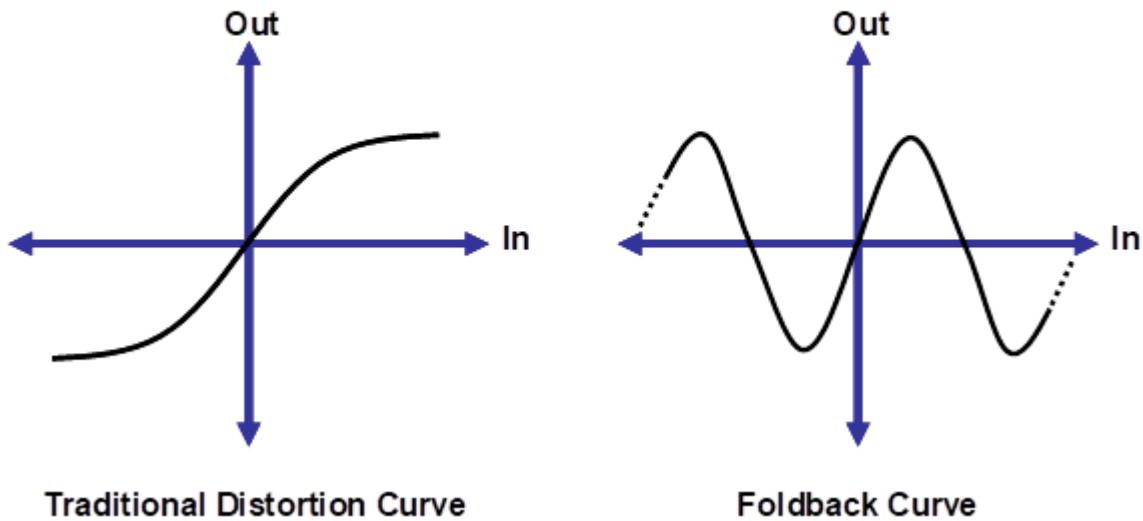
The diagram above is a functional representation of the signal path inside the Ultrawave. One should note there are 2 separate signal paths to provide true stereo, stereo imaging, and other multi-channel routing options. The multiband separation, distortion, and gain control lies in the center on the path. Note that the multiband blocks plus EQ and filtering can be “morphed” between two defined states via LFO, envelope or expression. For instance, one could create a clear octave up tone in one state and then a highly distorted foldback tone in the second state. If used with an envelope, a struck note would ring with a clear octave up tone, but then decay into highly distorted foldback fuzz. This is one example on an infinite range of possible sound creation options. There are two compressors in the Ultrawave, and they can be placed before or after the multiband processing. Through use of EQ and routing options, it is possible to use the Ultrawave as a 2-band compressor. Finally, it is possible to add phase offset tremolo to each band. Multiband tremolo adds yet another innovative and interesting option to the Ultrawave multiband toolbox. The diagram below summarizes the function of each block.

Define an alternate control state and use LFO, expression, or envelope to morph



Foldback Distortion

Input/Output Characteristics



Foldback distortion is one of the many distortion curve options on the Ultrawave. It is worth some background because they are not commonly found in effect pedals. In traditional distortion, as the input signal voltage rises, the output voltage also rises, but begins to level off and finally pins (or clips) at a maximum value. With a foldback curve, for large enough values of the input, the output will begin to decrease. With more extreme amounts of foldback, after decreasing for a while, the

output can begin to increase again. Maximum foldback has many regions where the output alternates between increasing and decreasing. These kinds of curves add a lot of high frequency content to the output. It also can provide a lot of control over the sound, based on the level of the input signal. With foldback, chords containing only octaves and fifths tend to sound best. Other intervals can cause some strange, although not necessarily undesirable sounds.

Using a special shape of the distortion curve, strong second harmonics can be created, sounding like a note an octave higher. Rolling off the guitar tone control or switching to the neck pickup will help maximize the octave impression by attenuating the higher-order harmonics. Complex chords do not typically work well for octave settings. The result is sensitive to the input signal level (as long as the SUSTAIN and DRIVE controls are not set too high) and can give a sort of auto-wah effect.

A conventional distortion effect tends to turn the guitar signal into square waves. Playing harder only makes the transition from negative clipping to positive clipping a little bit steeper. With the foldback and octave algorithms found in the Ultrawave, a slightly higher input can have a radical effect on the shape of the output signal.

Distortion Types

When using the Neuro Mobile App or Neuro Desktop Editor, you can select from a large list of distortion types as you're building a sound. Below is a guide to all the terms used in the Distortion Type list, and how to differentiate between them. Essentially, the Ultrawave uses these sounds or some combination of these sounds for each of the 44 distortion options.

For further reading and a visual representation of each unique distortion element, visit the [Distortion Appendix](#).

- **Basic (Tube) Distortion** - Similar to how Tubes feel and sound, gain goes from nearly linear to the input signal, to sag, to compressed distortion based on input level.
- **Hard Clip** - like Op-Amp style hard clipping.
- **Offset** - like Asymmetrical clipping (for reference, a Boss SD-1 uses asymmetrical clipping compared to a TS9 which uses symmetrical clipping in an otherwise similar circuit).
- **Diode** - Similar to LED Diode clipping.
- **Gate** - Any signal below the threshold is set to zero, and sustained signals will sputter out. Very Velcro-like in nature.
- **Absolute Value** – Essentially, this is the “code equivalent” of the 2-transistor Superfuzz circuit that causes an octave-up effect.
- **Octave** - Uses different tech for a smoother sounding octave, better for combining with other elements like Foldback.
- **Foldback** - The classic, synth-like, overtone-rich effect from the original Multiwave. Derived from modular synths. The distortion curve begins to collapse and turn back toward 0 when clipped.

Stereo Operation & Signal Routing

The Ultrawave is flexible for many different uses due to its stereo INPUT and OUTPUT jacks. By default, the Ultrawave auto-detects the cables connected to INPUTS and OUTPUTS 1 & 2 and engages the appropriate Routing Mode. Stereo Routing can also be performed manually with the Neuro Editors; select between “Mono In, Stereo Out” or “Stereo In, Stereo Out.”

Auto Routing Modes

There are four routing modes available when the Ultrawave is in its default Auto Detect mode. See detailed descriptions of each Auto Detect mode in the sections below.

- [Mono In, Mono Out](#)
- [Mono In, Stereo Out](#)
- [Stereo In, Stereo Out](#)
- [Stereo In, Mono Out](#)

Mono In, Mono Out

This is the most common use case. Plugging the incoming signal into INPUT 1 with OUTPUT 1 connected to an amp (or the next device in the signal chain) produces a standard mono signal. Dual processing effects are also mixed down to a single output.

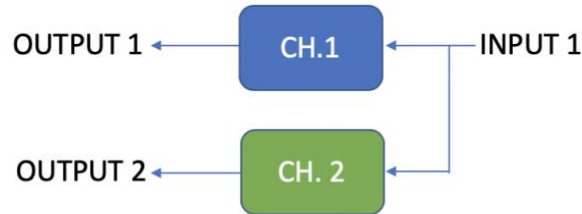
Mono In, Mono Out



Mono In, Stereo Out

This is a very common use case that allows you to create some nice stereo imaging from a single mono instrument input or use your Ultrawave as a splitter to send your signal to two separate outputs. When the unit is bypassed in this mode, it will automatically switch to Soft Bypass mode to maintain the bypass signal on the Channel 2 output. When Ch. 1 and Ch. 2 are linked, the processing will be the same for both channels. When they are unlinked, you can configure separate settings for Channel 2.

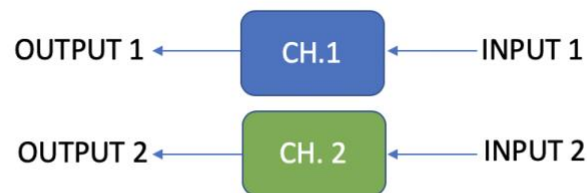
Mono In, Stereo Out



Stereo In, Stereo Out

This mode should be your default selection for Stereo In, Stereo Out applications. Stereo In, Stereo Out allows you to continue your stereo chain of effects. When Ch. 1 and Ch. 2 are linked, the processing will be the same for both channels. When they are unlinked, you can configure separate settings for Channel 2.

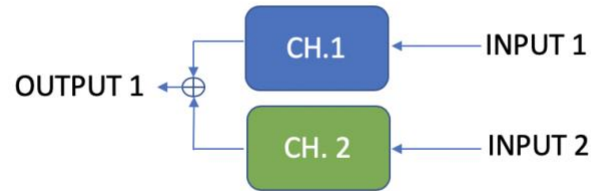
Stereo In, Stereo Out



Stereo In, Mono Out

This mode will accept stereo input on jacks INPUT 1 and 2. Inputs 1 and 2 are sent to Channel 1 and 2 respectively. When Ch. 1 and Ch. 2 are linked, the processing will be the same for both channels. When they are unlinked, you can configure separate settings for Channel 2. The outputs of the Channel 1 and Channel 2 equalizers are mixed together and sent to OUTPUT 1.

Stereo In, Mono Out



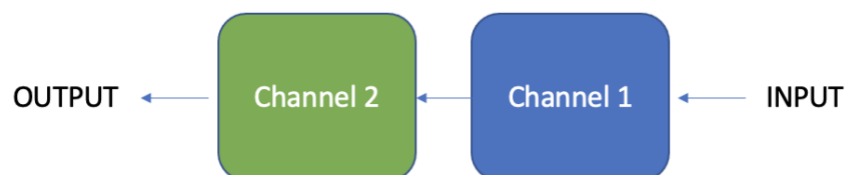
Additional Routing Modes

The Ultrawave supports two additional routing modes, **Cascade Ch.1 -> Ch. 2** and **Mono -> Stereo -> Mono** available in the [Neuro Mobile App](#) and the [Neuro Desktop Editor](#). View the routing modes below to find out how you can configure the Ultrawave's inputs, outputs and dual channels using a Neuro connection.

Cascade Ch. 1 -> Ch. 2

This routing mode allows you to run both channels in series, meaning Channel 1 will cascade into Channel 2. This is a very useful routing mode in terms of tone shaping and drive-stacking. When Ch. 1 and Ch. 2 are linked, the processing will be the same for both channels. When they are unlinked, you can configure separate parameters for Channel 2.

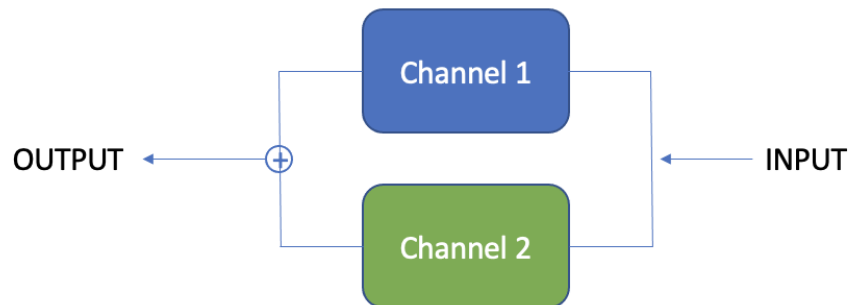
Cascade Ch. 1 -> Ch. 2



Mono -> Stereo -> Mono

This routing mode also allows for both channels to be run at once, but in this case, they are being run in parallel. The Channel Balance control in the Neuro sound editor comes in handy in this routing mode, as it controls the relative mix levels of each channel. When Ch. 1 and Ch. 2 are linked, the processing will be the same for both channels. When they are unlinked, you can configure separate parameters for Channel 2.

Mono -> Stereo -> Mono



Preset Storage and Recall

User Presets store all user-editable parameters. This includes the knob positions, parameter settings, frequencies, routing options, external control, and the full list of Neuro/MIDI-accessible parameters. Included in every preset are settings for either channel (Channel 1 [Mono] or Channel 2). After a preset is recalled, you can always tweak the top-level controls in a performance situation by turning the knob. The knob parameter will then “jump” to the current knob position as it is rotated.

Recalling Presets

The first six User Presets are accessible via the onboard hardware or with an external footswitch in the following ways:

1. Move the toggle switch to left, center, or right to access presets #1-3.
2. Press the ALT button, then while the Control LED is flashing, move the toggle switch to access presets #4-6, or press + hold the footswitch when the pedal is OFF for 5 seconds (or 2 second in “Quick Change” mode) to access the Red LED (presets #4-6).

Recalling MIDI Presets

All 128 available User Presets are accessible with an external MIDI controller. MIDI controllers can be connected via USB port at the top of the pedal, or through a Neuro Hub, which connected to the CONTROL INPUT at the top of the pedal. All 128 User Presets can be recalled with the corresponding

MIDI program change (PC) messages, or via continuous controller (CC) messages when accessing the pedal’s internal presets via the Neuro Hub.

Note: When recalling presets via MIDI PC messages, you may wish to queue up your preset with effect bypassed. To do this, simply engage the preset, bypass it with the footswitch, then re-save the preset normally. When recalled, the pedal will load the saved user settings, but the effects will be bypassed until you engage the pedal.

Copying a Preset to a New Location Using the Neuro App

Using the BURN and SAVE AS commands in Neuro Mobile or Desktop Editors, it is possible to copy presets to any location in memory.

Clearing all Presets

All 128 User Presets can be erased using the Factory Reset procedure. Warning: The Factory Reset procedure resets the entire pedal back to the state in which it was originally shipped – this includes all global settings and User Presets. A Factory Reset will not erase any firmware updates.

* * *

External Control

Plug an expression pedal, an external footswitch, the Source Audio Tap Tempo Switch, or the Source Audio Hot Hand 3 Universal Wireless Controller into the Ultrawave’s CONTROL INPUT jack and access an array of external functionality and expression control.



External Switch

External switches can be used for several different control options. They provide an easy way to remotely swap channels, tap the LFO tempo, and more. The Ultrawave is compatible with the Source Audio Tap Tempo Switch.

External Switch Options

There are three main ways the Control Input port is utilized. Below are the possible used for the Control Input port. Please note that External Switch Options is a global hardware setting.

Neuro Hub: This configures the Control Input port to receive MIDI code signals from the Neuro Hub, allowing the pedal to be added to Hub Scenes (which are controlled by PC messages) and allowing for MIDI CC (Continuous Controller) control.

Expression: Using the Source Audio Dual Expression pedal or a third-party expression pedal connected to the Neuro Hub, it is possible to map up to three parameters to be controlled via expression.

Tap Tempo: Connect a Source Audio Tap Tempo switch to be able to tap in the speed of the Ultrawave's LFO. The LFO can be set to control single tremolo, the multiband tremolo, morphing, or a combination of those elements.

External Switches (1/8" TRRS Connection)

The Source Audio Tap Tempo footswitch can also be connected to the CONTROL IN jack using a 3.5mm (1/8 inch) cable. If you wish to use this function, you must enable the function globally with the "Use Control Input for External Switch" option in the [Hardware Options](#) section of the Neuro Desktop Editor.

Source Audio Tap Tempo footswitches can be purchased directly from the Reverb.com [Official Source Audio Online Store](#).

Expression Control



Use a Source Audio Dual Expression pedal to control up to three different parameters on the Ultrawave per preset. Parameters include Drive level, Output Level, Treble, Bass, Mid Control, Noise Gate Enable, and many more.

Connecting the Expression Pedal

Connect a Source Audio Dual Expression pedal using a 3.5mm TRRS cable from the EXP pedal's Sensor Output to the Ultrawave's CONTROL INPUT port on the pedal's top panel. Press the CONTROL INPUT button to enable External Control.

If you are not getting the desired results from your expression pedal setup, go to the Hardware Options section of the Neuro software. You'll need to select "Neuro Hub/Expression" under "Control Input Option", and you may also need to calibrate your expression pedal. For more details, visit [Hardware Options](#).

Mapping Parameters

The quickest way to map parameters to your expression pedal is by connecting your Ultrawave to the [Neuro App](#) or [Neuro Desktop Editor](#). The Expression Control section is at the bottom of the Ultrawave's Sound Editor. Download the Neuro Desktop Editor and go to Devices > Show Offline Device Editor > Ultrawave to view the full list of expressible parameters.

MIDI

The Ultrawave can also receive expression signals over MIDI. To do this, you would need a MIDI controller that has an expression input, and which is also compatible with the Ultrawave (this will be most MIDI controllers). Connect your compatible expression pedal to your MIDI controller, and your MIDI controller to your Ultrawave. You can also achieve this with the Neuro Hub.



Neuro Desktop and Mobile Editors

Like all pedals in the Source Audio One Series line, the Ultrawave Multiband Processor features access to more precise editing parameters, preset sharing, and added functionality via the Neuro Desktop Editor and Mobile App. The Neuro Desktop Editor is available as a free download for Mac or Windows on the [Editors & Firmware](#) page of the Source Audio website.

The Neuro Desktop Editor

The Neuro Desktop Editor is an excellent tool for creating and organizing highly customized presets for your Ultrawave Multiband Processor. The Desktop offers an advanced cataloging system for naming and storing Ultrawave presets. The Desktop is also a tool for installing the latest updates to your Ultrawave's firmware.

Downloading and Connecting the Neuro Desktop Editor

The Neuro Desktop Editor is a free download for Mac and Windows PCs. To download the Neuro Desktop, go to [the Source Audio Editors & Firmware page](#). In the Software tab select the appropriate file (you have a choice between the Mac and Windows versions) and download it.

After the download process, connect your Ultrawave with a USB Type A male to mini type B male data cable (must be data-capable, not solely a charger cable). Connect the cable from the mini USB port on the pedal to the USB port on your computer. Once you've made the connection a blue box will appear in the Connections field indicating that the Ultrawave is ready to be edited.

If a new firmware update is available, the Firmware Update icon (the arrow icon) will be framed in yellow. When you click the arrow icon, you will be instructed on the updating procedure. Occasionally, a fresh download of the Neuro Desktop Editor will be required to access future firmware updates, and it is always a good idea to check [the Source Audio Editors & Firmware page](#) to see if there is a newer version of the editor available for download.

Neuro Desktop Editor User Interface

The Neuro Desktop's user interface features three primary sections: [Connections](#), [Sound Editor](#), and [Presets](#).



Connections

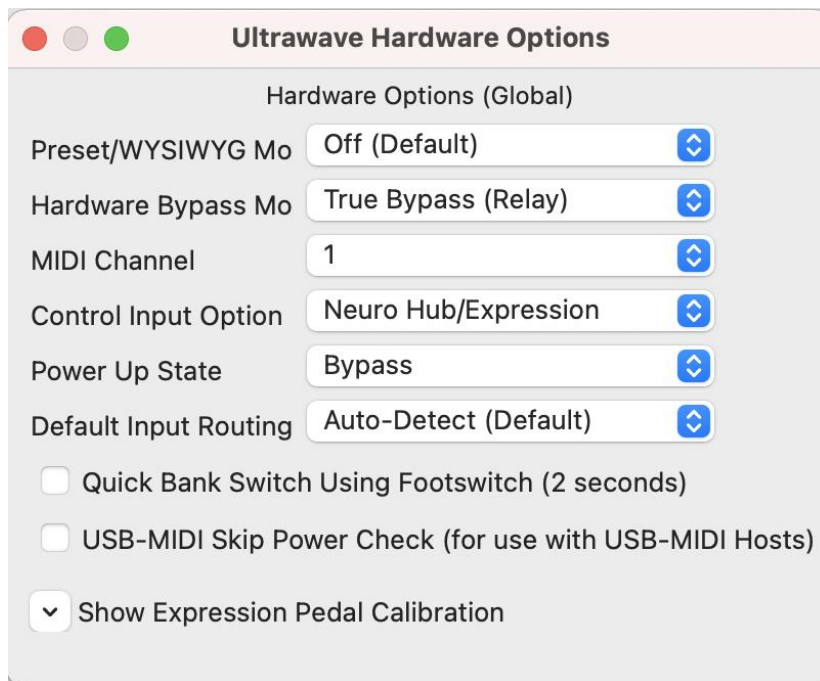
The Connections section is located on the left side of the Neuro Desktop Editor. This field displays all connected One Series pedals and the Neuro Hub. Each connected pedal offers the three options listed below, from left to right:



- **Firmware Updates:** The arrow icon checks for any recent firmware updates to the connected pedal. If an update is available, the software will provide instructions on how to proceed.
- **Hardware Options:** The gear icon opens the Hardware Options window. Each Source Audio pedal has its own set of global hardware settings. The attached pedal will retain all hardware option edits until either the option is changed, or a Factory Reset is performed.
- **Open Editing Interface:** The wrench icon opens the Ultrawave’s Sound Editor, revealing a deep set of editing controls for creating custom presets.

Hardware Options

Clicking the gear icon in the Ultrawave Multiband Processor’ Connections window opens the Hardware Options menu (see the graphic below). Use the Hardware Options window to choose your pedal’s global hardware settings.



The Ultrawave’s Hardware Options include the following:

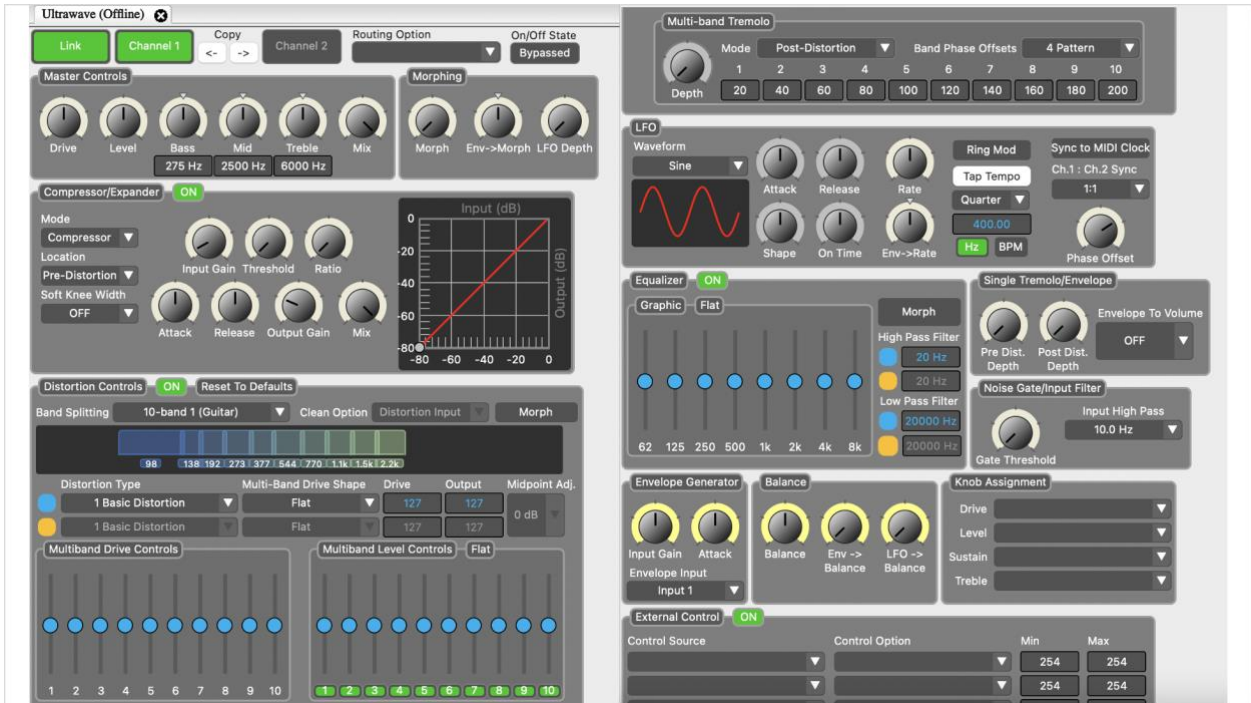
- **Preset/WYSIWYG Mode:** Selects between Preset (all parameters are saved & recalled) and WYSIWYG (the pedal’s physical knob positions override where they are set in the preset) modes.

- **Hardware Bypass Mode:** Selects between True or Buffered Bypass.
- **MIDI Channel:** Selects the pedal's MIDI channel (1 through 16).
- **Control Input Option:** This dropdown menu assigns the control function of the external switch connected to the CONTROL INPUT.
- **Power Up State:** Selects between engaging or bypassing the effect upon the initial power up of the pedal.
- **Default Routing Option:** Sets the default I/O signal routing mode. Descriptions of the available routing modes are available in the [Stereo Operation & Signal Routing](#) section of this manual.
- **Quick Bank Switch Using Footswitch (2 Seconds):** Enabling this setting allows you to bank to and from the secondary (red LED) bank of presets by pressing + holding down the footswitch for 2 seconds instead of 5 seconds.
- **USB-MIDI Skip Power Check (for use with USB-MIDI Hosts):** The Ultrawave can receive MIDI PC messages via the pedal's USB port. It requires MIDI DAW software or a MIDI host device with USB. The Ultrawave should respond to most devices, but some don't generate enough power for the Ultrawave to recognize them as a MIDI host (the MIDI Baby and qCONNECT from Disaster Area Designs are two examples). If your Ultrawave is not responding to your MIDI host device, try checking this box.
- **Pedal Input & Control Input Calibration (accessible via the Show Expression Pedal Calibration dropdown controls):** In some cases, it might be necessary to adjust the calibration range of an expression pedal to get the desired pedal response when using expression control either through the Neuro Hub, a direct connection to the Source Audio Dual Expression Pedal, or a 3rd-party pedal. To perform the calibration process, connect the pedal and press the "Calibrate" button. Then rock the pedal back and forth to set the minimum value and the range. When complete, press the "Stop and Set" button to retain the new calibration values. Or press "Reset" to return to the default values.

Sound Editor

Upon clicking the wrench icon in the Connections section, the Ultrawave Multiband Processor's Sound Editor interface appears in a tab in the center panel. This is where all of the sound editing work takes place.

The Sound Editor is broken into several sub-sections, each containing a unique variation of virtual knobs and dropdown menus. The following is an in-depth explanation of each Sound Editor sub-section.



Master Controls



Link: The Ultrawave’s two discrete channels are linked by default in the preset editor to create one master channel, for those presets that really only need one channel. De-select “Link” to access and edit Channel 2.

Copy: When Ch. 1 and Ch. 2 are unlinked, the Copy arrows allow you to copy settings from Channel 1 to Channel 2, or from Channel 2 to Channel 1. The channel that is highlighted is the channel you are currently editing. Use the arrows to select the target channel.

Routing Option: The Ultrawave utilizes stereo inputs and outputs, so the Routing Option selects how you want them to be configured in conjunction with the 2 channels. You can also choose to run both channels in parallel in mono, and even cascade Channel 1 into Channel 2 for more tonal complexity and possibility. See the [Stereo Operation & Signal Routing section](#) for a detailed explanation of each routing option.

On/Off State: This lets you toggle whether the effect is ON or bypassed and can be saved as a part of the preset for easy recall.

Drive: Sets the master drive level per channel, or for both channels simultaneously when this control is Linked.

Level: Sets the master output volume per channel, or for both channels simultaneously when this control is Linked.

Bass: Adjusts the overall low end per channel. The frequency value in Hz can be adjusted by clicking within the readout box and dragging up or down.

Mid: Adjusts the overall mid frequency level per channel. The frequency value in Hz can be adjusted by clicking within the readout box and dragging up or down.

Treble: Adjusts the overall top end per channel, or for both channels simultaneously when this control is Linked. The frequency value in Hz can be adjusted by clicking within the readout box and dragging up or down.

Mix: Adjusts the amount of clean mix blended in with the signal. Fully counterclockwise is completely clean or “dry”, fully clockwise is completely distorted.

Morphing Controls



Morphing is a unique part of the Ultrawave feature set. It allows you to seamlessly change between two separate sets of user-defined parameters, using the Ultrawave’s LFO, Envelope, or an external source (see [Expression Control](#)). Morphing can be applied to both the Distortion Module and the Graphic Equalizer module. When morphing is enabled, a second set of parameters will appear in yellow, where you can define your *morph to* (yellow) voice and your *morph from* (blue) voice.

Morph: When morphing is turned on for any given parameter set, the Morph knob adjusts how much morphing is applied. Fully counterclockwise is no morphing, and fully clockwise is maximum amount of morphing.

Env->Morph: Adjusts the intensity at which the envelope applies to morphing.

LFO Depth: Adjusts the depth of the low-frequency oscillator used when morphing.

Compressor Module



The compressor can be switched “on” or “off per preset and per channel.

Mode: Toggles between a compressor, which sustains and reduces the dynamic range of your input signal, and an expander, which increases the dynamic range of your input signal, and in extreme cases, softens the attack. In expander mode, signals below the threshold get softer; if attack time is very slow, the expander generates a slowly rising signal.

Location: Toggles between putting the compressor before or after the multiband processing. Pre-Distortion is the traditional choice, while Post-Distortion produces a more drastic overall effect.

Input Gain: Adjusts the level of gain sent to the compressor. Increase for heightened sustain.

Threshold: Adjusts the decibel (dB) level at which compression is applied. A lower threshold means that compression is applied at lower signal levels, meaning that less pick attack is needed to trigger the compression. This point is called the “knee”. Any signal lower than the knee will not be compressed, and any signal with a level higher than the knee will be compressed.

Ratio: Adjusts the severity of the compression applied to your signal. As you increase this knob, you will see the line begin to flatten at the knee.

Attack: Adjusts how quickly the compression is applied to your signal after playing a note. For some distortion mappings there may be a substantial transient at the attack; this can be suppressed with a very fast attack in compressor mode.

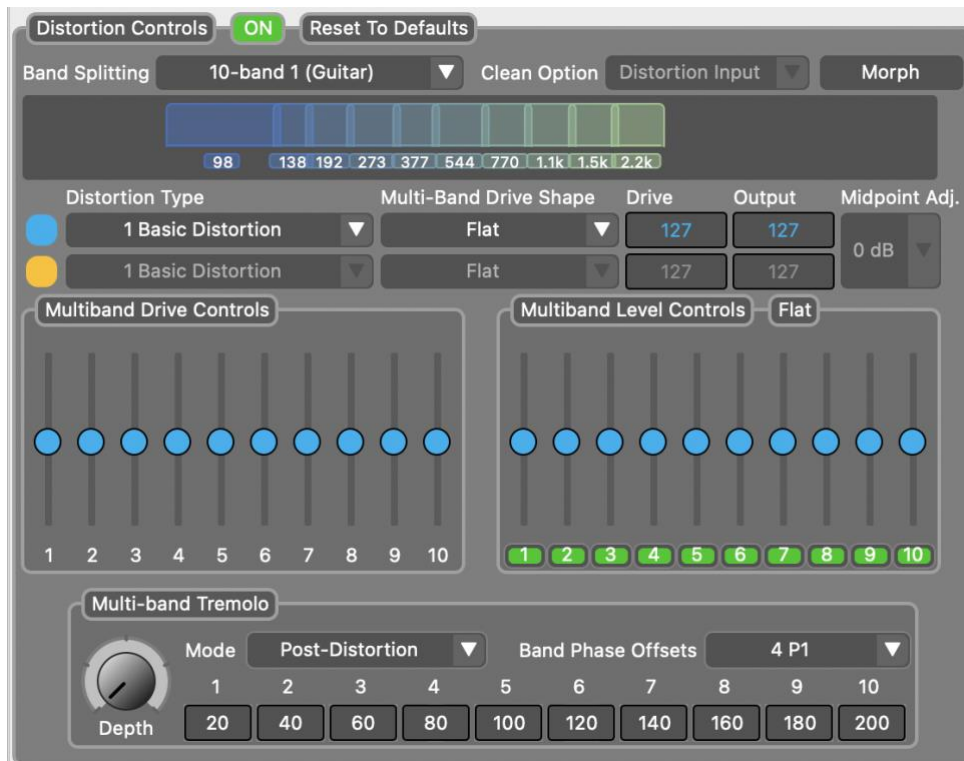
Release: Adjusts how quickly the compression “lets go” of your signal after it has been applied.

Output Gain: Adjusts the level of gain after the compressor. Increase for heightened overall output. In Pre-Distortion mode, this can help to drive the distortions even harder.

Mix: Acts as a clean blend between the dry and compressed signal. Fully counterclockwise is completely clean—no compression. Fully clockwise is 100% compressed. Mixing dry signal back into your compressed tone is what is known as “parallel compression”, and is often utilized in studios.

Soft Knee Width: When your signal approaches the point of compression at the threshold, the transition can often sound abrupt. Soft Knee Width adds a smoothness to the knee to ease the transition into compression, with higher values creating an increasingly more subtle feel.

Distortion Module



The distortion can be switched on or off per preset and per channel. This means you can use the Master Controls, Compressor, and EQ as standalone modules without distortion.

Band-Splitting: The Ultrawave contains 37 different band-splitting options. The most “traditional” multiwave distortion sounds use 10-band distortion, which splits your signal into 10 separate frequency bands and distorts them separately, creating rich, synth-like overtones. In addition to the 10-band splitter, you can select between multiple layouts of 2, 3, 4, 8, and 10 bands, each with several different options to match different instrument EQs. There is also a single-band (no split) option for more traditional distortion and fuzz tones.

Clean Option: When “Distortion Type” is set to “0. Clean”, you can select whether your clean signal comes from the distortion input (default) or out from one of the bands, for a very specific set of frequencies. This can be useful if you’re trying to compress a certain range of your signal.

Morph: When “Morph” is enabled, you can choose a second set of parameters in the distortion block to morph between, using the onboard Envelope, LFO, or an expression pedal.

This set of values will be represented in yellow, in contrast with your initial set of parameters, which are blue. This includes distortion type and individual band levels and gains.

Distortion Type: There are 44 different distortion types onboard, ranging from traditional styles of distortion found in other gear, to experimental foldbacks only our scientist, Bob Chidlaw, could’ve dreamed up. For more information about the distortion types included in the Ultrawave, see [Distortion Types](#).

Multi-Band Drive Shape: Since each band is distorted separately, we've given you fine-tuned control over each band's drive and output levels. This dropdown contains presets we've created, if you'd rather not mess with individual levels.

Drive, Level, and Midpoint Adj: When using Morphing, the parameters are being morphed between, not a simple audio crossfade. Because of this, drive and output levels of each parameter set need to be defined. Midpoint Adj is an optional gain boost (or cut) for the midpoint of the morphing, which can often cause volume discrepancies.

Multi-band Tremolo

In addition to applying distortion to each band, the Ultrawave also allows for the application of tremolo (manipulation of amplitude) to each band.

Mode: Much like the compressor, the multi-trem can be applied either pre-distortion or post-distortion. We've made post-distortion the default for a more pronounced sound.

Depth: Adjusts the overall depth of the multiband tremolo effect.

Band Phase Offsets: All bands are controlled by the same master LFO, but the tremolo of each band can be set to a different phase (starting point) on that LFO waveform. Since the possibilities are near infinite, we have created a drop-down menu for quick access to a selection of pre-set phase offset patterns.

LFO Module



The LFO utilized by the Ultrawave's multi-tremolo can be either a sine wave or a user-defined "Attack/Release" wave. (The single tremolo uses a standard sine wave only.)

The LFO wave diagram is interactive and it dynamically changes when the Attack, Release, Shape, and On Time knobs are adjusted. **Note: In Sine Waveform mode, the Attack, Release, Shape, and On Time knobs have no effect.**

Attack is the steepness of the upward slope of the wave.

Release is the steepness of the downward slope of the wave.

Shape adds sine-like curvature to the slopes when counterclockwise, or triangle/square-like rigidity when clockwise.

On Time increases the time the LFO is sustained at its peak value in each cycle

Rate controls the speed of the LFO.

Env->Rate sets the acceleration / deceleration of the amplitude-controlled LFO. At noon, no acceleration or deceleration is applied. Before noon on the knob, you get LFO acceleration as the envelope closes, and past noon you get LFO deceleration as the envelope closes.

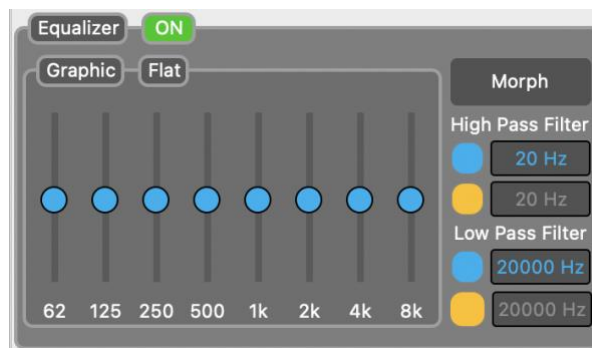
Enabling **Ring Mod** increased the LFO speed into pitch territory, producing a ring modulator effect.

The rate of the LFO can be input manually using the Tempo module, either by tapping or clicking the Tap Tempo button and selecting a beat division in the dropdown underneath it, or by inputting a Hz or BPM value in the field beneath the beat division dropdown.

The Ultrawave can also be synced to an external MIDI Clock per preset, by enabling the “Sync to MIDI Clock” button.

The LFO in Channel 2 can be synced to Channel 1 in any of the configurations listed in the “Ch. 1 : Ch. 2 Sync” dropdown menu, and the phase offset of Channel 2 relative to Channel 1 can be set in the knob directly beneath it.

Graphic Equalizer Module



The Graphic EQ can be switched on or off per preset and per channel.

For ultimate tone-sculpting, we’ve included a morphable 8-band graphic equalizer and two morphable filters. Much like the Distortion module, the Graphic EQ’s parameters can be morphed between a second set of parameters that will appear when enabling the “Morph” button.

The filters, represented as sliders, are very powerful and will help you make fine tweaks to achieve the precise tone you’re searching for.

High Pass Filter: An important equalizing tool is a high-pass shelving filter. By clicking in the box and dragging up or down, you can adjust the frequency point at which the filter begins cutting lower frequencies below that point. The higher the Hz value, the more dramatic the bass cut will sound.

Low Pass Filter: An equally important equalizing tool, known as the low-pass filter, helps to attenuate high frequencies. If you’re getting unwanted top-end treble, you can shelve it off by adjusting the frequency point of this low-pass filter by clicking in the field and dragging it up or down.

Single Tremolo/Envelope & Noise Gate/Input Filter Modules



The Ultrawave is also packed with a single tremolo for more conventional tremolo sounds. This single tremolo utilizes the sine wave and is controlled by the same Rate control in the LFO module. The depth is broken up into Pre-Distortion and Post-Distortion control.

Envelope To Volume switches on the amplitude-controlled envelope when set to either Pre-Distortion or Post-Distortion.

Gate Threshold adjusts the Ultrawave’s internal noise gate. Many of the distortion types are already gated, but you may desire to turn up the gate even higher to eliminate noise, hum, and feedback.

Input High Pass controls a configurable high pass filter applied to your input signal if you need to attenuate lower frequencies before the signal is processed by the Ultrawave. The default is 10.0Hz, which effectively removes the high pass filter, since it is below the threshold of the human ear.

Envelope Generator, Balance, and Knob Assignment Modules



Envelope Generator: The Ultrawave’s envelope comes with two simple controls and an input selector for assigning it to either Input 1 or Input 2. **Input Gain** acts like a sensitivity control; the higher the Input Gain, the lighter you need to play in order to open the envelope. **Attack** adjusts how quickly the envelope reacts.

The **Balance** control is a Channel 1/2 mixer. When the knob is at noon, there is an even 50/50 balance between channels 1 and 2. When the knob is fully counterclockwise, you will only hear channel 1. When the knob is fully clockwise, you will only hear channel 2.

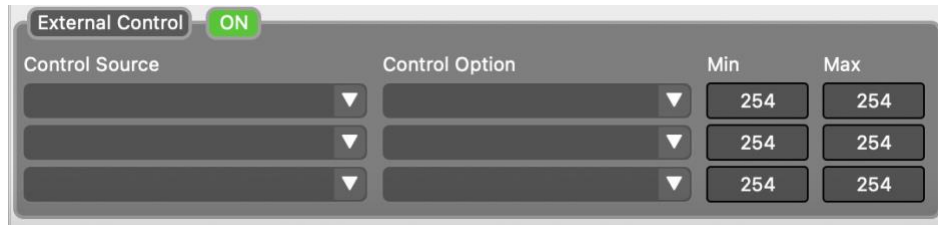
Env->Balance controls the intensity at which the Envelope affects the channel Balance control.

LFO->Balance controls the intensity at which the LFO affects the channel Balance control.

Knob Assignment: Many Source Audio pedals contain knob assignment (or re-assignment) controls for top-level flexibility. The Ultrawave is no different. Each of the top four knobs can be reassigned in this module from a list of parameters. The knob assignments are set and stored on a preset-by-preset rather than global basis for ultimate flexibility of control.

Link: Clicking Link next to each knob will allow that parameter to be controlled in both channels simultaneously.

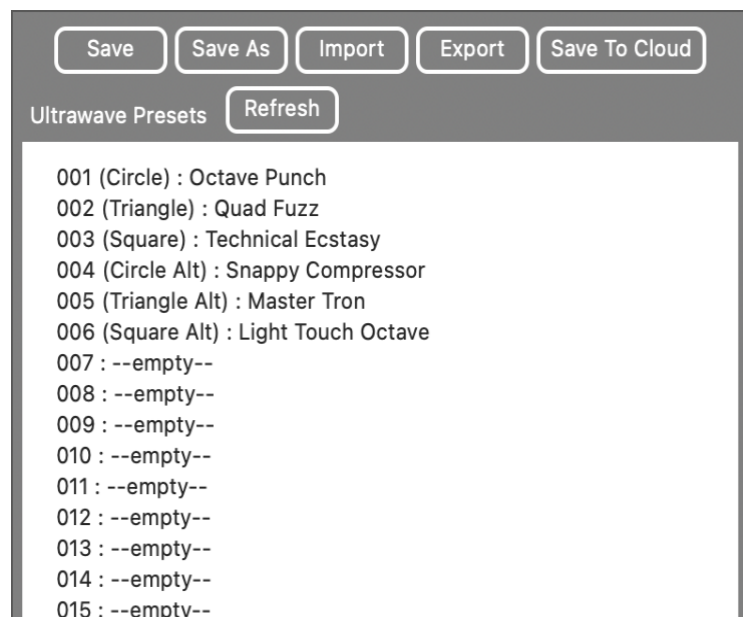
External Control



Control up to three parameters with a Source Audio Dual Expression Pedal, Tap Tempo Switch, or third-party expression controller via the Neuro Hub or USB-MIDI. Use the dropdown menus in the External Control block to select the expression device (Control Source) and controlled parameter (Control Option). Use the Min and Max fields to set the depth of the expression sweep.

Presets

The Presets section is located on the right side of the Neuro Desktop interface. There you will find a list of all the presets and empty preset positions available in your Ultrawave. The Presets section is also where you Save, Import, and Export presets. The buttons located at the top of the Presets field perform the functions listed below:



- **Save Button:** If you have made edits to a pre-existing preset, use the Save button to update the preset without changing its name or preset position.
- **Save As Button:** After creating a new preset hit the Save As button and you will be prompted to name it and select the preset or Effect Selector position to which it will be saved.
- **Import Button:** Use the Import button to upload saved .pre files to your Neuro Desktop Editor. Upon clicking the Import button, you will be asked to find the .pre file. Simply go to your Neuro presets folder, select file, and upload.
- **Export Button:** Use the Export button to save a preset on your computer or share it with other musicians. Presets are saved as .pre files and stored anywhere on your computer (we recommend creating a dedicated folder to store your presets). After creating a preset, hit the Export button - a window will pop up, asking you to name, tag, and select a location for the preset. After the preset is saved, the .pre file can be shared via email or any common file sharing method.
- **Refresh Button:** Hit the Refresh button to restore the Neuro Desktop edits to the state immediately after your last save procedure.
- **Hardware Presets:** This is where all of your pedal presets are listed. Use the Save As button to select where you would like to store an edited preset—you can choose from any of the 128 preset positions. You may also right click on any preset slot to erase it. Any preset with an asterisk * means that there are unsaved changes to that preset.
- **Save To Cloud:** Hit the Save To Cloud button to share your preset with the Neuro Community so that anybody with a Neuro account can audition, like, and download your preset.

The Neuro Mobile App — with New Direct MIDI-USB Support



Like all Source Audio One Series pedals, the Ultrawave is fully supported in the Neuro Mobile app. The Neuro Mobile app is available for iOS and Android devices and allows access to all of the preset parameters and hardware options described in the Neuro Desktop editor section above.

Connecting to the Neuro Mobile App (USB-MIDI)

The Ultrawave is the second Source Audio pedal after the EQ2 to add two-way communication with the Neuro Mobile app using MIDI over USB. This means that any changes made on the pedal are immediately reflected in the app and that the app always reflects the actual current state of all the pedal's parameters, rather than the one-way audio connection to Input 2, where the Neuro App is only able to send signals and not receive any. To connect the Ultrawave to the mobile device you will need the proper cable adapters.

- iOS Devices – Any iOS device with a lightning connector is supported. A “Lightning to USB Camera Adapter” is required. Connect the adapter to the USB A/B-mini cable that was included with your Ultrawave.



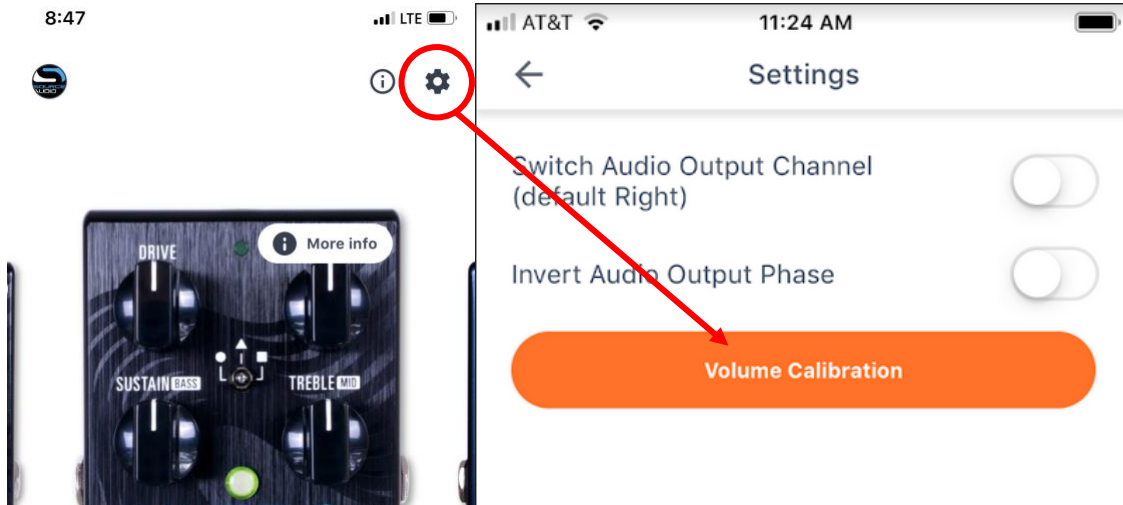
- Android Devices – Android devices may have either USB-micro or USB-C connectors that will support MIDI over USB communication with the Ultrawave. You will need the appropriate USB B/C (male) to USB A (female) adapter to use with the included USB A/B-mini cable. Note that the USB B-micro to USB A adapter is sometimes called an OTG (On-The-Go) adapter.



Connecting to the Neuro Mobile App (headphone jack)

The Ultrawave also supports one-way communication between a mobile device and the pedal using the included TRS ¼” to ⅛” cable. Connect the cable to the headphone jack (or headphone to Lightning dongle for Apple devices) of your mobile device and Input 2 of the Ultrawave. The cable is a TRS (stereo) connector that uses the “Right” channel to send data over audio signals to the pedal.

When using the headphone jack connection, we recommend using the Volume Calibration features in the Neuro Mobile app to configure the audio output for the most reliable communication between the mobile device and pedal.



Neuro Hub

The Source Audio Neuro Hub (sold separately) unites Source Audio pedals from the Soundblox 2 and One Series families to create a single, stage-ready effects system. It features shared MIDI, passive expression pedal input, Hot Hand connectivity, and USB, and can connect up to five Source Audio pedals. The Neuro Hub features a powerful scene saving functionality, which allows you to create up to 128 multi-pedal presets known as scenes, each recallable via MIDI program change messages. Connect the Neuro Hub to your computer via USB for updates, saving and editing multi-pedal presets, and more. To connect the Ultrawave to the Neuro hub, use a 3.5 mm TRRS cable and make a connection between the Ultrawave's CONTROL INPUT jack and any of the Neuro Hub's multi-function outputs. For more information, refer to the [Neuro Hub documentation](#) on the Source Audio website.

MIDI

Using a Neuro Hub connected to the pedal's Control Input or a USB connection, the Ultrawave can be controlled by generic MIDI Continuous Controller (CC) and Program Change (PC) messages. Many of the Ultrawave's parameters (even those that are not assigned to a control knob) are directly accessible via MIDI continuous controller messages. The Ultrawave has an open MIDI map for CC parameters so you can fully customize your MIDI landscape.

MIDI Channel

By default, the Ultrawave responds to MIDI Channel 1. The Ultrawave ignores all MIDI messages sent to it that are not on its channel. The input MIDI channel for the Ultrawave can be changed in the Hardware Options menu of the Neuro Editors, or via the Neuro Hub when the Hub is connected to your computer. Note that the MIDI Input Channel is a **global** setting that is NOT saved per preset. Note that some manufacturers begin counting MIDI channels at zero (from 0 to 15), while the Source Audio Neuro Editors use the convention of counting from 1 to 16.

Selecting Presets via Program Change (PC) Messages

The 128 user presets on the Ultrawave can be recalled via program change messages. Presets 1 to 128 are mapped to MIDI Program Change messages 0 to 127. Some companies use a 1-128 numbering system, so you may need to offset by 1.

It is possible to save presets with the Ultrawave bypassed, and it is also possible to save presets so that they are recalled while the Ultrawave is in its bypassed state.

Controlling the Ultrawave with MIDI Continuous Controller (CC) Messages

The Ultrawave responds to MIDI Continuous Controller (CC) messages. The pedal comes mapped to a default set of CC numbers, shown in the table below, but most of the available parameters remain unmapped. For a complete list of default MIDI mappings and ranges, download the Neuro Desktop Editor and connect the Ultrawave using a USB-A – Mini-B cable and click on the device in the Editor window, then go to Device > Edit Device MIDI Map.

Parameter	CC#	Value	Description
External Tap Tempo	93	0-127	Externally control the LFO rate
External Expression Control	100	0-127	Assign parameters with Neuro Editor
Engage / Bypass	102	0-127	0-64 = Bypass, 65-127 = Engage
Preset Recall (Off)	103	0-127	Recalls any preset in bypass
Preset Recall (On)	104	0-127	Recalls any preset engaged
Engage / Bypass Toggle	105	any	Externally toggle bypass state
Increment Preset	106	any	
Decrement Preset	107	any	

Custom CC Mapping

The default MIDI map provides control over parameters using specific Continuous Controller messages. It is also possible to override the default map and create a custom mapping. Custom MIDI CC mappings are global, meaning they are not unique per preset, and can be saved for future use by backing up the device. The CC mapping will apply in all situations, regardless of which preset is active.

To create a custom MIDI CC mapping, follow these steps:

- Connect your Ultrawave to the Neuro Desktop Editor.
- Select the Ultrawave as a device by clicking inside the blue box in the left margin.
- In the top bar menu select *Device* then *Edit Device MIDI Map* from the dropdown menu.
- The Ultrawave *MIDI Map Editor* window will open. Simply scroll to the MIDI CC value you wish to remap and click that CC's dropdown menu. A list of parameter choices will unfold.
- Select the parameter you wish to re-assign to the chosen CC. The process is complete.

USB

The Ultrawave's USB port is plug-and-play ready for Windows and Mac computers. The Ultrawave uses class-compliant drivers, so no special drivers are needed. Just power up the Ultrawave and connect it to the computer using a USB cable. The computer will automatically recognize the

Ultrawave, which will be identified as “One Series Ultrawave Multiband Processor” in the operating system.

USB connectivity brings many benefits, such as the ability to connect with the Neuro Desktop Editor for downloading Ultrawave firmware updates, accessing an advanced set of effect-editing parameters, and downloading alternate engines. The USB port also provides MIDI connectivity to a DAW.

USB-MIDI

The Ultrawave will appear as a MIDI device in your computer’s operating system. As a result, the Ultrawave can communicate with audio production software that utilizes MIDI, such as Pro Tools, Ableton Live, Logic Pro, and more. MIDI messages can be sent directly to the Ultrawave using the USB connection, which allows for full automation of the Ultrawave within host software such as a DAW. For example, a frequency band can be automated by outputting MIDI continuous controller messages from the host software to the Ultrawave via the USB connection. For more details, see [MIDI Implementation](#).

* * *

Specifications

Dimensions

- Length: 11.4 cm (4.5 inches)
- Width: 7.00 cm (2.75 inches)
- Height (not including knobs and footswitches): 3.71 cm (1.46 inches)
- Height (including knobs and footswitches): 5.1 cm (2 inches)

Weight

- 280 grams (0.625 pounds)

Power

- 150mA @ 9V DC
- Center-negative plug, 2.1 mm inner diameter, 5.5 mm outer diameter

Audio Performance

- Maximum Input Level: +6.54 dBV = 8.76 dBu = 2.12 V RMS = 6.0 V p-p
- Full Scale Output Level: +6.54 dBV = 8.76 dBu = 2.12 V RMS = 6.0 V p-p
- Input Impedance: 1 Mega Ohm (1 M Ω)
- Output Impedance: 600 Ohm (600 Ω)
- 110 dB DNR Audio Path
- 24-bit Audio Conversion
- 56-bit Digital Data Path
- Universal Bypass (relay-based true bypass or analog buffered bypass)

Troubleshooting

Restore Factory Settings

In order to revert the Ultrawave to its factory settings, clearing all user data, presets, expression mappings, and changes to the MIDI mapping, use either the Neuro Mobile App or Neuro Desktop Editor and choose the Factory Reset option in the Hardware Options menus. It is also possible to perform a factory reset without the Neuro App by following these steps:

- Press and hold the FOOTSWITCH.
- Connect the power supply.
- The CONTROL LED will blink rapidly until the reset is complete. You can stop holding the FOOTSWITCH once the CONTROL LED starts to blink.

Noise/Hum

Power source: Ensure that the proper power supply is being used.

Near noise source: Move pedal away from power supplies and other equipment.

Other equipment: Remove other effects from signal chain; see if noise persists.

Bad cables: Swap out audio cables.

USB ground loop: When connected to a computer using a USB cable, noise can appear in the audio signal. This usually results from ground loop noise due to the Ultrawave and computer running on separate power supplies. In the case of laptops, disconnecting the computer's power supply and running it on a battery can often mitigate the noise. External display monitors are often the primary source of noise, and powering down monitors can also resolve noise issues.

Ground loop with amp: Make sure your Ultrawave is running on the same power mains circuit as your guitar amplifier.

Unit Appears Dead / No LEDs Lit

Wrong power supply: Use correct power supply. See the [DC 9V \(Power\)](#) section for more details.

Frequently Asked Questions

What kind of instruments can I connect to the Ultrawave's inputs?

The Ultrawave's audio inputs are high impedance (~ 1 M Ω) and they can accept high impedance signal sources like guitars/basses with passive pickups, as well as low impedance sources like line-level audio circuits, guitars/basses with active pickups, electronic keyboards, or mixer outputs. The input circuit can handle signals ranging up to 6.0 Volts, peak-to-peak.

Can I power the Ultrawave directly over USB, without using the 9 Volt supply?

No. USB provides 5 Volts, but the Ultrawave needs 9 Volts, so the Ultrawave cannot be powered directly from USB. Make sure that you have plugged in the included 9V DC power supply or a suitable third party PSU when connecting to the Ultrawave USB port.

When connecting the Ultrawave to a recording interface or mixer, should I use a Lo-Z (microphone) or Hi-Z (line / instrument) input?

The Ultrawave’s output will be low impedance when the effect is active or in buffered bypass mode, but it will be high impedance when using true bypass mode and a guitar with passive pickups. Therefore, it is recommended that you use a high impedance (Hi-Z) input on your recording interface or mixer to avoid signal loss.

Why doesn’t the Ultrawave respond to MIDI messages being sent to it?

By default, the Ultrawave should respond to MIDI continuous controller messages on channel 1. The Ultrawave’s MIDI channel can be configured using the Neuro Editors. Channel numbers in MIDI use zero-based counting, so MIDI channel 1 is described as 0 in hexadecimal, MIDI channel 2 is described as 1 in hexadecimal, and so on, concluding with MIDI channel 16, which is described as F in hexadecimal. A continuous controller message starts with a hexadecimal B and is followed by the channel number (0 through F).

So, the command byte from your MIDI controller should be formatted as shown in the following table:

MIDI Channel (Decimal)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CC Command Byte (Hex)	B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF

Each continuous controller command byte is followed by two bytes, the CC number and the value. So, each CC message consists of a total of three bytes. If the Ultrawave is not responding to MIDI, make sure that your MIDI controller is properly configured and sending messages in the format described above.

Can I use the Ultrawave in my amp’s effects loop?

The Ultrawave’s audio inputs can handle up to 8.76 dBu or 6.0 Volts peak-to-peak, which allows it to work in most amp effects loops. Be sure to check your amp’s documentation to verify that the maximum send level is less than the Ultrawave’s maximum input level.

How do I update the firmware?

Firmware updates are available via the Neuro Desktop Editor using the USB port. Power the pedal and connect it to your computer using a mini USB cable. The Neuro Desktop Editor is available from Source Audio’s website: <http://www.sourceaudio.net/editorsandfirmware.html>. While the pedal is connected, select the Arrow Icon located in the Ultrawave Multiband Processor square in the Connections field. A firmware update is available for your pedal if the downward arrow icon has a yellow ring around it.

Mac isn’t letting me download your software?

Mac users may see this warning message when trying to open the Neuro Desktop software: “App can’t be opened because it was not downloaded from the Mac App Store.” In order to run the Neuro Desktop, please refer to the steps in this Apple support article: <https://support.apple.com/en-us/HT202491>.

Rubber Feet

The Ultrawave comes standard with a flat aluminum bottom, making it easy to apply Velcro and mount to a pedalboard. Additionally, adhesive rubber feet are included in the Ultrawave box. Applying the rubber feet to the Ultrawave can help prevent it from sliding on flat surfaces such as a hardwood floor.

Waste Disposal Notes



If possible, dispose of the device at an electronics recycling center. Do not dispose of the device with the household waste.

For full compliance with EN 61000-4-6 standard, input cable must be less than 3 meters in length.

Warranty

Limited Transferrable Warranty

Source Audio, LLC (hereinafter “Source Audio”) warrants that your new Source Audio One Series Ultrawave Multiband Processor, when purchased at an authorized Source Audio dealer in the United States of America (“USA”), shall be free from defects in materials and workmanship under normal use for a period of two (2) years from the date of purchase by the original purchaser. Please contact your dealer for information on warranty and service outside of the USA.

Under this Limited Warranty, Source Audio’s sole obligation and the purchaser’s sole remedy shall be repair, replacement, or upgrade, at Source Audio’s sole discretion, of any product that, if properly used and maintained, proves to be defective upon inspection by Source Audio. Source Audio reserves the right to update any unit returned for repair and to change or improve the design of the product at any time without notice. Source Audio reserves the right to use reconditioned parts and assemblies as warranty replacements for authorized repairs. Any product repaired, replaced, or upgraded pursuant to this Limited Warranty will be warranted for the remainder of the original warranty period.

This Limited Warranty is extended to the original retail purchaser. This Limited Warranty can be transferred to anyone who may subsequently purchase this product provided that such transfer is made within the applicable warranty period and Source Audio is provided with all of the following information: (i) all warranty registration information (as set forth on the registration card) for the new owner, (ii) proof of the transfer, within thirty (30) days of the transfer, and (iii) a photocopy of the original sales receipt. Warranty coverage shall be determined by Source Audio in its sole discretion. This is your sole warranty. Source Audio does not authorize any third party, including any dealer or sales representatives, to assume any liability on behalf of Source Audio or to make any warranty on behalf of Source Audio.

Warranty Information

Source Audio may, at its option, require proof of the original purchase date in the form of a dated copy of the original authorized dealer’s invoice or sales receipt. Service and repairs of Source Audio

products are to be performed only at the Source Audio factory or a Source Audio authorized service center. Prior to service or repair under this Limited Warranty, the purchaser must request from Source Audio a return authorization, which is available at:

Source Audio LLC
120 Cummings Park, Woburn, MA 01801
(781) 932-8080 or at www.sourceaudio.net

Unauthorized service, repair, or modification will void this Limited Warranty.

Disclaimer and Limitation of Warranty

Do not open the effects pedal under any circumstance. This will void the warranty.

The foregoing limited warranty is the only warranty given by Source Audio and is in lieu of all other warranties. All implied warranties, including warranties of merchantability and fitness for any particular purpose, exceeding the specific provisions of this limited warranty, are hereby disclaimed and excluded from this limited warranty. Upon expiration of the applicable express warranty period, Source Audio shall have no further warranty obligation of any kind, express or implied. Source Audio shall in no event be liable for any special, incidental, or consequential damages suffered by the purchaser or any third party, including without limitation, damages for loss of profits or business or damages resulting from use or performance of the product, whether in contract or in tort. Source Audio shall not be liable for any expenses, claims, or suits arising out of or relating to any of the foregoing. Some states do not allow the exclusion or limitation of implied warranties so some of the above limitations and exclusions may not apply to you. This Limited Warranty gives you specific legal rights, and you may also have other rights, which vary, from state to state. This Limited Warranty only applies to products sold and used in the USA. Source Audio shall not be liable for damages or loss resulting from the negligent or intentional acts of the shipper or its contracted affiliates. You should contact the shipper for proper claims procedures in the event of damage or loss resulting from shipment.

Version History

March 16, 2021: Initial release



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