



# Thump User's Guide

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# Thump Users Guide

Metric Halo

Revision: 4.0.2

Publication date April 22, 2024

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# Table of Contents

1. Introduction .....	5
2. System Requirements .....	6
3. Installation .....	7
Mac .....	7
Windows .....	12
Update Notification (all platforms) .....	18
4. Plug-In Header Bars .....	19
Plug-In Header: Top Row .....	20
Metric Halo Header Icon .....	20
Plug-in Snapshot Registers: A/B .....	26
Snapshot Blend .....	27
Plug-in Undo/Redo .....	28
Help Button .....	28
Graph Visible Selector .....	28
UI Size Selector .....	28
Compare Button .....	29
Soft Bypass .....	29
Plug-In Header: Preset Row .....	30
Plug-in Hamburger menu .....	30
Preset Step-Through Buttons .....	31
Preset Name/selector menu: .....	31
5. Operation .....	32
Control Knob .....	32
Toggle Button .....	32
Fader .....	33
Oscillator Pitch History .....	33
Output Meter .....	34
6. Processing .....	35
A Detailed Description .....	35
Amplitude Followers .....	35
Oscillators .....	36
Output .....	36
A. Key Commands .....	37
B. Service and Support .....	38

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## List of Figures

1.1. Thump's User Interface .....	5
3.1. MH Thump installer package .....	7
3.2. Opening Dialog .....	7
3.3. License Agreement .....	8
3.4. Accepting the License Agreement .....	8
3.5. MH Thump Installer .....	12
3.6. Welcome Dialog .....	12
3.7. License Agreement .....	13
3.8. Custom Setup .....	14
3.9. Ready to Install .....	15
3.10. Final installer verification and permission to execute .....	16
3.11. Installation in Progress .....	17
3.12. Installation Complete .....	18
3.13. Plug-in Update Alert .....	18
4.1. MH Plug-in header (default setting: eq and dynamics graph display closed) .....	19
4.2. Preferences tab (example shown is SuperGate with sidechain filter graph closed) .....	20
4.3. Plug-in control pane tabs .....	20
4.4. standard plug-in UI Preferences .....	21
4.5. About tab (ChannelStrip shown) .....	23
4.6. Current Release Notes example .....	24
4.7. Update tab with new version release notes header(text from update release notes omitted from above for brevity) .....	25
4.8. Plug-in Header: Snapshot Registers: A/B .....	26
4.9. Plug-in Header: Snapshot Blend .....	27
4.10. Plug-in Header: Undo/Redo .....	28
4.11. Help Button .....	28
4.12. Graphs Closed .....	28
4.13. Graphs Open .....	28
4.14. UI Size Selector .....	28
4.15. Compare Button (inactive) .....	29
4.16. Compare Button (active) .....	29
4.17. Soft Bypass Button (not bypassed - plug-in is processing) .....	29
4.18. Soft Bypass Button (bypassed - plug-in is not processing) .....	29
4.19. MIOConsole3d ChannelStrip header .....	29
4.20. Preset Step-Through Buttons .....	31
4.21. Plug-in Header: Preset selector menu (ChannelStrip shown) .....	31
4.22. Preset selector menu: Audition on select .....	31
5.1. Swept Knob .....	32
5.2. Toggle Button (Off) .....	32
5.3. Toggle Button (On) .....	32
5.4. Mix Fader .....	33
5.5. Pitch History Display .....	33
5.6. Output Meter .....	34
6.1. Thump Signal Flow .....	35

# 1. Introduction

Thank you for downloading Thump by Metric Halo. Thump synthesizes bass notes from the input signal, allowing you to generate anything from simple drum reinforcement to synthetic bass lines. This manual will show you how to use Thump in your audio projects.



Thump's User Interface

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## 2. System Requirements

### Hosts:

- *Pro Tools™ (Mac)*: Pro Tools 11 or higher running on a Macintosh computer. The v4 software currently supports Native AAX operation only.
- *Pro Tools™ (Windows)*: Pro Tools 10 or higher running on a Windows computer. The v4 software currently supports Native AAX operation only.
- *Native (Mac)*: Any Intel or Apple Silicon-native Mac DAW (64-bit) that supports AU, VST2, VST3 or AAX plug-ins.
- *Native (Windows)*: Any Intel Windows (64-bit) DAW that supports VST2, VST3 or AAX plug-ins.

### Operating System:

- *Mac*: Any Apple Silicon (ARM) or Intel-based Mac running Mac OS X 10.9 or newer
- *Windows*: Any Intel-based Windows PC running Windows 10 or newer.

# 3. Installation

For both Mac and Windows, there is a single standard installer for Thump containing all formats that allows you to decide which formats you would like to use.

## Mac

*Please note*– The following graphics show installation on a macOS 12 system; the process may be slightly different in other versions of the OS, but the basic concepts are the same. Small details such as file sizes shown may vary with subsequent releases.

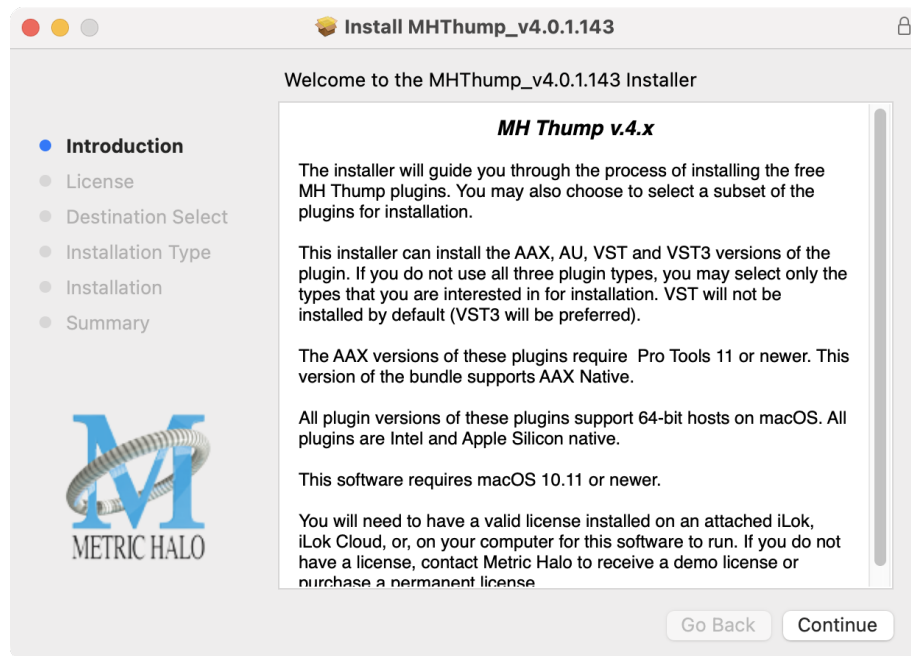
- Double-click the “MHThump.pkg” application



MHThump.pkg

### MH Thump installer package

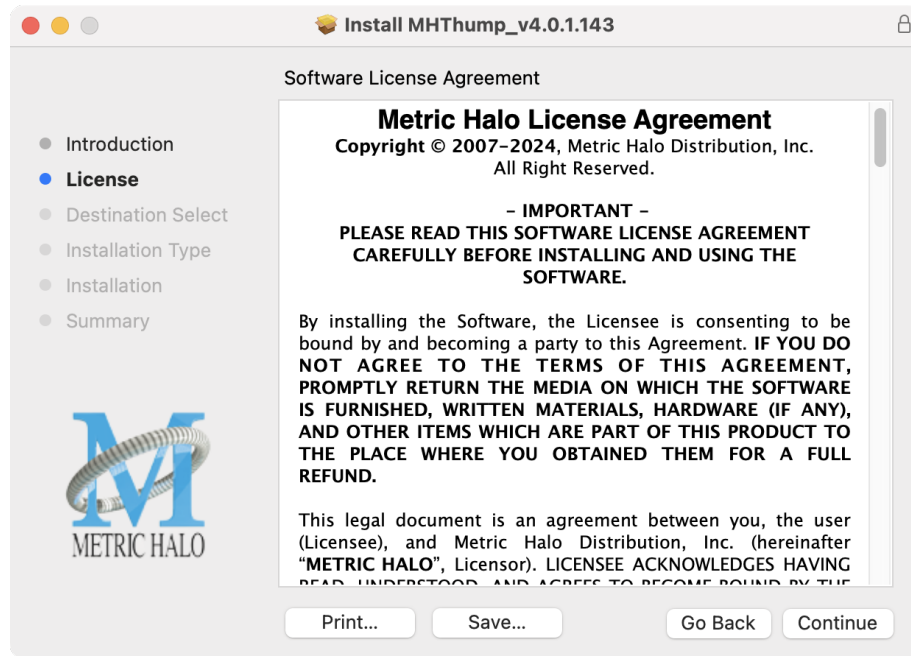
- The installer dialog will appear:



Opening Dialog

Click “Continue”...

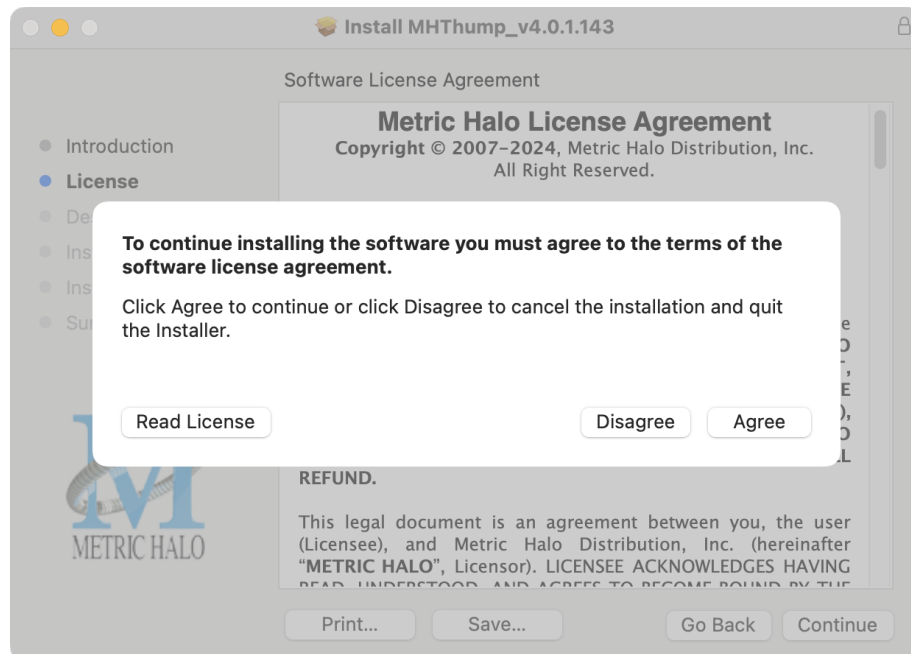
- Now you will see the Metric Halo License Agreement:



**License Agreement**

After you have read it, click "Continue"...

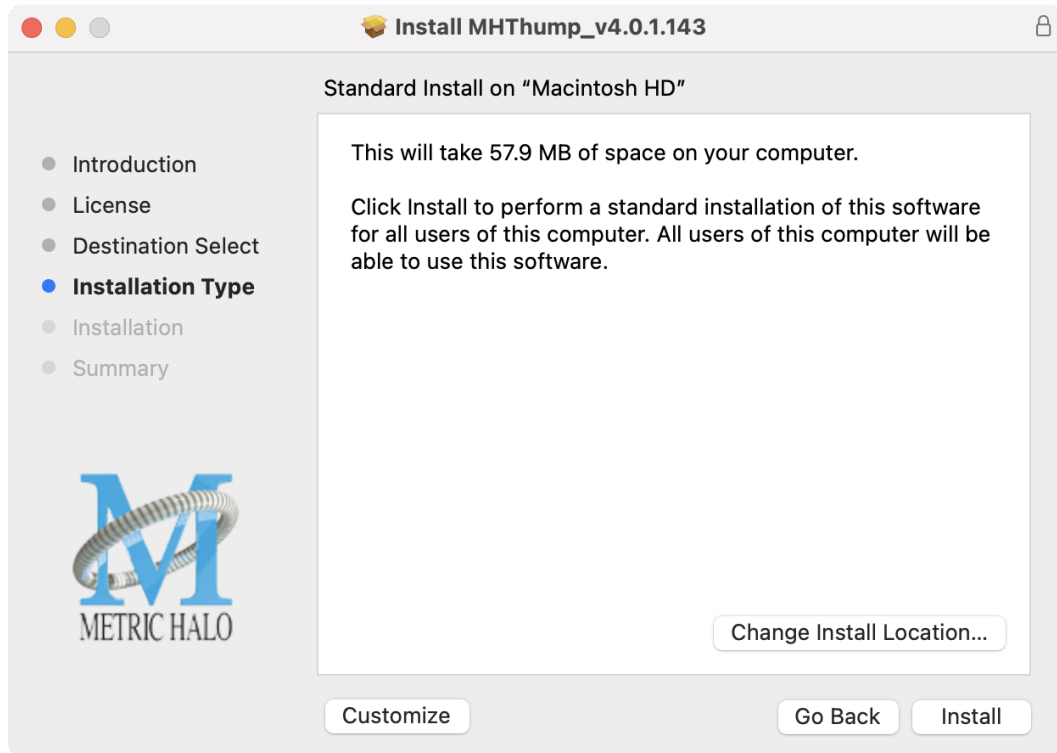
- Next, click "Agree" to accept the License Agreement:



**Accepting the License Agreement**



- The default installation will install Audio Unit, VST3 and AAX plug-ins to their respective folders in the root Library directory:
  - AU to `/Library/Audio/Plug-Ins/Components`
  - VST3 to `/Library/Audio/Plug-Ins/VST3`
  - AAX to `/Library/Application Support/Avid/Audio/Plug-Ins`



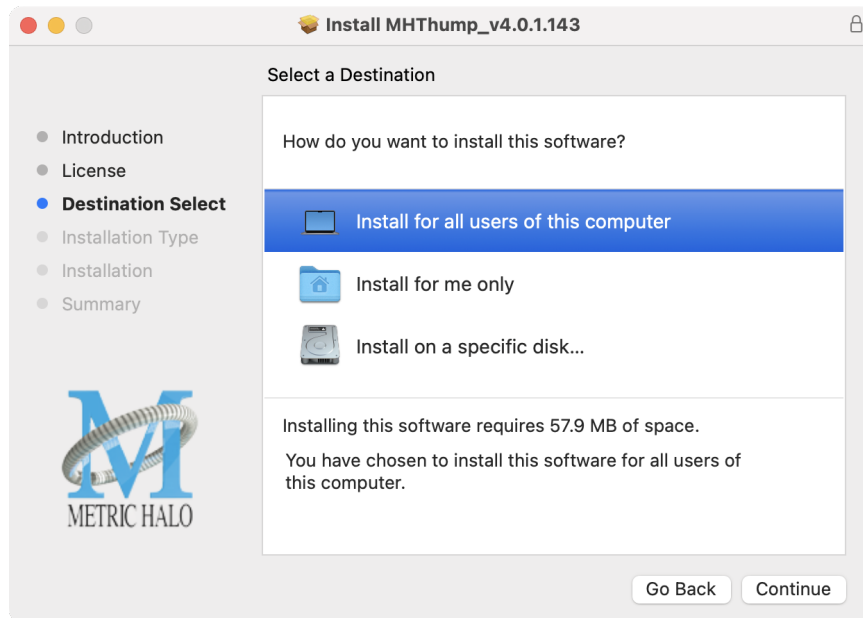
VST2s are not included in the Standard Install, but are available as a custom installation.

All v4 plug-ins are 64-bit, including VST2. If you are upgrading Thump v3 the default installation will leave your existing 32-bit-friendly VST2 Thump plug-in untouched, maintaining compatibility with older 32-bit DAWs and projects.

Many DAWs automatically choose the VST3 when both VST2 and VST3 versions of the same plug-in are found, either by default or as a user preference. However, some DAWs do not, so if your DAW has since been updated to fully support 64-bit plugs and you are not worried about maintaining 32-bit backwards-compatibility, you may want to Custom install the VST2 version as well.

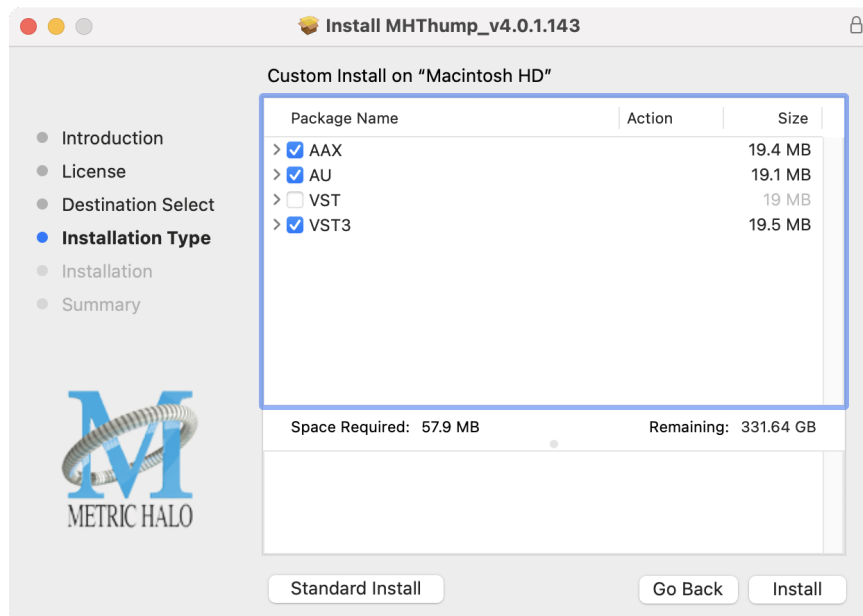
“Change Install Location...” and “Customize” installation details follow on the next page...

- “Change Install Location...” lets you install the plugs for *all users* (if you are logged in as an admin), *only your user*, or to another volume entirely.



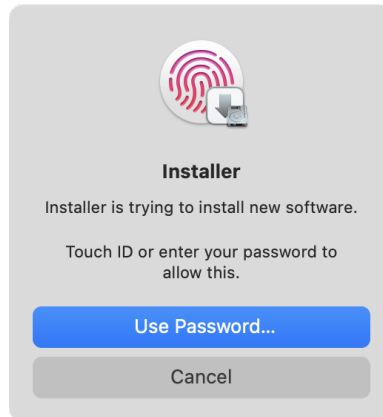
We recommend that you use the standard installation location unless you have a specific reason not to.

- Click “Customize” to install specific plug-in formats.



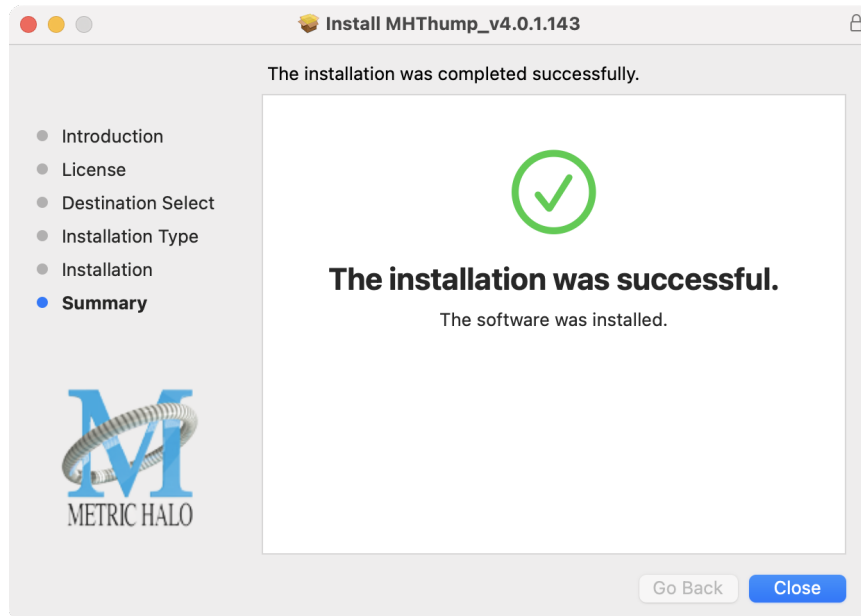
Check one of the formats to select all of the plug-ins for that format. Using the disclosure triangles, you can select and install individual plug-in(s) in the format(s) you wish to use. Click “Install” to proceed.

- If present, Touch ID/Face ID will execute the installation once it recognizes your biometrics:



Otherwise, enter your login password as usual and click "Install Software".

- Once the installer has finished, you'll see this dialog:



If you do not see the "Installation Successful" message, contact [MH Support](#).

That's it! Enjoy using Metric Halo Thump!

## Windows

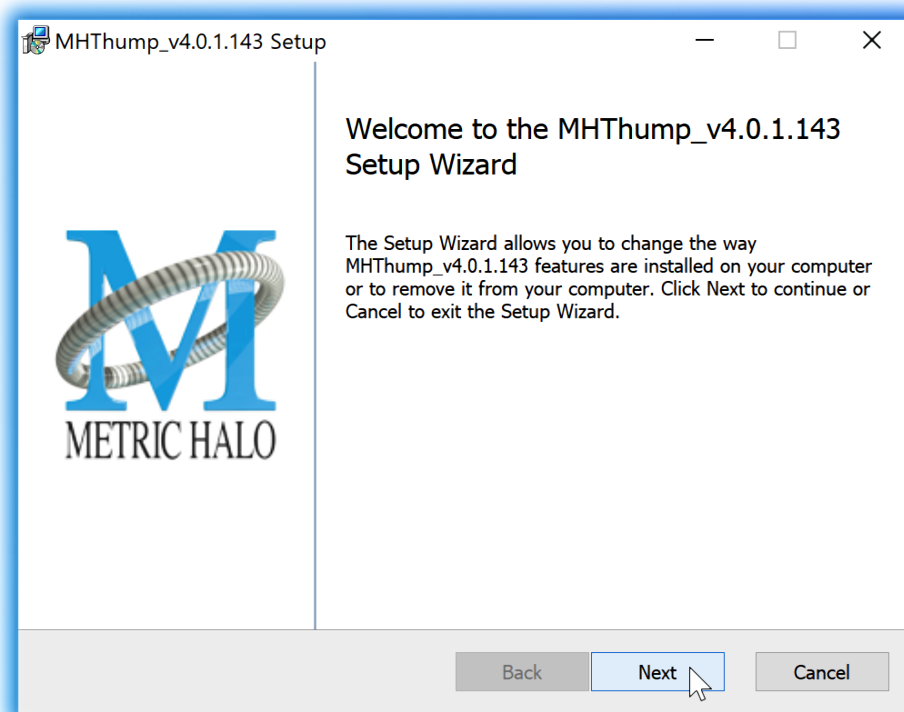
*Please note* – The following graphics show installation on an Windows 10 system; the process may be slightly different in other versions of the OS, but the basic concepts are the same. Small details such as file sizes shown may vary with subsequent releases.

- Double-click the “MH Thump” installer application.



**MH Thump Installer**

- The installer dialog will appear:



**Welcome Dialog**

Click “Next” to proceed.

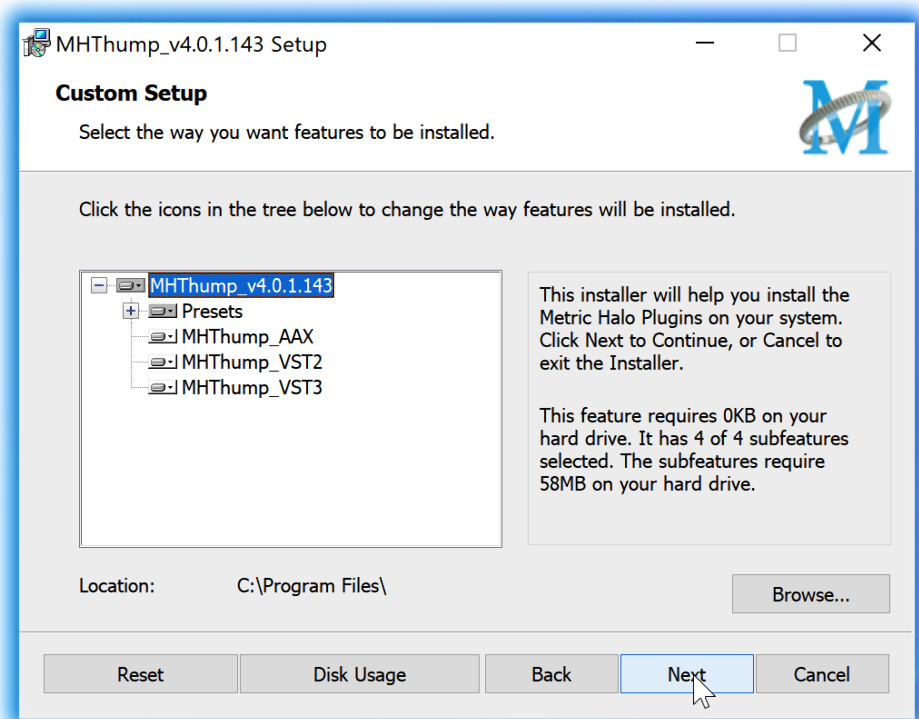
- Read the Metric Halo License Agreement:



**License Agreement**

After you have read it, click next to "I accept the terms of the License Agreement" and click "Next".

- Custom Setup Options



### Custom Setup

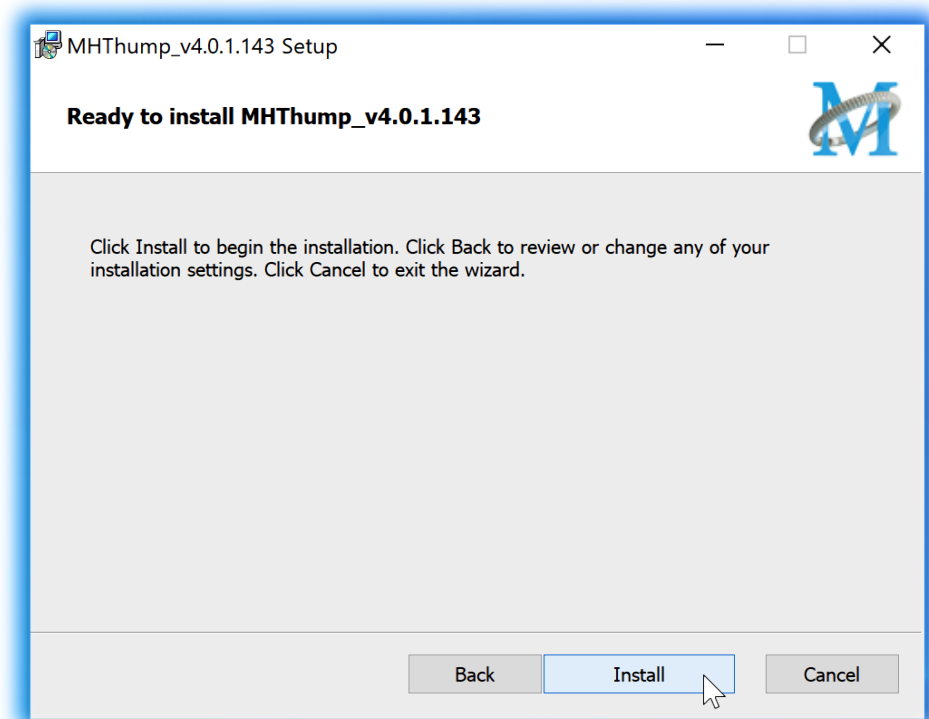
The Windows installer **Custom Setup** page allows you to refine the features to be installed and their location.

By default, VST2, VST3 and AAX will be selected for installation to the C:\Program Files\ folder. Click **Browse** to change the installation target folder.

We recommend that you use the file path that will allow your host software to recognize the plug-ins. See your host software documentation.

When you have made your selections, click "Next" to continue.

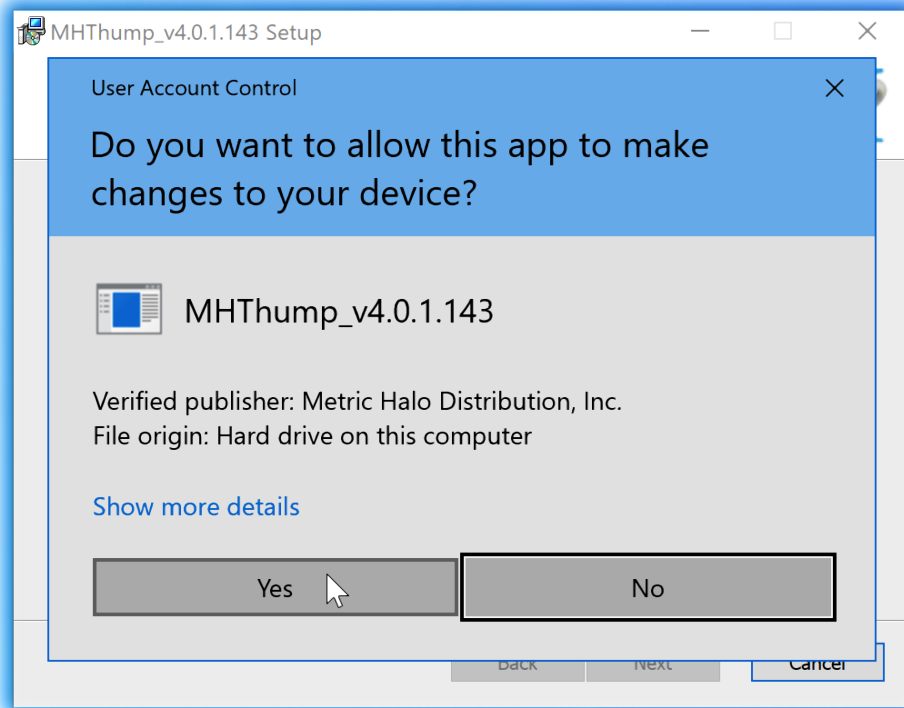
- The next page is a confirmation to continue, offering a last chance to go back and review your selections from the previous window:



**Ready to Install**

Click "Back" to return to the Setup page, "Cancel" to cancel the installation, or click "Next" to continue.

- A final dialog before executing the installation process is a security confirmation, providing a verification of the location of the installer executable and information regarding the publisher of the installer package and its contents:



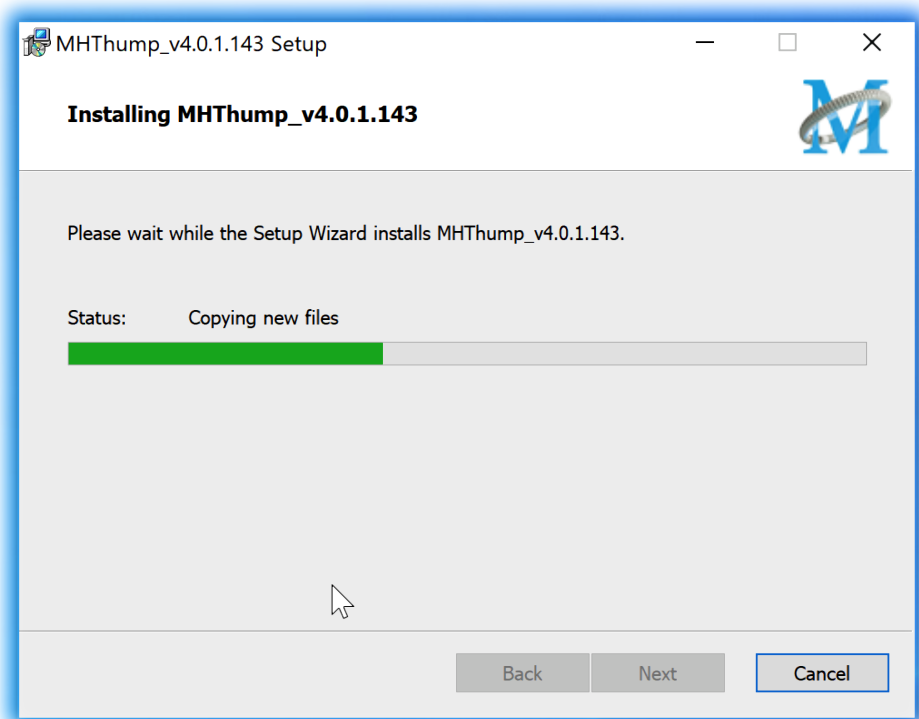
**Final installer verification and permission to execute**

Clicking "Show Details" and digging through the ensuing submenus will reveal signing credentials and other data for confirming the legitimacy of the installer executable.

Click "Yes" to proceed with the installation.

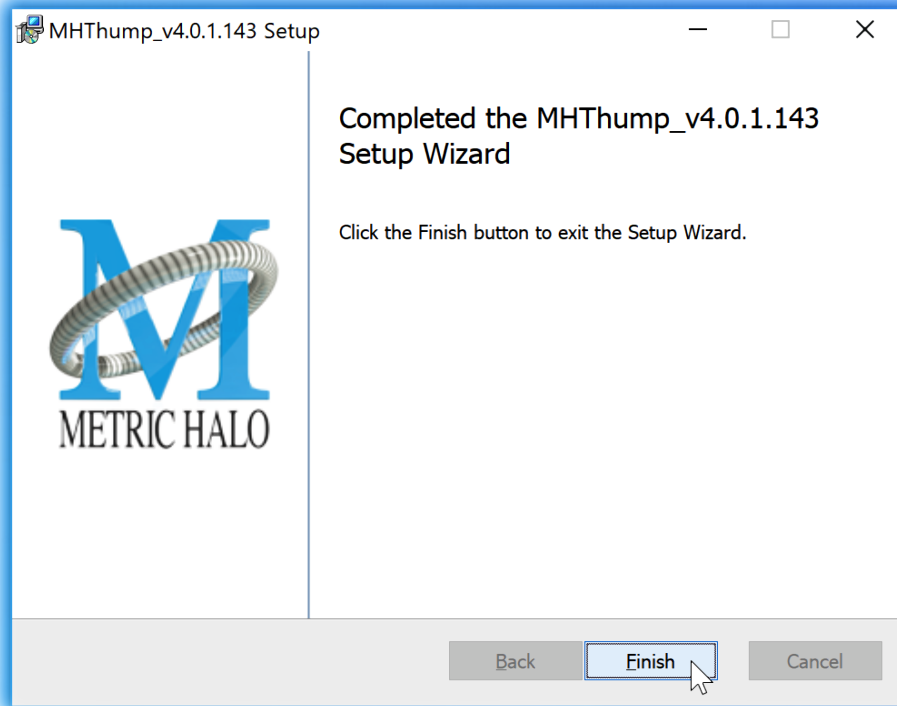


- The Setup Wizard will install and register the files:



**Installation in Progress**

- Once the installer has finished, you will see this dialog:



**Installation Complete**

If you do *not* see this installation "Completed" dialog, contact [MH Support](#).

That's it! Enjoy using Thump!

**Update Notification (all platforms)**

All Metric Halo Production Bundle plug-ins will automatically check for newer version availability (if your computer is connected to the internet).



**Plug-in Update Alert**

If a new version is found, the Metric Halo icon in the plug-in header bar will sport a lovely red dot. Click on the dotted icon and check the Update Notification tab for release notes and download instructions.

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## 4. Plug-In Header Bars

All Metric Halo family plug-ins display the MH control bar directly above the processor control UI. This control bar is very helpful for organizing your MH presets, as it allows you to organize and access all your presets across all supported plug-in formats on Mac, Windows and our hardware DSP via MIOConsole3d.

It is especially useful in that, regardless of platform, it provides a straightforward, powerful and consistent processing workflow wherever you might be working.

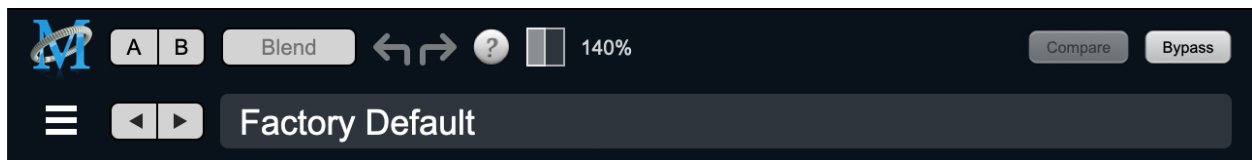
With the constant evolution of computer capabilities opening the door to new production techniques and music delivery formats, the differences between DAW software workflows have become ever more diverse. Many of the major DAWs provide their own plug-in headers within every plug-in instance window, providing their own feature set catering specifically to their internal workflow.

Conversely, other equally popular DAWs provide no added feature support for plug-ins (such as plug-in parameter Undo/Redo), opting instead to insert plugs as a straight processing block.

The MH family plug-in header bar bridges that gap by offering the most asked for plug-in functions in a simple GUI, making all of our plug-ins functions and their presets available to every user on every platform.

The plug-in header bar has two rows of controls, with the Metric Halo logo icon at the top row left.

The top row handles plug-in operations, including update notification and download, access to MH online resources, GUI preferences, tooltip help, A/B parameter snapshots, snapshot Blend, plug-in Undo/Redo, Compare and soft Bypass.

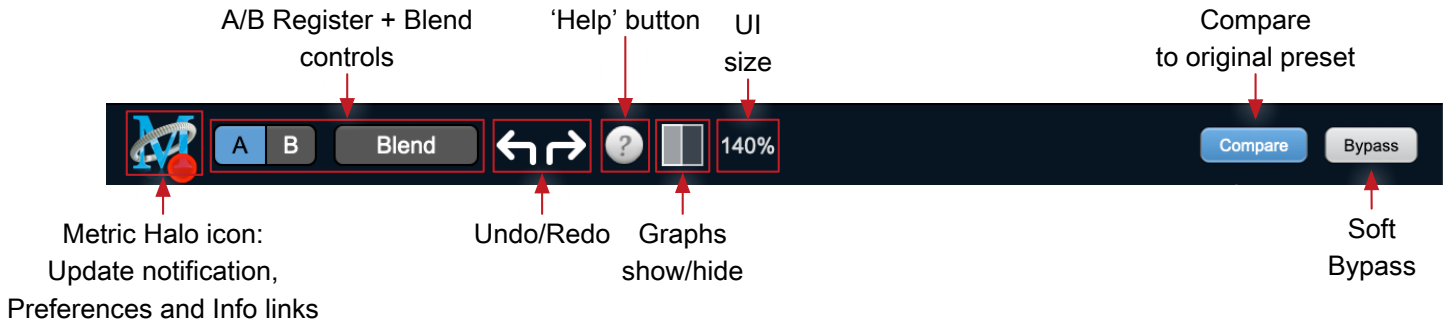


**MH Plug-in header (default setting: eq and dynamics graph display closed)**

The lower row (with the 'hamburger' menu icon at the left) is all about preset management.

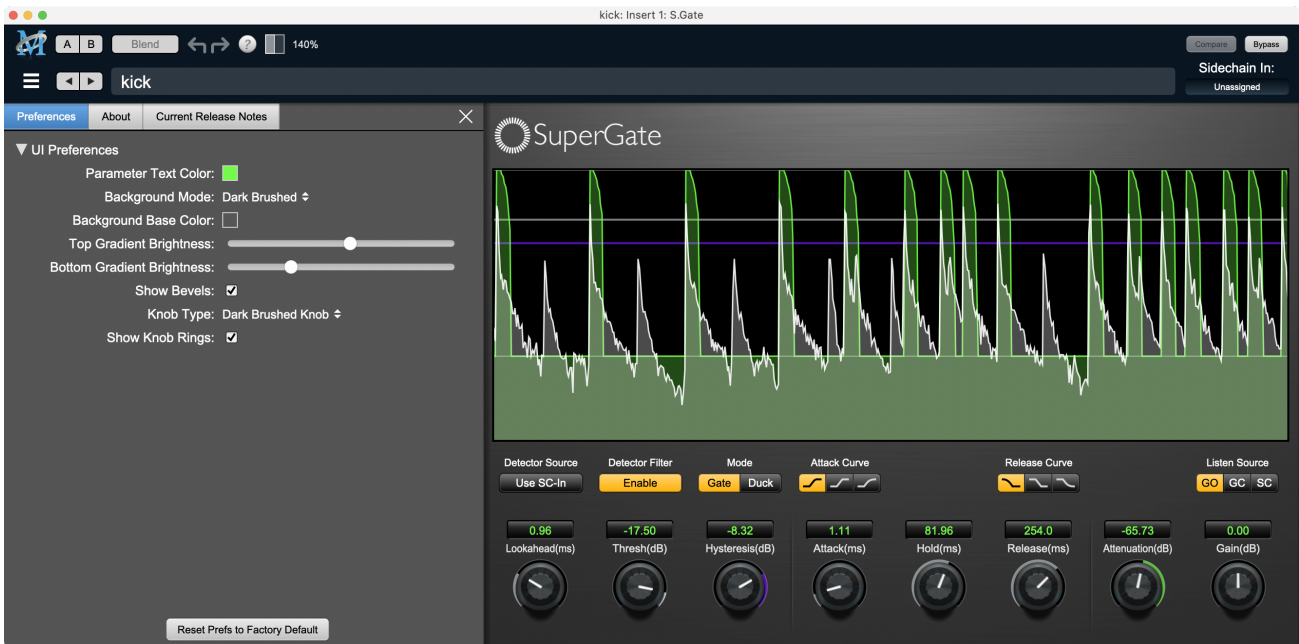
The menu includes organizational and preset import/export features for sharing saved preset files with the outside world, and restoring presets from early days MIO and MH plug-in versions.

### Plug-In Header: Top Row



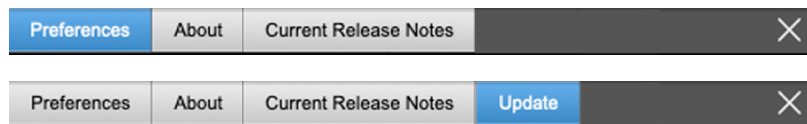
### Metric Halo Header Icon

Clicking the MH icon expands the entire plug-in window to the right and opens a multi-function control sidebar with the Preferences tab in focus:



**Preferences tab (example shown is SuperGate with sidechain filter graph closed)**

This sidebar has context-sensitive tabs across the top for GUI Preferences (shown above), **About**, and **Current Release Notes**.

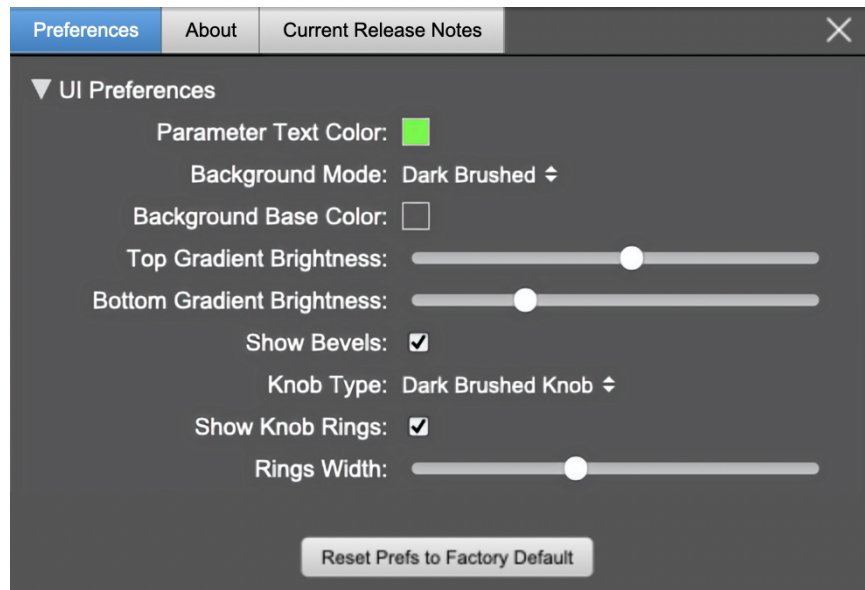


**Plug-in control pane tabs**

When updates are available for download from Metric Halo, the MH icon will sport a blatant red dot (shown in the header map at the top of this page) and an **Update** tab is added to the sidebar. These tabs are dynamic by design, and additional tabs may appear as new content becomes available.

To close the sidebar, click the MH icon again, or the "X" at the right edge of the tab bar.

**Preferences tab**



**standard plug-in UI Preferences**

The Preferences tab provides controls to modify the color scheme of text and graphical elements.

Initially added in response to requests from users with various visual impairments, in practice the ability to match the color of the plug-in to the mixer strip where it resides makes for a nice improvement in workflow.

Shown above are the basic parameter controls used by the majority of Production Bundle plug-ins.

More complex processors, such as ChannelStrip with multiband EQ and dynamics graph grids, will have additional preferences to further customize those UI elements. Processors with simpler graphics will have fewer UI preference controls.

UI parameter changes are live, so you can see changes to the plug-in graphics as you make them. This includes colors, gradients, graphic element show/hide, knob types and bevels.

Clicking color selection swatches opens the standard OS color pickers window with the eyedropper tool for sampling any color visible on your display.

UI Preferences functions are listed on the next page.

**Note:** The color scheme you set will be saved to the computer and automatically applied to the next instance of that plug-in type of whatever native format, even on another DAW.

You can always revert to the factory default settings by clicking the **Reset Prefs to Factory Default** button at the bottom of the Preferences pane.

### Complete Plug-in Preferences List

The following is a list of all the preferences available across all of the plug-ins. They don't all apply to every plug-in, but you can refer here to find the documentation for the prefs that that are displayed in the actual plug-in.

- **UI Preferences**

- **Parameter Text Color:** sets the text color of all click-to-enter numeric readouts.
- **Background Mode:** selects the background type and texture.

*Brushed* background modes place an uncolored textured metal graphic behind the control elements. Color and Gradient controls will not affect the Light and Dark Brushed backgrounds.

1. **Light Brushed:** a light brushed metallic facing with mild gradient lighting (the "vintage" Production Bundle faceplate).
2. **Dark Brushed:** a dark neutral brushed metal facing with a stronger gradient and lighting effect
3. **Flat Color:** select the background color with the **Background Base Color** picker.
4. **Gradient Color:** select the background color with the **Background Base Color** picker and adjust Top Gradient Brightness and Bottom Gradient Brightness to taste
5. **Grad w/Hits:** same as **Gradient Color** with two mild rack light sources from above and one centered below

- **Background Base Color:** when in color background modes, sets the background color
- **Top Gradient Brightness:** when in gradient background modes, sets the top gradient brightness
- **Bottom Gradient Brightness:** when in gradient background modes, sets the bottom gradient brightness
- **Show Bevels:** show/hide shaded edge and processor section separator bevels
- **Knob Type:** select from six "physical" knob types, or no knob at all
- **Show Knob Rings:** show/hide the colored rings surrounding parameter knobs
- **Rings Width:** widen/narrow the colored rings surrounding parameter knobs
- **Show Band Swatches:** show/hide the color swatches above each EQ band enable switch (used to set the color of each EQ band)
- **Swatch Alpha:** opacity control for the band color swatch buttons (does not affect Band Color selection)
- **Show Graph Grids:** show/hide the numeric grids in dynamics and EQ graph displays
- **Graph Grid Color:** set the color of the numeric grids in dynamics and EQ graph displays
- **Graphs Background Color:** set the background color of the dynamics and EQ graph displays
- **Fill EQ Curves:** shades the area of deviation of each eq band from 0dB reference (makes it easier to see the effect of each filter band amongst multiple active filters)

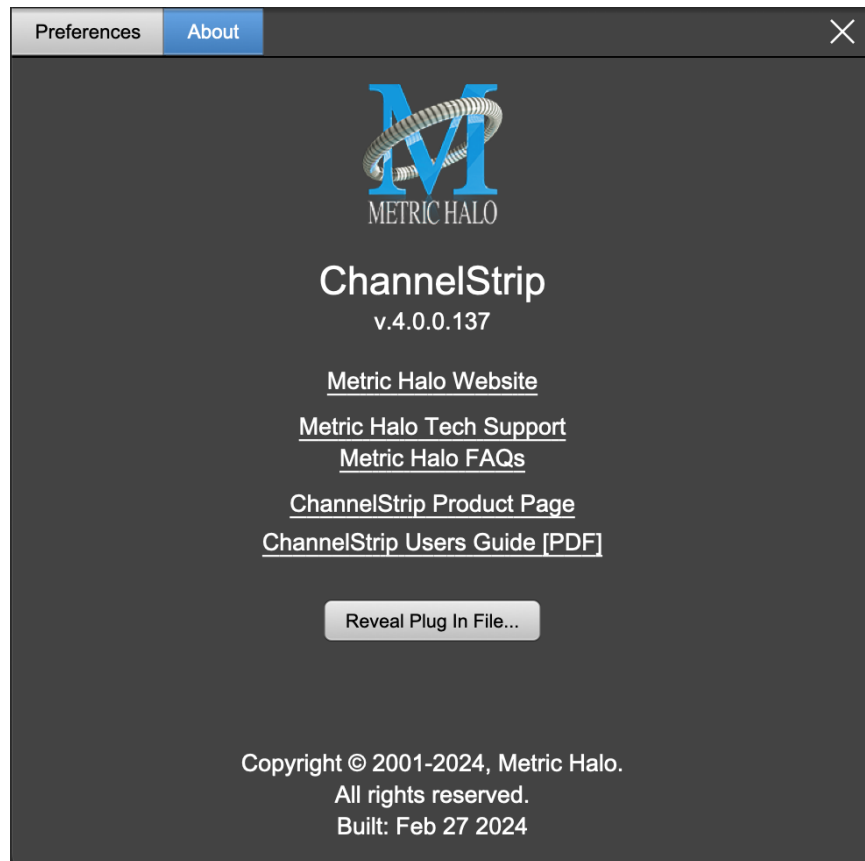
- **EQ Colors**

- **Overall EQ Curve Color:** sets the color of the aggregate EQ energy curve (the total sum effect of all active bands)
- **Band 1 Color:** sets the color of filter band 1 UI elements
- **Band 2 Color:** sets the color of filter band 2
- **Band 3 Color:** sets the color of filter band 3
- **Band 4 Color:** sets the color of filter band 4
- **Band 5 Color:** sets the color of filter band 5
- **Band 6 Color:** sets the color of filter band 6

- **Sidechain EQ Colors**

- **Gate EQ Color:** sets the color of Gate Sidechain filter band
- **Comp EQ Color:** sets the color of Comp Sidechain filter band

## About tab



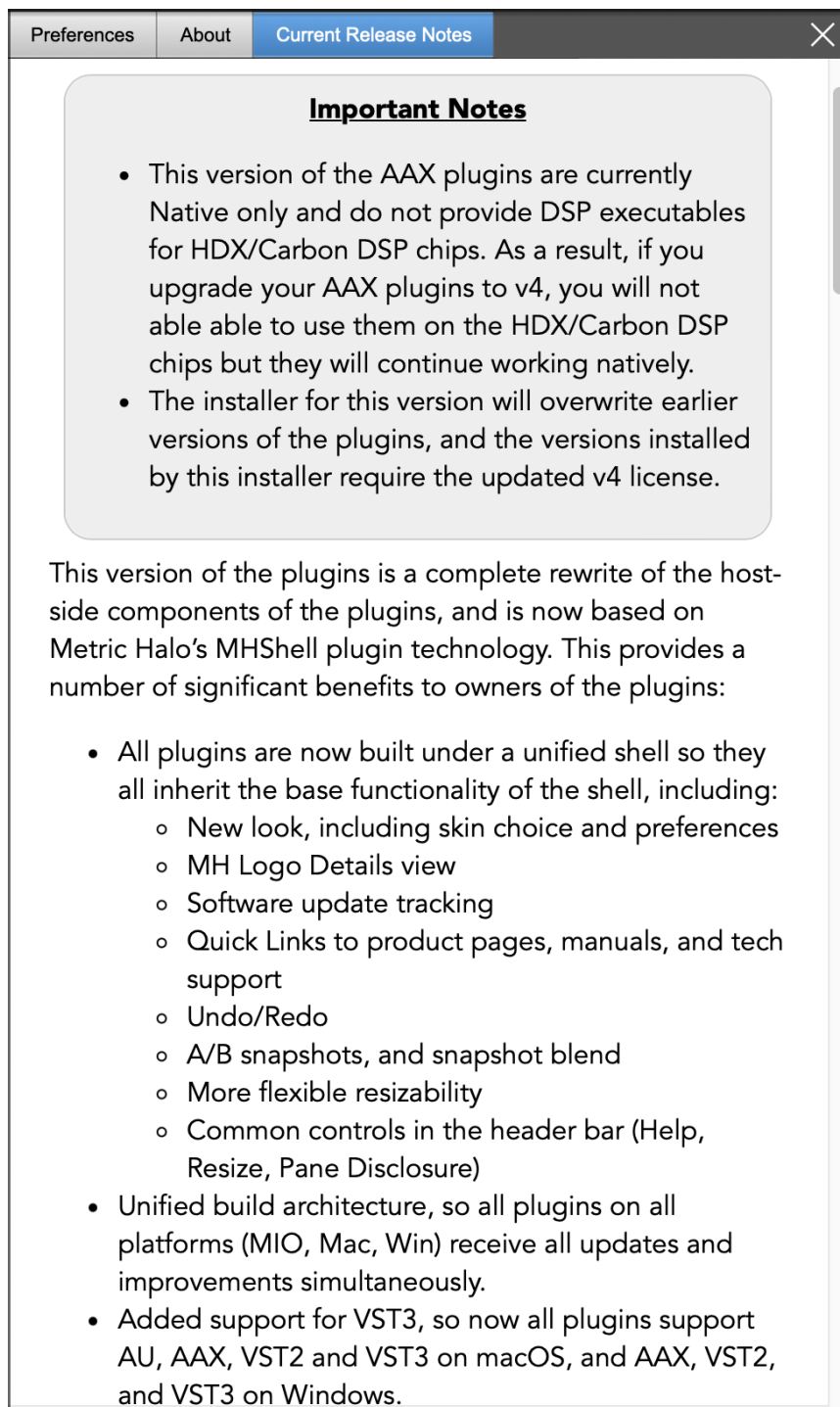
**About tab (ChannelStrip shown)**

The **About** tab reveals the current plug-in version information and provides convenient web links to product info, support pages and the current manual on the Metric Halo main website.

Clicking the "...Users Guide [PDF]" link will open and display the plug-in manual version in your default web browser.

**Reveal Plug-In File...** will open the folder containing the current plug-in file, with the plug-in file itself selected. Very handy for troubleshooting on the fly.

**Current Release Notes**



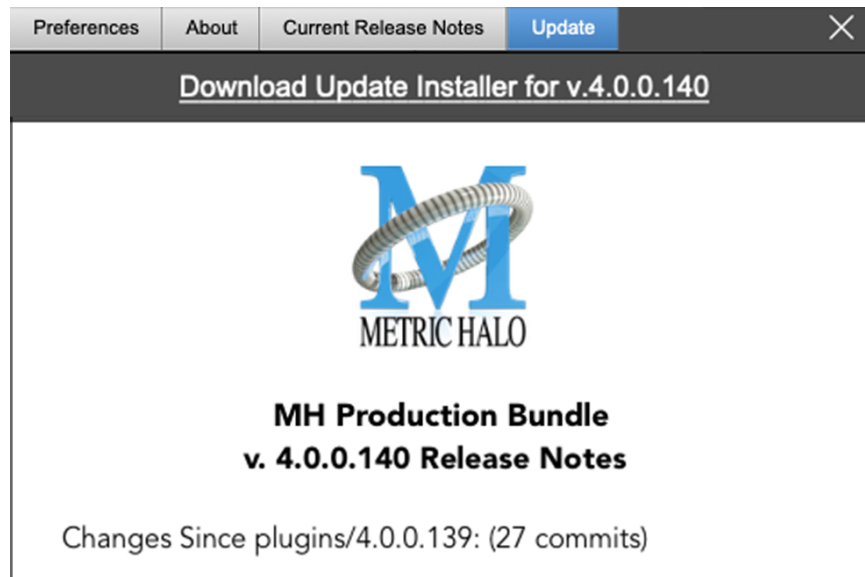
**Current Release Notes example**

**Current Release Notes** lists a synopsis of major changes (a snippet of which is shown above), with feature and bugfix revisions for the most recent software releases listed below.

Please note that on Windows, the release notes will not be displayed in the pane, and a link to the release notes will be displayed instead. You can click the link to view the release notes using your current default web browser.



**Update notification tab**



**Update tab with new version release notes header  
(text from update release notes omitted from above for brevity)**

The **Update** tab will contain a link to download the new installer package in the header at the top of the pane.

Below the download link header, you will see new version information with a synopsis of the of major changes included in the update, and bugfix revisions for the most recent software releases listed further below. As with the Current Release Notes tab, Windows users will see a link to view the release notes using your current default web browser.

Click the Installer link to download, unzip and run the installer manually, preferably when your audio software is inactive so it can properly scan the new versions at launch.

### Plug-in Snapshot Registers: A/B



Plug-in Header: Snapshot Registers: A/B

The A and B buttons control the A and B state registers. The A/B registers are used to store modified parameter snapshots in addition to the original saved preset called up by **Compare**.

The Blend function can be used to smoothly morph between the parameters set in the A and B registers, and Blend is a mappable parameter so it can be operated with external MIDI control. Details of the A/B Snapshot Blend feature follow on the next page.

For each of the A and B buttons the visual display tells you the state of the register:

- Light Grey means the register is empty
- Dark Grey means it has settings, but is unselected
- Blue means it has settings and is selected

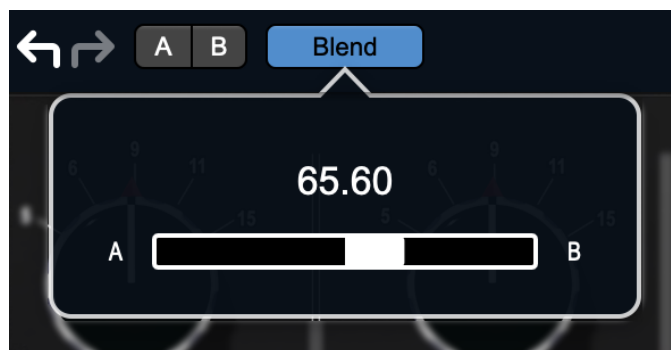
You can perform the following actions:

- Clicking on an empty register takes a snapshot of the current settings and saves them to the register.
- Clicking on an unselected filled register copies the register parameters to the current active plug-in settings.
- Clicking on a **selected** register toggles to the other register; this lets you toggle between the register settings without having to move the mouse
- <Option> - clicking on a register snapshots the current settings and saves them to the register, overwriting the prior contents (if any).
- Changing settings when a register is selected will update the settings in the register to reflect the change.

## Snapshot Blend

The Blend button allows you to interpolate (or morph) between the parameter snapshots stored in the A and B registers. It becomes active when both A and B have a parameter set stored.

Blend is a MIDI-mappable parameter so it can be operated in realtime with external MIDI control and/or automated in the DAW. This allows you to automate a transition from the A → B register, the B → A register or any setting between the two.



**Plug-in Header: Snapshot Blend**

The Blend button's visual display tells you the state of the register:

- Light Grey means it is empty
- Dark Grey means it has settings, but is unselected
- Blue means it has settings and is selected

Click on Blend to popup the blend control. Slide all the way to the left to apply the settings in the A register. Slide all the way to the right to apply the settings in the B register. Intermediate settings for blend will give you intermediate settings for any parameter that is different in register A and B. The blend control does not change the state of Bypass.

Note that the Blend is not a parallel processing mode where two instances of the processor are running the A and B settings and the output is a parallel blend of the two settings. Rather, Blend interpolates the parameter settings of the two registers to one instance of the processor. You can see the parameter controls move between A and B settings as you slide the Blend control.

The A/B and Blend settings are stored and recalled as part of the plug-in state, but are not saved as individual presets in the preset bar.

While you can use the blend with arbitrary A and B settings we find it works best when you craft the settings in the two registers in such a way as they are related to each other. Specifically, if an indexed (stepped) parameter is different between the two settings, the interpolated value will snap to one of the indexes between the two settings, which can be jarring.

It is best if the parameters that you blend are smooth parameters (e.g. gains, frequencies) and make sure the indexed parameters (enables, modes, band types) are set the same for both registers.

The easiest way to do this is to load the same setting into both registers and then tweak the settings of one of the registers.

This works especially well if you make one of the registers be the basic settings with all the gains or thresholds flattened out so that you can smoothly interpolate between a setting and effectively bypassed - we have found that this allows you to zero in a perfect configuration between too much and too little.

### Plug-in Undo/Redo

All the plug-ins provide support for undo/redo from the plug-in header bar.



**Plug-in Header: Undo/Redo**

The left and right curved arrows represent Undo (Left) and Redo (Right). These arrows are grey when there is nothing to Undo or Redo.

The arrows are white when it is possible to Undo (Left) or Redo (Right). Clicking the left arrow when it is white will undo the last action you made in the plug-in. When you undo something that change is placed on the redo stack, and the Redo button will turn white.

Clicking the Redo button (when it is white) will restore the state that the last Undo changed.

If the Redo button is white and you make a change in the plug-in, the Redo button will go grey as the redo buffer will be cleared.

### Help Button



**Help Button**

This button toggles the tooltip display. When enabled, tooltips will be shown when the mouse hovers over a control. When the tooltip display is disabled, you may still see tooltips by holding down the ? key and hovering over a control.

### Graph Visible Selector



**Graphs Closed**



**Graphs Open**

This button toggles visibility of various response graphs. This button allows you to maximize screen real-estate while still providing details on the processing when they are needed. Not all MH family plug-ins will have this button, and on some plug-ins the button will have three panes. Clicking the button will step through the available views, with hidden panes shown darker in the button graphic.

### UI Size Selector

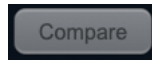


**UI Size Selector**

This pull-down menu lets you set the plug-in UI size to taste.

The last selected setting for a plug-in processor will be applied to the next new instance you create of that same plug-in. For example, if you open an instance of ChannelStrip and set it to 80%, the next instance of ChannelStrip you create will also open at 80%.

## Compare Button



**Compare Button (inactive)**



**Compare Button (active)**

To use the compare button, a preset must first be loaded. The compare button will be lit up when the current settings differ from the selected preset. If you click this button while it is lit, the preset settings will be restored, but you can still return to the changes you made by clicking on the button again. It is important to note that any changes you make to activate the compare light are always for comparison to the last loaded preset.

## Soft Bypass



**Soft Bypass Button (not bypassed - plug-in is processing)**



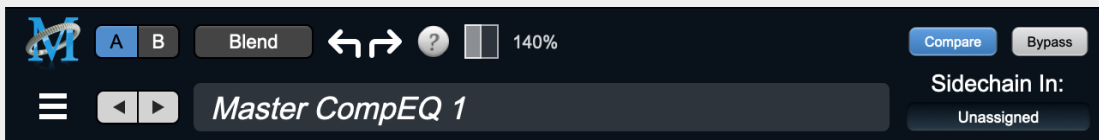
**Soft Bypass Button (bypassed - plug-in is not processing)**

When glowing yellow, this button will maintain the time delay through the channel and will continue to show metering, but will cleanly disable the processing.

### For MH 3d hardware users: A note regarding plug-in Sidechains

In host-based DAWs, the mechanism for routing signals to plug-in sidechain inputs is handled within the DAW itself in a separate routing UI from the plug-in.

In MIOConsole3d, plug-ins which support external sidechain inputs are assigned from within the plug-in UI (as shown below).

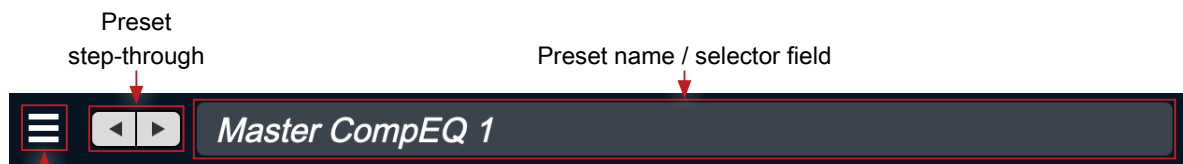


**MIOConsole3d ChannelStrip header**

In MIOConsole3d, sidechain inputs may be routed from any input or bus available in the system, except for the Main bus. These routes are naturally going to be different from what would be assigned in a DAW session.

For this reason, external sidechain assignments are the one parameter which can not translate between a host-based DAW preset and the same preset opened within MIOConsole3d.

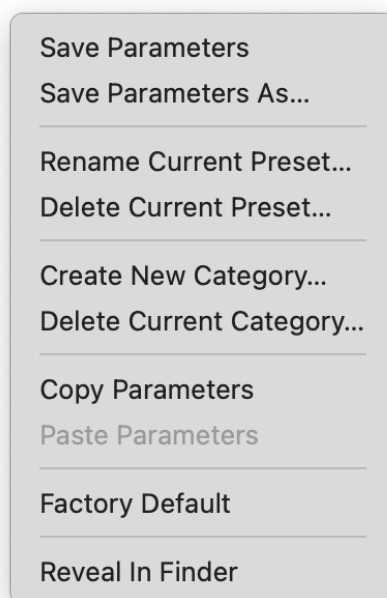
## Plug-In Header: Preset Row



“Hamburger” menu:  
Preset operations

## Plug-in Hamburger menu

The preset and parameter functions within the hamburger menu break down as follows:



- **Save Parameters** saves the current plug-in parameters to the current preset.
- **Save Parameters As...** opens a dialog box where you can name and choose a category to save your current plug-in settings.
- **Rename Current Preset...** lets you rename the current preset.
- **Delete Current Preset...** deletes the current preset.
- **Create New Category...** lets you create a new preset category for the current plug-in type.
- **Delete Current Category...** deletes the current preset category.
- **Copy Parameters** copies the current parameter set so you can paste them to another instance of the same type plug-in.
- **Paste Parameters** pastes the copied parameters. Note that pasting a parameter set over an existing named preset will change the preset name field to: **[No Preset]**.
- **Factory Default** loads the factory default settings for this plug-in.
- **Reveal In Finder** opens the folder in which the current preset is saved.

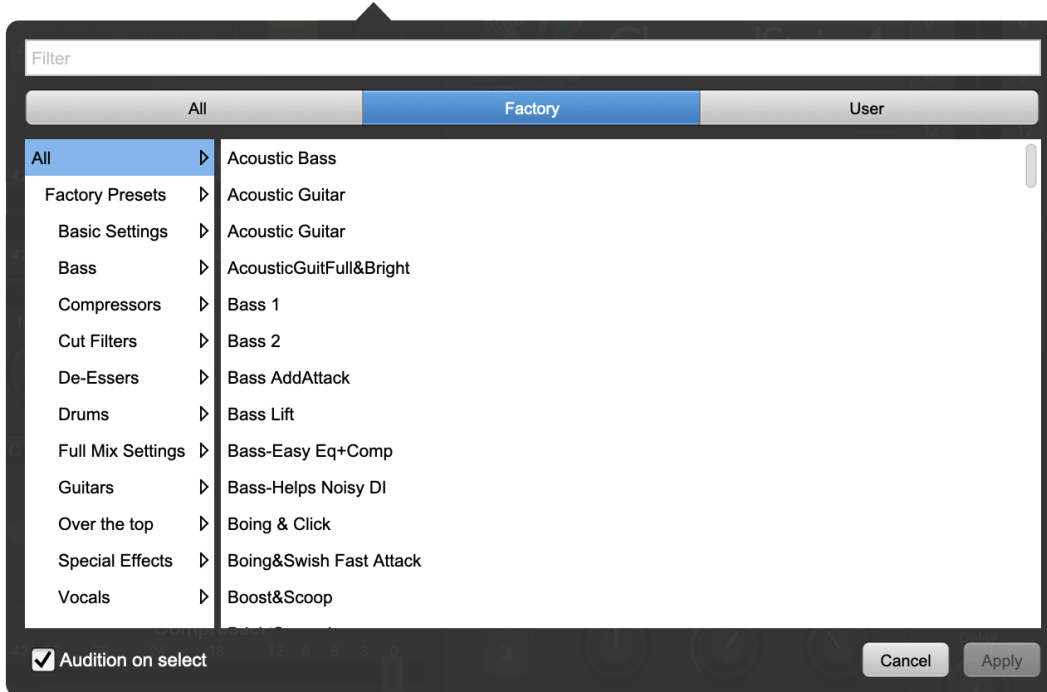
### Preset Step-Through Buttons



**Preset Step-Through Buttons**

These buttons step through Factory and User Presets in succession, as they are listed in the Preset Selector window. The left arrow chooses the previous preset. The right arrow chooses the next preset.

### Preset Name/selector menu:



**Plug-in Header: Preset selector menu (ChannelStrip shown)**

The Preset selector will open to show all the available preset categories, and the presets within those categories.



**Preset selector menu: Audition on select**

With “**Audition on select**” enabled at the bottom of the window, selecting a preset will temporarily load those parameters so you can hear the effect on the audio you are playing, without actually committing to the preset.

Click **Cancel** to revert to your previous settings and close the selector window.

Hit **Apply** to commit the new preset parameters and close the preset selector window.

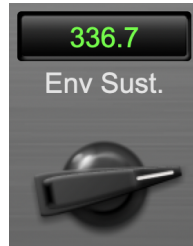
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## 5. Operation

As with most plug-ins, Thump provides many copies of controls that are all operated in a similar manner. The Thump user interface uses a few different control elements to control all of the processing. These elements are:

### Control Knob

Control Knobs are used to control the value of various continuous parameters of a process. Examples of these types of parameters include: Attack Frequency, Envelope Attack, Out Gain, etc.



**Swept Knob**

You can change the value of each knob in a number of different ways. Click and drag the knob to change the value continuously. Dragging up or to the right will increase the value, while dragging down or to the left will decrease the value. If you hold down the Mac ⌘ (Command) key or Windows **Control** key when you click, you will be able to adjust the value with finer precision. If you hold the Mac ⌥ (Option) key or Windows **Alt** key when you click, the knob will reset to its default value. You may also double-click a knob to reset it.

Click on the number (readout) of the knob to display a text entry field that allows you to type in a number directly. The pop-up will remain active until you dismiss it by clicking somewhere else or hitting the **return**, **enter**, **tab**, Mac ⌘. (Command + .), Windows **Alt** key or **ESC** keys. Hit **return** or **enter** to confirm the value and dismiss the pop-up. Hit the **tab** key to confirm the value and display an entry field for the next control. **⇧-tab** (Shift + tab) will display the entry field for the previous control). Hit the Mac ⌘. (Command + .), Windows **Control**. (Control + .) or **ESC** (Escape) to dismiss the pop-up and cancel the change.

When you enter a number into the pop-up entry, you can use a couple of abbreviations: "k" multiplies the number by 1000 and "m" divides the number by 1000. So if you want to enter 16,500 Hz you can just type 16.5k.

### Toggle Button



**Toggle Button (Off)**

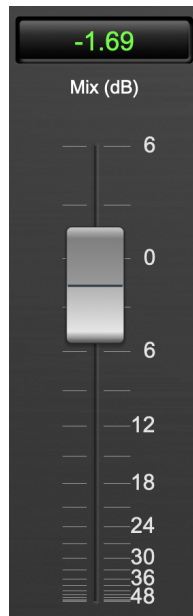


**Toggle Button (On)**

Toggle buttons are simple on/off switches. They light up when they are on and are dark when they are off. You toggle the state of the button by clicking on it. These buttons are used to enable the oscillators.



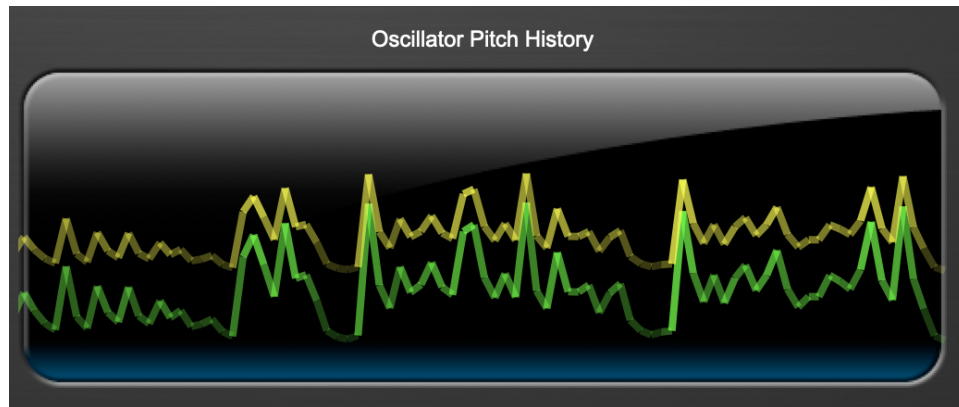
## Fader



**Mix Fader**

The faders are used to control the output gain of the oscillators. This allows you to set the mix level of each tone.

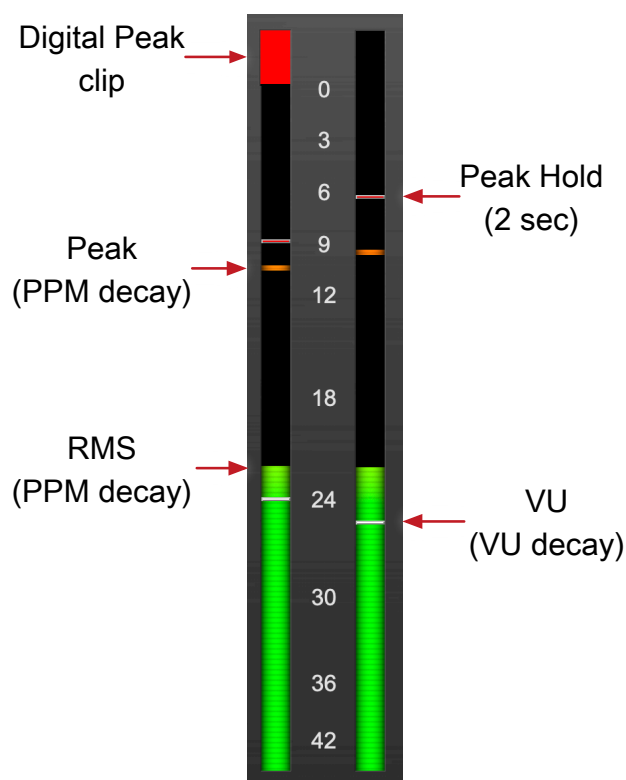
## Oscillator Pitch History



**Pitch History Display**

This display shows the activity of the two oscillators; Oscillator 1 is shown in green, Oscillator 2 in orange. As the display scrolls from right to left, each trace displays the oscillator output. As the oscillator pitch goes up in frequency, the trace goes higher in the window. As the oscillator output gets louder, the trace gets brighter.

## Output Meter



**Output Meter**

For the main output stage of Thump we have provided meters driven with SpectraFoo™ metering technology. These meters show digital Peak, Peak Hold, RMS level and VU level.

Both the Peak and RMS level are represented with fast PPM ballistics.

The instantaneous Peak level is represented by the floating colored pip. Peak Hold is 2 seconds, indicated as a red floating marker pip.

The RMS level is the solid colored bar which transitions from green at “safe” high-headroom levels to yellow at -18dBFS, then to orange and finally red approaching -6dBFS.

The VU meter is the white floating marker pip showing IEEE standard 300 ms RMS average level.

When Thump is on a mono insert there will be a single meter.

The output section clip lights activate if there is an over in the output stage or in any of the processing section input stages. It is reset by clicking on the meter.

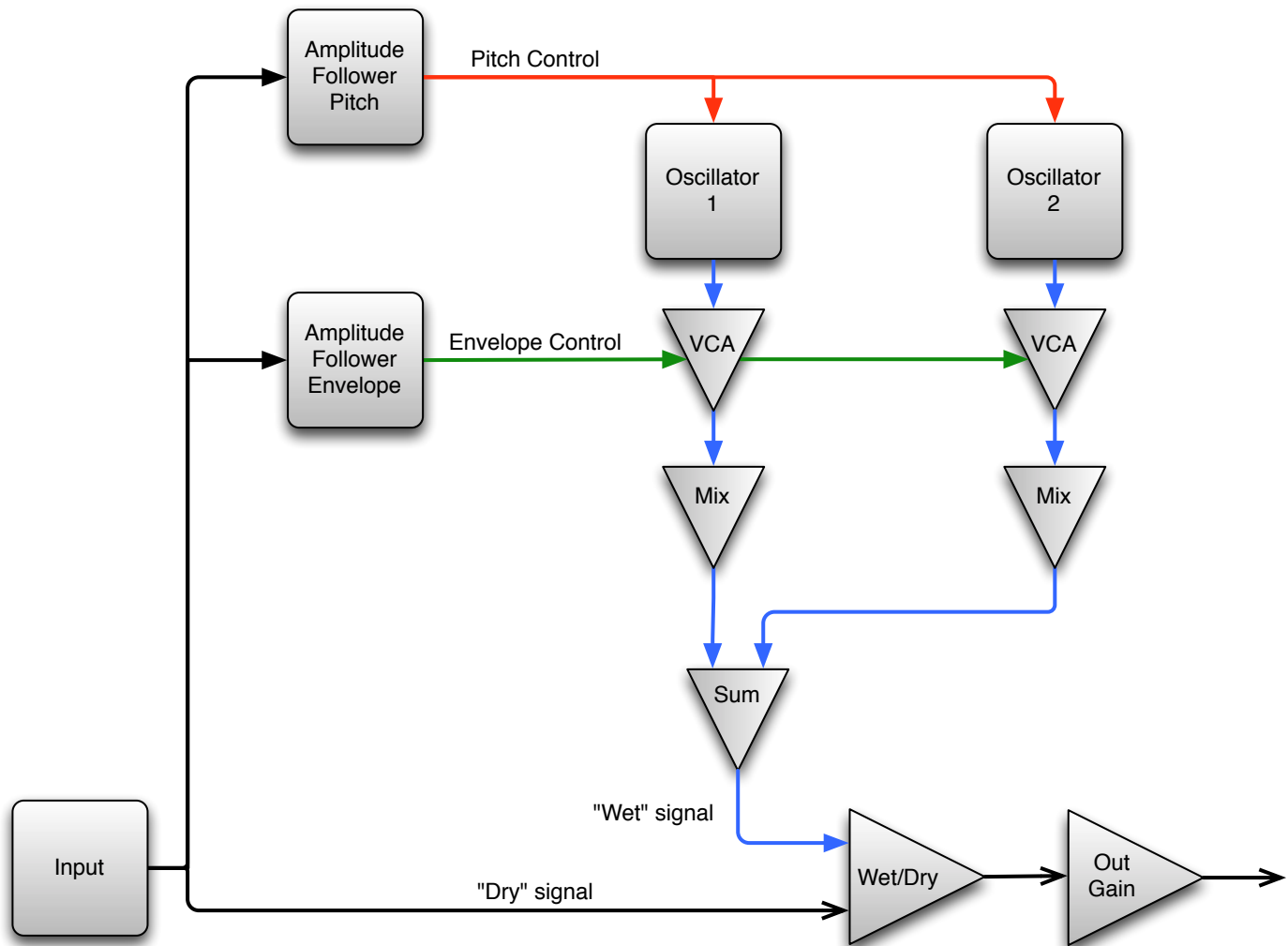
### **A Note About Clipping Indicators:**

The clip lights do not mean that the plug-in is clipping; it means that the audio level in the DSP is currently over 0 dBFS. If you do not lower the signal level you run a chance of actually clipping the input of another processor or D/A convertor.

# 6. Processing

## A Detailed Description

In this chapter we'll discuss what each processing block does and how the controls work.



**Thump Signal Flow**

The block diagram above illustrates the overall structure of the processing system provided by Thump. The diagram does not indicate the various metering blocks.

Now lets examine the various processing blocks indicated in the diagram.

## Amplitude Followers

Thump's Amplitude Followers convert the audio input into control signals for the oscillators. The Envelope Amplitude Follower extracts an envelope that is used to control the amplitude of the output of the oscillator. The Pitch Amplitude Follower extracts an envelope that is used to control the pitch of the oscillators.

Each Amplitude Follower functions as an envelope detector that is driven by the input audio signal. The Amplitude Follower extracts the amplitude envelope from the signal. Each Amplitude Follower provides the following controls that you can use to control its behavior:

- The *Envelope Atk.* and *Pitch Atk.* controls set the attack time constant in milliseconds (ms) of their respective Amplitude followers. The attack time constant controls how quickly the envelope output increases when the level of the input signal is higher than the envelope output. Smaller values cause the envelope to follow the signal more closely, but values that are too small could lead to distortion, depending on the characteristics of the input signal.
- The *Envelope Sust.* and *Pitch Sust.* controls set the release time constant in milliseconds (ms) of their respective Amplitude followers. The release time constant controls how quickly the envelope output decreases when the level of the input signal is lower than the envelope output. Smaller values cause the envelope to follow the signal more closely, but values that are too small could lead to distortion, depending on the characteristics of the input signal.

## Oscillators

The envelope outputs from the Amplitude Followers are used to control the two oscillators that make up Thump's synthesis section. Each oscillator has two controls to allow you to adjust how the frequency of the oscillator changes with the control input from the Pitch Amplitude Follower:

- *Atk. Frequency*: This control sets the frequency of the oscillator when the Pitch Amplitude Follower output is at its maximum value (e.g. the input signal is at full-scale). This control ranges from 1 to 440 Hz.
- *Sust. Frequency*: This control sets the frequency of the oscillator when the Pitch Amplitude Follower output is at its minimum value (e.g. the input signal is silent). This control ranges from 1 to 440 Hz.

As the output of the Pitch Amplitude Follower swings from its minimum value to its maximum value, the oscillator's frequency will swing from the value set by the *Sust. Freq.* to the value set by the *Atk. Freq.* Each of the controls can take any value in the range, so that the oscillator frequency can be decreasing as the signal decays away, increasing as the signal decays away or even constant (if both controls are set to the same value). The traditional decaying pitch drum sound can be made by setting the attack frequency higher than the sustain frequency. The frequency characteristics of each oscillator can be set independently.

The output of the Envelope Amplitude Follower is used to control the amplitude envelope of the output of the oscillators. The overall amplitude of each oscillator is independently controlled by its associated mix parameter. By adjusting the *Env Atk.* and *Env Sust.* parameters you can control how audible the attack frequency sweep is, and how long the decay of the sound will continue to be audible.

The oscillators have two master controls:

- *Enable*: This button turns each oscillator on and off.
- *Mix*: this fade sets the output level of each oscillator, from  $-\infty$  to +6 dB.

## Output

Thump's output section has two controls:

- *Wet/Dry Mix*: This controls the balance between the original signal and synthesized audio. 0% is full dry (no effect), 50% is equal balance and 100% is full effect (no original audio). If you are using Thump on an aux bus, you would traditionally set the Wet/Dry Mix to 100.
- *Out Gain*: This sets the final output level of Thump, and ranges from -24 to +24 dB.

# A. Key Commands

There are several key commands used as modifiers combined with mouse actions:

Command	Mac Key Sequence	Windows Key Sequence
Show tooltips	Hold ? down	Hold ? down

**Table A.1. Tooltip Control**

Command	Mac Key Sequence	Windows Key Sequence
Fine control	⌘ (Command)-click and drag	Control-click and drag
Reset to default value	⌥ (Option)-click or double-click	Alt-click or double-click

**Table A.2. Control Knob Modifiers**

Command	Mac Key Sequence	Windows Key Sequence
Confirm & dismiss numeric pop-up	return, enter	return, enter
Confirm & move to next entry	tab	tab
Confirm & move to previous entry	⇧-tab (Shift + tab)	⇧-tab (Shift + tab)
Dismiss numeric pop-up & cancel change	⌘. (Command + .), ESC	Control. (Control + .), ESC

**Table A.3. Numeric Field Modifiers**

Command	Mac Key Sequence	Windows Key Sequence
Reset Clip	⌥ (Option)-click the meter	Alt-click the meter

**Table A.4. Meters**

Command	Mac Key Sequence	Windows Key Sequence
Toggle band enable	⌘ (Command)-click or double-click frequency dot	Control-click or double-click frequency dot
Adjust bandwidth (click then drag)	⌥ (Option)-click frequency dot	Alt-click frequency dot
Change filter type	⌘⌥ (Command + Option)-click frequency dot	Control+Alt-click frequency dot
Access EQ TF settings	^ (Control) or right-click graph	Right-click graph

**Table A.5. EQ Transfer Functions**

Command	Mac Key Sequence	Windows Key Sequence
Popup Parameter Menu	^⌥⌘ (Control + Option + Command)-click	Alt + Control+Windows-click
Show Automation Breakpoint	^⌘ (Control + Command)-click	Control + Windows-click
Set Parameter to Default Value	⌥ (Option)-click or double-click	Alt-click or double-click
Set Parameter to Minimum Value	^⌥ (Control + Option)-click	Control + Alt-click

**Table A.6. Pro Tools Key Commands**

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## B. Service and Support

Metric Halo takes great pride in the reputation for customer service and support that we have built. If you have any problems, questions, or suggestions please get in touch with us at:

- <https://mhsecure.com/support>
- [support@mhsecure.com](mailto:support@mhsecure.com)
- (727) 725-9555

Please keep us informed about your successes and projects. We love to hear from you!