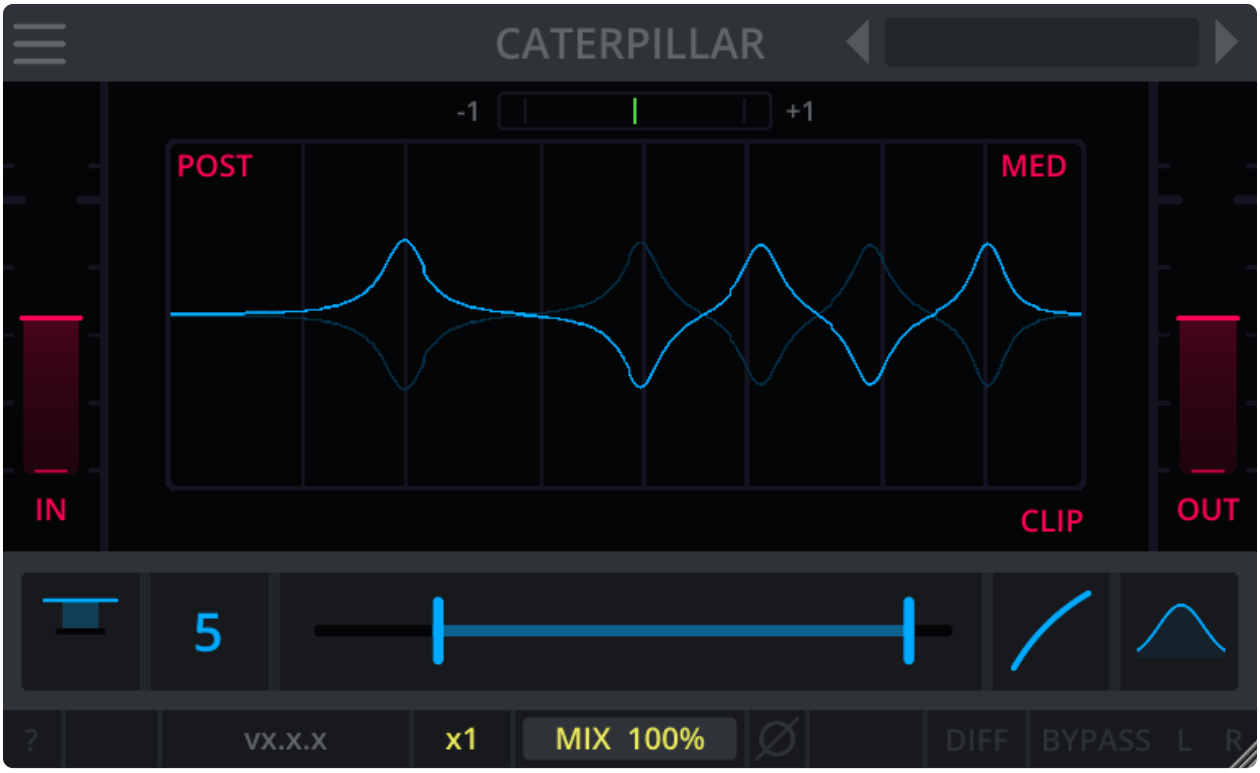
Caterpillar Manual



Version 1.0.0

1.0 Introduction

Caterpillar applies bell-shaped peak filters with alternating gain to the left and right audio channels, creating a unique stereo effect while maintaining full mono compatibility.

By boosting and cutting specific frequencies differently in each channel, Caterpillar can:

- enhance the perceived stereo width
- make the soundstage feel broader and more immersive
- be used to create formant-like filters
- create unique resonances in the bass domain or the high frequency spectrum
- create transitions by applying modulation effects or automation.

2.0 Installation

2.1 Automatic installation

> For Windows and macOS an installer is available

2.2 Manual installation

Darkpalace Studio plugins can be installed in a manual way. After downloading the zip or dmg archive for your operating system from tentary, extract the desired plugin format into your respective plugin folder.

If you don't have a custom plugin folder set in your DAW, refer to the to the default locations:

- VST3
  - **Win**: C:\Program Files\Common Files\VST3\
  - **Linux**: ~/.vst3/
  - **macOS**: /Library/Audio/Plug-ins/VST3
- CLAP
  - **Win**: C:\Program Files\Common Files\CLAP\
  - **Linux**: ~/.clap/
  - **macOS**: /Library/Audio/Plug-ins/CLAP
- AU
  - **macOS**: /Library/Audio/Plug-Ins/Components

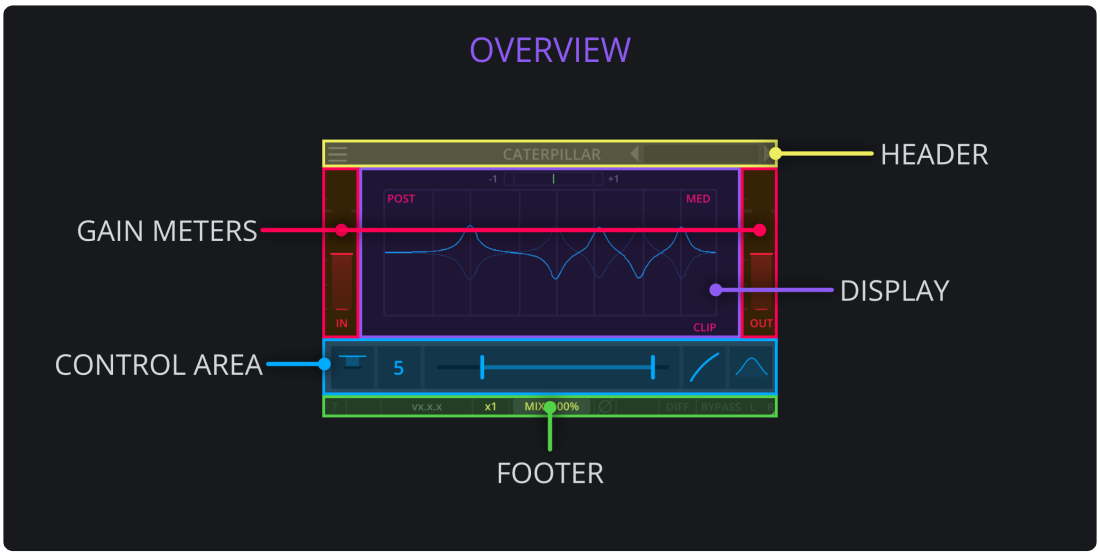
As for the themes and presets from the ZIP archive, please extract them to the following locations:

- **Win**: C:\Users\Public\Documents\Darkpalace Studio\[pluginName]\
- **Mac**: /Users/Shared/Darkpalace Studio/[pluginName]/
- **Linux**: ~/.config/Darkpalace Studio/[pluginName]/

If you want to learn about presets, themes and configuration files, please refer to section 5 (Configuration).

3.0 Controls

3.1 Overview



3.1.1 Shared Regions

In order to easily distinguish the various elements of the plugins as well as make manual navigation easier, all of our plugins can be separated into shared regions:

- Header
- Display
- Gain Meters
- Control Area
- Footer

3.1.2 Shared Interactions

In order to keep a consistent playing-field, our plugins share common interaction methods such as:

- Double-Click: Reset to default values.
- Hold SHIFT or CTRL: Precision mode, smaller incremental values
- Mouse-Wheel: Incremental Steps.
- Hover over a Widget: Shows a tooltip.
- Adjust a Widget: Shows tooltip with the current value.
- [?]-Button: Shows explanations when hovering over widgets.
- Resize: Done by grabbing any of the sides or corners.

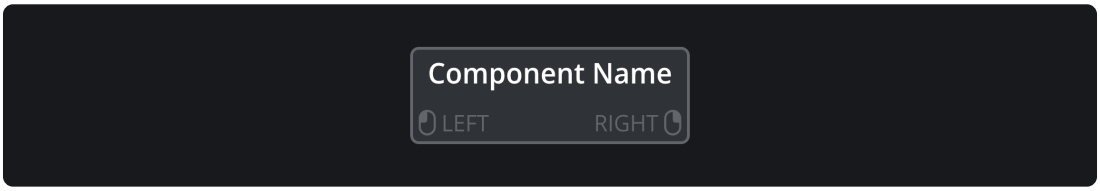
3.1.3 Visual Feedback

A lot of the widgets within our plugins are designed to provide visual feedback to indicate a change is occurring. Additionally this is aided by the Tooltip and Explanation system.

3.1.3.1 Explanations

When help mode is enabled *(Located left of the footer indicated by a '?')*, hovering over any widget will show a window containing an explanation of its functionality.

3.1.3.2 Tooltip



When you hover your mouse over any of the widgets, a tooltip will appear displaying the widget's name. Additionally, if a widget has a special interaction, such as a dedicated right-click function, the tooltip will also indicate this. It will do so by showing both left and right mouse button icons along with the name of the associated action.

3.2 Header



Shared across all Darkpalace Studio plugins, the header is a central component for managing various aspects including loading and saving presets as well as loading themes.

3.2.1 Menu-Button

(Located left of the Header)

- Left-Click: Opens the menu.

3.2.2 Previous-Preset-Button

(Located center-right of the Header)

- Left-Click: Cycle through the presets in backward order.

3.2.3 Current-Preset-Button

(Located right of the Header)

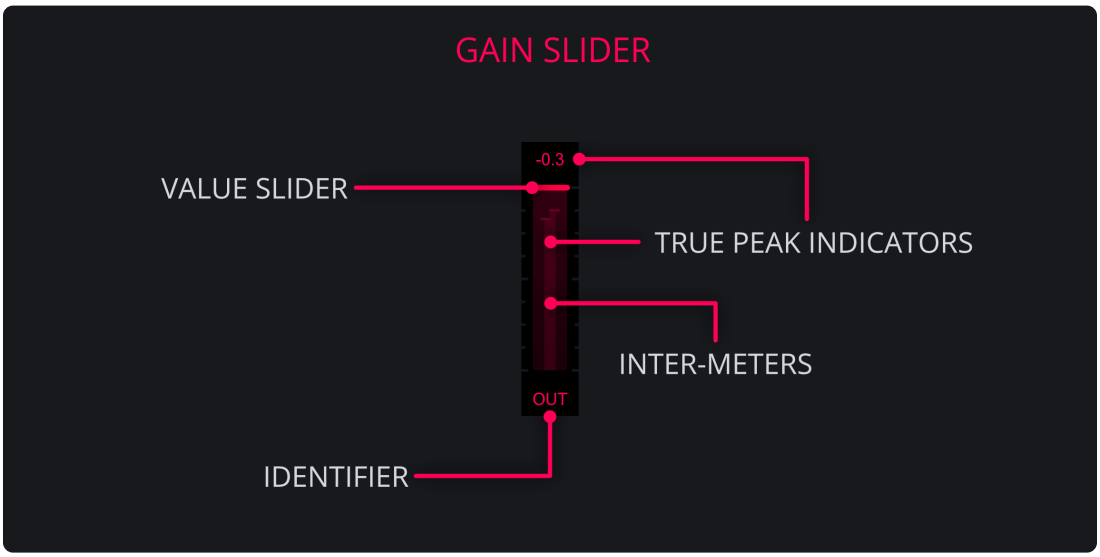
- Left-Click: Opens the menu.

3.2.4 Next-Preset-Button

(Located right of the Header)

- Left-Click: Cycle through the presets in forward order.

3.3 Gain Meter (Input/Output)



The Gain components allow for adjustment to the input and/or output signal of the plugin with some Darkpalace plugins offering a change in functionality.

3.3.1 Identifier

(Located below the Meter)

Displays the current position in the processing chain of the slider.

3.3.1.1 In

(Located on the left side of the plugin)

The **IN** gain slider controls the volume of the signal being sent into the plugin with a range of -12dB to +12dB.

> The in gain is applied at the beginning of the processing chain. It can be used to drive any dynamic effects of the plugin.

3.3.1.2 Out

(Located on the right side of the plugin)

The **OUT** gain slider controls the volume coming out of the plugin with a range od -12dB to +12dB. This is clean digital gain that does not color the sound in any way by itself.

> The out gain is applied after all internal processing.

3.3.2 Value-Slider

(Located bottom of the Meter)

- Left-Click and Drag: Adjust value of the Gain.

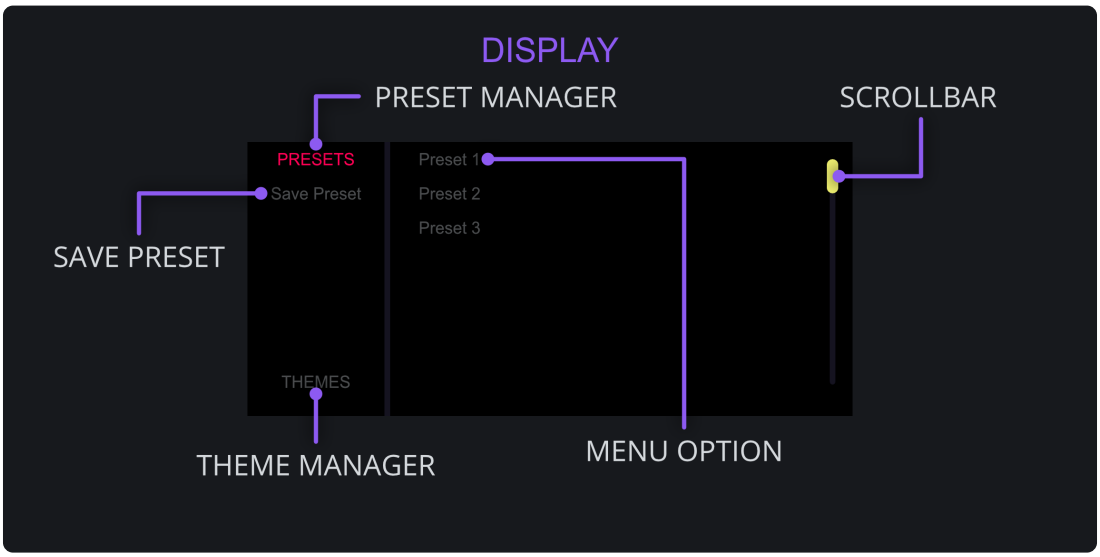
3.3.3 True-Peak Indicators

(Located top of the Meter)

Displays the current true-peak value of the signal. If the signal is mono, the inter-meters will show a singular line whereas a stereo signal will display separate left/right inter-meters.

When switched to M|S mode, the peak indicators will display the peak values for the mid- and side channel respectively.

3.4 Menu



The Display Widget allows you to browse the various presets and themes that are available. When a preset or theme is incompatible with the current version the item will be displayed with a strikethrough.

3.4.1 Preset Button

(Located top-left of the Display)

- Left-Click: Switch to the Preset-Manager.

3.4.2 Save-Preset Button

(Located top-left of the Display)

- Left-Click: Save the current information to a preset.

The Save Preset button will only appear when the Preset-Manager is active, indicated by PRESET being highlighted. Saving is handled through your systems File-Dialogue window where you will be prompted for a name and location.

3.4.3 Theme Button

(Located bottom-left of the Display)

- Left-Click: Switch to the Theme-Manager.

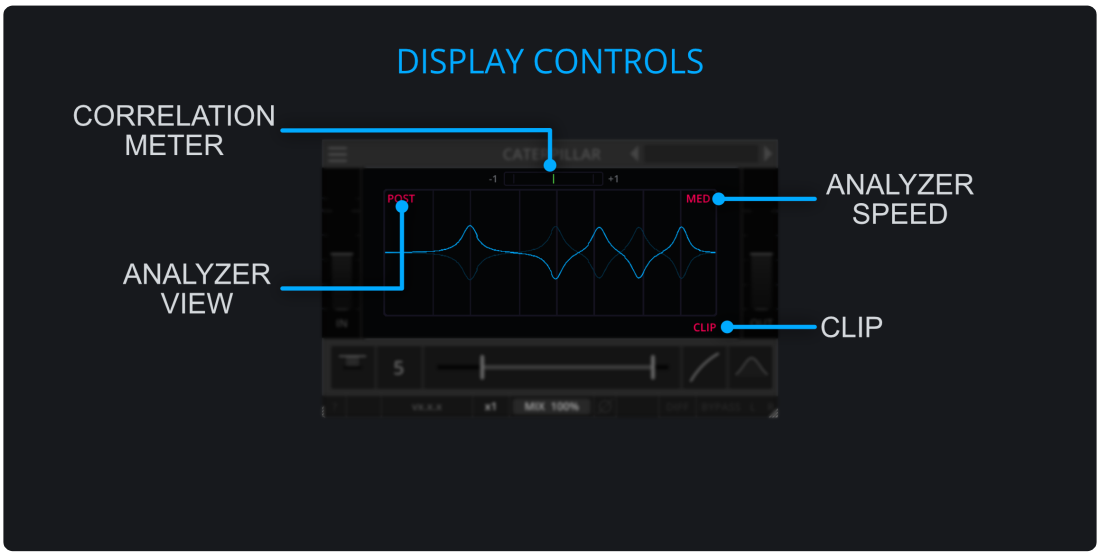
3.4.4 Menu Options

(Located right side of the Display)

- Left-Click: Select Preset.
- Mouse-Wheel: Move Window Up/Down.

Displays the available options based on which mode is active on the left side of the Display. When there is a large amount of options, the scroll-bar on the right side can be used as well as the Mouse-Wheel to go up/down within the window.

3.5 Display Controls



3.5.1 Correlation Meter

(Located above the analyzer)

The correlation meter is a common indicator for showing how mono-compatible the signal is.

- A value of 1 indicates that the left and right channels are completely in phase.
- A value of 0 indicates that the left and right channels are not correlated at all.
- A value of -1 indicates that the left and right channels are completely out of phase.

3.5.2 Analyzer View

(Located at the top left edge of the analyzer)

- Left-Click Cycle through analyzer modes.

The analyzer has 3 different display modes:

- Off: Disables the spectrum analyzer.
- Pre: Displays the incoming signal.
- Post: Displays the outgoing signal.

3.5.3 Analyzer Timing

(Located at the top right of the plugin)

- Left-Click Cycle through analyzer timings.

The analyzer has different timings, allowing to change how fast it rises and falls:

- Slow: Rise time: 850ms, Fall time: 3.4s.
- Med: Rise time: 150ms, Fall time: 600ms.
- Fast: Rise time: 62.5ms, Fall time: 250ms.

3.5.4 Clip-Button

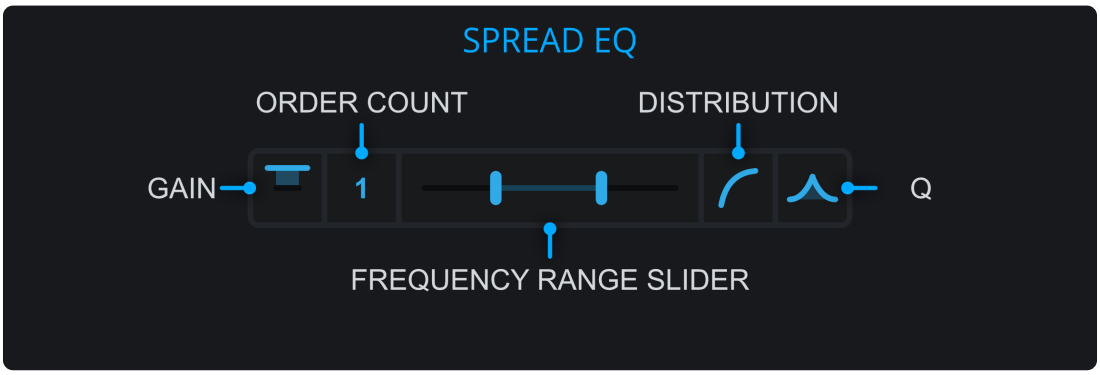
(Located bottom-right of the analyzer)

- Left-Click Toggle Clipper.

Some settings of Caterpillar produce strongly resonant boosts, which can potentially damage speakers or ears. The built-in clipper prevents the output-signal from exceeding the 0dB threshold and becoming too loud.

Tip: The Spread EQ gain and the In gain of the plugin can be used to creatively drive the clipper.

3.6 Spread EQ



The spread EQ applies a series of bell filters to the left and right channels of a track.

Peaks are applied in alternating order with opposing gain on left and right. As an example (4 bells from 100Hz to 200Hz, 3dB Gain):

- First peak (100Hz): left +3dB, right -3dB
- Second peak (133Hz): left -3dB, right +3dB
- Third peak (166Hz): left +3dB, right -3dB
- Fourth peak (200Hz): left -3dB, right +3dB

The volume and phase differences introduced by the spread EQ on the two channels cause a wider stereo image while maintaining mono compatibility.

3.6.0.1 Gain

(Located right of the Spread EQ Widget)

Click and drag to adjust the gain of the bell filters.

3.6.0.2 Filter Count

(Located left of the Spread EQ Widget)

- Left-Click and Drag Up/Down: Adjust Filter Count.

The Filter count determines how many “dual” bell-curves are applied within the frequency range. For each instance, 2 bell-curve filters will be created with opposite gain values where one is placed on the left channel and the other is placed on the right channel.

A value of 0 will disable the Spread EQ. Any odd values will result in the volume of one of the channels being louder than the other. Even counts will keep the volume roughly equal.

3.6.0.3 Frequency Range Slider

(Located central of the Spread EQ Widget)

- Left-Click and Drag Left/Right: Adjust filter placement range.

The Frequency Range slider is a widget divided into 3 components that can each be dragged to change the value:

- Left Handle:: Adjust the lower range for the filter placement.
- Middle Rail:: Move the whole range left/right for the filter placement..
- Right Handle:: Adjust the upper range for the filter placement.

3.6.0.4 Peak Distribution Slider

(Located left-ish of the Spread EQ Widget)

- Left-Click and Drag Left/Right: Adjust filter distribution.

The filter distribution slider allows placing individual bands on a linear and logarithmic scale (or any mix thereof) within the frequency range. As the natural perception of frequencies happens logarithmically, setting the value to 100% logarithmic can result in boosting the harmomic series with a narrow Q value.

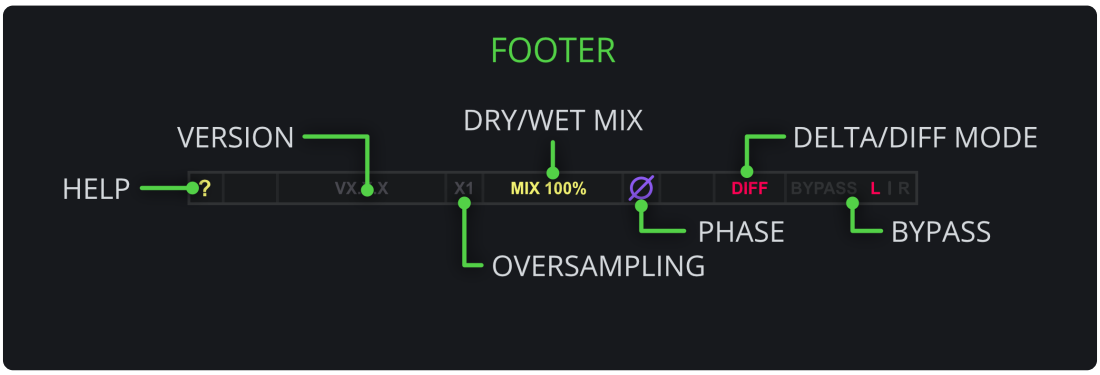
3.6.0.5 Q-Slider

(Located right-ish of the Spread EQ Widget)

- Left-Click and Drag Left/Right: Adjust Q.

Click and drag to adjust the Q value of the bell peaks. Large values apply broad peaks, while small values allow for sharp, resonant peaks.

3.7 Footer



The footer component contains a set of controls that enhance the workflow such as flipping the phase/polarity, switching between Left-Right and Mid-Side processing, enabling delta/diff mode, bypassing the complete plugin or individual channels and finally a global dry/wet mix.

3.7.1 ?-Button

(Located left in the Footer)

- Left-Click: Toggle 'Help' mode.

When enabled, 'Help' mode will display explanations directly within the plugin window when hovering over a widget.

3.7.2 Version

(Located left in the Footer)

Displays the current version of the plugin. If 'Help' mode is enabled via the **?**-button, the explanation will display the exact commit-hash of the plugin.

3.7.3 Oversampling-Slider

(Located left-ish in the Footer)

• Left-Click and Drag Left/Right: Change Oversampling value.

The max oversampling value varies depending on the plugin. A value of **1x** will always indicate no oversampling.

The oversampling process includes filters aimed at removing upsampling artifacts as well as removing useless frequency content introduced by the oversampling process. For this purpose, Darkpalace Studio plugins use FIR filters for oversampling.

Increasing oversampling will introduce additional delay and increases processing requirements. The delay is reported to the host to be automatically compensated for by most modern DAWs.

> Please note that a change in oversampling can result in short audio-dropouts. It is not adviced to automate this control.

3.7.4 Mix-Slider

(Located center of the Footer)

• Left-Click and Drag Left/Right: Change Mix value.

The Mix slider allows for blending between an unprocessed (dry) and fully processed (wet) signal, allowing for parallel processing behaviour.

3.7.5 Phase-Button

(Located right of the Mix slider)

• Left-Click: Cycle through Phase modes.

All Darkpalace Studio plugins support 3 different phase modes for processing:

- No-Phase: Leave signal as is, no change.
- Pre-Phase: Inverts the polarity at the input stage, before processing.
- Post-Phase: Invert the polarity at the output statge, after the mix.

The different phase options allow creating interesting results when mixing the processed signal with the dry signal or using the **DIFF** option.

3.7.6 Diff-Button

(Located right in the Footer)

- Left-Click: Toggle Difference/Delta mode.

When enabled, the plugin will not output the processed signal, but instead the difference between the unprocessed and processed signal, effectively providing the difference (or delta) of the processing.

> Note that **DIFF** is applied *before* the **MIX** slider. This allows to blend the delta-signal with the dry signal for additional parallel processing options.

3.7.7 Bypass-Button

(located right in the Footer)

- Left-Click: Toggle Bypass.

When Bypass mode is enabled, the input signal is directly routed to the output, bypassing the entire signal processing chain. Additionally, the plugin will also turn grayscale indicating its state.

> Note that internal oversampling and process mode conversion will still be performed, even if bypass is enabled.

Most DAWs offer the option to bypass a plugin. However, this will also bypass oversampling, potentially resulting in clicks. The internal bypass avoids these issues.

3.7.7.1 Individual Channel Bypass

(located right in the Footer)

- Left-Click: Toggle Bypass on an individual Channel.

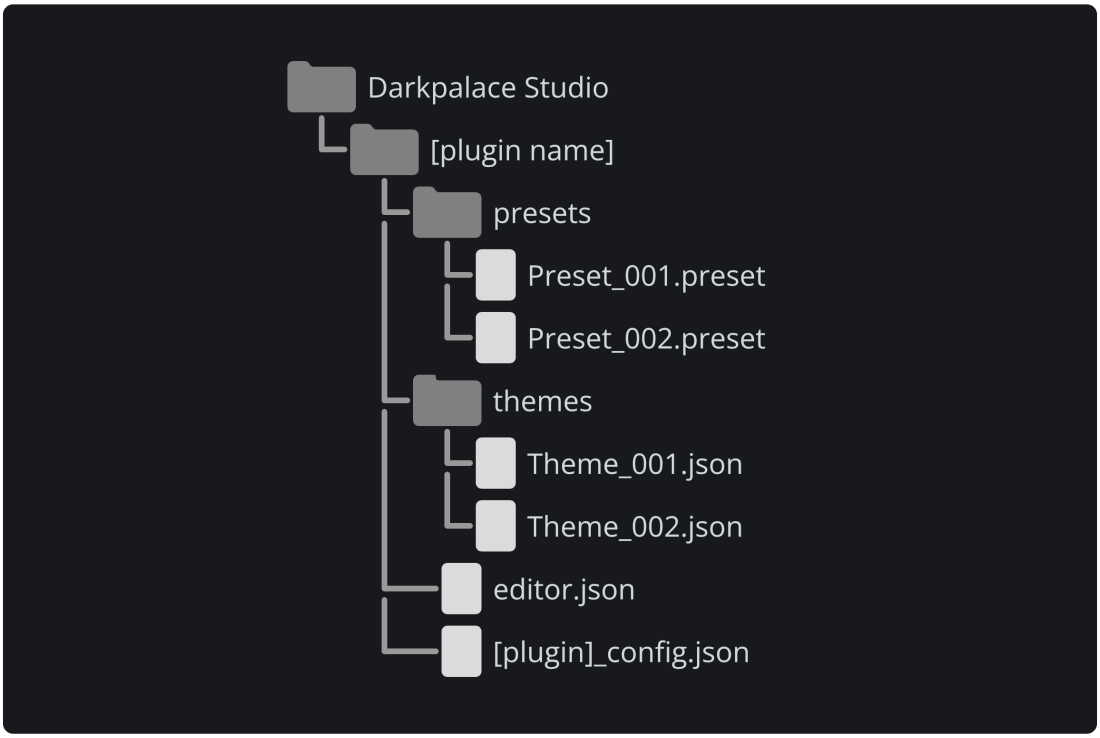
This allows to bypass an individual channel, based on the Processing Mode. Thus it is possible to bypass none, one or both of L/R or M/S channels, giving plenty of options, e.g. just processing the Mid channel. Additionally, the bypassed channel will be highlighted, indicating its state.

4.0 Examples and Tricks

Note that Caterpillar stereo modifications are fully mono-compatible.

- Enhance the perceived stereo width by using a low number of broad bells and 3dB–6dB of gain.
- Create formant like filters by applying a mid to high number of very steep bell peaks.
- Use automation to increase the gain and frequency range to create never-heard transitions between parts in a song.

5.0 Configuration



5.1 Configuration files

All Darkpalace Studio plugins are highly customizable by changing settings via the json configuration files. This includes changing some additional settings as well as creating custom themes.

As mentioned back in 2, the files are required to be in specific locations depending on your operating system:

- **Win**: C:\Users\Public\Documents\Darkpalace Studio\[pluginName]\
- **Mac**: /Users/Shared/Darkpalace Studio/[pluginName]/
- **Linux**: ~/.config/Darkpalace Studio/[pluginName]/

The original json files can be found in the zip file and easily edited with a standard text editor. If you encounter any issues with editing json files, you can visit jsonlint.com for validation.

5.1.1 [PluginName]_config.json

The name of this file is usually *plugin dependant*. e.g. you are browsing the files for Sloth, this would mean the file would be called sloth_config.json.

On top of that, this file contains plugin-specific settings which can be changed to alter the functionality of the plugin. e.g. you would like to change the frequency scaling in a plugin from exponentially to linearly. You can achieve this by changing the following settings in the respective plugin:

- Change the value of “exponential” to false
- Change the value for “frequency_skew” to 1.0

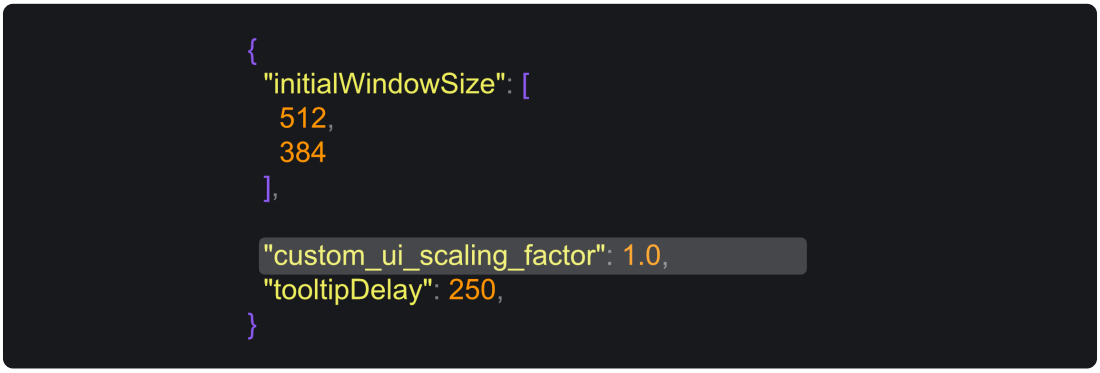
> If no json file is found or if the json is invalid (e.g. a typo or a missing entry), the plugin will use default settings.

5.1.2 editor_config.json

Stores the last used window-size as well as the currently selected theme

> If no json file is found or if the json is invalid (e.g. a typo or a missing entry), the plugin will use default settings.

5.1.3 Fix for broken UI Scaling on Windows



Windows is known to not always be consistent, this including letting applications know of the ui-scaling factor it uses. Because of this the GUI of Darkpalace Studio plugins can often look out of proportions. In order to address this you will have to change a value in the json file of the theme you are using.

The themes folder should be located in the data:

- **Win**: C:\Users\Public\Documents\Darkpalace Studio\[pluginName]\themes\
- **Mac**: /Users/Shared/Darkpalace Studio/[pluginName]/themes/
- **Linux**: ~/.config/Darkpalace Studio/[pluginName]/themes/

After this open the respective JSON file for the current theme and look for the value custom_ui_scaling_factor key which should be located at the top of the file.

Once you've found this, change is to a decimal value representing your display-scaling value. e.g. If your display-scaling is set to 125% in windows, change the value of custom_ui_scaling_factor to 1.25.

5.2 Presets

Presets are xml files that can easily be shared and edited. They are stored in the following folder:

- **Win**: C:\Users\Public\Documents\Darkpalace Studio\[plugin_name]\presets
- **Mac**: /Users/Shared/Darkpalace Studio/[plugin_name]/presets
- **Linux**: ~/.config/Darkpalace Studio/[plugin_name]/presets

Another option is to click the **Save Preset** button in the menu. This will open the system dialog that will directly show you the folder where presets are stored.

5.3 Themes

5.3.1 How to switch themes

In the plugin, click on the menu button (the three lines) in the top left corner. In the left half of the display, select **THEMES**. Then select the themes on the right side.

If no themes are listed, make sure the theme files are installed in the correct folder.

5.3.2 Themes folder location

Theme files can be found in the following folder:

- **Win**: C:\Users\Public\Documents\Darkpalace Studio\sloth\themes
- **Mac**: /Users/Shared/Darkpalace Studio/sloth/themes
- **Linux**: ~/.config/Darkpalace Studio/sloth/themes

5.4 Preset and Theme versions

Presets and themes have specific versions. While we strive to make compatibility with new versions of the plugin the top priority, this can not always be ensured.

If a preset or theme is crossed out in the list, it means that it has an old version and needs to be updated. Please refer to the last section of this manual (Release Notes) to check changes that need to be adapted to.

6.0 Release Notes

6.1 v1.0.0

Initial release