Sloth Manual

Version 1.2.1

1.0 Introduction

Sloth brings the concept of slew rate limiting to the digital domain. In electronics “slew rate” is the change of voltage over time. When the input signal at an amplifier switches instantly, the output will not immediately change, but “slew” to the new value at a certain rate.

Applying slew rate limiting can result in a variety of effects, including denser signals, subtle darkening of the tone, enhanced texture of sounds, creative transient shaping, fuzz-sounds up to massively crushed effects.

2.0 Installation

> For Windows and macOS an installer is available

2.1 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

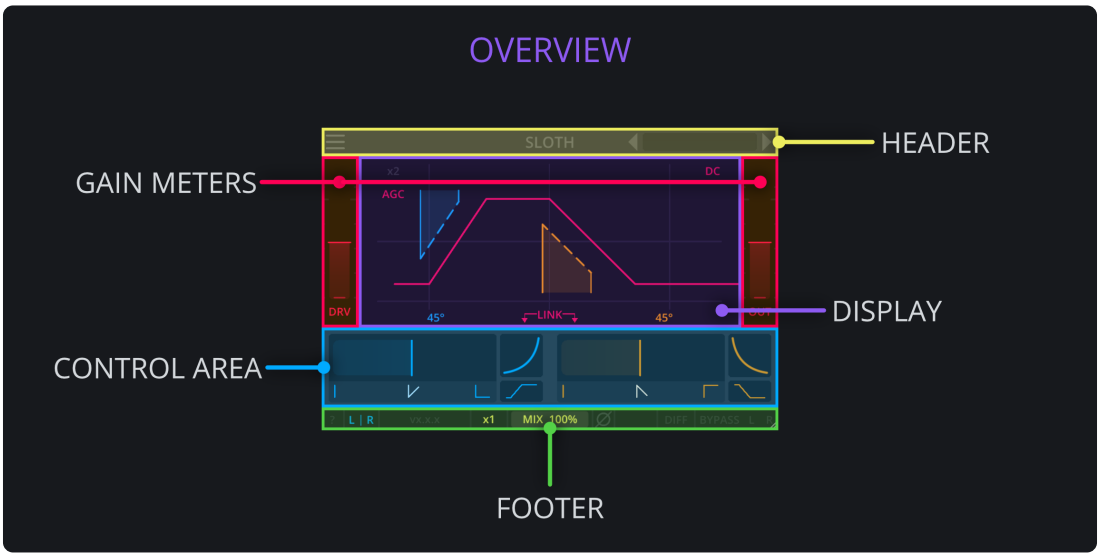
As for the themes and presets from the ZIP archive, please extract them to the following locations:

- **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 interactio 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.

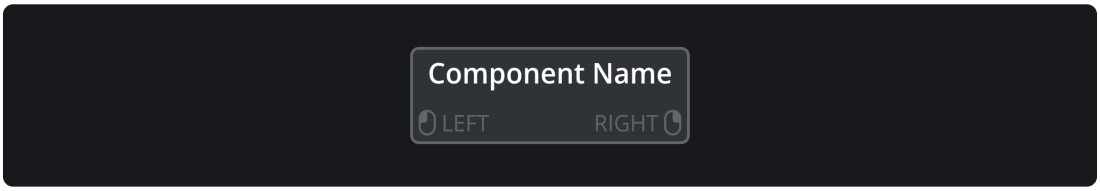
3.1.3 Visual Feedback

A lot of the widgets within our plugins are designed to provide visual feedback to indicate a change is occuring. Additionally this is aided by the toolip 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 hovering over any of the widgets, a tooltip will show up containing the name of the widget. Additionally, the tooltip will also display if a widget has a special interaction associated with it, e.g. a dedicated right mouse button interaction. This is indicated by a Left and Right Mouse-Button Icon as well as the name of the 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)

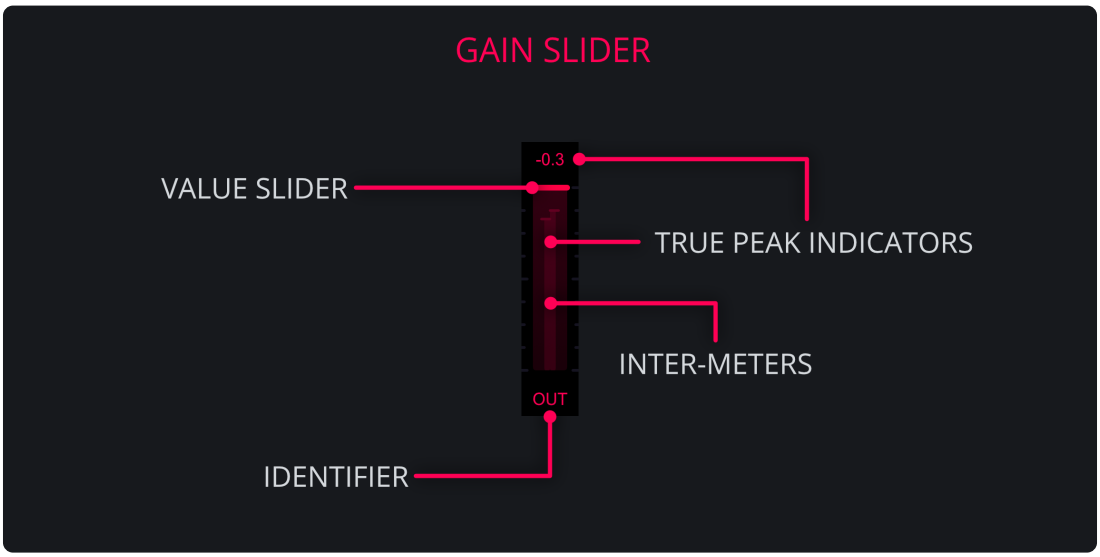
- Left-Click: Opens the menu.

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.

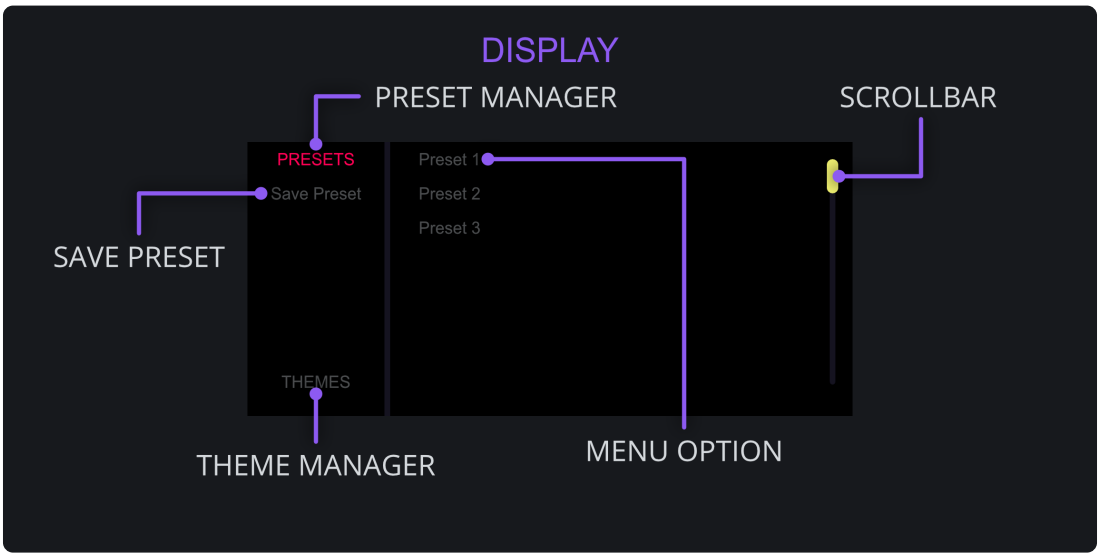
3.3.3 True-Peak Indicators

(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.

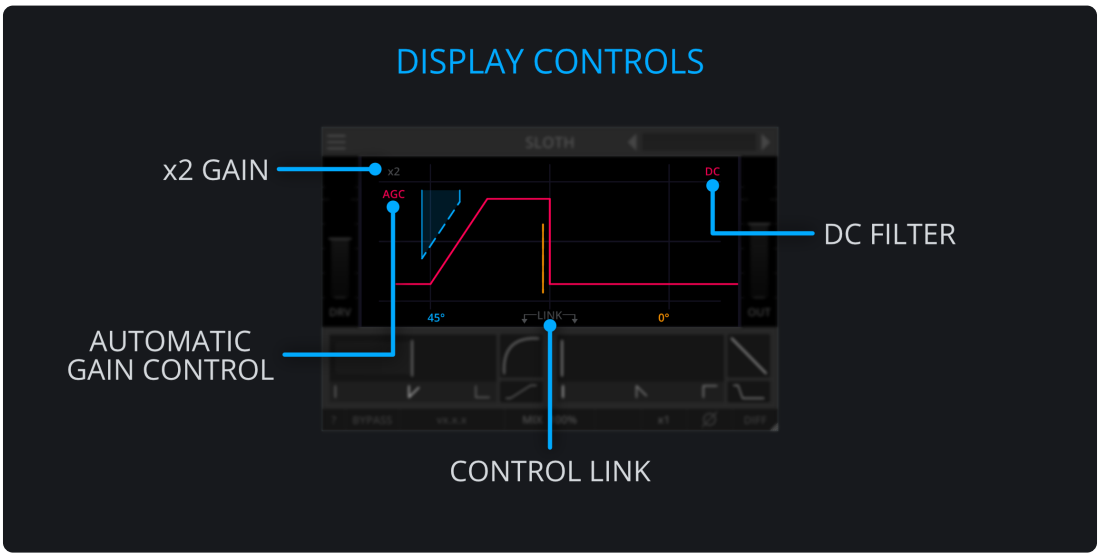
3.4.4 Menu Options

(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 x2

(Located top-left of the Display)

- Left-Click: Toggle X2 mode.

When enabled, the input signal is doubled in volume causing slopes to become steeper and as a result makes the Slew-Limiting process more aggressive.

> The increase in volume will be compensated for, independently of AGC.

3.5.2 AGC

(Located top-left of the Display)

- Left-Click: Toggle AGC.

Automatic **G**ain **C**ompensation will attempt to compensate for any change in input-gain to keep things as balanced as possible. Additionally, the In-Gain-Meter will change its state to DRIVE allowing the signal to be pushed louder into the Slew-algorithm resulting in more aggressive Slew-Rate-Limiting. This means the In-Gain-Meter on the left of the display has additional functionality:

- AGC Enabled: The widget controls the DRIVE.
- AGC Disabled: The widget controls the input signal.

> AGC will not take output gain or any change in volume from the Slew-Rate-Limiting into account. This means the output can actually have a lower volume which can be compensated for with the Out-Gain-Meter

3.5.3 DC-Button

(Located top-right of the Display)

- Left-Click: Toggle a 10Hz DC-Filter.

When enabled a 10Hz first-order high-pass-filter will be applied to the output signal to account for any DC-Offsets which might be introduced by the Slew-Rate-Limiting Algorithm.

Generally the asymmetric Slew-Rate-Limiting (Meaning different values for Rise and Fall) results in a DC offset at the output state. This can be understood by the fact that asymmetric Slew-Rate-limiting will “reduce” e.g. any rising slopes, while leaving falling slopes untouched. Effectively this leads to a shift of the complete waveform to negative values which can be solved by using a High-Pass-Filter.

> Adding a high-pass-filter will also increase some phase rotation at low frequencies.

3.5.4 Link

(Located bottom-center of the Display)

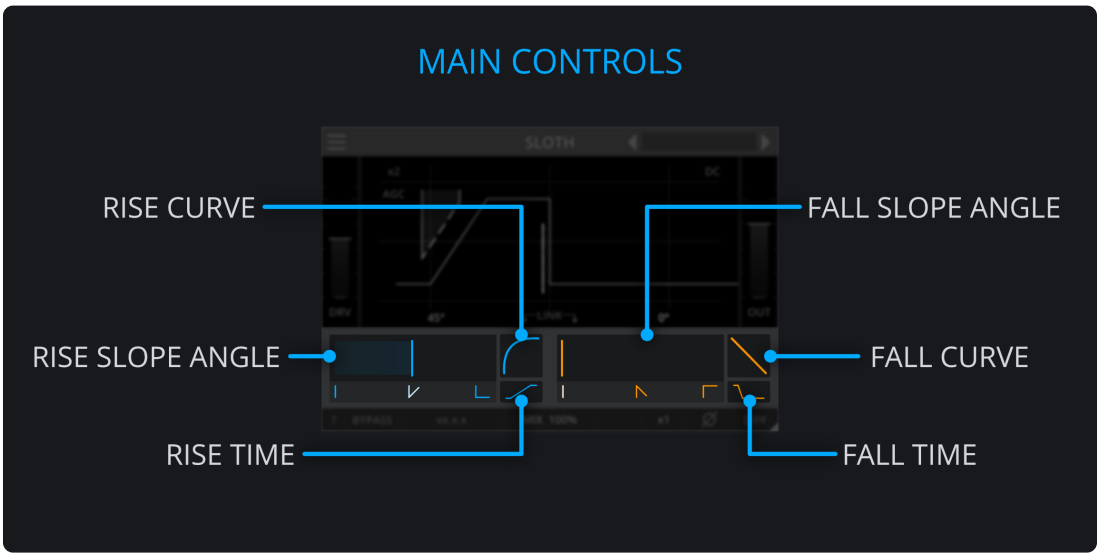
- Left-Click: Toggle Control Linking.

When enabled, the Slew-Widgets (Slew-Rate, Slew-Curve and Slew-Time) are adjusted for in tandem. This provides easy access to symmetric Slew-Rate-Limiting where rising and falling slopes are treated similarly.

Please note that this will only affect changes made via the interface and not automation. If automation is used to change any of the parameters when linking is enabled, only the automated parameter will change whereas the other counterpart will remain unaffected.

This is to done avoid potentially conflicting input from different automation tracks.

3.6 Main Controls



> The fall and rise controls are basically the same so the following information will apply to both of them.

3.6.1 Slew Slope Angle

(Located on the left side of a slew group)

- Left-Click and Drag Left/Right: Adjust angle of the Slew-Rate.

The Slew-Rate/angle applied to the incoming signals with higher values resulting in shallower Slew-Rate. If the slope of the input signal is steeper than the Slew-angle, the output signal will be Slew-rate-limited.

3.6.2 Slew-Curve

(Located on the upper-right side of a slew group)

- Left-Click and Drag Up/Down: Adjust slope curvature,

Based on the position, the values will blend between:

- Square-Root: Towards a value of 1.0.
- Linear: Around value of 0.0.
- Quadratic: Towards as value of -1.0.

This can have an effect on brightening or darkening a sound and is a great option for shaping transients as well.

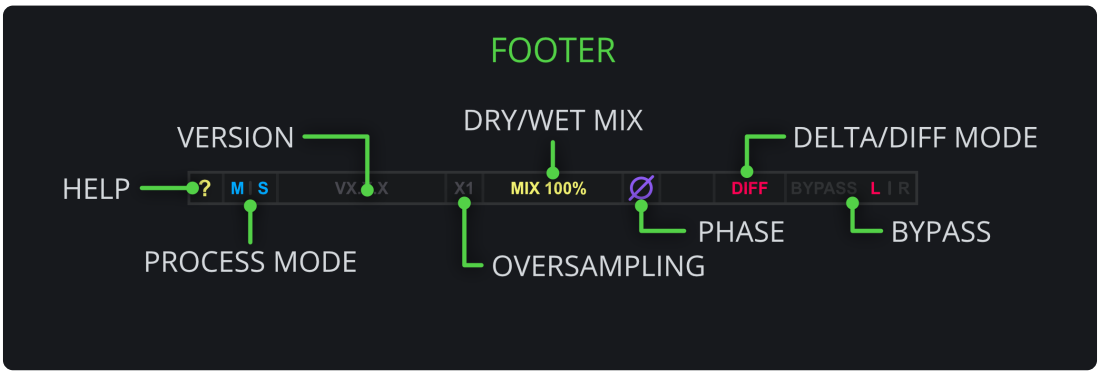
3.6.3 Slew-Time

(Located on the lower-right side of a slew group)

- Left-Click and Drag Left/Right: Adjust Slew-Time.

Slew-Time controls how fast the behaviour of the Slew-Curve is applied with higher values resulting in a faster transition through the selected Slew-curve. This will only have an effect when the Slew-curve setting is non-zero.

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

3.7.2 Process Mode Button

(Located left in the Footer)

- Left-Click: Toggle Processing Mode.

The plugin can operate in both Left/Right and Mid/Side processing modes. Conversion to the respective mode is done before any processing is applied. Likewise, conversion back to the original channel configuration is performed at the end of the processing chain. Aditionally, the mode will also effect the single-channel bypass options.

3.7.3 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.

3.7.4 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 advices to automate this control.

3.7.5 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.

3.7.6 Phase-Button

(Located right of the Mix slider)

- Left-Click: Cycle thruogh Phase modes.

All Darkpalace Studio plugin 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: Inverst the polarity at the output statge, after the mix.

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

3.7.7 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.

3.7.8 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 grey-scale 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 this issues.

3.7.8.1 Individual Channel Bypass

(located right in the Footer)

- Left-Click: Toggle Bypass 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

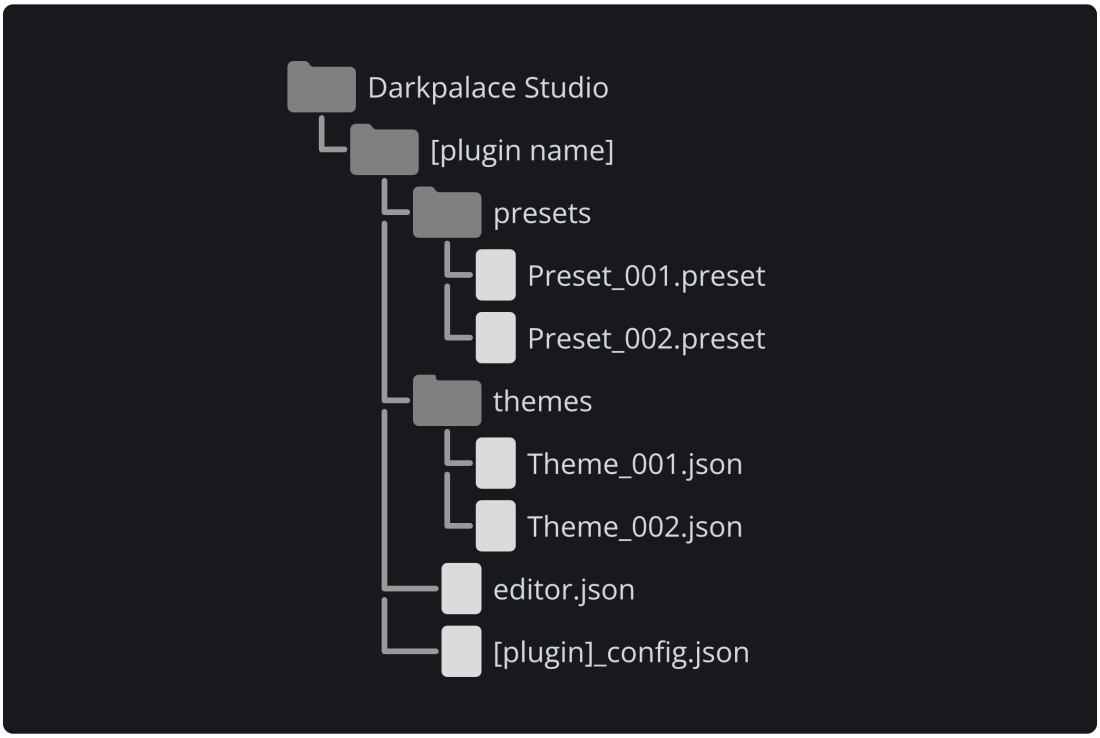
- The audible effect of slew rate limiting varies drastically between symmetric slew rate limiting (same slew rate for rise and fall) and asymmetric slew rate limiting (different slew rates for rise and fall).

- Try applying hard slew rate settings and then dialing back the **MIX** slider until the desired blend between processed and unprocessed signal is achieved.

- Sloth can be used as a transient shaper. By engaging the **DIFF** button you can listen to how Sloth modifies the signal. Naturally transients have the steepest slopes, so they are heavily affected by slew rate Limiting. Mixing the diffed signal allows for parallel transient processing.

- The selected first order high-pass-filter introduces a phase shift. The option of a linear phase filter would avoid the phase shift. However, linear phase filters introduce pre-ringing and other issues, which are often sounding way worse than the shift in phase itself. Please check carefully for any phasing issues introduced by the filter. Often they can be mitigated by flipping the phase via the **PHASE** button.

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

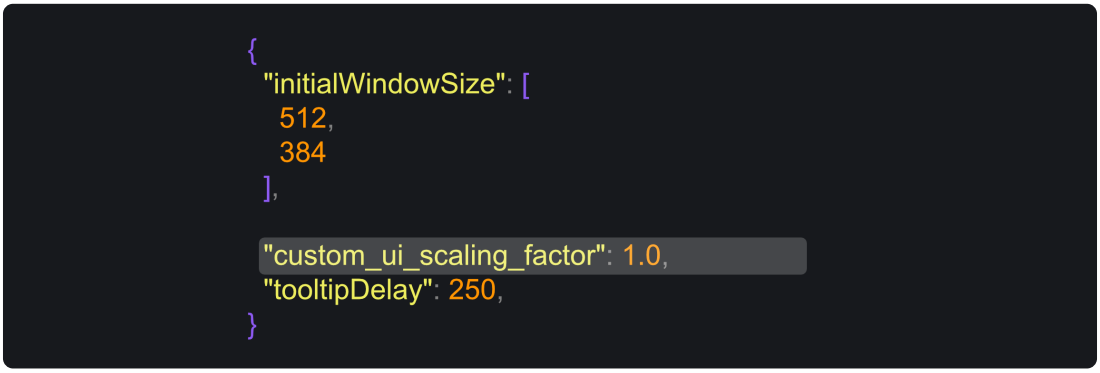
> If no json file is found or if the json is invalid (e.g. a typo or a missing entry), the plugin will use default settings.

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 v1.2.1

- Implement sample-accurate parameter smoothing
- Improve tooltips and explanations display
  - theme jsons contain new key tooltipBorder
  - remove explanationBackground and explanationText
- Add LV2 plugin for windows and linux
- Build Linux plugin on ubuntu 22 to support more devices
- Update to juce 8.0.6
- Remove red flash on clap plugin startup

6.2 v1.2.0

- Update to juce 8.0.3
- Add MS Processing options in footer
- Add individual-channel-bypass in footer
- Introduce versioning for themes and presets
- Switch to high precision filter
- Improve UI behaviour
- Improve gain slider peak display shader

6.3 v1.1.3

- Update to juce 8.0.2+ (with opengl bugfix)
- Rename plugins to start with an uppercase character
- Improve plugin startup time by removing unused shaders
- Improve graphics performance by consistently using opengl 4.1

6.4 v1.1.2

- Introduce Option to apply phase before or after processing. This might require manually setting the phase for existing plugin instances in case they had phase flipped.
- Improve UI: Fix incorrect color for the footer when disabled
- Have macOS version codesigned
- Improve plugin startup time by avoiding unnecessary theme load

6.5 v1.1.1

- Apply adjustments to themes to match upcoming plugin release
- Improve UX: Menu closes when any of the controls are used

6.6 v1.1.0

- Add peak display for In and Out Gain
- Add support for themes
- Update to juce 8.0.1

6.7 v1.0.4

- Fix broken UI on macOS, caused by gradient in tooltip
- Fix crash on some systems when changing oversampling
- Implement short mute on change of oversampling to avoid audible cracks
- UI improvement: Highlight effect on all UI elements is now time dependent
- Use latest filter_lib which has improved error checking

6.8 v1.0.3

- Update to latest juce version, which fixes issue with UI Scaling on some systems. If you have previously set custom_ui_scaling_factor in sloth_ui.json and your UI looks broken after this update, reset the value to 1.0
- Output gain affects only the wet signal
- Small UI improvements: add a gradient on tooltips, slightly tweaked colors

6.9 v1.0.2

- Add custom_ui_scaling_factor in sloth_ui.json to allow for correcting inconsistently reported display scaling
- Fix Windows installer

6.10 v1.0.1

- Fix crash on some systems when rapidly changing oversampling
- Include vst3 in linux release