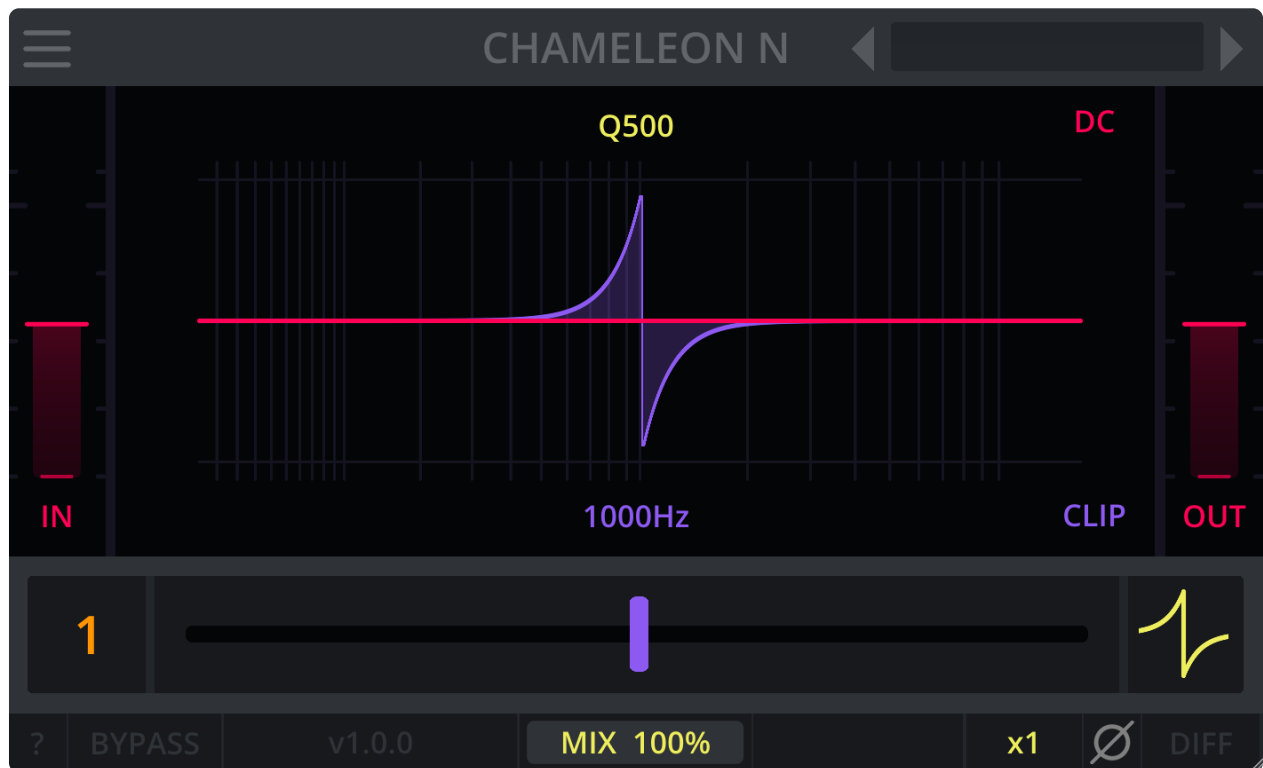


Chameleon Suite Manual



Version 1.1.2

1.0 Introduction

The Chameleon Suite is a comprehensive collection of audio-plugins based on the concept of allpass filters that will unlock and empower you with creative flexibility and precision for your audio projects.

The suite offers the following plugins:

- **Chameleon 1**: First order allpass filter with frequency control
- **Chameleon 2**: Second order allpass filter with frequency and q controls
- **Chameleon N**: Nth 2nd order allpass filter with frequency, q and order controls
- **Chameleon X**: Artfully stacking X allpass filters for full creative freedom

1.1 Allpass filters

Allpass filters are one of the most fundamental building-blocks in the world of signal processing, and while they are not as popular or well-known as other types of filters, they play a crucial role when it comes to shaping sound and can be used to create almost all other filter types.

In general, an allpass filter is characterized by the fact that they pass through all frequencies without a change in level. This means that by themselves it is unable to shape frequencies one would normally do with a bell-, shelf-, notch- or any other type of filter.

They do, however, introduce a phase shift which can be used for other creative purposes. As the phase shift is frequency dependant, you can think of this as a frequency-dependant delay. Whereas standard delays delay the complete signal, an allpass filter delays different frequencies by different amounts of time

1.2 Chameleon Plugins

Chameleon 1 and Chameleon2 are your bread and butter allpass-filters. By mixing, adding and/or subtracting the processed signal from the dry signal they can create low-, notch-, high- and bandpass-filters, See section 4 for further details.

Chameleon N stacks multiple 2nd order allpass filters at the same frequency, resulting in a Nth order allpass filter that allows for wild processing as the phase rotation quickly sums up.

Finally, Chameleon X distributes multiple 2nd order allpass filters around a central frequency with additional controls for the placement of the filters to allow for frequency dependant delays, dispersed sounds, pitch-shifting and far more!

2.0 Installation

For Windows and macOS an installer is also available

2.1 Manual installation

In order to install the Chameleon Suite, a manual approach is required. After downloading the ZIP 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

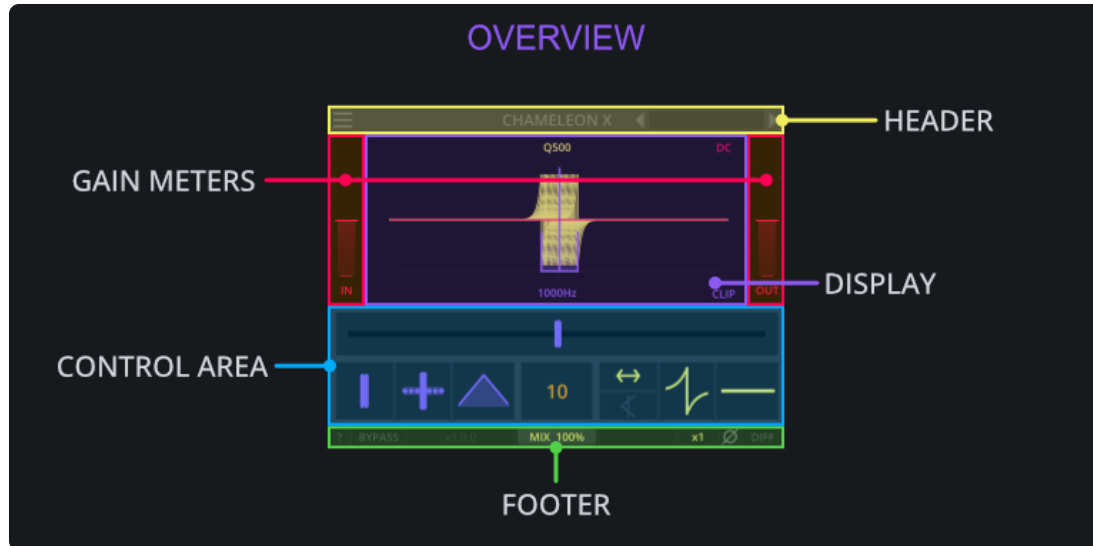
As for the themes and presets from the ZIP archive, please extract them to the following locations:

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

If you would like to know more, please refer to section 5 for more information on installation of presets, themes and configuration files.

3.0 Controls

3.1 Darkpalace Studio Plugins Overview



All Darkpalace Studio plugins share common UI elements as well as general interactions with the majority of widgets. Shared components include:

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

Whereas shared interactions include:

- Double-Clicking on a widget to reset it to its default value.
- Holding SHIFT or CTRL while dragging a widget to allow for precise adjustments.
- Using the mouse-wheel to adjust a widget in incremental steps.
- Hovering over a widget for a short time shows a tooltip.
- Changing the value of any widget makes a tooltip show the current value.
- Pressing the ? button (*located bottom-left*) will turn on explanations.
- The plugin can be scaled by dragging any of the sides or corners.

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)

Click to open the menu to browse presets and themes.

3.2.2 Previous-Preset-Button

(Located center-right of the Header)

Click to cycle through presets in reverse order.

3.2.3 Current-Preset-Button

(Located right of the Header)

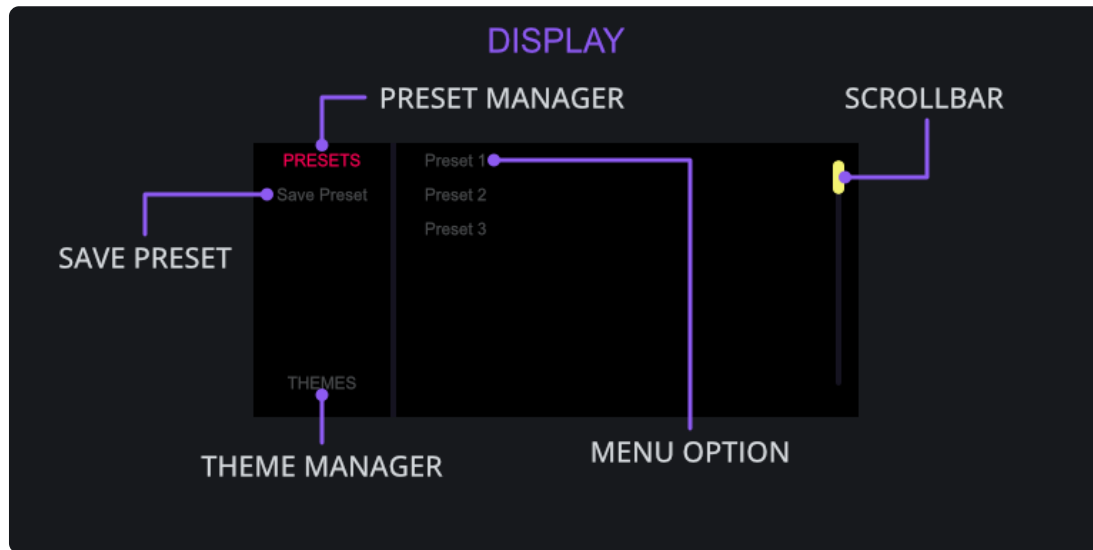
Displays the name of the currently selected preset. Click to open up the menu.

3.2.4 Next-Preset-Button

(Located right of the Header)

Click to cycle through presets in forward order.

3.3 Display/Menu



Shared across all Darkpalace Studio plugins, The display component contains the preset-manager and theme-manager windows that allow you to browse the various presets and themes available. Feel free to explore the presets and themes to get a taste for creative opportunities!

3.3.1 Preset-Manager-Button

(Located top-left of the Display)

Click to switch to the preset-manager mode, will display a list of available presets.

3.3.2 Save-Preset-Button

(Located top-left of the Display)

Click to save a preset, make sure the preset-manager is active by having PRESET in the top-left of the display highlighted. Clicking this will open up File-Dialogue where you will be prompted for a name and location.

3.3.3 Theme-Manager-Button

(Located bottom-left of the Display)

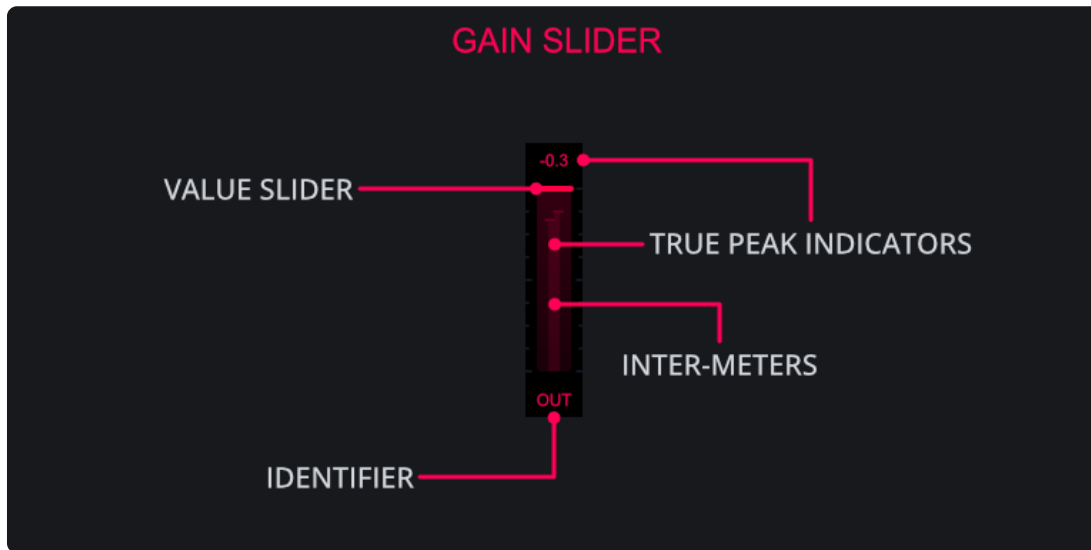
Click to switch to the theme-manager mode, will display a list of available themes.

3.3.4 Menu Options

(Located right side of the Display)

Will display 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 can be used as well as the mouse-wheel to view more options.

3.4 Gain Meter (Input/Output)



Shared across all Darkpalace Studio plugins, 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.

3.4.1 Identifier

(Located top of the Meter)

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

3.4.1.1 In

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 and can thus be used to drive the clipper.

3.4.1.2 Out

The **OUT** gain slider controls the volume coming out of the plugin with a range of -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 clipping the signal.

3.4.2 Value-Slider

(Located bottom of the Meter)

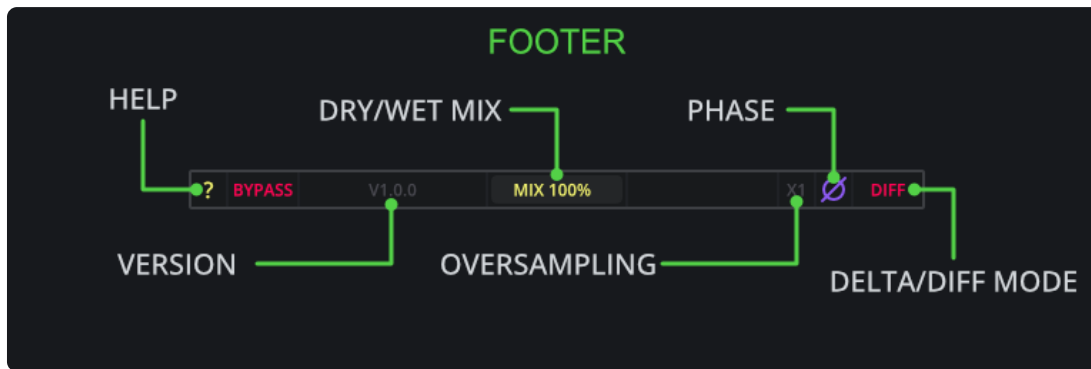
Click and drag to change the value of the slider. A label will show up with the current value.

3.4.3 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.

3.5 Footer



Shared across all Darkpalace Studio plugins, the footer component contains a set of controls that enhance the workflow such as flipping the phase/polarity, enabling delta/diff mode and even a global dry/wet mix.

3.5.1 ?-Button

(Located Left of the Footer)

Click to activate 'Help' mode which will display explanations directly within the plugin window when hovering over a control.

3.5.2 Bypass-Button

(Located Left of the Footer)

Click to enable bypass mode which will directly route the input signal to the output signal and completely bypassing the plugin. Most of the UI will also become grey-scale indicating its state.

3.5.3 Version

(Located Left-ish of the Footer)

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

3.5.4 Mix-Slider

(Located center of the Footer)

Click and drag to blend continuously between the processed and unprocessed signal allowing for parallel-processing behavior.

3.5.5 Oversampling-Slider

(Located right of the Footer)

Click and drag to change oversampling up to 1x, 2x and 4x which can often help by optimizing and/or reducing distortion characteristics.

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, the Chameleon Plugins uses FIR filters for oversampling.

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

While allpass filters generally do not benefit from an increased sampling rate, some of the plugins in the Chameleon Suite offer a clipping option due to drastic changes being able to introduce increased signal dynamics. Oversampling can have a positive impact to preset said anomalies.

As allpass filters are mostly only concerned about the phase relationship of the signal, be aware that enabling oversampling can and will introduce additional phase shift in the higher frequency range due to the filter used when up- and down-sampling.

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

3.5.6 Phase-Button

(Located right of the Footer)

Click to cycle through 3 different phase states:

- No-Phase, which leaves the signal as is.
- Pre-Phase, which inverts the polarity at the input stage, before processing.
- Post-Phase, which flips the phase at the output of the plugin, after MIX.

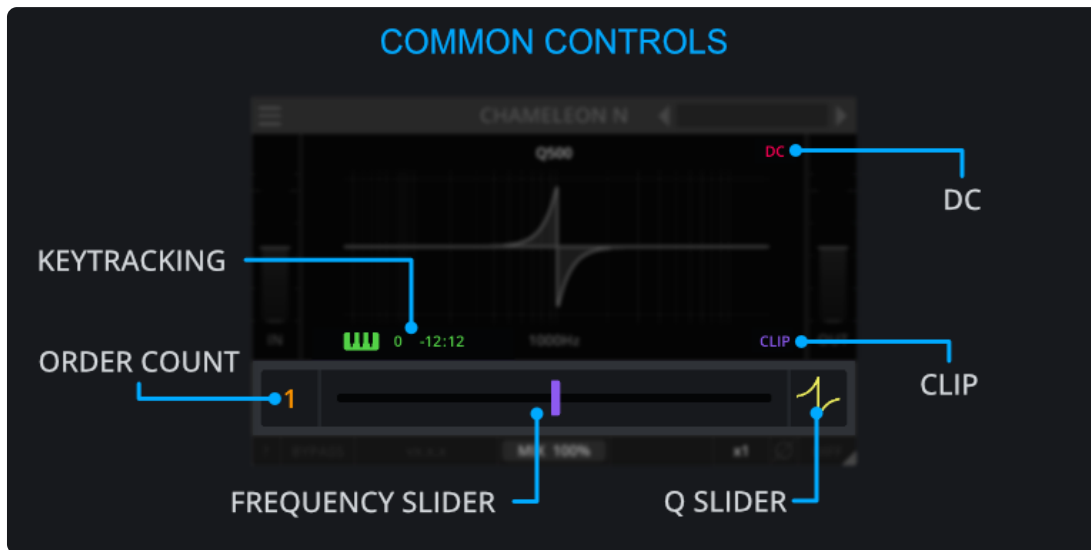
3.5.7 Diff-Button

(Located right of the Footer)

Click to enable 'Diff' mode which will output the Difference/Delta in signal between the input and output.

Note that **DIFF** is applied before the **MIX** slider.

3.6 Common Controls



Shared primarily across the Chameleon Suite plugins are a set of controls including:

- DC Button
- Keytracking Controls
- CLIP Button
- Order Count
- Frequency Slider
- Q Slider

3.6.1 DC-Button (N, X)

(Located top-right of the Display)

Applies a 10Hz first order high-pass-filter to the output to account for any DC-Offset which might be introduced by the plugin.

Generally the frequency response of allpass filters is flat. However, automating the parameters of multiple allpass filters can often introduce some significant changes causing dc offset that can potentially damage your speakers and headphones.

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

3.6.2 CLIP (N, X)

(Located bottom-right of the Display)

Click to cycle through 3 stages of clipping:

- No-Clip, which leaves the signal as is.
- Output-Clip, which will hard-clip the output signal.
- Per-Filter-Clip, which will clip the signal per-filter-instance.

3.6.2.1 No Clip

No clipping is applied in this mode.

3.6.2.2 Output Clip

Clips the output at 0db

3.6.2.3 Per-Filter Clip

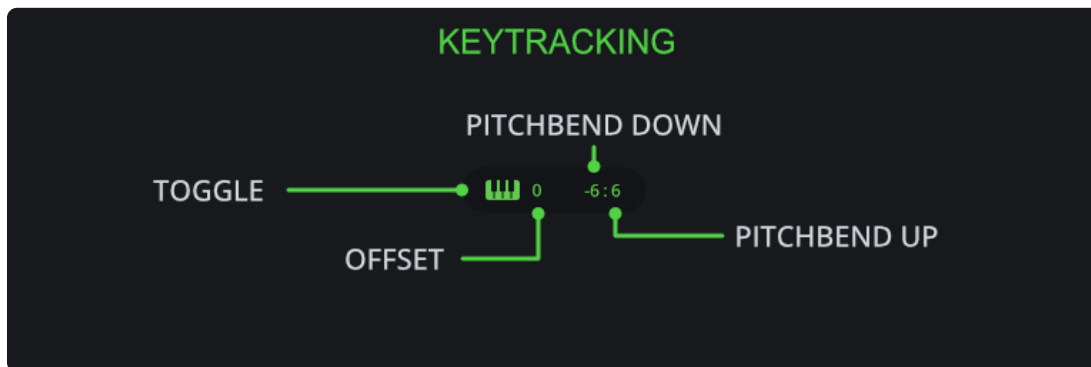
Clips after each allpass filter and at the output. Each allpass filter stage alters the sound in a tiny bit, resulting in tiny differences in the waveform.

This is a great option for sound design work as it offers some unique sounds.

Modulating any of the parameters can introduce strong resonant peaks, and potentially self-oscillating filters. Those can cause a massive energy buildup, which can potentially damage your speakers, headphones and ears. Clipping the output to a maximum of 0dB offers some protection for such measures.

3.6.3 Keytracking (1, 2, N, X)

(Located bottom left of the Display)



Click to toggle Keytracking. When enabled, the frequency slider will snap to the frequency of the incoming midi data, including pitch-bend CC.

3.6.3.1 Keytrack-Note offset (1, 2, N, X)

(Located bottom left of the Display)

Click and drag to internally offset the incoming midi notes by semitones to a range of -24 to +24.

Whilst this is purely the offset in semitones, via the plugin parameters available in your DAW you can also set an additional linear frequency offset which is currently not available via the UI.

3.6.3.2 Pitchbend Range (up and down) (1, 2, N, X)

(Located bottom left of the Display)

Click and drag to change the pitchbend range for up and down. There is no general range for pitchbend which is why we offer the option to set a custom range of -36 to 0 for down and +36 to 0 for up.

3.6.4 Frequency

(Located in the center of the Control-Area)

Click and drag to change the center frequency of the allpass filter(s).

- Chameleon 1 (first-order allpass filter) this corresponds to the frequency that has the steepest change in phase rotation.
- Chameleon 2 and N (second-order allpass filters) this corresponds to the frequency that has the maximum amount of phase rotation.
- Chameleon X this is the frequency of the central frequency. More allpass filters are added based on the other parameters of the plugin

Note that the plugin configuration offers the option to select between linear or exponential frequency control. See section 5 for detailed instructions.

3.6.5 Q (2, N, X)

(Located right of the Control-Area)

Click and drag to adjust the Q value of the filter. Changing this will adjust the bandwidth where a narrow bandwidth affects only a small range of frequencies, and a large bandwidth affects a large range of frequencies.

In an allpass filter the Q value determines the range over which the phase rotation happens. This allows to confine the space rotation to a very small area or to spread it out over the full spectrum. As the absolute change of phase rotation is fixed, the q control effectively adjusts the steepness of the phase change.

3.6.6 Order (N, X)

(Chameleon N: Located left of the Control-Area.)

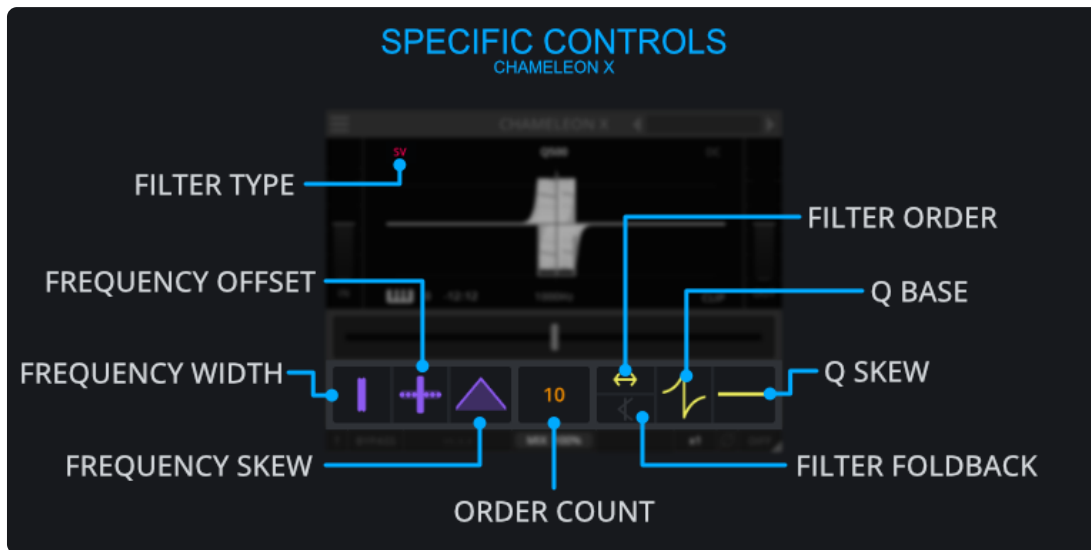
(Chameleon X: Located center of the Control-Area.)

Click and drag to change the amount of filters being stacked.

Both Chameleon N and Chameleon X come with the addition of the **Order** Control that allows you to stack multiple allpass filters upon each-other. Stacking multiple allpass filters increases the phase rotation and overall delay usually resulting in dispersed sounds.

In Chameleon N all the filters are stacked onto a central frequency whereas in Chameleon X additional distribution controls are available.

3.7 Chameleon X Specific Controls



3.7.1 Filter Type

(Located top-left of the Display)

Click to change type of allpass filter. This allows you to swap between currently 2 different implementations:

- Generic
- State-Variable

3.7.1.1 Generic

The generic filter type is suited for static placement of the controls. It allows for a wide range of q values and can be used to create strongly ringing, almost self-oscillating sounds. So called 'zipper-noises' might occur when controls are automated.

3.7.1.2 State-Variable

The state-variable filter type is designed for allowing modulation of the controls. It allows 'dynamic' placement of the controls. The state-variable filter won't introduce 'zipper-noises' but offers a more limited range of q values.

3.7.2 Frequency Width

(Located left of the Control-Area)

Click and drag to change the total width over which the filters are spread out.

3.7.3 Frequency Offset

(Located left of the Control-Area)

Click and drag to offset the placement of the filters relative to the center frequency.

At the zero position the allpass filters are distributed around the central frequency, while smaller and larger values will move the frequency distribution to lower and higher frequencies respectively.

3.7.4 Frequency Skew

(Located center-right of the Control-Area)

Click and drag to change the placement of the filters relative to the distribution width.

- Values smaller than zero will “pinch” the filter towards the center frequency.
- Value of 0 will distribute the filters equally linearly.
- Values higher than zero will “bloat” the filters away from the center frequency.

3.7.5 Filter Sorting

(Located Center-Right of the Control-Area)

Click to change the order in which the filters are placed based:

- Ascending (right arrow), places them from lower to higher frequencies.
- Descending (left arrow), places them from higher to lower frequencies.
- Interleaved (left and right arrow), places them from the center outwards.

3.7.6 Filter Foldback

(Located center-right of the Control-Area)

Click to enable foldback of filters that go outside the audible range.

- A filter that would sit at 10Hz (5Hz below the lowest allowed frequency) will be moved to 20 Hz (5Hz above the lowest allowed frequency).
- A filter that would sit at 22kHz (2kHz above the highest allowed frequency) will be moved to 18 kHz (2kHz below the highest allowed frequency).

When disengaged, filters will stack at the limits of the allowed frequency range.

3.7.7 Q Skew

(Located center-right of the Control-Area)

Click and drag to change the Q values of the filters dependant on the frequency.

- Values higher than zero will increase the Q based on ascending frequency
- Values of zero will set all filters to the same Q value.
- Values lower than zero will increase the Q based on descending frequency

4.0 Examples

4.1 High-cut/Low-pass

Using Chameleon 1 it's incredibly easy to create a high-cut/low-pass filter by mixing the original signal together with the output. To achieve this, use the following settings:

- Frequency as desired
- Mix at 50%

A first order allpass filter causes a half phase rotation of 180 degrees exactly at the target frequency which can then be used for creative filtering.

4.2 Low-cut/high-pass

Using Chameleon 1 it's incredibly easy to create a low-cut/high-pass filter by mixing the original signal together with the output. To achieve this, use the following settings:

- Frequency as desired
- Diff enabled

A first order allpass filter causes a half phase rotation of 180 degrees exactly at the target frequency which can then be used for creative filtering.

4.3 Notch

Using Chameleon 2 it's incredibly easy to create a notch filter by mixing the original signal together with the output. To achieve this, use the following settings:

- Frequency as desired
- Q as desired
- Mix at 50%

A second order allpass filter causes a full phase rotation of 360 degrees exactly at the target frequency which can then be used for creative filtering.

4.4 Bandpass

Using Chameleon 2 it's incredibly easy to create a notch filter by mixing the original signal together with the output. To achieve this, use the following settings:

- Frequency as desired
- Q as desired
- Diff enabled

A second order allpass filter causes a full phase rotation of 360 degrees exactly at the target frequency which can then be used for creative filtering.

4.5 Frequency Dispersion

Chameleon X can be used to disperse sounds rich in transients, this often results in a “laser”-type of sound. This works e.g. exceptionally well on drums as they usually have quite strong transients.

Additionally, the multiple allpass filters applied work as a sort of frequency-dependant delay and will smear out the impact of drum hits over a certain timeframe.

To achieve something like this, try using the following settings:

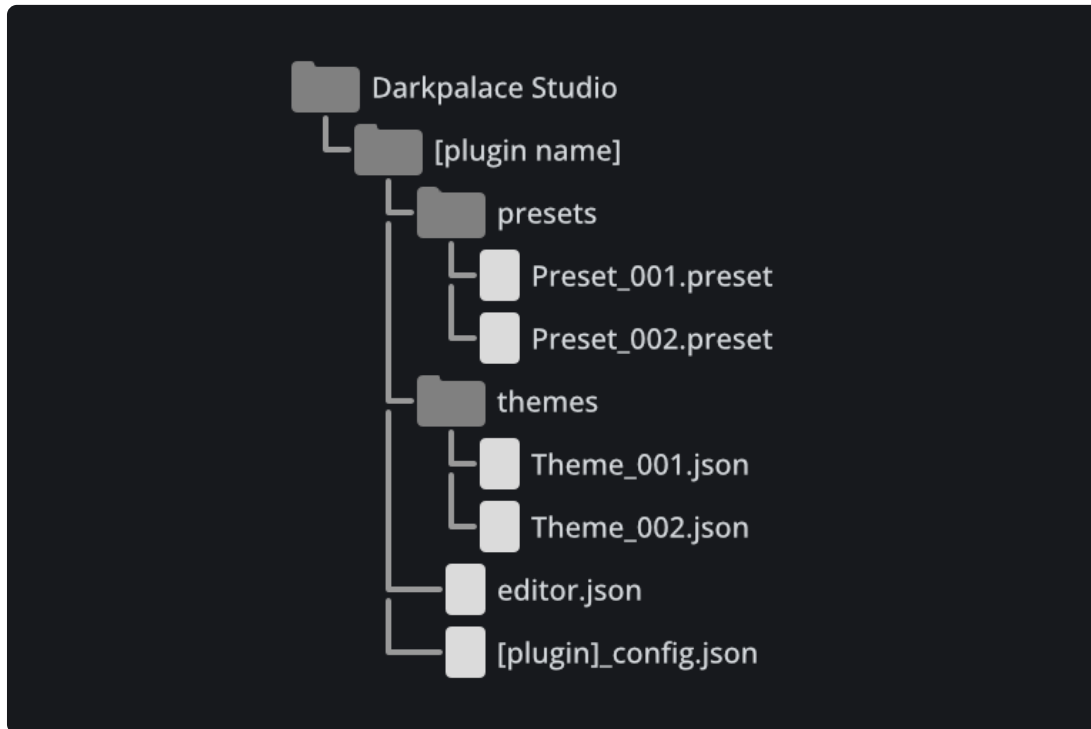
- Frequency at the center frequency of the drum. This can range from anywhere around 90hz for kick or around 200Hz for snare drums.
- Order Count at around 10 to 40
- Q and Q Skew as desired, try experimenting with these values.

4.6 DC cutoff considerations

The DC cutoff in Chameleon N and Chameleon X is implemented via a first order high-pass-filter. This 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 consider if your processing actually need DC oversampling. If it does, check carefully for any phasing issues introduced by the filter. Often the phase issues 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 ChameleonX, this would mean the file would be called chameleonx_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

```
{
  "initialWindowSize": [
    512,
    384
  ],
  "custom_ui_scaling_factor": 1.0,
  "tooltipDelay": 250,
}
```

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

6.0 Release Notes

6.1 v1.1.2

- Update to juce 8.0.2+ (with opengl bugfix)
- Rename plugins to start with an uppercase character
- Remove internal upper q limit for generic filter in chameleon X
- Improve plugin startup time by removing unused shaders
- Improve graphics performance by consistently using opengl 4.1

6.2 v1.1.1

- Fix CLAP plugins not responding to midi-input

6.3 v1.1.0

- Have macOS version codesigned
- Allow keytracking input for all chameleon plugins
- Introduce State Variable ("SV") filter for Chameleon X

6.4 v1.0.0

Initial release