



ASHLIGHT

 **NATIVE INSTRUMENTS**

THE FUTURE OF SOUND

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Software version: 1.0 (08.2021)

2. Welcome to ASHLIGHT

ASHLIGHT is a real-time cinematic texture instrument that produces complex atmospheres, pads, leads, soundscapes and effects. It combines a custom sound library, specifically designed around the Grain and Sample playback modules, with multiple effects sections and a performance-focused XY modulation control. ASHLIGHT is the third release in a trilogy of granular instruments from Frank Elting. This iteration sees Elting work with Amsterdam sound designers The Solos, towards a darker, colder, and more submersive sonic palette.

ASHLIGHT's granular engine places the source audio into a powerful and intuitive interface. Within the granular engine, sounds can be substantially augmented in size, without sacrificing the sound quality or character. The granular sounds are layered with bespoke multi-samples or atmospheric one-shots from ASHLIGHT's Sample module. The Sample engine is especially powerful when combined with additional editing and modulation features, whereby unique opportunities in sound design are presented.

Combining the Grain and Sample layers enables you to produce highly expressive and multi-faceted tones with immense versatility. The resulting sound palette ranges from sophisticated timbres and moody atmospheres, to cinematic soundscapes and dramatic leads. The XY control is the core of ASHLIGHT's performance philosophy, designed to produce expressive articulations with special regard to the precision in timing and intensity required for nuanced, powerful sound design.

Thank you for choosing ASHLIGHT. We hope you enjoy it!



2.1. Document Conventions

In this document the following formatting is used to highlight useful information:

<i>Italics</i>	Indicates paths to locations on your hard disk or other storage devices
Bold	Highlights important names, concepts, and software interface elements.
[Brackets]	References keys on a computer's keyboard
►	Single item instructions are represented by a bullet icon.
→	Results in procedures are represented by an arrow icon.

The following three icons represent different types of information:



The **light bulb** icon indicates a useful tip, suggestion, or interesting fact.



The **information** icon highlights important information that is essential for the given context.



The **warning** icon alerts you of serious issues and potential risks that require your full attention.

3. Installation and Setup

Before you can make music with ASHLIGHT, you must install and setup the necessary software. Follow these instructions to get started:

Native Access

Native Access is where you will install the software for ASHLIGHT. If you are new to Native Instruments, you will first have to create your Native ID.

1. Download and install Native Access [here](#).
2. Login to Native Access using your Native ID.
3. Click the **Not installed** tab.
4. Click **INSTALL** for the following products:
 - KONTAKT or KONTAKT PLAYER
 - ASHLIGHT

→ The software is installed automatically.



If the software is already installed, click the **Available updates** tab and check for new updates before proceeding.

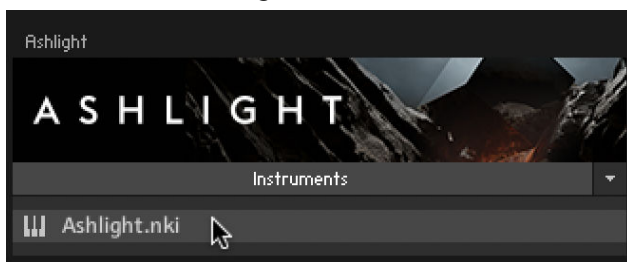


To learn more about Native Access, visit our support page [here](#).

ASHLIGHT via KONTAKT

Once installed, you can start using ASHLIGHT in KONTAKT. ASHLIGHT is not an independent plug-in, so you first need to open an instance of KONTAKT or KONTAKT PLAYER:

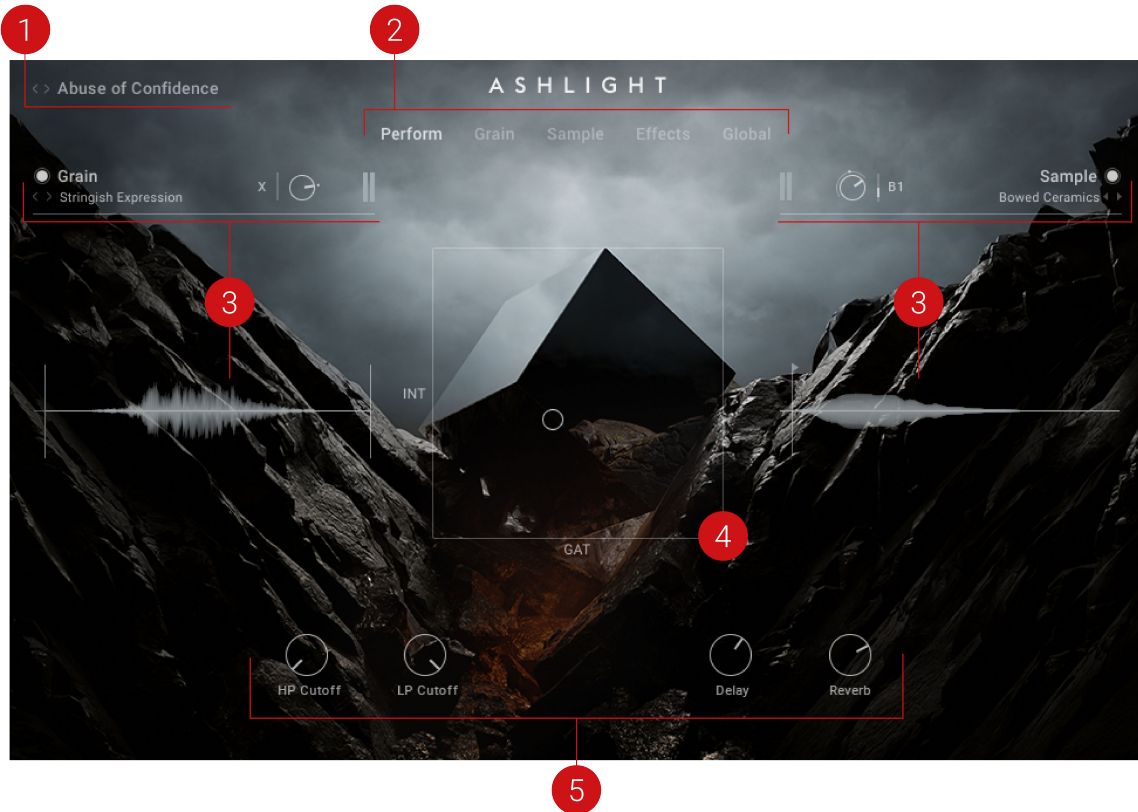
1. Open KONTAKT as a plug-in in your host software (DAW), or as stand-alone application.
2. Locate **ASHLIGHT** in the Browser on the left side of the user interface.
3. Click **Instruments** to open the product's content.
4. Double-click the **Ashlight.nki** file to load the instrument.



For more information, visit [KONTAKT PLAYER](#) and [KONTAKT](#).

4. ASHLIGHT Overview

ASHLIGHT contains the following key elements and controls:

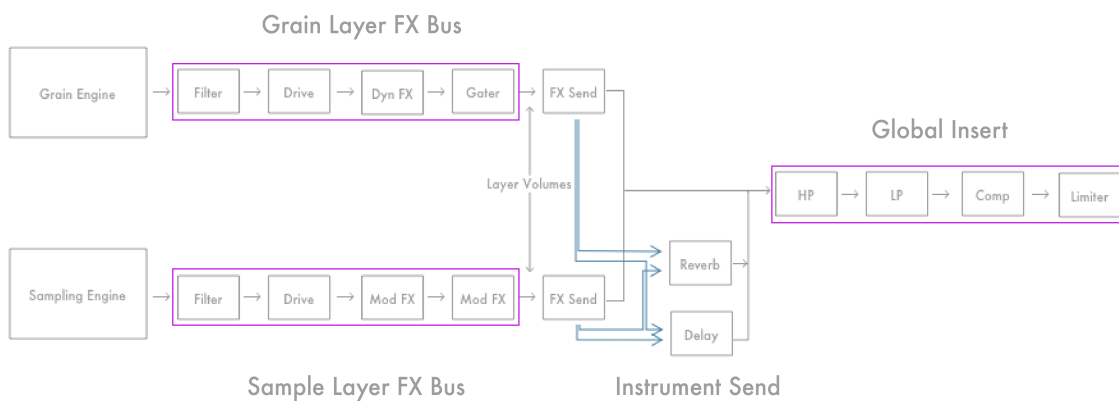


1. **Snapshots:** Snapshots are your own personalized user presets, which you can save and recall at a later time. For more information, see [Snapshots](#).
2. **Main Navigation:** Selects between the five main pages; Perform, Grain, Sample, Effects, and Global.
 - **Perform Page:** The XY pad at the center of the Performer page works as the key interaction for shaping the sound. The main change in the character of the sound will take place using the XY pad. This page also hosts four Macros that provide quick access to control and change the assigned parameters. For more information, see [Perform Page](#).
 - **Grain Page:** The Grain page covers all parameters related to playback within the Grain engine. The lower area has separate navigation, displaying either Send FX, Macros or Modulation. For more information, see [Grain Page](#).
 - **Sample Page:** The Sample page covers all parameters related to playback within the Sample engine. For more information, see [Sample Page](#).
 - **Effects Page:** The Effects page contains a flexible FX chain for both the Grain engine and Sample engine, with a large XY Pad in the middle for mapping effects parameters. For more information, see [Effects Page](#).
 - **Global Page:** The Global page allows for mapping of MIDI CCs to the XY Pad and includes a third effects chain which affects the combined Grain and Sample layers. For more information, see [Global Page](#).

3. **Sound Sources:** Displays the waveform and contains controls relating to the currently selected Grain and Sample sources. For more information, see [Grain Header](#) and [Sample Header](#).
4. **XY Pad:** The XY pad at the center of the Performer page works as the key interaction for shaping the sound. The main change in the character of the sound will take place using the XY pad. For more information, see [XY Pad](#).
5. **Macros:** The lower pane has separate navigation, displaying either Send FX, Macros or Modulation. For more information, see [Macros](#).

4.1. Signal Flow

The Grain and Sample layers each travel through their own independent FX Bus. Their combined layer volumes are then sent into the Global Insert chain. Separately from this, the Sample and Grain layers' FX sends are combined at the global Delay and Reverb FX. These send FX are then routed into the Global FX chain, which allows for true global effects.



The Signal Flow of ASHLIGHT.

4.2. Creating a Sound

ASHLIGHT is built from a custom granular engine with hand-tailored audio sources routed through matching effects and modulators. In addition to the primary granular engine, there is also a sample layer that can be used for complementary sonic tasks like background noise, envelope attacks, tonal centering, or pads.

To build your own sound and get a feel for the ASHLIGHT workflows, follow these steps:

Grain Layer

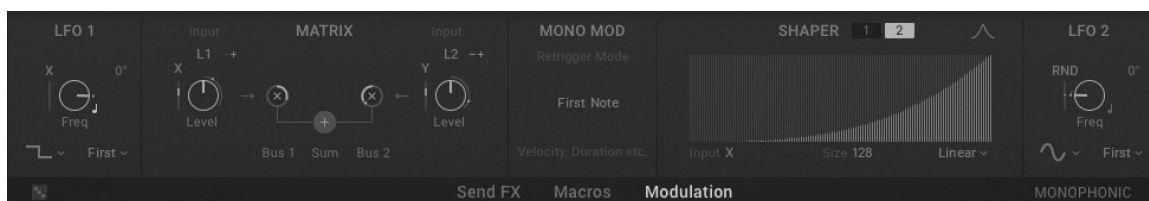
The Grain layer uses granular synthesis to manipulate and alter audio sources. Change the playback order and speed of the grains, and apply processing to each grain (duration, fades, level and pitch) for dramatic effects.



1. Select your Grain source and determine the behavior of the Granular layer. Presets for the Granular engine are selected by the arrows or Grain Source label. Click the arrows to browse presets quickly, or click on the label to open the Grain browser, where you can search for presets that are categorized by Type, Pitch, Category, and Character.
2. Adjust the **Start** position and set the **Range** and **Length** of the Grain sample playback.
3. Introduce some movement into your sound by adjusting the **Scan** and **Jitter** parameters in the Cursor section. The **Scan** control will determine the speed and direction in which the cursor moves, and the **Jitter** control will determine the random position of each grain.
4. Adjust the envelope section to determine the **Attack** and **Decay** of the Grain source.
5. Assign the **Detune** control to the X-axis and apply a subtle amount of modulation. As you move the cursor of the XY pad, you will hear the fine deviations in pitch.

Modulation and Effects

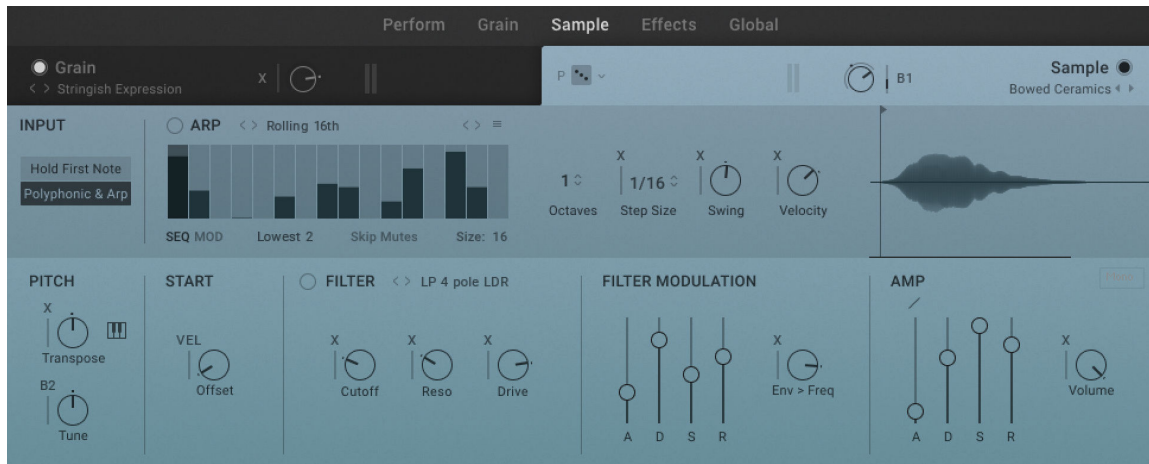
The Modulation pane is where ASHLIGHT comes to life. It provides modulation sources that bring movement and dynamics to your sound. The Modulation pane contains two LFO, two Shapers, and a Matrix for altering and combining modulation sources.



1. In the Modulation pane, route an **LFO** to the **Shaper** and assign the **Shaper** to any modulatable parameter by choosing **S1** from the corresponding menu. Adjust the modulation amount with the slider underneath the drop-down menu.
2. Open the Send FX pane and turn up the **Delay** level for the Grain layer. Now select a preset from Effect type dropdown until you find a delay character that works with your Grain sound. Assign the **Time** and **Feedback** parameters to the X and Y-axis respectively.
3. In the Effect page, select a **Filter** and assign the **Cutoff** to the Y-axis. Assign the **Resonance** control to the X-axis, and move the cursor up and down to hear the filter open as the **Delay** send effect becomes more intense.

Sample Layer

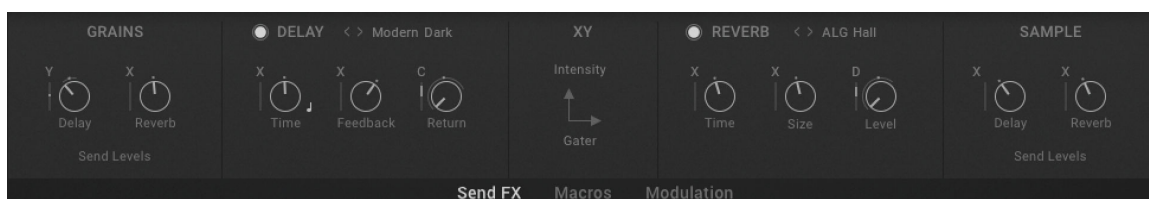
The Sample layer contains controls for the playback of the sample source. The Sample layer accesses a custom sound library of multi-samples and one-shots, designed to compliment those in the Grain layer.



1. Sources for the Sampler layer can be chosen via the Sample browser. Use the browser to search for sample presets that are categorized by Type, Pitch, Origin, and Mood.
2. Transpose the Sample layer to -1 octave or use the **Tune** control to finely tune the sample to compliment the Grain sample source.
3. Extend the **Filter Modulation** and **Amp** envelopes to create a more expansive sound, then assign **LFO 2** to the **Volume** parameter to create a tremolo effect.
4. In the Modulation pane, set **LFO 2** to a fast setting to create the rapid deviations in volume that define tremolo.

Global FX

The Send FX Pane is where the global Delay and Reverb send effects are contained. Each effect has controls that determine their behavior and sonic character. Explore how effects can shape and inspire your sound.



1. A final Global FX chain applies effects to the combined Grain and Sample layers.
2. Explore adding other Effects and assigning their parameters to the XY pad. Using your ears, following your intuition, and experimenting is the best way to find your own signature sound.

4.3. Importing Your Own Samples

ASHLIGHT allows you to import your own samples. This feature can be used when designing your own Snapshots allowing you to utilize the processing power of the specialized grain and sample modules, effects, and the powerful performance-based XY modulation matrix.

Samples can be added to ASHLIGHT by dragging and dropping them from your operating system or the **Files** folder in KONTAKT, directly onto the waveform displays in the Perform page, the Grain page, or the Sample page. Compatible audio file formats are: .wav, .aif, and .ncw. Compressed files such as .mp3 do not work but can be converted to one of the compatible formats using third-party file conversion software.

To add your own sample:

1. Using the mouse, click-and-hold the audio file you want to add.
2. Drag the file to a waveform display on the Performance page, Grain page or Sample page.
3. Release the mouse button.

→ The sample is imported and the waveform is displayed accordingly.

Once a file has been imported KONTAKT will automatically try to detect the root key. You can also set the root key of the imported sample manually using the up/down arrows of the Sample Layer Root Key in the top right corner of the Grain or Sample Waveform display. This allows you to increase or decrease the root key of the imported user sample by one octave. Hold [Option] (Mac) / [Alt] (Windows) to change the key in semi-tones. For more information, refer to [Grain Page Overview](#) or [Sample Page Overview](#).



For information on importing files from the KONTAKT File menu, refer to the KONTAKT Manual available [here](#).

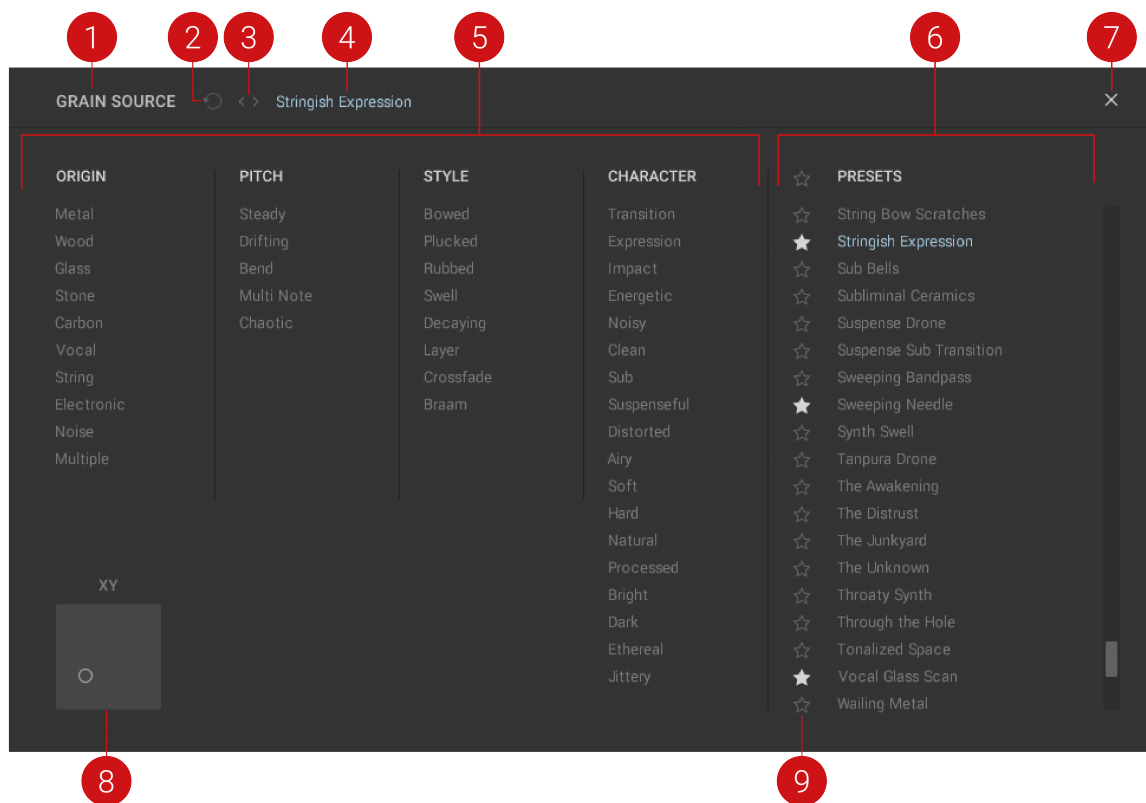
5. Using Browsers

ASHLIGHT offers three individual browsers to directly search for Snapshots, Grain Source presets and Sample Source presets. In each of these browsers you can limit the search in the Results list by selecting tags from several sound categories. Besides limiting the search, you can also mark presets as favorites and filter by favorites in the Results list.

i The designs and workflows of the individual browsers are identical. The overview and workflows are written globally.

5.1. Browser Overview

Each of the browsers contain the following elements:



- 1. Browser name:** Displays the name of the file type you are currently browsing. This can either be **SNAPSHOT**, **GRAIN SOURCE**, or **SAMPLE SOURCE**.
- 2. Reset:** Resets the browser when pressed, clearing any selected tags.
- 3. Preset previous/next:** Loads the previous and next Snapshot or preset from the Results list in the browser. If sound category tags are selected for limiting the search in the Results list, the arrows appear filled out.
- 4. Snapshot/Source name:** Displays the name of the loaded Snapshot highlighted in white, Grain Source preset or Sample Source preset highlighted in red.

5. **Sound categories:** Contains different sound categories with several tags each. You can use these tags to limit your search in the Results list. For more information, refer to [Snapshot Browser](#).
6. **Results list:** Provides you with the results defined by the search criteria in the sound categories. You can also mark Snapshots and presets as favorites and filter the results list by favorites. For more information, refer to [Using Favorites in the Browser](#).
7. **Close** (x icon): Closes the browser.
8. **XY Pad:** Provides a smaller version of the main XY pad that displays the position for the X and Y parameters of the selected Snapshot. You can also use this XY pad to control the sound of the selected Snapshot. For more information, refer to [XY Pad](#).
9. **Favorites:** Provides the option to mark presets as Favorites. Click the star icon next to the preset in the Results List to mark it as a Favorite. For more information, see [Using Favorites in the Browser](#).



For more information on browsing for Snapshots and presets, refer to [Filtering a Browser Search](#).

5.2. Opening and Closing a Browser

To open a browser:

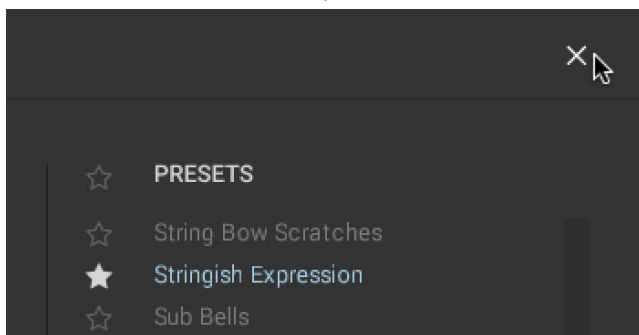
- Click on the Snapshot name, the Grain Source label, or the Sample Source label.



→ The corresponding browser opens.

To close a browser:

- Click on the X icon at the top left of the browser.



→ The corresponding browser closes.

5.3. Filtering a Browser Search

In each browser, you can limit the search criteria by selecting tags in several sound categories. You can also exclude an attribute from the search for by pressing [Command] (Mac) / [Ctrl] (Windows) whilst clicking a tag name. The attribute will be displayed stricken through, as shown below.

To filter in a browser search:

1. Click on the tag name to select the tag(s) in the sound category of your choice.
 2. Press [Command] (Mac) / [Ctrl] (Windows) + click on the tag name to exclude the tag(s) in the sound category.
- Selected tags are highlighted, and excluded tags appear as strikethrough text. Items in the Results list are limited accordingly.

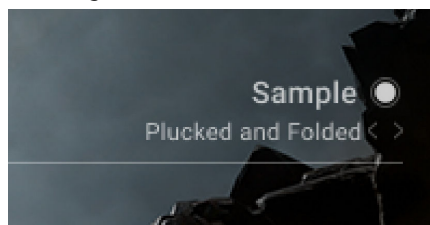
TYPE	PITCH
Instruments	Steady
Percussive	Drifting
Hits	Chord
Plucked	Keytracking
Synth	Chaotic
Reversed	
Noise	
Cinematic	
Sub	

Plucked samples with Key Tracking and with no Pitch Drifting.

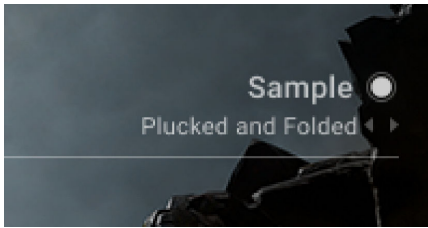
Preserved Tag Settings

After closing the browsers, ASHLIGHT preserves the tag settings for each browser. The tag settings are also reflected in the corresponding previous/next buttons arrows the headers. The previous/next buttons indicate if they will step through all available items presets or if a filtered search is in use:

- If no tags selected in the browser, the previous/next buttons appear as open arrows:



- If tags have been selected, the Results list will contain filtered presets. To represent this, the previous/next arrows appear as filled triangles:



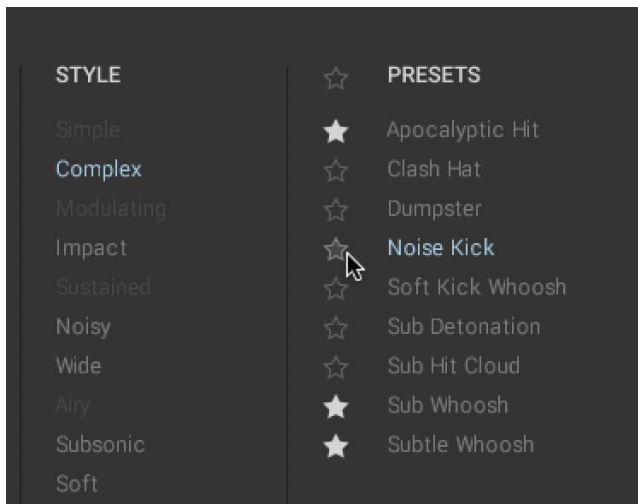
You can also multi-select tags within or across sound categories to further refine your search.

5.4. Using Favorites in the Browser

The Favorites feature is another way you can tailor your browsing experience in ASHLIGHT. They can help to organize your sounds and streamline your preset searching, and can also be useful for collecting all the inspiring sounds that you may encounter as you explore ASHLIGHT's extensive sound library. You can mark Snapshots, Grain presets and Sample presets as Favorites and then search and recall them at a later time.

To mark a preset as a Favorite:

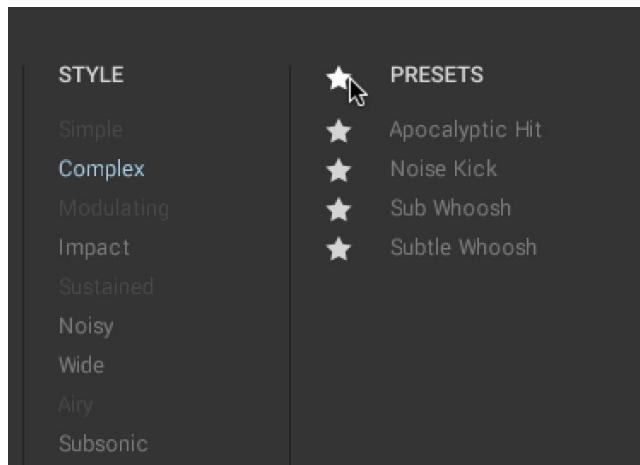
- ▶ Open the respective browser.
Click the star icon next to the Snapshot or preset in the Results List.
- The Snapshots or preset is now marked as a Favorite, indicated by the highlighted star icon.



Marking a preset as a Favorite.

To filter by Favorites:

- ▶ Click the star icon next to the **PRESETS** label of the Results list.
- The Results list now displays all presets marked as Favorites.



Filtering by Favorites.

6. Snapshots

ASHLIGHT combines a custom sound library with Grain and Sample playback modules. The result is a collection of 363 unique sound sources, with over 320 expertly designed Snapshots that showcase the best of ASHLIGHT's engine. As the product of extensive research into unconventional sound sources, the included samples range from bowed and rubbed metals, carbon, ceramics, glass, waterphones, cymbals, feedback cycles, synths, and more. All samples were subject to an extensive sound design process exploring the idiosyncrasies of each sound source in combination with one another.

The preset collection provides a vast range of sounds, including monochrome soundscapes, pulsing textures, intricate leads, and cold atmospheres. The intuitive modulation controls allow for scoring with expressive shifts in intensity. An entire movie score can exist within one singular Snapshot, which also means that some sounds may need to be thinned out to work more effectively within a fuller musical arrangement. Thinning can easily be achieved by deactivating one of the layers and/or applying the hi-pass and low-pass filters, which are setup up on Macros A and B for many of the provided presets.

6.1. Snapshots Overview

Snapshots offer a quick way of browsing for new sounds and saving custom presets. Snapshots are also a useful starting point from which you can tweak and tailor your own sounds. When a User Snapshot is saved, the Macro settings and parameter controls are stored within the preset. Using Snapshots, you can create your own preset sounds, save them in the .nksn file format and use them in other projects, across computers or even share them with other users.

Key features relating to Snapshots include:



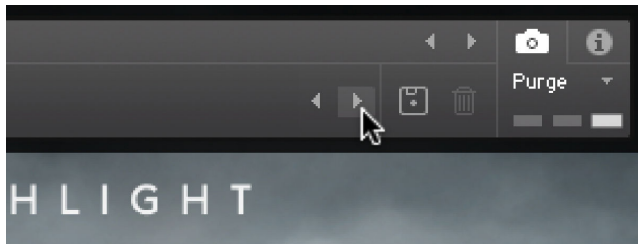
1. **Load Snapshot:** Opens the Snapshot menu where you can load a Snapshot from the **Factory** or **User** library. For more information, see [Loading a Snapshot](#).
2. **Snapshot name:** Displays the name of the currently selected Snapshot.
3. **Snapshot previous/next** (<> icons): Allows you to quickly browse and load Snapshots. Pressing an arrow icon will load the previous or next Snapshot in the selected category. If no Snapshot is active, the first Snapshot on the list will be loaded. For more information, see [Loading a Snapshot](#).
4. **Save Snapshot** (floppy disk icon): Allows you to save changes made to a sound. When a User Snapshot is saved, the macros settings, parameter controls, and sequence are stored within it and can be accessed at any time via the **User** library. For more information, see [Saving a User Snapshot](#).
5. **Delete Snapshot** (bin icon): Deletes the currently selected Snapshot from the **User** library. You can only delete **User** Snapshots and not **Factory** Snapshots. For more information, see [Deleting a User Snapshot](#).
6. **Snapshot View** (camera icon): Provides access to the Snapshot features described above; saving, loading, browsing, and deleting. When **Snapshot View** is selected, configuration settings and features relating to the **Info View** are replaced in the display.

6.2. Loading a Snapshot

Snapshots are loaded from the drop-down menu in the top header of the instrument. You can also use the arrows to the left of the floppy disk icon to load the previous or next preset.

To load and browse Snapshots using the arrow icons:

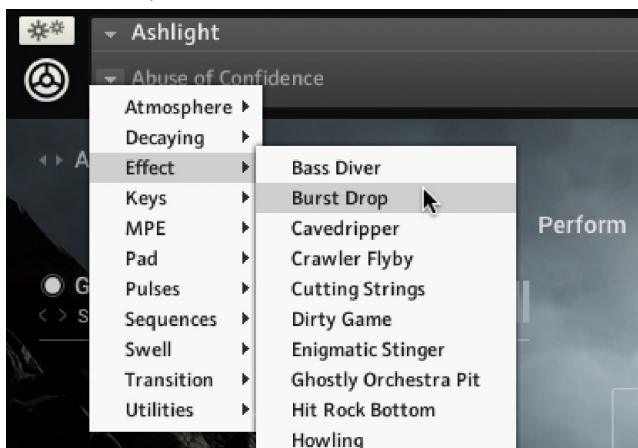
1. Click the Snapshot View (camera icon) to open Snapshot view.
2. Click the arrow icons (<>) in the Snapshot header to browse through the Snapshots list.



→ The previous or next Snapshot will load immediately each time an arrow icon is clicked.

To load a Snapshot from the library:

1. Click the Snapshot View (camera icon) to open Snapshot view.
2. Click the arrow icon next to the Snapshot name field to open the Snapshot menu.
3. Select the **Factory** category to load a Factory preset, or select the **User** category to load one of your own Snapshots.
4. Select an instrument category, if available.
5. Select a Snapshot to load it.



→ The loaded Snapshot is displayed in the instrument header.

i The **User** category will not appear until you have first saved a Snapshot.

6.3. Saving a User Snapshot

Snapshots can be saved at any time while you are working on them. When a Snapshot is saved, the macro settings and parameter controls are also saved.

To save a Snapshot:

1. Click the Snapshot View button (camera icon) to open Snapshot view.
 2. Click the Save button (floppy disk icon).
 3. Enter a name for your new Snapshot in the **Save** dialog box.
 4. Click **Save** to finish the process and close the dialog box.
- Your Snapshot .nksn file is saved to the User Snapshot Library. It appears in the **User** Snapshot list.

To overwrite a Snapshot:

1. Click the Snapshot View button (camera icon) to open Snapshot view.
 2. Click the Save button (floppy disk icon).
 3. Click **Overwrite** to confirm the process.
- Your Snapshot .nksn file is saved to the User Snapshot Library, in replace of the old file.

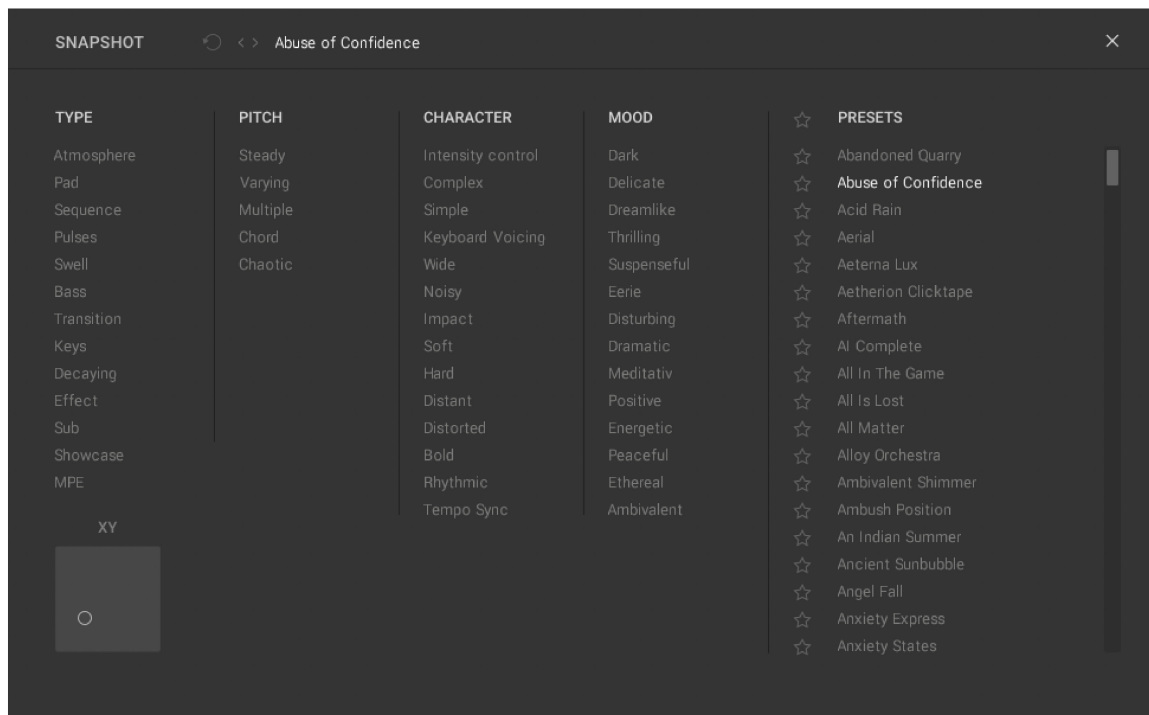
6.4. Deleting a User Snapshot

Snapshots can be deleted using the bin icon in the instrument header. To delete a User Snapshot:

1. Click the Snapshot view (camera icon) to open Snapshot view.
 2. Load the User Snapshot you wish to delete.
 3. Click the Delete button (bin icon).
 4. Confirm deletion of the Snapshot by selecting **Yes** in the dialog box.
- The User Snapshot .nksn file is deleted from the User Snapshot Library.

6.5. Snapshot Browser

This section provides an overview of the Snapshot browser categories and a brief explanation of the tags you can use to limit your search for Snapshot presets. Often the character of the sounds will be highly controlled by the number of notes played and the octave range in which you play them. ASHLIGHT is very sensitive to voicing; wide chords with few notes will often give you better results than a common, narrow keyspacing, which you might use to play a standard piano patch.



Snapshot browser.

Type

The TYPE category contains the following tags:

Atmosphere:	The sound is best played using a single note or just a few notes. Try octaves in the lower register and one or two additional notes in the higher range. Atmospheres can also be atonal or noisy soundscapes and are often more complex than pads.
Pad:	Polyphonically playable sounds much like typical synthesizer pads. These sounds are not as complex as those in the Atmosphere category but are well suited to arrangements with other instruments.
Sequence:	Contains a sequenced element. The rhythm may be synced to the host clock or free and fluid.
Pulses:	Contain a rhythmic, arpeggiated, or gated Element. Sometimes the rhythm is bound to the host clock and in other cases, it is free and fluid. The Tempo Sync tag enables you to filter for presets that follow the arrangement's beat
Swell:	Sounds that have a quality of a musical crescendo commonly associated with the electric guitar. The sound of the note is characterized by an initial attack that produces higher pitched overtones over the top of the fundamental note, followed by a diminution of these overtones.
Bass:	Sounds especially suited for bass. These are best played monophonically.
Transition:	Sounds that contain a spectral transition or movement that is either scanned through automatically, synced to the host clock or the transition is the main parameter on the XY pad allowing real-time control of the spectral change.
Keys:	Keyboard type sounds, which also includes organ and mellotron-like presets. The sounds in this category can be played in a typical keyboard style.
Decaying:	All kinds of sounds that do not contain a loud sustain phase.
Effect:	All kinds of real-time controlled cinematic sound effects. There is some overlap with Atmospheres and Transitions here but it still makes sense to look at it as a separate category. These sounds are mostly atonal.

Sub:	Sounds with remarkable subharmonic content. These are best played monophonically or in octaves.
Showcase:	Indicates a representative selection of ASHLIGHT sounds. Listen to these to get a first impression of the product.
MPE:	Dedicated MPE sounds that use the polyphonic slide modulation assignments.

Pitch

The PITCH category contains the following tags:

Steady:	The sounds feature a steady pitch suitable for chords.
Varying:	The sound has a pitch drift, slide, or detuned element.
Multiple:	The sound plays a phrase or changes to a different note over time.
Chord:	The sound plays a chord.
Chaotic:	The sound has no dedicated root pitch and can change continuously, or has dominant noise components.

Character

The CHARACTER category contains the following tags:

Intensity control:	The XY pad assignments of the sound is setup to be able to control the 'intensity' of the sounds. Often, the Snapshot will sound more dramatic when the Y-axis amount it at the top.
Complex:	Indicates that a higher amount of spectral change over time occurs in the sound. This can be an indicator of how easy it is to combine the preset with other instruments in an arrangement.
Simple:	Indicates that the sound feature a small amount of spectral change over time and is easier to integrate with other sounds in a musical arrangement.
Keyboard Voicing:	Sounds with this tag can be played with a narrow, piano style voicing. You can use this tag to remove Snapshots from the Results list which require a wider voicing, or sound best with few notes.
Wide:	Either stereo spread or depth of dimension are extraordinary in sounds featuring this tag.
Noisy:	The sound contains a remarkable noise amount.
Impact:	The sound contains an attacking element. This can be either at the beginning of the note or within a soundscape or pulsating snapshot.
Soft:	The sound has a damped or soft spectrum and soft volume transition.
Hard:	The sound has a higher or hard spectrum and might contain dissonant elements.
Distant:	The sound has remarkable amount of reverb or delay applied. Attacks might be softened or washed out.
Distorted:	The sound features distortion either in the layer sources or applied via the ASHLIGHT effects chains.
Bold:	Sounds which cover a wide range of the sonic spectrum and might be the main sound in a scene.
Rhythmic:	The sound contains a rhythmic element, which can be either a repeating spectral changes or an attacking or noise-like component.
Tempo Sync:	The rhythmic element either follows the host tempo or the transition speed is synchronized to the DAW's clock.

Mood

The MOOD category contains the following tags:

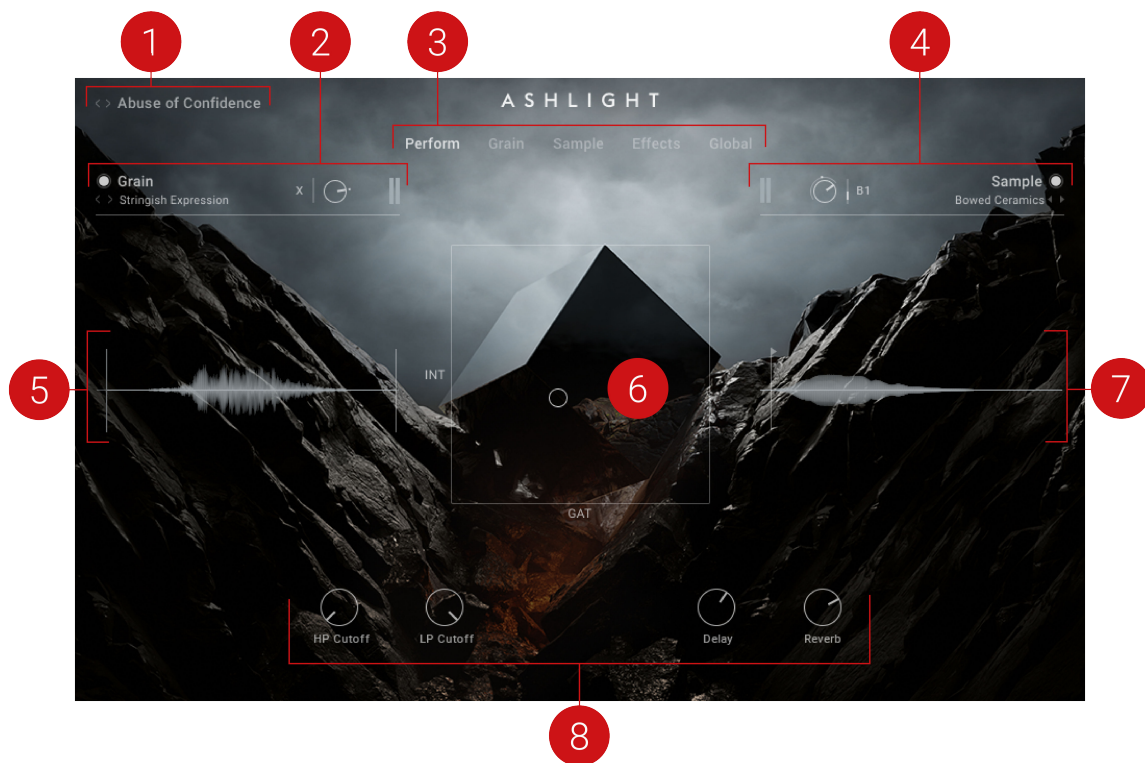
Dark:	The sound might be suitable for a sinister scene and often features detuned, modulated, distorted aspects.
Delicate:	The sound is relatively thin and clean.
Dreamlike:	The sound is beautiful or has a utopian, unreal character to it.
Thrilling:	Depending on the voicing, the sound can create a thrilling mood. Thrill is not used in the context of horror here but rather like excitement.
Suspenseful:	Depending on the voicing, the sound can create a mood of suspense and uncertainty.
Eerie:	Depending on the voicing, the sound can create a scary atmosphere and might contain dissonant elements or transitions.
Disturbing:	The sound contains an unexpected, annoying or impacting element.
Dramatic:	Depending on the voicing the sound can be used to increase the level drama by riding the Macros.
Meditativ:	The sound has calm, sometimes slightly repetitive mood.
Positive:	Depending on the voicing, the sound can be used to convey a confident and positive vibe.
Energetic:	Depending on the voicing, the sound has an active, driving mood. Often, a rhythmic elements is involved.
Peaceful:	Depending on the voicing, the sounds create a quite, balanced and beautiful mood.
Ethereal:	Depending on the voicing, the sounds create a light, mystic or arcane mood.
Ambivalent:	Some presets can change their mood quite drastically, depending on the played voicing and the settings of the macro controllers.

7. Perform Page

The Perform page is the main view of ASHLIGHT and gives you direct access to the key controls of the other pages. The XY pad at the center of the page can be used to perform real-time modulation of both the Grain and Sample layers. From the Perform page you can also browse Grain and Sample presets, adjust their output levels and applied modulation. The four Macro controls below the XY pad are freely configurable and provide quick access to control and change their assigned parameters.

7.1. Perform Page Overview

The Perform page contains the following elements and controls:



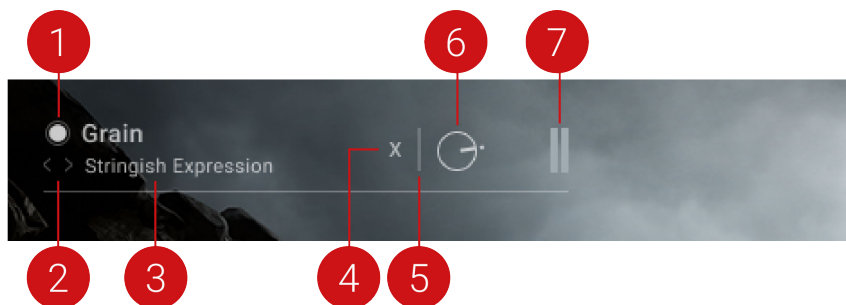
1. **Snapshot Browse controls:** Contains previous/next buttons to browse through Snapshots and provides quick access to the Snapshot browser. For more information, refer to [Snapshot Browse Controls](#).
2. **Grain Header:** Contains global functions including the selection of the source sample, access to the Grain Source browser, and overall volume level control for the Grain layer. For more information, refer to [Grain Header](#).
3. **Top Navigation:** Contains buttons to display the other pages of ASHLIGHT .
4. **Sample Header:** Contains global functions including the selection of the source sample, access to the Sample Source browser, and overall volume level control for the Sample layer. For more information, refer to [Sample Header](#).
5. **Grain Waveform display:** Displays the Grain Source waveform and visualizes the Grain Cursor position of up to ten notes. You can also directly jump to the Grain page by clicking within the waveform.

6. **XY Pad:** Controls the sound of the current Snapshot in realtime according to the modulation assignments for the X and Y parameters. For more information, refer to [XY Pad](#).
7. **Sample Waveform display:** Displays the Sample Source waveform and visualizes the playhead position.
8. **Macros:** These top-level parameter controls can be assigned to multiple targets at the same time. You can select the labels corresponding to the parameters. For more information, refer to [Macros Pane Overview](#).

7.2. Grain Header

The Grain Header contains global functions including selection of the source sample, access to the Grain Source browser, and overall volume level control for the Grain layer. The Grain Header is available on the Perform page, on the Grain page, and on the Effects page. It contains the following controls:

The Grain Header contains the following controls and features:

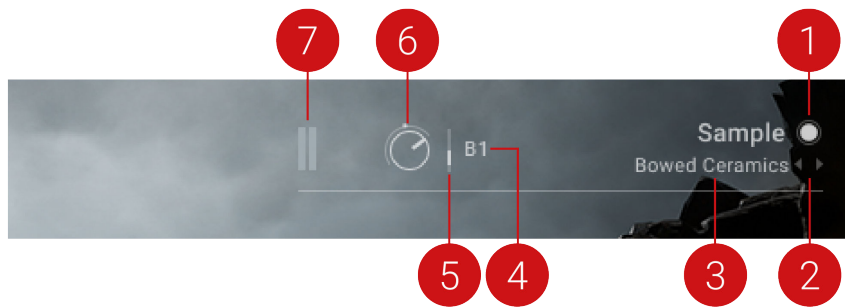


1. **Grain Layer on/off:** Determines if the Grain layer is active or bypassed. When the button is filled out, it indicates the Grain Layer is active.
2. **Grain Source previous/next:** Loads the previous/next Grain Source from the Results list in the Grain Source browser. If tags are selected to limit the results in the Grain Source browser, the arrows appear filled out. For more information, refer to [Filtering a Browser Search](#).
3. **Grain Source:** Displays the name of the loaded Grain Source. Click the name to open the Grain Source browser. For more information, see [Using Browsers](#).
4. **Modulation Source:** Selects the Modulation Source to be applied to the Grain Volume control.
5. **Modulation Amount:** Controls the amount of modulation applied to the Grain Volume control by the selected Modulation Source.
6. **Grain Volume:** Sets the volume for the Grain Layer which is applied after the Grain Layer effects, and before the Global FX chain and the Send FX chain.
7. **Grain Level meter:** Displays the current output volume level for the Grain Layer.

7.3. Sample Header

The Sample Header contains global functions including selection of the source sample, access to the Sample Source browser, and overall volume level control for the Sample layer. The Sample header is available on the Perform page, the Sample page, and the Effects page.

The Sample Header contains the following controls and features:

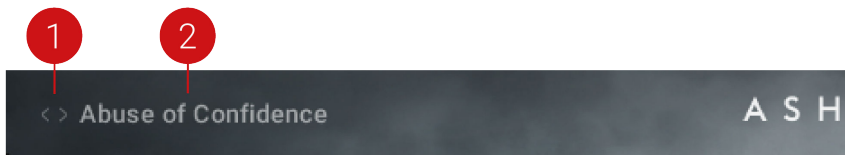


1. **Sample Layer on/off:** Determines if the Sample Layer is active or bypassed. When the button is highlighted, the Sample Layer is active.
2. **Sample Source previous/next:** Loads the previous/next Sample Source from the Results List in the Sample Source browser. If tags are selected to limit the results in the Grain Source browser, the arrows appear filled out. For more information, see [Filtering a Browser Search](#).
3. **Sample Source:** Displays the name of the loaded Sample Source. Click the name to open the Sample Source browser. For more information, see [Using Browsers](#).
4. **Modulation Source:** Selects the Modulation Source to be applied to the Sample Volume control.
5. **Modulation Amount:** Sets the amount of modulation applied to the Sample Volume control by the selected Modulation Source.
6. **Sample Volume:** Sets the volume for the Sample Layer which is applied after the Sample Layer effects, and before the Global FX chain and the Send FX chain. Note that this parameter can not be modulated polyphonically. Sample Volume should be used if volume control per voice is required.
7. **Sample Level meter:** Displays the current output volume level for the Sample layer.

7.4. Snapshot Browse Controls

The Snapshot Browse controls are available on any page in ASHLIGHT, and provide a quick and easy-access option for browsing Snapshots. The Snapshot browser is also opened here, where you can search for a specific Snapshot using tags.

The Snapshot Browse controls contain the following features:



1. **Snapshot Previous/Next** (<> icons): Loads the previous/next Snapshot from the Results List in the Snapshot browser. If tags are selected to limit the results in the browser, the arrows appear filled out. For more information, see [Filtering a Browser Search](#).
2. **Snapshot Name:** Displays the name of the loaded Snapshot. A Snapshot contains a complete ASHLIGHT preset. Click the name to open the Snapshot browser. For more information, see [Using Browsers](#).



Snapshots can be saved with KONTAKT's Snapshot functionality in the Instrument header. For more information, refer to [Snapshots Overview](#).

7.5. XY Pad

The XY pad lies at the center of the Perform page, controlling the sound of the Snapshot in real-time according to the modulation assignment of the X and Y parameters. The XY pad also appears on the Effects page and Global page, as well as in the three browsers. The XY pad contains the following elements:



1. **XY Cursor:** Controls the sound of the Snapshot in real-time according to the modulation assignment of the X and Y parameters. For more information, refer to [XY Pad Assignment](#). You can also assign MIDI controllers to control the X and Y axis on the Global page, see [Assigning XY Pad to a MIDI Controller](#).
2. **Y axis label:** Selects a label for the Y axis functionality. Moving the XY Cursor vertically will affect all controls assigned to Y XY Pad. For more information, see [XY Pad Assignment](#).
3. **X axis label:** Selects a label for the X axis functionality. Moving the XY Cursor horizontally will affect all controls assigned to X XY Pad. For more information, see [XY Pad Assignment](#).

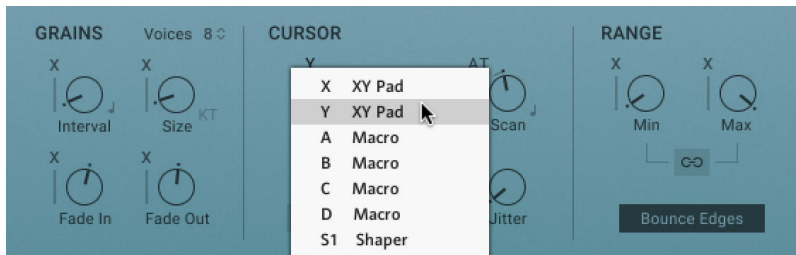
7.5.1. XY Pad Assignment

The XY pad should operate the most important real time parameters. The main purpose of the Y axis should be to control the Intensity. Assigning multiple parameters to the XY control enables you to create subtle and complex sonic articulations using only the XY pad.

To assign a control to the X or Y axes:

1. Click on the Modulation Connector of the parameter you wish to assign.

- From the drop down, select the **X XY Pad** to assign the parameter to the X axis, or the **Y XY Pad** to assign to the Y axis.



→ The parameter is now assigned to the XY Pad.

Below are some examples of suitable parameters for the XY pad:

Grain Settings:

- Grain Detune
- Cursor position / Range
- Scan speed
- Grain Rate and Volume compensation
- Grain Fade In/Fade Out

FX:

- Filter Cutoffs
- Dry Wet or FX send levels
- Delay Feedback

Sources:

- Level / Balance control layers

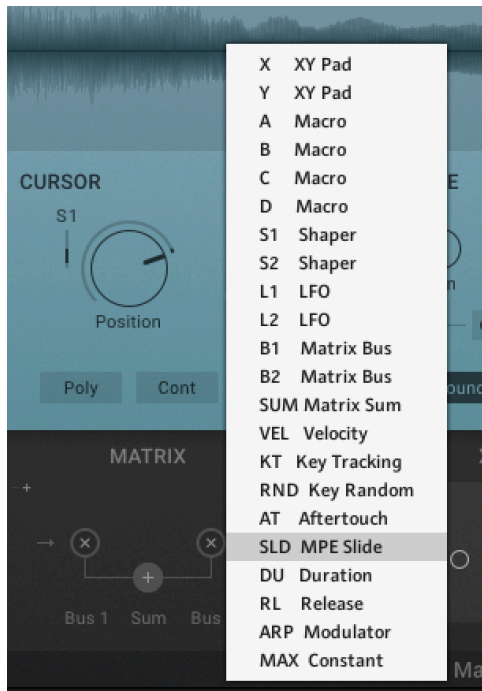
7.6. MPE Support

MIDI Polyphonic Expression (MPE) is a method of using MIDI that allows for more nuanced and expressive control over electronic instruments, replicating the varying articulations that one can apply to an acoustic instrument. Rather than global MIDI messages, MPE sends each message on a per-note basis, allowing for more dynamic and expressive performances.

In ASHLIGHT, polyphonic pitch bend is hardwired to control the tuning of the played notes. Slide and pressure (aftertouch) messages are handled in the modulation system in the same way as every other polyphonic modulation source is processed. The effects section does not process every voice separately, hence the modulation applied to effect parameters is monophonic.

Pitch bend messages are processed with a pitch bend range from -12 to 12 for pitch wheel messages on channel 1. This channel is used for global messages and affects all voices. Pitch bend messages on member channels 2 to 16 affect individual notes and are processed with a range from -48 to 48. Therefore, MIDI Channel 1 is mandatory when using ASHLIGHT with a standard keyboard without MPE. Make sure that your host and hardware use the corresponding pitch bend range setting and MIDI channels.

Polyphonic pitch bend and aftertouch work with all Snapshots from ASHLIGHT's library. To find dedicated MPE sounds that use the polyphonic slide modulation assignments, filter for Snapshots tagged with **MPE** in the Browser. You can also set up your own slide controller assignment by assigning the **SLD MPE Slide** modulation source to any polyphonic parameter. The grain position knob is a good starting point.



MPE Slide option in the Mod Assignment menu.

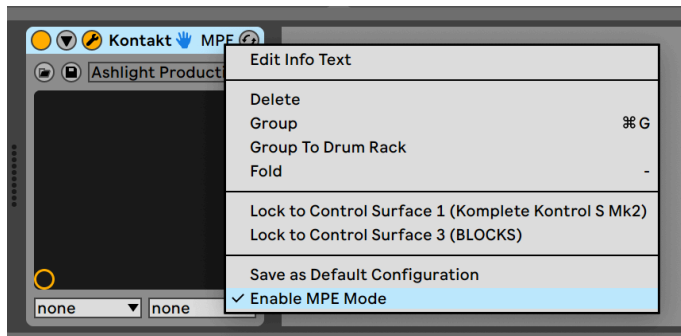
i Note that some DAWs require you to explicitly enable MPE for a specific plug-in instance. For instructions on setting up MPE, refer to [Ableton Live 11](#), [Bitwig Studio](#), and [Cubase 11](#).

i MASCHINE is not yet MPE compatible. Please run ASHLIGHT in KOMplete KONTROL, which supports MPE.

7.6.1. Ableton Live 11

In Ableton Live 11, the MPE option is located in the context menu of the VST plug-in device. To activate MPE for an instance of KONTAKT:

1. Right click on the device header.
2. Select **Enable MPE Mode**.

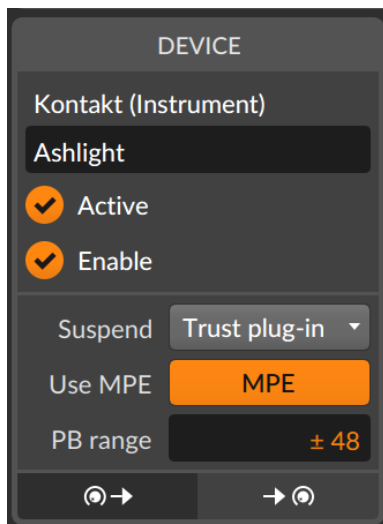


Enabling MPE Mode in Ableton Live 11.

7.6.2. Bitwig Studio

To activate MPE for an instance of KONTAKT in Bitwig Studio:

1. Ensure that your MPE input device is set up in the **Controllers** tab of Bitwig Studio's preferences.
2. Select the KONTAKT device.
3. Activate the **MPE** button on the left side of the device's settings section.

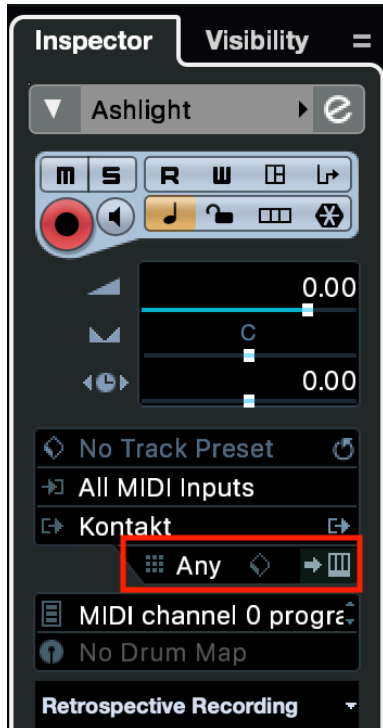


Activating MPE in Bitwig Studio.

7.6.3. Cubase 11

To activate MPE for an instance of KONTAKT in Cubase 11:

1. Ensure that your MPE input device is set up on Cubase's Studio Setup page.
2. Set the MIDI channel on the track used for ASHLIGHT to **All**.



Activating MPE in Cubase 11.

8. Sample Page

The Sample page provides a range of parameters that allow you to shape and manipulate the playback of the selected source sample. The Sample layer accesses a custom sound library of multi-samples and one-shots, designed to compliment those in the Grain layer. The Transpose control enables you to pitch the sample an octave higher or lower in relation to the Grain layer, creating a full, robust blend. The Tune control allows for subtle detuning when modulated to replicate the desired detuning effect found in analog synthesizers. Modulating the Start point can also create captivating timbral effects, that add depth and excitement to the sample playback.

Choirs, synths, noise, percussion, pulses, and other one-shots can be blended in with the grain layer to provide patches with attack or ambience. The sample module also allows your to layer multi-sampled pianos, strings, vibraphones, ceramics and more, when working on melodic patches.

8.1. Sample Page Overview

The Sample page contains the following elements and controls:

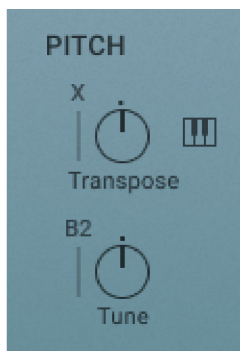


1. **INPUT:** Provides two input modes that determines how the sample layer processes incoming notes. When **Hold First Note** is selected, only the first note plays until the last key is released. The arpeggiator is not available in **Hold First Note** mode. **Polyphonic and Arp** mode triggers every pressed key as every other polyphonic sample player. Select this mode to access the arpeggiator.
2. **ARP:** Contains settings and controls relating to the Arpeggiator. For more information, see [Arpeggiator](#)
3. **Sample Randomize:** Applies random values to all parameters in the Sample page when dice icon is pressed. The drop-down menu next to the Sample Randomize button offers two options for assigning randomization. **P Parameter only** applies randomization to parameters only. **S Include Source** randomizes the Sample Source and parameters. The randomization of the Source sample is limited by the tags selected in the browser.
4. **Sample Header:** Contains global functions including the selection of the source sample, access to the Sample Source browser, and overall Volume control for the Sample layer. For more information, refer to [Sample Header](#).

5. **Sample Waveform display:** Displays the source sample's waveform and visualizes the playback Start position. You can move the Start position by adjusting the Start Offset control. Some Sources can only be played monophonically, indicated by the **Mono** tag in the top right corner of the Waveform display. You can import your own sample by dropping your sound onto the waveform display. For more information, see [Importing Your Own Samples](#).
6. **PITCH:** Contains controls related to tuning and transposition. For more information, refer to [Pitch](#).
7. **START:** Sets the start point from which the sample will playback. For more information, refer to [Start](#).
8. **FILTER:** Contains controls that remove frequencies as determined by the Filter type and Cutoff frequency. For more information, refer to [Filter](#).
9. **FILTER MODULATION:** Contains envelopes that modulate and shape the filter and the cutoff frequency of your sample. For more information, refer to [Filter Modulation](#).
10. **AMP:** Contains envelopes that modulate the Sample Layer's volume. For more information, refer to [Amp](#).

8.2. Pitch

The Pitch section relates to the tuning and transposition of the sample playback. Each control has its own Modulation source which can be used for classic vibrato effect or more extreme sound design. Use the Tune control to fine-tune your sample to the Grain layer.



Sample page – Pitch.

- **Transpose:** Determines the MIDI transposition of the notes before entering the sample layer. It can be adjusted within +2 octaves and -2 octaves.
- **Tune:** Transposes the sample in cents from -2400 cent (-24 semitones, or -2 octaves) to +2400 cent (+24 semitones, or +2 octaves).
- **Key Tracking** (keyboard icon): Determines if the Sample layer takes pitch from the currently pressed key. When this function is deactivated, the Sample layer will always trigger C3. Note that the Arpeggiator Octave setting, as well as the Transpose and Pitch knobs, remain fully functional.

8.3. Start

The Start section sets the point from which the sample will playback. The start point can be modulated to create more dynamic timbres.

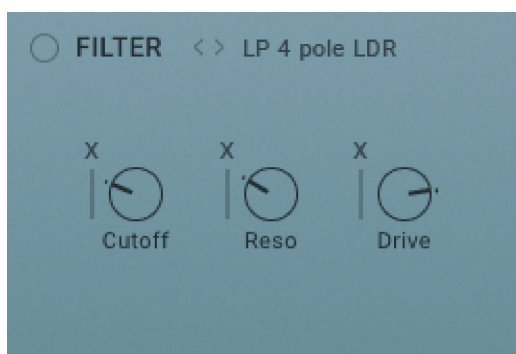


Sample page – Start

- **Start Offset:** Determines where the sample starts to play when a note is triggered.
- **Start Offset Modulation:** Sets the amount of modulation applied to the parameter by the selected modulation source.

8.4. Filter

The Filter takes the raw sample and removes certain frequencies as determined by the Filter type and Cutoff Frequency. This changes the harmonic content of the signal and shapes the tone of the sound. This change can be varied over time using the Filter Envelope or modulated to produce more dynamic animated timbres. You can select from 29 different Filter types, including HP, LP, BP, Notch and Vowel, for variation in spectral character. For more information on the different Filter types, refer to [Filter](#).

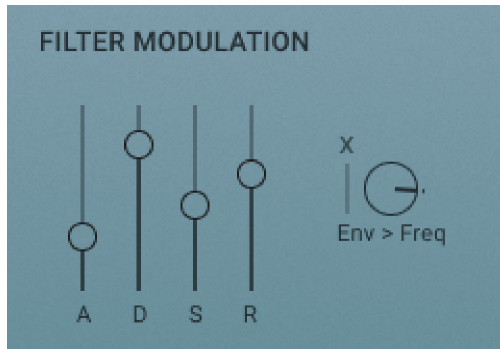


Sample page – Filter

- **Filter on/off:** Switches the Filter in the Sample Layer on or off. When the button is highlighted, the Filter is active.
- **Filter Type previous/next** (< > icon): Browses the different Filter type options.
- **Filter Type:** Selects the Filter type used for the Sample Layer.
- **Cutoff:** Sets the Filter Cutoff frequency of the selected Filter type.
- **Resonance:** Sets the Resonance or peak of the selected Filter type.
- **Drive:** Sets the amount of Drive for the selected Filter type.

8.5. Filter Modulation

The Filter Modulation section contains envelopes that allow you to modulate and shape the filter and the cutoff frequency of your sample. Use the Envelope Amount to determine the intensity of the envelope over the cutoff frequency. Modulating the Envelope Amount can create subtle movements or dramatic timbral changes.

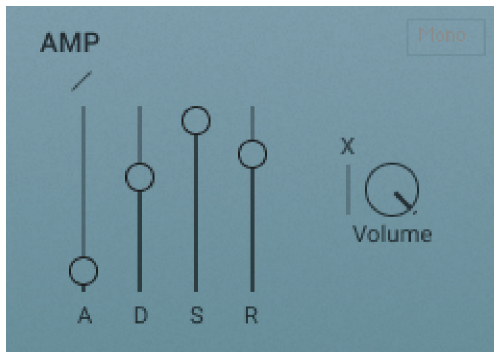


Sample page – Filter Modulation

- **Attack (A):** Adjusts the duration of the envelope's attack stage, which is the time the envelope takes to rise from zero to peak level.
- **Decay (D):** Adjusts the duration of the envelope's decay stage, which is the time the envelope takes to fall from peak to sustain level.
- **Sustain (S):** Adjusts the level of the envelope's sustain stage, at which the envelope stays as long as a note is held.
- **Release (R):** Adjusts the duration of the envelope's release stage, which is the time the envelope takes to fall from sustain level to zero.
- **Envelope Amount:** Determines to which extent the filter envelope modulates the filter. This works on a polyphonic level.

8.6. Amp

The Amp section contains controls related to the Sample layer's volume envelope. It is triggered by incoming MIDI notes and used to dynamically control the amplitude of the Sample layer's output signal. By adjusting the four envelope stages, you can define the overall character of the sound, from snappy, percussive plucks to sustained, elongated drones. Modulate the Volume control with an LFO to create a classic tremolo effect.



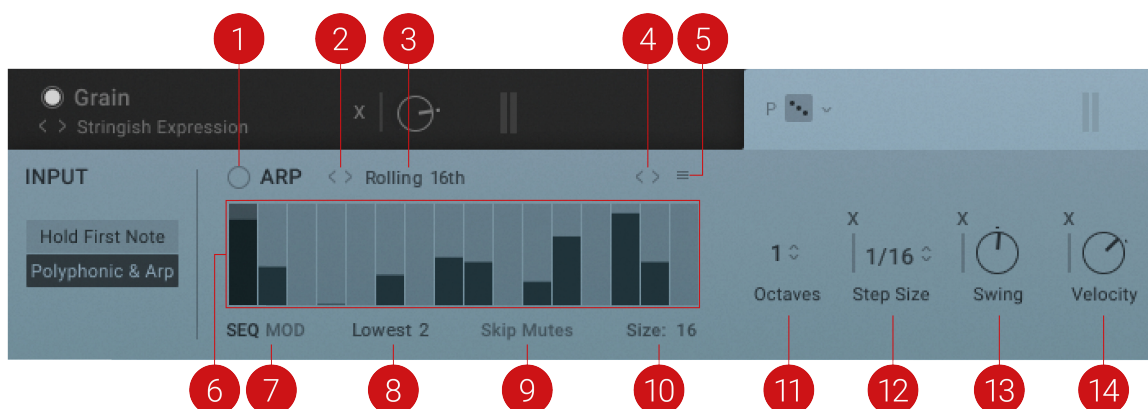
Sample page – Amp

- **Attack Curve:** Adjusts the shape of the envelope's attack stage from an exponential response with a slow onset (-100%) to a logarithmic response with a fast onset (100%). At center position (0%), the response is linear, making the attack stage rise evenly for its entire duration.
- **Attack (A):** Adjusts the duration of the envelope's attack stage, which is the time the envelope takes to rise from zero to peak level.
- **Decay (D):** Adjusts the duration of the envelope's decay stage, which is the time the envelope takes to fall from peak to sustain level.
- **Sustain (S):** Adjusts the level of the envelope's sustain stage, at which the envelope stays as long as a note is held.
- **Release (R):** Adjusts the duration of the envelope's release stage, which is the time the envelope takes to fall from sustain level to zero.
- **Sample Volume:** Determines the volume of the sample before entering the sample layer effects chain.

8.7. Arpeggiator

ASHLIGHT's arpeggiator allows you to create rhythmic patterns in the Sample layer. Explore the predefined arpeggiator presets via the preset menu, or experiment with your own arpeggios by adjusting each individual step directly in the arpeggiator display. Standard settings like Swing, Length, Octaves and Velocity scaling are all available as global controls.

The Arpeggiator contains the following settings and controls:



1. **Arpeggiator on/off:** Switches the arpeggiator for the Sample layer on or off.

2. **Arpeggiator Preset previous/next** (< > icon): Loads the previous or next arpeggiator setting from the preset menu.
3. **Arpeggiator Preset**: Displays the currently selected presets, and opens a menu containing predefined arpeggiator presets.
4. **Arpeggiator Shift left/right**: Nudges all values of the sequence one position to the left or right.
5. **Arpeggiator Options menu**: Opens a menu that allows you to choose a function from the list to process the sequence.
6. **Arpeggiator display**: Displays the sequenced notes or modulation of the arpeggiator.
7. **SEQ/MOD**: Defines whether the notes or the modulation sequence is displayed.
8. **Arpeggiator Mode**: Sets the mode to determine how held notes are filtered, ordered and played back by the arpeggiator.
9. **Skip Mutes**: Determines if steps with 0 velocity in the step sequencer are skipped in the arpeggiator playback.
10. **Size**: Sets the number of steps for the arpeggiator's velocity and modulation sequencer.
11. **Octaves**: Sets the octave range of the arpeggiator playback. Note that the Octaves setting is effective even if Key Tracking is deactivated in the Pitch section.
12. **Step Size**: Sets the length of each arpeggiator step in musical note values. The corresponding slider sets the amount of modulation applied to the parameter from the selected modulation source.
13. **Swing**: Sets the amount of swing for the arpeggiator. 50% is the default setting and applies no swing to the arpeggiator. The corresponding slider sets the amount of modulation applied to the parameter from the selected modulation source.
14. **Velocity**: Scales the velocity output of the arpeggiator. The corresponding slider sets the amount of modulation applied to the parameter from the selected modulation source.

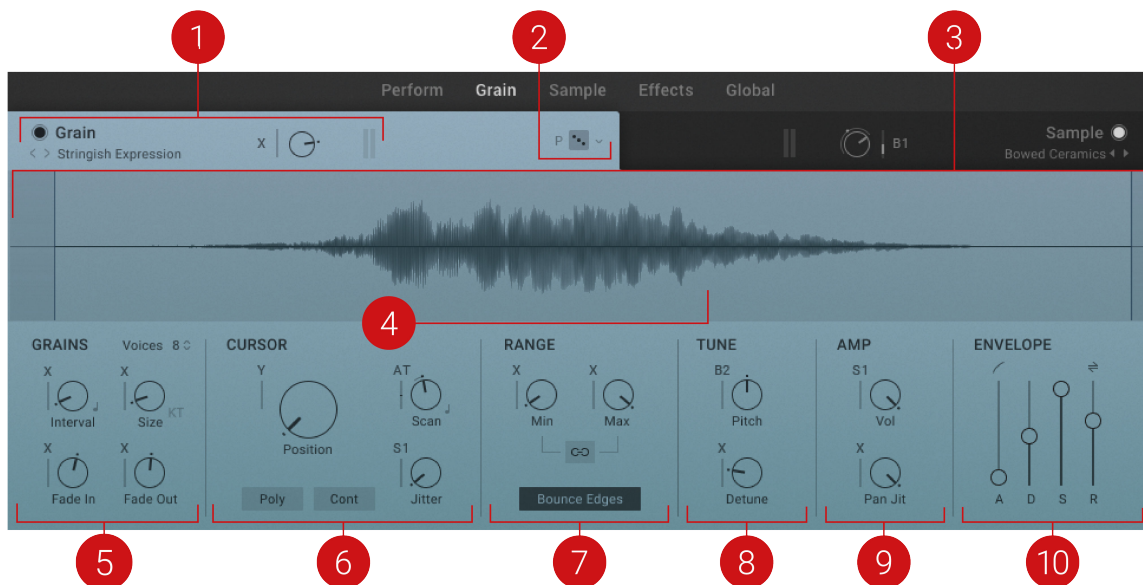
9. Grain Page

The Grain page provides unique ways to play and manipulate the source sample using granular synthesis. The result is lush, organic timbres that can defy time and pitch, whilst retaining the character and quality of the original sounds. Granular synthesis uses an audio sample as a basic sound source and divides it into small segments, called grains. The duration, or size, of a single grain is typically around a tenth of a second and below (< 100 ms). In ASHLIGHT, you can set grain sizes ranging from 10 ms to 1000 ms. If all grains are played consecutively, the result approximates the original sample. The power of granular synthesis lies in the flexibility to change the playback order and speed of the grains, and the ability to apply processing to each grain (duration, fades, level and pitch) for dramatic effects. Using the tempo-synced Grain Cursor you can also create perfectly timed transitions, sweeps, and risers.

The streamlined granular engine scans across ASHLIGHT's specialized source material to create otherworldly organic tones. The smallest nuances of a bowed carbon object can be expanded into epic pads, metal layers can develop into a unique bass timbre, or foley can be scanned for ghostly accompaniments to key patches—all while preserving their original sonic quality. Tempo-synced playback means risers and transitions can be played on-cue.

9.1. Grain Page Overview

The Grain page contains the following elements and controls:



Grain page.

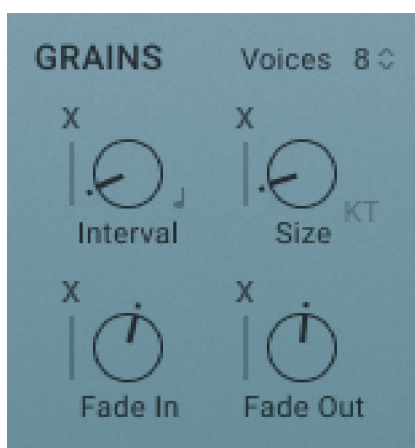
1. **Grain Header:** Contains global functions including the selection of the source sample, access to the Grain Source browser, and overall volume level control for the Grain layer. For more information, refer to [Grain Header](#).
2. **Grain Randomize:** Clicking the dice button applies random values to all parameters in the Grain page. The drop-down menu next to the Grain Randomize button offers two options for assigning randomization. **P Parameter only** applies random values only to the parameters of the Grain layer. **S Include Source** randomizes the Grain Source and parameters. The randomization of the Source sample is limited by the tags selected in the browser.

3. **Grain Waveform display:** Displays the source sample's waveform and visualizes the Cursor position for up to ten notes simultaneously. You can adjust the Cursor Range by clicking and dragging the left and right boundaries in the waveform. For more information about the Cursor Range, refer to [Range](#). In Scan Sync mode, the display additionally shows the sync anchor (4). You can import your own sample by dropping your sound onto the waveform. For more information on adding samples, refer to [Importing Your Own Samples](#).
4. **Sync Anchor:** Sets the Cursor's synchronization point in Scan Sync mode. In this mode, the **Scan** control in the **CURSOR** section adjusts the time it takes the Cursor to move from the **Start** position to the sync anchor. Note that the Sync Anchor can be positioned outside of the cursor range. For more information, refer to [Cursor](#).
5. **GRAINS:** Contains controls related to the basic generation of the individual grains and their shape. For more information, see [Grains](#).
6. **CURSOR:** Contains controls related to the Cursor and how it moves through the Source Sample. The Cursor represents the read-out position of the grains. For more information, see [Cursor](#).
7. **RANGE:** Contains controls related to the Cursor Range, which sets boundaries for the read-out position of the grain in the source sample. For more information, see [Range](#).
8. **TUNE:** Contains controls related to the Pitch of the individual grains. For more information, see [Tune](#).
9. **AMP:** Contains controls related to the Volume level of the individual grains. For more information, see [Amp](#).
10. **ENVELOPE:** Contains controls related to the Grain Layer's Volume Envelope. For more information, see [Envelope](#).

9.2. Grains

This section contains controls related to the basic generation of the individual grains and their shape. This way you can define the basic character of your sound. **Interval** and **Size** are fundamental to the way the sound transforms the source sample. High **Interval** values can be used for more consistent and slowly evolving sounds, while low values can create lively or erratic results that change at a high rate. Use high values for **Size** to allow more of the character of the source sample to shine through the sound, or dive fully into abstract micro sound with low values. **Fade In** and **Fade Out** can be used to make the sound smoother at high values, or more textured and angular at low values.

The Grains section contains the following parameters:



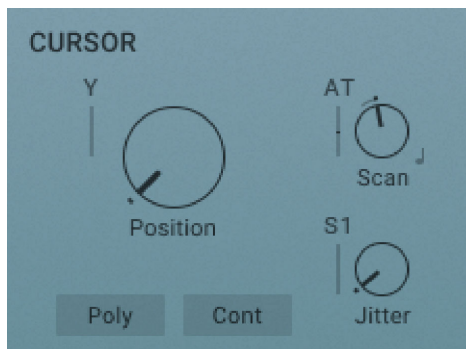
Grain page – Grains.

- **Voices:** Sets the maximum number of voices the Grain layer can play at the same time.
- **Interval:** Adjusts the time between the generation of individual grains from the source sample.
 - **Grain Interval Mode:** Allows you to set the grain interval in relation to the host tempo and/or if the grains are triggered freely or in sync with the first key, indicated by the two note icon. Longer intervals are mandatory for recognizing the trigger mode difference.
- **Size:** Adjusts the duration of each individual grain until it is faded out.
 - **KT:** Enables key tracking mode for the Size parameter. When enabled, the grain duration is compensated according to the pitch of the MIDI note: high pitches result in short-grain durations, while low pitches result in long-grain durations.
- **Fade In:** Adjusts the fade applied at the beginning of each grain. You can use this to soften the edges of the grains.
- **Fade Out:** Adjusts the fade applied at the end of each grain. You can use this to smoothen the release of the grains.

9.3. Cursor

This section contains controls related to the Cursor and how it moves through the source sample. The Cursor represents the read-out position of the grains. By changing the **Start** position, you can explore the source sample for new sonic material to build your sound. **Scan** and **Jitter** determine the movement of the Cursor during note events. Therefore, they strongly contribute to the character of the sound and how the original sample is transformed. The additional **Poly** and **Free** modes make it possible to adjust the Cursor's behavior in relation to how the instrument is played via MIDI.

The Cursor contains the following parameters:



Grain page – Cursor.

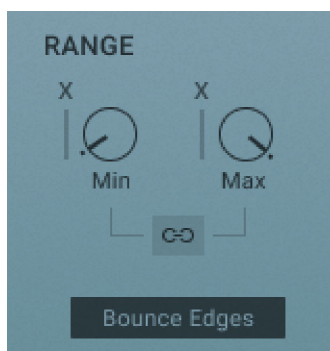
- **Start:** Adjusts the position of the Cursor in the source sample. The Cursor represents the read-out position of the grains. The position is set as percentage of the range between the left and right boundaries of the Cursor Range. For more information about the Cursor Range, refer to [Range](#).
- **Poly:** Activates Poly mode. When activated, each incoming MIDI note has its own dedicated Cursor. Therefore, each note can play grains from different read-out positions. When deactivated, all MIDI notes coming in are locked to the Cursor position of the first played note.

- **Free:** Activates Free mode. When activated, the Cursor position moves freely within the Cursor boundaries and according to the **Scan** parameter once a note event has started. In this case, modulation applied to the Cursor boundaries or the **Start** do not change the Cursor position. When deactivated, modulation applied to related parameters during a note event change the Cursor position accordingly.
- **Scan:** Adjusts the Cursor's speed and direction as it moves across the source sample during a note event. Negative values let it move backwards, positive values let it move forwards. Note that related parameters including **Bounce Edges**, Release direction (option above the envelope's **R** stage), **Free** mode and the Cursor Range boundaries interact with **Scan**.
- **Scan Sync:** Activates Scan Sync mode, which synchronizes the scan speed to the host clock. When enabled, **Scan** is set in musical note divisions relative to the host clock. The note duration is the time it takes the Cursor to move from the **Start** position to the sync anchor as set in the waveform display.
- **Jitter:** Adjusts the range of random position changes applied to the Cursor position. The maximum value corresponds to 40% of the Cursor Range.

9.4. Range

This section contains controls related to the Cursor Range, which sets boundaries for the read-out position of the grain in the source sample. By setting the range you can generate grains only from a specific part of the source sample, or you can apply modulation to the controls to access different parts of the source sample dynamically. Since the source samples contain evolving and dynamic tone colors, you can use this to morph your sound in interesting ways.

The Range contains the following parameters:



Grain page – Range.

- **Min:** Adjusts the position of the Cursor Range's left boundary in the source sample.
- **Length/Max:** Adjusts the position of the Cursor Range's right boundary in the source sample. When **Grain Range Link** is enabled, the **Length** control adjusts the size of the Cursor Range. This way you can move the Cursor Range through the source sample at a fixed length using the **Min** control. When **Grain Range Link** is disabled, the **Max** control adjusts the absolute position of the right boundary.
- **Grain Range Link:** Sets the behavior of the **Length/Max** control. When enabled, the control is switched to **Length**. When disabled, the control is switched to **Max** (see **Length/Max** for more information).
- **Bounce Edges:** Sets the Cursor's behavior when hitting the Cursor Range's boundaries. When enabled, the Cursor rebounds from the position of the boundaries and continues to move in the opposite direction.

i When **Free** is enabled in the **CURSOR** section, the Cursor can move past the boundary's position and bounces back into the Cursor range in a spring-like movement. When **Free** is disabled, the Cursor cannot move past the boundary's position.

9.5. Tune

This section contains controls related to the pitch of the individual grains. By using the **Pitch** control, you can transpose grains in the range of four octaves. This way you can subtly detune the source sample or completely change its character. Applying modulation creates interesting vibrato effects. The **Detune** control randomizes the pitch of individual grains and can turn any sample into an otherworldly sound effect.

The Tune section contains the following parameters:



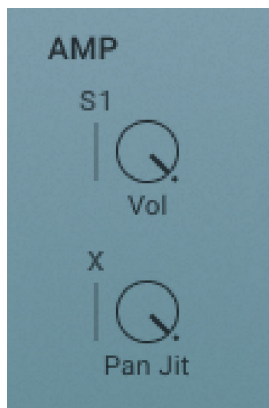
Grain page – Tune.

- **Pitch:** Transposes the grains in cents from -2400 cents (-24 semitones, or -2 octaves) to +2400 cent (+24 semitones, or +2 octaves).
- **Detune:** Adjusts the range of random pitch deviations added to each grain in one cent intervals from 0 to 50 cents.

9.6. Amp

This section contains controls related to the volume level of the individual grains. Using **Vol** you can set a suitable level for the output signal going into the Grain Effects, or apply modulation for tremolo effects. **Pan Jit** randomizes the stereo position of grains and can be used to create a wide and lively stereo image.

The Amp contains the following parameters:



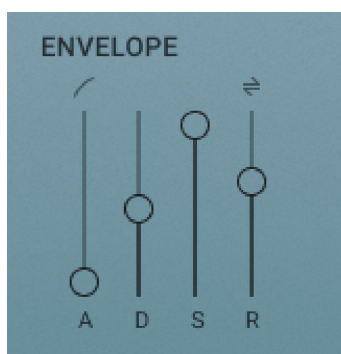
Grain page – Amp.

- **Vol:** Adjusts the volume level of the grains.
- **Pan Jit:** Adjusts the amount of random panning introduced to each individual grain.

9.7. Envelope

This section contains controls related to the Grain layer's volume envelope. It is triggered by incoming MIDI notes and used to dynamically control the amplitude of the Grain layer's output signal. By adjusting the envelope stages, you can define the overall character of the sound from plucked and percussive to bowed and sustained. The additional Release Direction setting is used to define the behavior of the Cursor once a note is released, allowing you to fine-tune the release behavior of the sound.

The Envelope contains the following parameters:



Grain page – Envelope.

- **Attack Curve:** Adjusts the shape of the envelope's attack stage from an exponential response with a slow onset (-100%) to a logarithmic response with a fast onset (100%). At center position (0%), the response is linear, making the attack stage rise evenly for its entire duration.
- **Release Direction:** Sets the direction of the Cursor's movement during the release stage. When set to **Continue**, the Cursor maintains its direction. When set to **Force Cursor Left**, the Cursor moves to the left once the MIDI note is released. When set to **Force Cursor Right**, the Cursor moves to the right.
- **Attack (A):** Adjusts the duration of the envelope's attack stage, which is the time the envelope takes to rise from zero to peak level.

- **Decay (D):** Adjusts the duration of the envelope's decay stage, which is the time the envelope takes to fall from peak to sustain level.
- **Sustain (S):** Adjusts the level of the envelope's sustain stage, at which the envelope stays as long as a note is held.
- **Release (R):** Adjusts the duration of the envelope's release stage, which is the time the envelope takes to fall from the sustain level to zero.

10. Effects Page

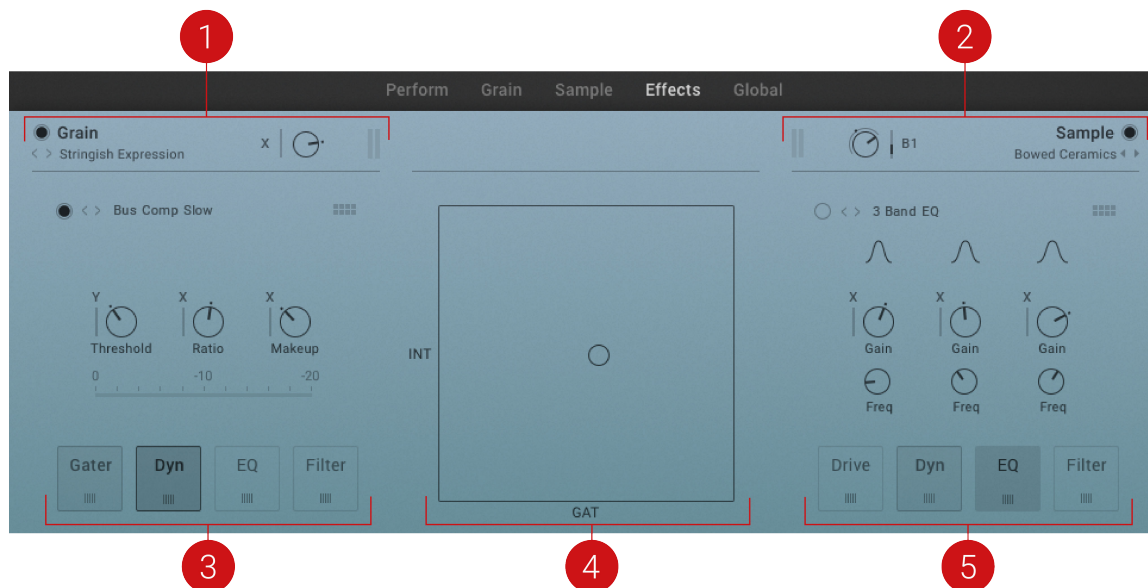
On the Effects page, you can apply effects to the audio signals coming from the Grain layer and the Sample Layer. For each layer, there is a dedicated Effects section containing an effects chain. Each effect chain consists of four effect slots for loading individual effects. You can choose from nine effects which can be operated in several modes. Depending on the effect mode, there will be different parameters and controls for the select effect.

This section contains an overview of the Effects page. Here you will learn how to load effects into effect slots and how to select an effect mode. You will also learn how to reorder and to disable effect slots within the effect chain.

i The procedures for the Effect sections explained here are the same for the Grain Layer, the Sample Layer, and the FX section on the Global page.

10.1. Effects Page Overview

The Effects page contains the following elements and controls:



Effects page.

- 1. Grain Header:** Contains global functions including selection of the source sample, access to the Grain Source browser, and overall volume level control for the Grain layer. For more information, refer to [Grain Header](#).
- 2. Sample Header:** Contains global functions including selection of the source sample, access to the Sample Source browser, and overall volume level control for the Sample layer. For more information, refer to [Sample Header](#).
- 3. Grain Effects section:** Contains settings and controls relating to the Grain layer's Effects Chain. For more information, refer to [Effects Section Overview](#).
- 4. XY Pad:** With the XY Pad you can shape the sound of the Snapshot in realtime according to modulation assignment for the X and Y parameters. The axis labels provide a hint of what to

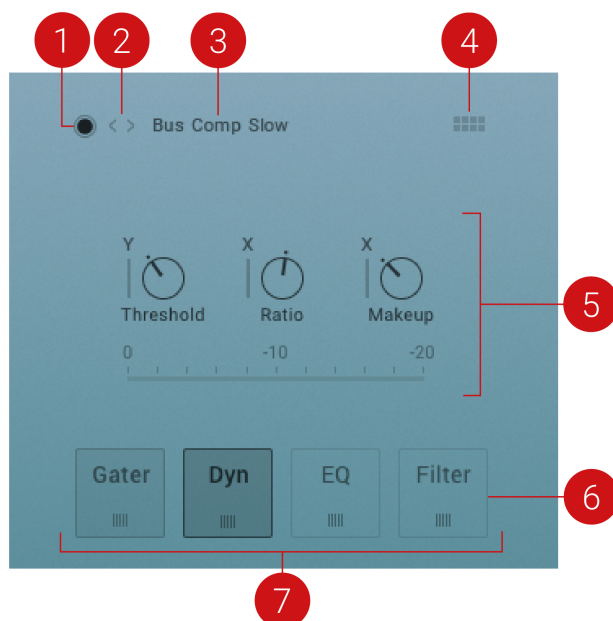
expect when moving the Cursor. You can assign MIDI CCs for the XY pad on the Global page. For more information, refer to [Assigning XY Pad to a MIDI Controller](#).

5. **Sample Effects section:** Contains settings and controls relating to the Sample layer's Effects Chain. For more information, refer to [Effects Section Overview](#).

10.2. Effects Section Overview

The Effects page contains two Effects sections: one for the Grain layer and one for the Sample layer. The Global page contains another Effects section to further process the audio signal mixed from the Grain layer and the Sample layer. The Grain, Sample and Global Effects all share the same controls and workflows.

Each Effects section contains the following elements and controls:



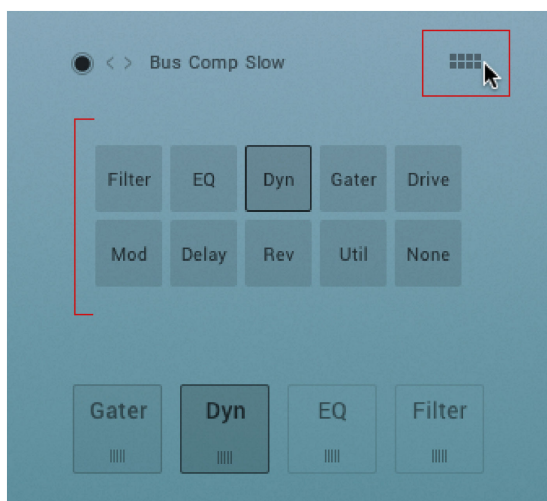
1. **Effect on/off** : Switches the effect in the selected Effect Slot on or off. When the button is highlighted, the Effect is active. For more information, refer to [Bypass Effect Slots](#).
2. **Effect Mode previous/next**: Selects the previous or next Effect Mode for the selected effect. For more information, refer to [Selecting Effect Modes](#).
3. **Effect Mode**: Displays the selected Effect Mode. Clicking the display opens a drop-down menu to directly select an Effect Mode for the selected effect. For more information, refer to [Selecting Effect Modes](#) and [Effect Reference](#).
4. **Effect Selector button**: Opens the Effect Selector to load one of nine effects into the selected Effect Slot. For more information, refer to [Effect Selector](#).
5. **Effect parameters**: Each effect contains up to three individual parameters, and some additional control, for adjusting the effect's sound. For more information, refer to [Effect Reference](#).
6. **Effect Slot**: Each slot can load one effect. Selecting an effect slot displays the parameters of the loaded effect. For more information, refer to [Loading Effects into Effect Slots](#).
7. **Effects Chain**: The Effect Chain contains four Effect Slots, each with an individual effect. The Effect Slots can be moved and rearranged within the Effects Chain. For more information, refer to [Moving Effect Slots in the Effects Chain](#).

i The procedure explained here for editing controls is the same for the Grain Layer, the Sample Layer, and the FX section on the Global page.

10.2.1. Effect Selector

When clicking the Effect selector button in the Effects section, the Effect selector opens. The Effect selector allows you to choose one of nine different Effect types for loading into the selected Effect slot. You can also select **None** to leave the selected Effect slot empty. The Effect selector closes as soon as an effect is selected.

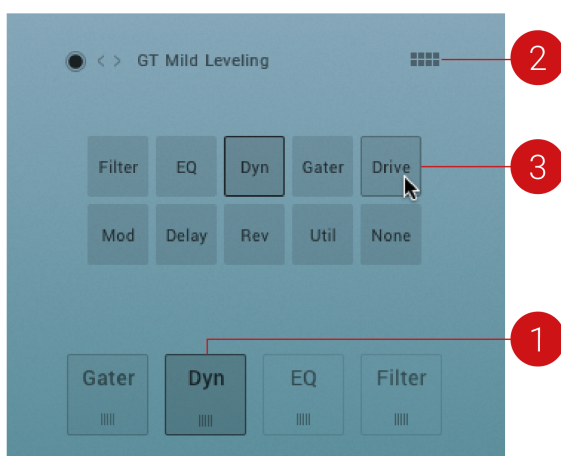
For more information on the effect types, refer to [Effect Reference](#).



Effect selector.

10.2.2. Loading Effects into Effect Slots

To load an effect into an Effect Slot:



1. Select an Effect Slot in the Effect Chain.
2. Click the Effect Selector button to open the Effect Selector.

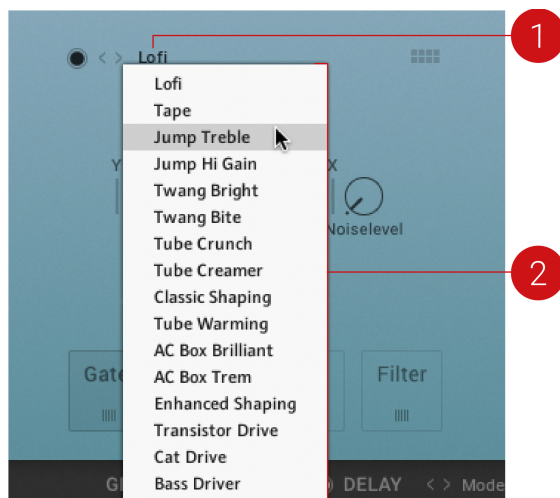
3. Select an effect to load it.

→ The effect is loaded into the Effect Slot. The Effect Selector closes. You can now adjust the effect's parameters.

10.2.3. Selecting Effect Modes

Any effect can be operated in various modes to change the general behavior of the effect. Each Mode has its own set of unique parameters that best shape and articulate the sound of that effect. For more information on Effect Modes, refer to [Effect Reference](#).

To select an Effect Mode:



1. Click the Effect Mode Display to open the Modes menu.

2. Select a Mode from the drop-down menu.

→ The Effect Mode is changed. The new Mode is shown in the Mode Display, and the parameter controls are changed accordingly.

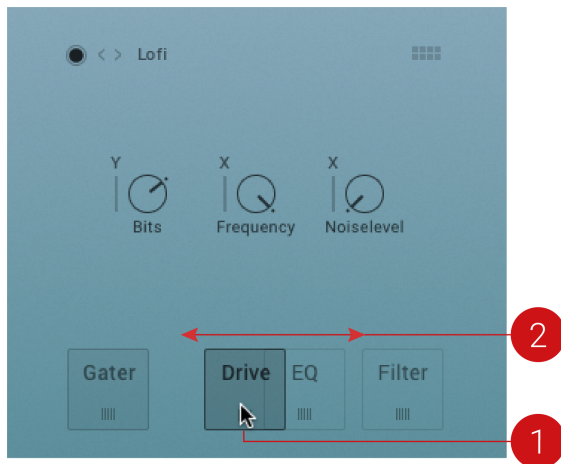


Alternatively, you can skip to the next or previous Mode using the Effect Mode arrows, located next to the Mode Display.

10.2.4. Moving Effect Slots in the Effects Chain

You can move effects slots within the effect chain to change the resulting sound of the effect chain.

To move effect slots within the effect chain:

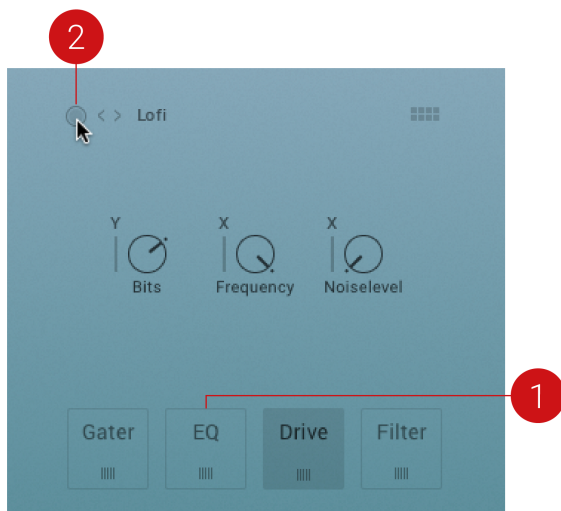


1. Click and hold the icon at the bottom center of the effect slot.
 2. Drag the effect left or right within the effects chain, and release.
- The effect is moved to a new position within the effects chain.

10.2.5. Bypass Effect Slots

You can bypass individual effect slots in the effects chain to compare the sound with or without particular effects.

To bypass an effect slot:



1. Select the effect slot you want to bypass.
 2. Click the Bypass button.
- The Active button is deselected and the effect slot is bypassed. This is also indicated by the missing frame around the effect slot.

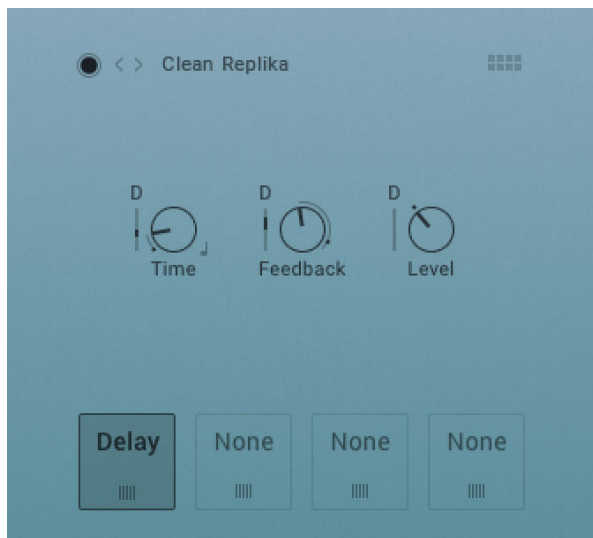
10.3. Effect Reference

ASHLIGHT provides nine different types of Effects, which can be loaded into any of the four slots in the Effects Chain. When selecting effects, you must consider the function of the effect itself, and its impact in the signal flow of the Effects Chain. Certain combinations of effects are particularly effective when used together, while other combinations are less successful. For further flexibility and functionality for a wide range of sound design, each effect has multiple Effect Modes, which will shape the character and behavior of the effect. In this section you are introduced to all available Effects in ASHLIGHT, and the range of Effect Modes in which they can be operated in.

10.3.1. Delay

This delay module is based on Native Instruments' dedicated Replika XT delay plug-in. It features different modes: Modern, BBD, Tape, Vintage and Diffusion, that add distinct color to your sound. All modes offer controls for time, feedback level, a low cut filter, a high cut filter, and ping pong effect. Each mode also provides a unique range of parameter controls to tailor the effect to your specific needs.

The following parameters are available for all effect modes:



Clean Replika Delay

- **Time:** Adjusts the delay time in milliseconds. To synchronize the time to your host or Master Editor tempo, click the Time control's unit display [ms] and choose a note length value from the drop-down menu.
- **FX Sync:** Sets the effect's time-based parameter in sync with the master clock.
- **Feedback:** Adjusts the level of the signal that is fed back to the delay's input. Increasing Feedback adds delay repeats. Levels above 100% create swelling echo repeats up to self-oscillation.
- **Level:** The range is from 100/0% to 0/100%.

Delay Modes

The following Delay modes are available:

- **Modern (Saturation, Dark, Ping Pong):** Modern mode is a clean delay, with saturation and filter controls that allow you to add warmth and color to your sound. It is a pristine and transparent delay, well-suited to acoustic instruments like guitar and piano. When changing the delay time, pitch stays constant.
- **BBD (Clean, Warm, Dark, Grunge, Ping Pong, Vibrato LR):** Analog mode offers four Bucket Brigade delay models that replicate the character sound of BBD chips. From subtle distortion and warmth, to clean, smooth sounds, each model emulates desired characteristics of classic analog delay units.
- **Tape (Fresh, Vintage, Dark, Dark LR):** Tape mode reproduces the sound of tape delay, modeled on the physical mechanisms that make up early tape machines. Controls for Tape Age, Flutter, and Saturation allow you to manipulate the noise, hiss, and color of the effect.
- **Vintage (Ping Pong, Mod, BP):** Vintage mode emulates the sound of early digital delay units. Select between four quality levels that model the behavior of vintage delays with a limited sample memory size. Increasing the delay time causes the sampling rate to decrease, introducing audio artifacts. The sample quality and interpolation vary for each of the four quality levels.
- **Diffusion (Dense, Small LR, Gentle, Cloud Pan, 4 Times):** Diffusion mode can produce a standard delay effect, but it is best used for its huge, diffusion-based reverb sound. Thicken the density of delay repeats with the Dense, Modulation, and Size controls to create a full sounding reverb effect. This mode is ideal for ambient music and sound design.

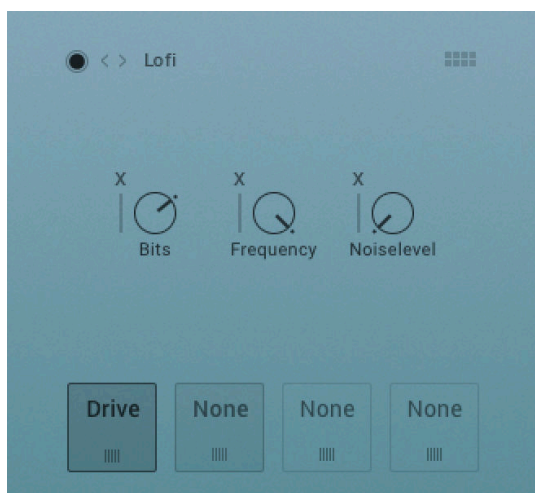
10.3.2. Drive

The Drive effect can be used to apply specific saturation to the sound. Several effect modes for different saturation sounds are available which are explained in more detail below.

Lofi

This module adds various digital artifacts, like quantization noise or aliasing, to a clean signal. It's great for roughing up sounds that would otherwise be too plain and featureless.

Lofi contains the following parameters:



Lofi effect

- **Bits:** Re-quantizes the signal to an adjustable bit depth. Fractional bit levels (such as 12.4 bits) are possible and can add considerable “grit”. Audio CDs have a quantization depth of 16 bits, old samplers frequently used 8 or 12 bits, and 4 bits evoke memories of countless irritating children’s toys.
- **Frequency:** Adjusts the frequency characteristic of the noise and acts as a low-pass filter.
- **Noiselevel:** Adds hiss to the audio signal.

Tape

The Tape Saturator emulates the soft compression and distortion of recording to tape. It can be used lightly to add warmth and coloring to the sound, or heavily to add aggressive distortion.

Tape contains the following parameters:



Tape effect

- **Gain:** Controls the input gain of the effect. This will increase the amount of tape distortion and compression.
- **Warmth:** Controls the low frequency boost/cut of the effect.
- **Damp:** Attenuates high frequencies in the output signal, thereby counteracting the brightness caused by the artificial harmonics.

Jump Treble, Jump Hi Gain

The Jump effect simulates the classic tone of British guitar amplifiers. It is ideal for creating smooth, singing lead sounds. The Jump effect is available on both the Group and Instrument level.

The following parameters are available:



Jump treble effect

- **Preamp:** Sets the amount of gain added by the preamp. Turning it clockwise adds drive, distortion and edge to the sound.
- **Treble:** Adjusts the high-frequency response.
- **Master:** Adjusts the amp's master volume.

Twang Bright, Twang Bite

The Twang effect simulates the rich tube sound of classic guitar amps from decades ago. It's ideal for screaming leads and crunchy rhythm guitar sounds, as well as clean sounds with personality.

The following parameters are available:



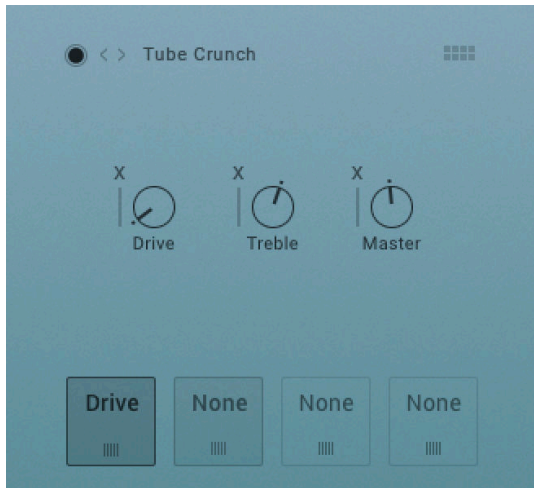
Twang Bright effect

- **Gain:** Controls the input level. In contrast to the Output knob, which merely adjusts the overall level of the module, this knob works like the gain control of a guitar amp and affects the amount of distortion.
- **Bass:** Adjusts the level of the signal's low-frequency components.

- **Treble:** Adjusts the level of the signal's high frequency components.

Tube Crunch

The following parameters are available:

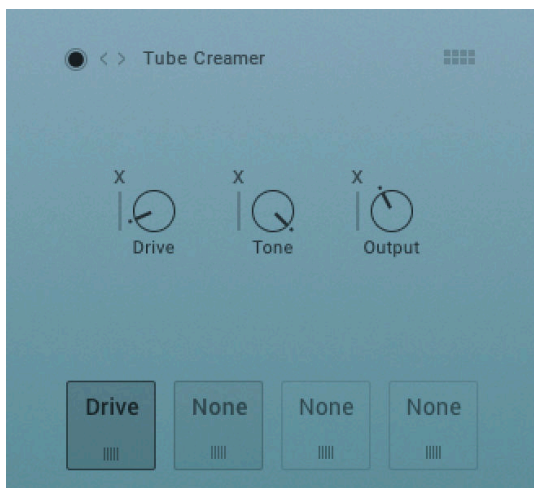


Tube Crunch effect

- **Drive:** Adjusts the amount of distortion.
- **Treble:** Adjusts the level of the signal's high frequency components.
- **Master:** Adjusts the amp's master volume.

Tube Creamer

The following parameters are available:

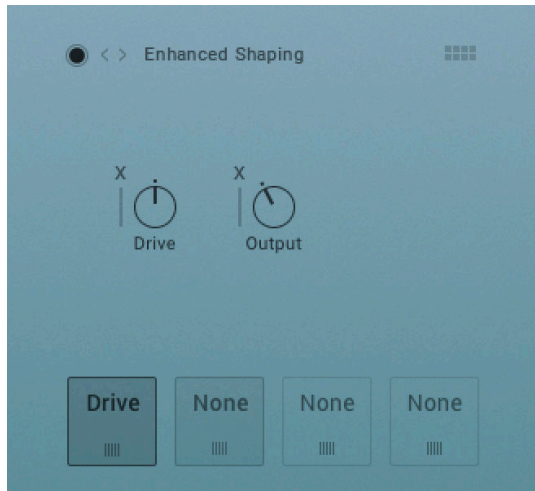


Tube Creamer

- **Tone:** Controls the brightness of the sound. Turning this knob clockwise will result in a more pronounced top-end, which works great on bright, screaming leads and biting rhythms. Turning it counter-clockwise results in a mellower, darker sound.
- **Output:** Adjusts the module's output level.

Enhanced Shaping

The following parameters are available:

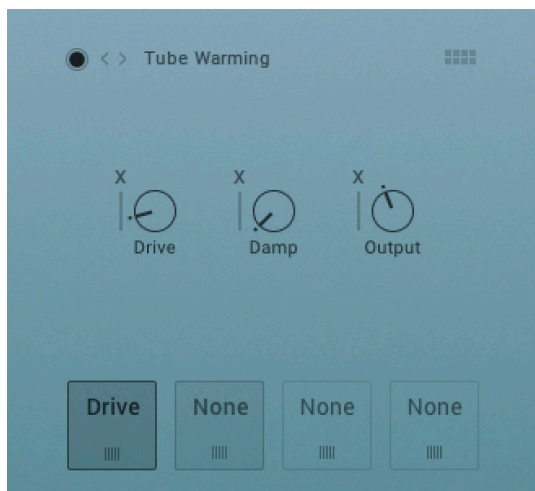


Enhanced Shaping effect

- **Drive:** Adjusts the amount of distortion.
- **Output:** Adjusts the module's output level.

Tube Warming

The following parameters are available:



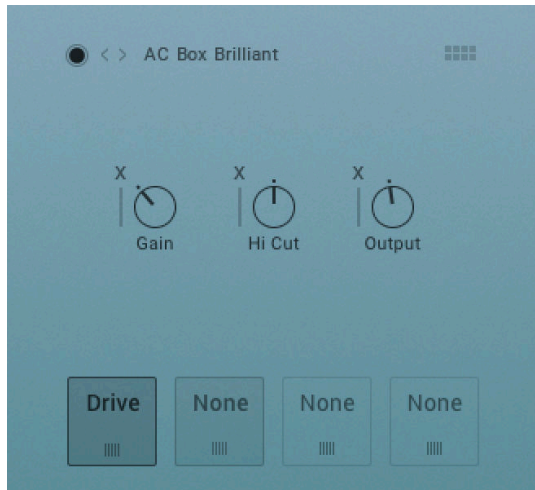
Tube Warming

- **Drive:** Adjusts the amount of distortion.
- **Damp:** Attenuates high frequencies in the output signal, thereby counteracting the brightness caused by the artificial harmonics.
- **Output:** Adjusts the module's output level.

AC Box Brilliant, AC Box Trem

The ACBox models the guitar amplifier sound that powered the British Invasion of pop music. There were many versions of this highly original amp made, each having a different character. We chose a model that stands out with a unique flavor and includes the famous Top Boost channel!

The following parameters are available:



AC Box Brilliant

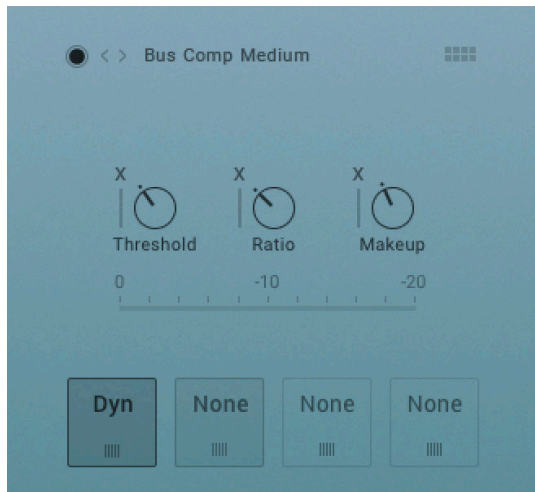
- **Gain:** Sets the level for the Brilliant channel.
- **Hi-Cut:** Controls a low-pass filter. By turning the knob clockwise treble in the output of the Normal channel is reduced.
- **Output:** Adjusts the module's output level.

10.3.3. Dynamics

The Dyn (Dynamics) effect can be used, for example, to reduce the level of loud passages in the audio signal. The available parameters and effect modes are explained in more detail below. The following parameters are available in the respective modes:

Bus Comp Effect Modes

Compressors are dynamic tools which automatically reduce the level of loud passages in a signal, thereby affecting the signal's dynamic range. The Solid Bus Comp is modeled after a classic analog bus compressor. It offers a more characteristic dynamic control than KONTAKT's standard compressor.

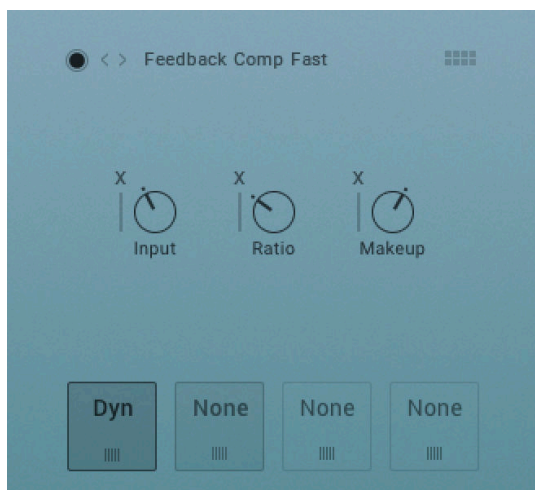


Bus Comp Medium

- **Threshold:** Sets a level threshold above which the Compressor starts working. Only levels that rise above this threshold will be reduced by the compression; signals that stay below it will be left unprocessed.
- **Ratio:** Controls the amount of compression, expressed as a ratio of “input level change” against “output level change”. A Ratio of 1:1 means that no compression will be happening. For example, a Setting of 4 represents the ration 4:1, which means for every 4 decibel increase of amplitude above the threshold, the output will increase by only 1 decibel.
- **Makeup:** Controls the output gain of the compressed signal. Used to compensate for the gain reduction of the effect.

Feedback Comp Fast Effect Modes

Compressors are dynamic tools that automatically reduce the level of loud passages in a signal, thereby affecting the signal's dynamic range. A feedback compressor is a type of compressor that compares the amplifier's output signal, rather than the input signal, to a threshold level. When the threshold level is reached, the compressor reduces the signal's gain level. The Feedback Compressor is modeled after a classic feedback compressor known for its bright and punchy sound.

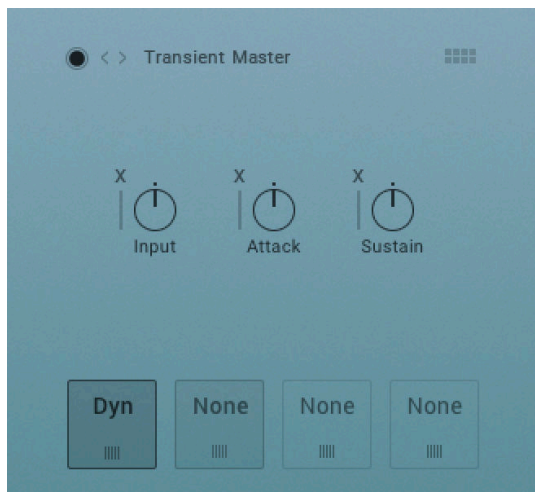


Feedback Comp Fast effect

- **Input:** Controls the input gain to the effect.
- **Ratio:** Controls the amount of compression, expressed as a ratio of “input level change” against “output level change”. A Ratio of 1:1 means that no compression will be happening. For example, a Setting of 4 represents the ration 4:1, which means for every 4 decibel increase of amplitude above the threshold, the output will increase by only 1 decibel.
- **Makeup:** Controls the output gain of the compressed signal. Used to compensate for the gain reduction of the effect.

Transient Master

The Transient Master is an easy to use compressor designed to control the attack and sustain of a sound. Instead of following the amplitude of the sound like a traditional compressor, it follows the general envelope and is thus not as susceptible to changes of input gain. It is best used on sounds with fast attacks, like percussion, pianos or guitars. The Transient Master can also be quite extreme in some cases, so use it with caution.

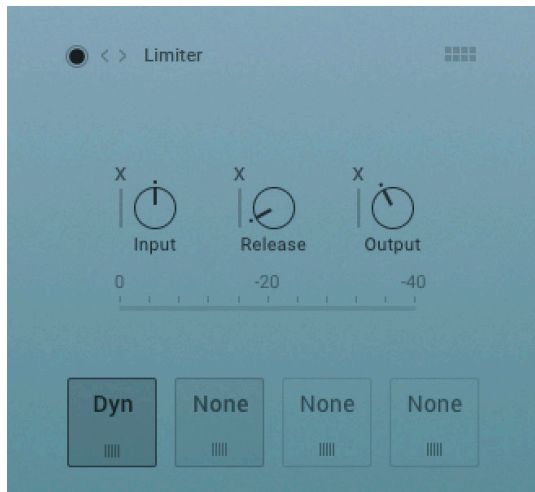


Transient Master

- **Input:** Controls the input gain to the effect.
- **Attack:** Adjusts the time the Compressor will take to reach the full Ratio value after an input signal exceeds the Threshold level.
- **Sustain:** Controls the scaling of the sustain portion of the input signal’s volume envelope. Increasing this parameter will add more body to the sound and decreasing it will reduce the sound’s tail.

Limiter

Limiters are actually a special form of compressors with a ratio of one to infinity, a threshold just below the maximum level, and a very short attack time. They act as a “safety net” to keep short signal peaks from overloading the system, which would result in audio clipping. While compressors have a range of artistic applications, limiters are usually used for technical reasons — they can tame signals with peaks which would otherwise overload the output, without requiring you to turn the signal’s overall volume down.



Limiter

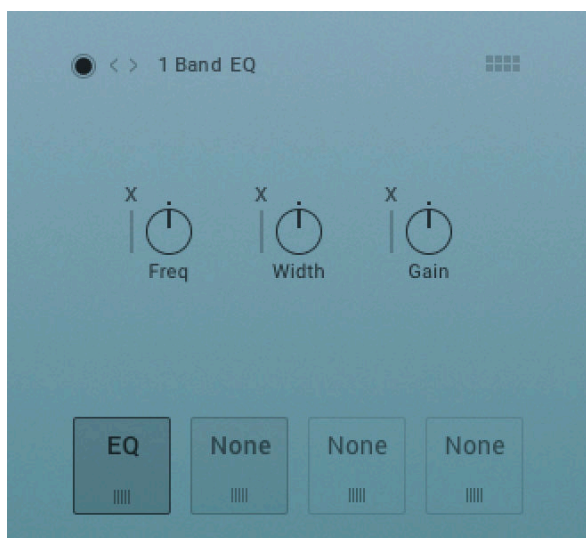
- **Input:** Controls the input gain to the effect.
- **Release:** Adjusts the time the compressor will take to fall back to non-compression after the input signal falls below the threshold.
- **Output:** Controls the module's output level.

10.3.4. EQ

Fully parametric peak equalizers allow for a wide range of tonal alterations and corrections. Use the EQ to boost or cut selective frequencies of the audio signal. The EQ is mainly a tool to tailor your audio signal to taste by cutting out selected frequencies or boosting others. The EQ can be operated in a 1 Band EQ and in a 3 Band EQ which are explained in more detail below.

1 Band EQ

The 1 Band EQ is a simple equalizer. It contains the following parameters:



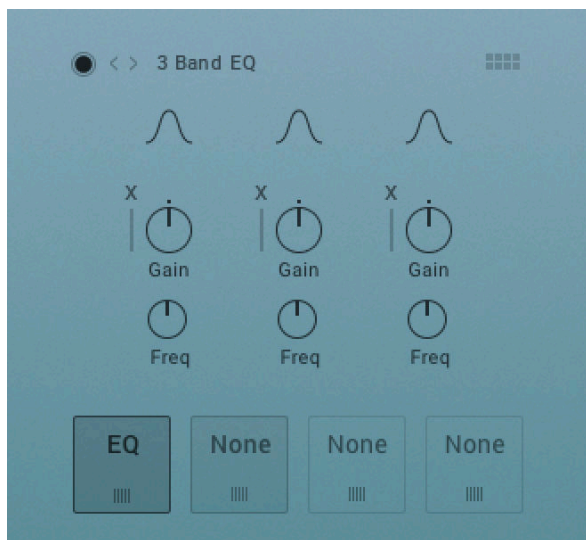
1 Band EQ effect

- **Freq.** (Frequency): Adjusts the center frequency at which the boost or cut will occur.
- **Width** (Bandwidth): Adjusts the width of the frequency range that will be affected in octaves (bell shape).
- **Gain:** Adjusts the amount of boost (positive values) or cut (negative values) at the center frequency.

3 Band EQ

Using up to three EQ bands, you can boost or cut any frequency range throughout the entire spectrum by up to 18 dB, with an adjustable Bandwidth parameter allowing you to choose between gentle corrections or very steep edits.

The 3 Band EQ contains the following parameters:



3 Band EQ effect

- **Q:** Controls the Quality of the frequency band. For most EQs, the higher the quality, the narrower the frequency band. For most EQs, the higher the quality, the narrower the frequency band, but with this EQ the control is reversed to match the hardware it emulates and becomes a bandwidth control.
- **Gain:** Adjusts the amount of boost (positive values) or cut (negative values) at the center frequency.
- **Freq.** (Frequency): Adjusts the center frequency at which the boost or cut will occur.

10.3.5. Filter

A filter is a signal processor which changes the frequency content of a signal that passes through it. This means that in contrast to effects like distortion, reverb, or chorus, it only changes the amplitude and phase of frequency components which are already present in your signal, without creating new frequency content.

The following parameters are available depending on the effect mode:



LP Ladder 2 Pole

- **Cutoff:** Adjusts the frequency below which signals will be attenuated.
- **Reso:** With a value greater than 0, this control will boost a small frequency range around the cutoff frequency.
- **Width:** Controls the gap between the cutoff frequencies of the two filters, with the low-pass filter's cutoff always above that of the high-pass. The gap is generated around a central point controlled by the Cutoff control.
- **Drive:** Adjusts the amount of distortion.
- **Gain:** Controls the amplitude increase after the filter. This control can be used to compensate for amplitude reduction due to the filter, or to increase the soft saturation of the effect.
- **HP Cutoff:** Controls the cutoff frequency of the High Pass filter.
- **LP Cutoff:** Controls the cutoff frequency of the Low Pass filter.
- **Talk:** Controls the frequency response of the filter. Can be used to morph between vowel-sounds.
- **Sharp:** Increases and decreases the peaks and notches in the response respectively, analogous to the resonance control of the other filters.
- **Size:** Controls the center of the frequency response, analogous to the cutoff control of the other filters.

Filter Modes

- **LP Ladder 2 Pole:** Based on the classic ladder circuit used in early synthesizers, these filters would be a first choice for synthetic sounds, but can work well on any signal. The LP2 is a 2-pole low-pass, which attenuates frequencies above the cutoff at a rate of -12 dB/octave.
- **LP Ladder 4 Pole:**
- **LP SV 2 Pole:** The State Variable (SV) filters have a clean characteristic that can be used for all kinds of audio signals. The LP2 is a 2-pole low-pass, which attenuates frequencies above the cutoff at a rate of -12 dB/octave.
- **LP SV 4 Pole:** The State Variable (SV) filters have a clean characteristic that can be used for all kinds of audio signals. The LP4 is a 4-pole low-pass, which attenuates frequencies above the cutoff at a rate of -24 dB/octave.

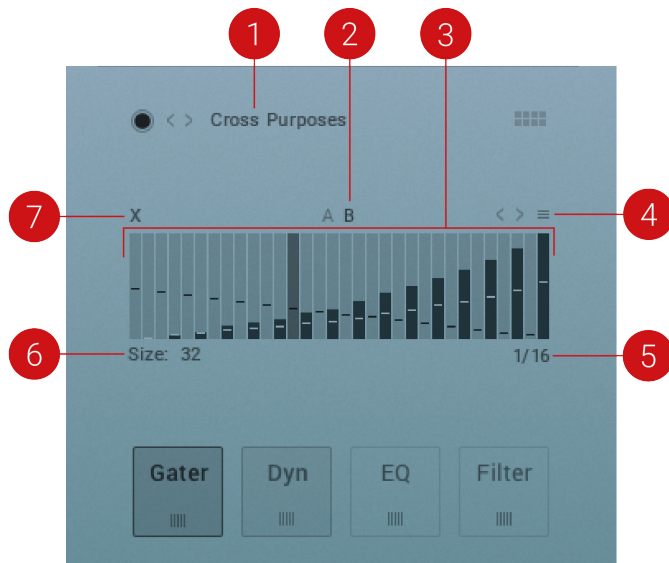
- **HP Ladder 2 Pole:** Based on the classic ladder circuit used in early synthesizers, these filters would be a first choice for synthetic sounds, but can work well on any signal. The HP2 is a 2-pole high-pass, which attenuates frequencies below the cutoff at a rate of -12 dB/octave. The Ladder HP2 filter also includes the following controls:
- **HP Ladder 4 Pole:** Based on the classic ladder circuit used in early synthesizers, these filters would be a first choice for synthetic sounds, but can work well on any signal. The HP4 is a 4-pole high-pass, which attenuates frequencies below the cutoff at a rate of -24 dB/octave. The Ladder HP4 filter also includes the following controls:
- **HP SV 2 Pole:** The State Variable (SV) filters have a clean characteristic that can be used for all kinds of audio signals. The HP2 is a 2-pole high-pass, which attenuates frequencies below the cutoff at a rate of -12 dB/octave.
- **HP SV 4 Pole:** The State Variable (SV) filters have a clean characteristic that can be used for all kinds of audio signals. The HP4 is a 4-pole high-pass, which attenuates frequencies below the cutoff at a rate of -24 dB/octave.
- **BP Ladder 2 Pole:** Based on the classic ladder circuit used in early synthesizers, these filters would be a first choice for synthetic sounds, but can work well on any signal. The BP2 is a 2-pole band-pass, which attenuates frequencies above and below the cutoff at a rate of -12 dB/octave. The Ladder BP2 filter also includes the following controls:
- **BP Ladder 4 Pole:** Based on the classic ladder circuit used in early synthesizers, these filters would be a first choice for synthetic sounds, but can work well on any signal. The BP4 is a 4-pole band-pass, which attenuates frequencies above and below the cutoff at a rate of -24 dB/octave.
- **BP SV 2 Pole:** The State Variable (SV) filters have a clean characteristic that can be used for all kinds of audio signals. The BP2 is a 2-pole band-pass, which attenuates frequencies above and below the cutoff at a rate of -12 dB/octave.
- **BP SV 4 Pole:** The State Variable (SV) filters have a clean characteristic that can be used for all kinds of audio signals. The BP4 is a 4-pole band-pass, which attenuates frequencies above and below the cutoff at a rate of -24 dB/octave.
- **LP HP:** This very clean sounding filter lacks any pronounced resonance and is ideally suited for removal of low frequency rumble and high frequency issues like harshness and excessive noise without coloring the filtered signal. The HP filter is a 2-pole (12 dB/octave), whereas the 1-pole LP has a more gentle slope of 6 dB/octave.
- **Phaser:** This effect continually changes the phase relationships in your signal with an all-pass filter. This results in a comb filtering effect, which attenuates some frequencies while boosting others. The sound is similar to that of a Flanger but in a more subtle manner.
- **Vowel A:** This filter simulates the resonant frequencies of the human vocal tract; when forming a vowel, the throat and mouth cavities will change their shape in order to create a complex, natural filter which emphasizes certain frequencies in the sound created by the vocal chords. These characteristic frequencies, called formants, allow the human hearing to discern between different vowels, and are being replicated by this filter.
- **Vowel B:** This filter works similarly to the Vowel A module, but has a slightly different sonic character.
- **Formant:** Formants are acoustic resonances. The term often applies to the phonetics of human speech, as such, the formant filters are designed to mimic the frequency response of the human vocal tract. These filters can be used to emulate the “talk box” effect.

- **LP Draft:** The Daft filter has been adapted from MASSIVE and is a more aggressive synthesizer filter design. The response of the filter is a 2-pole low-pass, which attenuates frequencies above the cutoff at a rate of -12 dB/octave. The daft filter also includes a **Gain** knob that controls the amplitude increase after the filter. This control can be used to compensate for amplitude reduction due to the filter, or to increase the soft saturation of the effect.
- **HP Draft:** The Daft filter has been adapted from MASSIVE and is a more aggressive synthesizer filter design. The response of the filter is a 2-pole high-pass, which attenuates frequencies below the cutoff at a rate of -12 dB/octave. The Daft filters also include the following controls:
- **Notch SV4 Pole:** The State Variable (SV) filters have a clean characteristic that can be used for all kinds of audio signals. The Notch 4 is a 4-pole notch filter, which attenuates frequencies at the cutoff.
- **AR LP 2:** The Adaptive Resonance (AR) filters follow the amplitude of the input signal and adjust the resonance accordingly. At higher input levels, the resonance will reduce, and for lower levels it will increase, this avoids unpleasant peaks. These filters work best on full loops or drums. The LP2 is a 2-pole low-pass, which attenuates frequencies above the cutoff at a rate of -12 dB/octave.
- **AR LP 4:** The Adaptive Resonance (AR) filters follow the amplitude of the input signal and adjust the resonance accordingly. At higher input levels, the resonance will reduce, and for lower levels it will increase, this avoids unpleasant peaks. These filters work best on full loops or drums. The LP4 is a 4-pole low-pass, which attenuates frequencies above the cutoff at a rate of -24 dB/octave.
- **AR HP 2:** The Adaptive Resonance (AR) filters follow the amplitude of the input signal and adjust the resonance accordingly. At higher input levels, the resonance will reduce, and for lower levels it will increase, this avoids unpleasant peaks. These filters work best on full loops or drums. The HP2 is a 2-pole high-pass, which attenuates frequencies below the cutoff at a rate of -12 dB/octave.
- **AR BP 2:** The Adaptive Resonance (AR) filters follow the amplitude of the input signal and adjust the resonance accordingly. At higher input levels, the resonance will reduce, and for lower levels it will increase, this avoids unpleasant peaks. These filters work best on full loops or drums. The BP2 is a 2-pole band-pass, which attenuates frequencies below and above the cutoff at a rate of -12 dB/octave.
- **HP LP Serial:** The State Variable (SV) filters have a clean characteristic that can be used for all kinds of audio signals. The Ser. LP/HP is the combination of a high-pass filter routed serially after a low-pass filter. The result is similar to a band-pass filter.

10.3.6. Gater

The Gater controls the volume of a sound with the help of two step sequencers. This can be used to rhythmically chop the signal and make it stutter or sound staccato. The Gater has two individual rhythms **A** and **B** which you can crossfade using the applied modulation source. The Gater in ASHLIGHT retriggers on the first note to better accommodate vocal-based presets.

The Gater contains the following controls:



Gater effect

1. **Presets:** Selects a preset for the Gater effect. The name of the selected preset is displayed.
2. **Rhythm A and B:** Switches between the rhythms **A** and **B**.
3. **Stepping area:** Adjust the steps for the selected rhythm by dragging the bars up or down.
4. **Context menu:** With the options in this menu you can, for example, copy or swap the rhythms from **A** to **B**.
5. **Musical timing:** Determines how fast the Gater is stepping forward. You can select from 1/4 to 1/ 64 of a beat.
6. **Size:** Determines how many steps the Gater provides. You can select between 2 to 32 steps.
7. **Modulation Source:** Selects the modulation source to be applied to the parameter.

i The Gater effect can only be used once in ASHLIGHT .

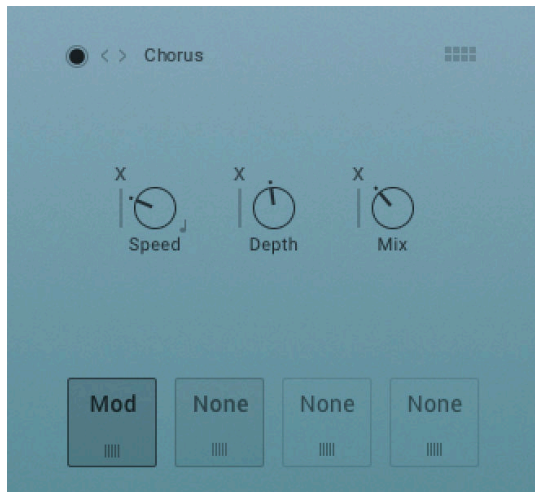
10.3.7. Modulation

The Mod (Modulation) effect modifies the sound in various ways, depending on the selected effect mode. Mod can be used to thicken the sound as a standard chorus effect, or can be used to radically manipulate and alter the audio signal. The following effect modes are available:

Chorus and Chorus Phase

The Chorus module “thickens” the audio signal by splitting it up and detuning one version in relation to the original. Separate LFOs with an adjustable phase relationship detune each stereo channel independently for creating wide-panorama effects.

Chorus contains the following controls:



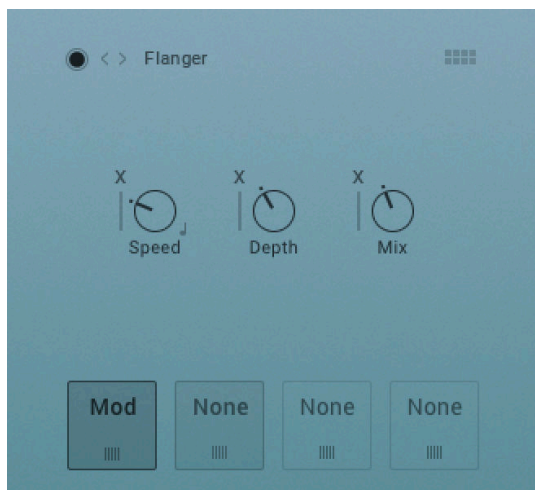
Chorus effect

- **Speed:** Adjusts the LFO speed. To synchronize the speed to your host or Master Editor tempo, click the Speed parameter's unit display and choose a note length value from the drop-down list.
- **FX Sync:** Sets the effect's time-based parameters in-sync with the master clock.
- **Depth:** Adjusts the range of modulated detuning. Higher values give a more pronounced chorusing effect.
- **Mix:** Adjusts the respective levels of the original and processed signals. Note that the typical phasing effect is created by the combination of both signals, so setting these to the same levels results in the most pronounced effect.

Flanger and Flanger Color and Flanger Reso

This module splits the audio signal up and delays one version in relation to the original signal. By modulating the delay time, as well as feeding an adjustable amount of the output signal back into the input, the Flanger creates a characteristic “whooshing” sound. Just like the Phaser module, the Flanger uses a separate LFO for each stereo channel, with the phase relationship between both LFOs being adjustable.

Flanger contains the following controls:

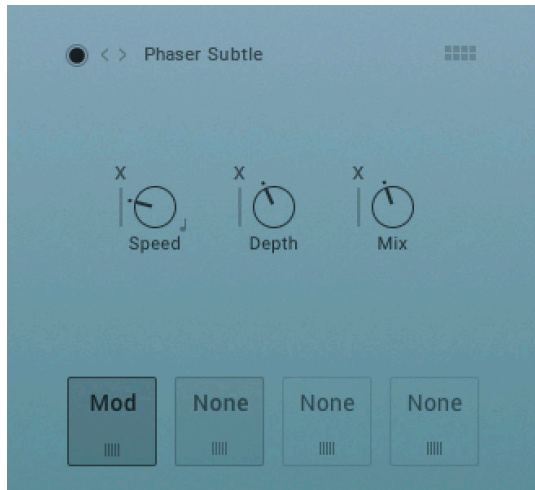


Flanger effect

Phaser Subtle and Phaser Feedback

This effect continually changes the phase relationships in your signal with an all-pass filter. This results in a comb filtering effect, which attenuates some frequencies while boosting others. The sound is similar to that of a Flanger but in a more subtle manner.

Phaser contains the following controls:



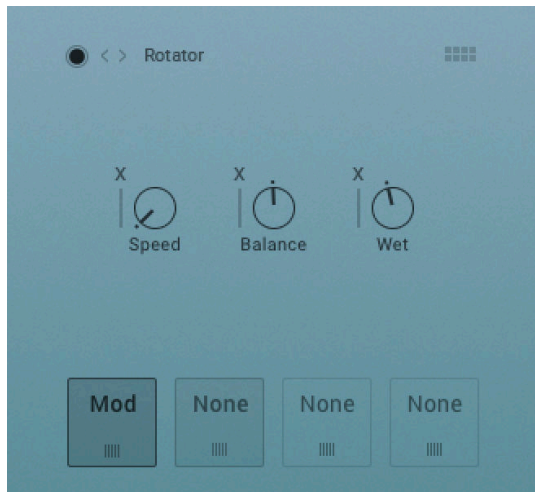
Phaser effect

- **Speed:** The LFO modulation speed. To synchronize the speed to your host or Master Editor tempo, click the Speed control's unit display and choose a note length value from the drop-down list.
- **FX Sync:** Sets the effect's time-based parameters in-sync with the master clock.
- **Depth:** The amount of LFO modulation. Higher values cause the Phaser effect to sweep over a wider frequency range.
- **Mix:** Adjusts the respective levels of the original and processed signals. Note that the typical phasing effect is created by the combination of both signals, so setting these to the same levels results in the most pronounced effect.

Rotator and Rotator Room and Rotator Slow Acc and Rotator Fast Acc

The Rotator effect realistically simulates the sound of rotating speaker cabinets, which are commonly associated with drawbar organs that became popular in rock music of the 60s and 70s. Although the effect is almost intrinsically tied to "the" prototypical drawbar organ sound, it works equally well on guitars, synth pads, and a wide range of other sounds.

Rotator contains the following controls:



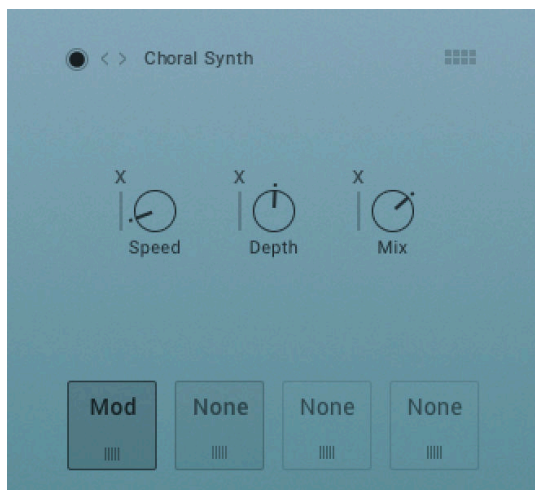
Rotator effect

- **Speed:** Although this parameter appears as a knob in order to facilitate automation, it has two positions Slow and Fast. A change of this setting realistically simulates the acceleration or braking of the rotor.
- **Balance:** Controls the relative levels of the cabinet's treble and bass parts.
- **Wet:** Adjusts the level of the original and processed signal.

Choral Synth, Feedback, Ensemble, Dimension, and Sauce

Choral features four distinct chorus modes, ranging from the subtle sound of classic studio rack processors to the large ensemble sound of early string synthesizers.

Choral contains the following controls:



Choral Synth effect

- **Speed:** Adjusts the LFO speed. To synchronize the speed to your host or Master Editor tempo, click the Speed parameter's unit display and choose a note length value from the drop-down list.
- **Depth:** Adjusts the range of modulated detuning. Higher values give a more pronounced chorusing effect.

- **Mix:** Adjusts the respective levels of the original and processed signals. Note that the typical phasing effect is created by the combination of both signals, so setting these to the same levels results in the most pronounced effect.

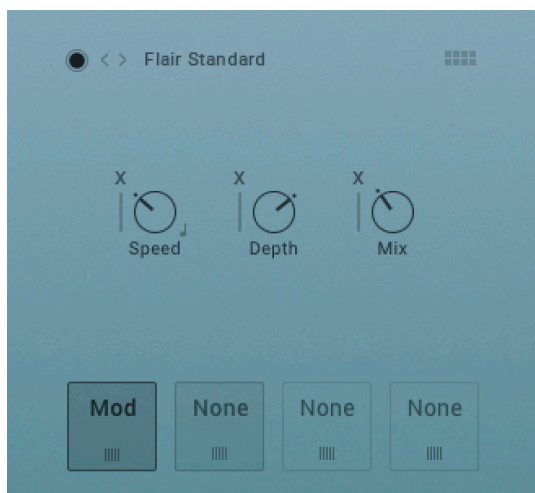
Choral Modes

- **Synth:** This mode is inspired by the choruses of polyphonic synthesizers from the late seventies and early eighties. Its sound characteristic is dark and vintage. The modulation behavior is tuned for rich and dispersed sounds.
- **Ensemble:** This mode is inspired by the choruses of string synthesizers from the seventies. Its sound characteristic is warm and lush. The modulation behavior is tuned for animated and lively sounds.
- **Dimension:** This mode is inspired by the choruses of studio rack processors from the early eighties. Its sound characteristic is bright and transparent. The modulation behavior is tuned for wide and consistent sounds.
- **Universal:** This mode is a more generic chorus implementation. Its sound characteristic is clean and modern. The modulation behavior is tuned for a range of sounds from consistent to lively, depending on the number of Voices.

Flair Standard, Resonance, Unison, Scan on C, Stairways

Flair features five flanger modes that offer different approaches to a range of effects from flanging to harmonization. The effect is produced by up to four comb filters, called Voices. Further expanding on the original concept of a flanger, the flanger voices have a harmonic relationship based on a wide selection of preset chords (Chord parameter).

Flair contains the following controls:



Flair Standard

- **Speed:** The LFO modulation speed. To synchronize the speed to your host or Master Editor tempo, click the Speed control's unit display and choose a note length value from the list.
- **FX Sync:** Sets the effect's time-based parameters in-sync with the master clock.
- **Depth:** The amount of LFO modulation. Higher values cause the effect to sweep over a wider frequency range.
- **Mix:** Adjusts the respective levels of the original and processed signals.

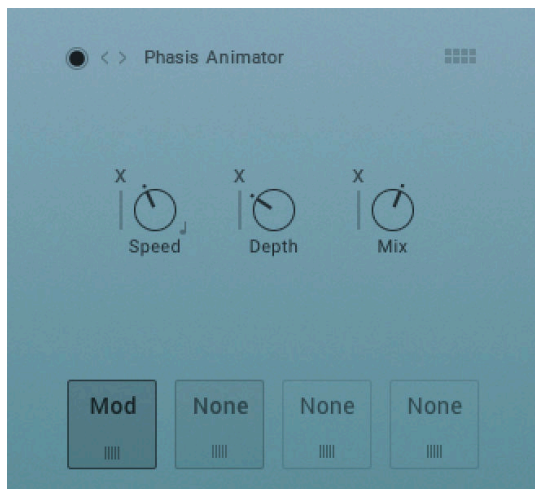
Flair Modes

- **Standard:** Each flanger voice behaves like a basic flanger effect, creating harmonically related peaks and notches in the frequency spectrum
- **Thru Zero:** Each flanger voice is duplicated. The duplicated instances of the flanger voices are excluded from the modulation and thus rest at their respective base pitch. When modulation is introduced, the flanger voices shift against the duplicated instances in time. This creates the strong thru zero flanging effect with its characteristic signal cancellation, similar to the flanging effect originally created with two tape machines.
- **Scan:** Instead of adding the flanger voices to form a chord, the effect scans through them one after the other. This is similar to how an arpeggiator on a keyboard plays the notes contained in a chord as a sequence.
- **Scan on C:** A “ringing” tone is added in the key of C.
- **Stairways:** An ascending resonance is created.

Phasis Animator, 6 Notches, Complex Low, and High Scanner

Phasis is a new take on the phaser concept with additional features that have been carefully chosen to allow for more sophisticated and extreme sounds than possible with common phasers while staying true to the ease of use and clarity associated with these devices.

Phasis contains the following effects:



Phasis Animator

- **Speed:** The LFO modulation speed. To synchronize the speed to your host or Master Editor tempo, click the Speed control's unit display and choose a note length value from the list.
- **FX Sync:** Sets the effect's time-based parameters in-sync with the master clock.
- **Depth:** The amount of LFO modulation. Higher values cause the effect to sweep over a wider frequency range.
- **Mix:** Adjusts the respective levels of the original and processed signals.

Phasis Modes

- **Animator:** classic, subtle two-notch phaser stereo effect.

- **6 Notches:** medium phaser effect with higher resonance.
- **Complex Low:** Complex nine-notch phaser with the center frequency in the lower spectrum at around 300 Hz.
- **High Scanner:** intense four-notch phaser effect in the upper mid-range at 3.2 kHz and obvious feedback setting.

10.3.8. Rev

With the Rev (reverb) effect you can adjust the size of the sound.



Reverb effect

IRC Flat and Low Cut

This module simulates the natural reverberation that occurs when a sound source is placed in an acoustic environment, thus adding a feeling of spaciousness to the sound.

The following parameters are available:

- **Level:** Adjusts the reverb's output level.
- **SIYE:** Adjusts the size of the simulated room. This affects the duration of the reverb trail.

ALG Effect Modes

This algorithmic reverb offers Room and Hall modes. Room mode generates a natural reverb with strong initial reflections and a quick decay. You can use this to simulate the natural sound of a small acoustic space. With a faster reverberation time, it is particularly suited to drums and guitars.

Hall mode emulates the immensity of a large hall space, with a warm and rich sounding reverb. This can be used to replicate a vast, natural space. The large reverberation and long decay time make it a great tool to experiment with on a variety of sounds.

The following parameters are available:

- **Time:** Adjusts the duration of the reverb effect.
- **Size:** Adjusts the size of the room simulated by the reverb effect. Higher values replicate larger rooms.

- **Level:** Adjusts the reverb's output level.

ALG Plate

Plate reverb was developed as an early method of generating an artificial reverb effect. A vibrating sheet of metal is employed to simulate reflection patterns in acoustical spaces. Since the sheet of metal vibrates across a two-dimensional plane, the echo density is higher and more evenly distributed than in a three-dimensional space. It is a good choice if you want to brighten a sound source. Plate reverb has a smooth reverb tail, allowing you to lengthen a sound without pushing it back in the mix. For this reason plate reverbs are most commonly used on vocals and snare drums. The Damping control affects the overall tone, so applying it to a bright source warms the sound.

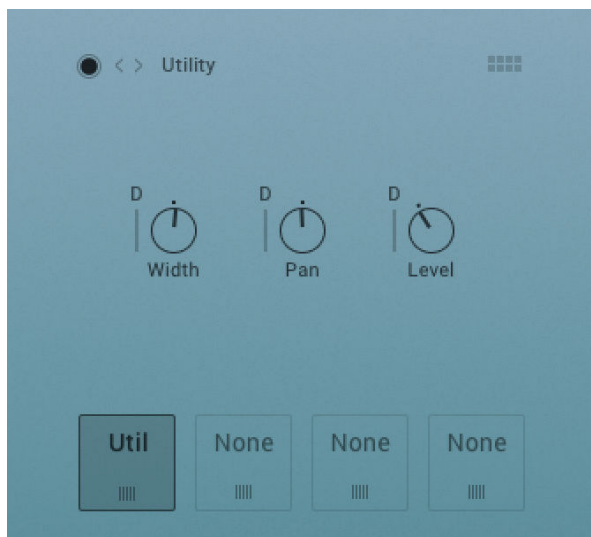
The following parameters are available:

- **Decay:** Adjusts the duration of the reverb effect.
- **Low Shelf:** Attenuates or amplifies the low-frequency content of the reverb signal.
- **Level:** Adjusts the reverb's output level.

10.3.9. Utility

The Utility effect allows you to control the width of your signal's stereo image and adjust the panning. Applying modulation from an LFO or Shaper can produce particularly interesting stereo effects.

Utility contains the following parameters:



Utility effect

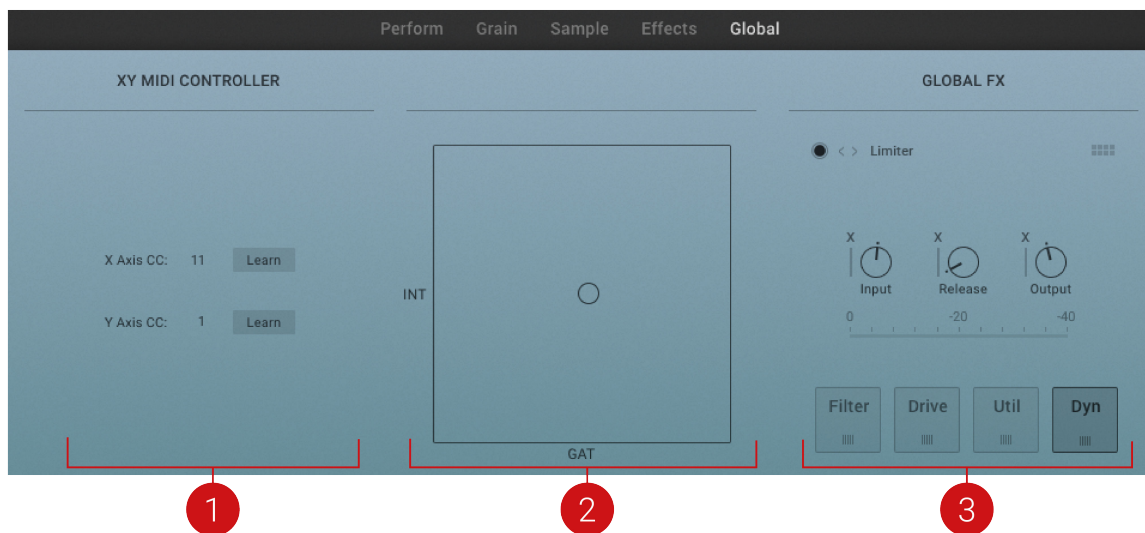
- **Width:** Collapses or expands the signal's stereo base. At the far left position, stereo signals will be summed to mono. Positive values will result in an artificial widening of stereo sources that has a tendency to apparently expand beyond the speakers, but watch out, this tends to cause mono incompatibilities in your mix.
- **Pan:** This control allows you to place your signal within the stereo field. It works exactly like the Pan control of the Amplifier module.
- **Level:** Adjusts the effect's output level.

11. Global Page

On the Global page, you can further process the mixed audio signal coming from the Grain and the Sample layers, and you can assign the X and Y-axis of the XY Pad to the controls of your MIDI controller. For this, you have the GLOBAL FX section on the right side and the XY MIDI CONTROLLER section on the left side. The following sections provide an overview of the Global page and the procedure for assigning the X and Y-axis to your MIDI controller.

11.1. Global Page Overview

The Global page contains the following sections:



- 1. XY MIDI CONTROLLER section:** Use the Learn buttons to assign MIDI messages of your MIDI controller to the X and Y-axis of the XY Pad in the middle or directly select the desired MIDI CC number. For more information, refer to [Assigning XY Pad to a MIDI Controller](#).
- 2. XY Pad:** Controls the sound of the current Snapshot in realtime according to the modulation assignments for the X and Y parameters. For more information, refer to [XY Pad](#).
- 3. GLOBAL FX section:** The GLOBAL FX section further processes the audio signal coming from the Grain layer and the Sample layer. The GLOBAL FX section works in a similar way to the effects sections on the Effects page. For more information, refer to [Effects Section Overview](#).

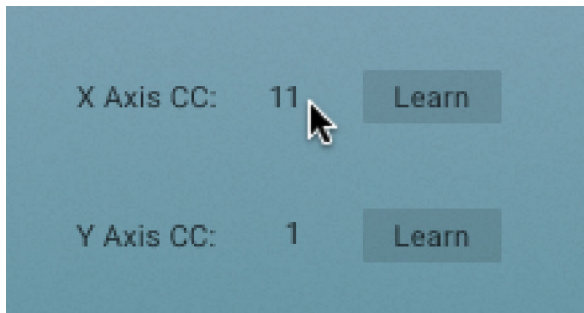
11.2. Assigning XY Pad to a MIDI Controller

You can also control the X and Y axis of the XY Pad with a MIDI controller. On the Global page, two options are available to assign the X and Y axis to a MIDI device. Directly select the MIDI CC number or use the MIDI learn function to quickly integrate a hardware control into the ASHLIGHT environment.

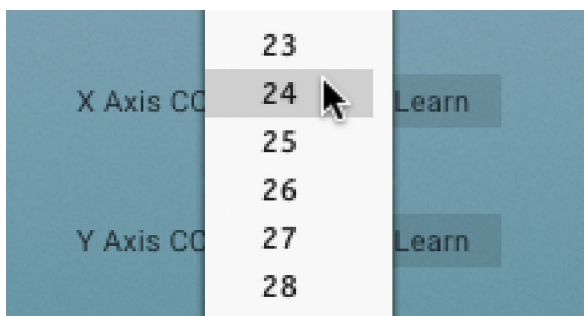
Selecting the MIDI CC Numbers

To directly select the MIDI CC number for the X or Y axis:

1. Click the MIDI controller number for the corresponding axis to open the MIDI CC number drop-down menu.



2. Select the desired MIDI CC number.

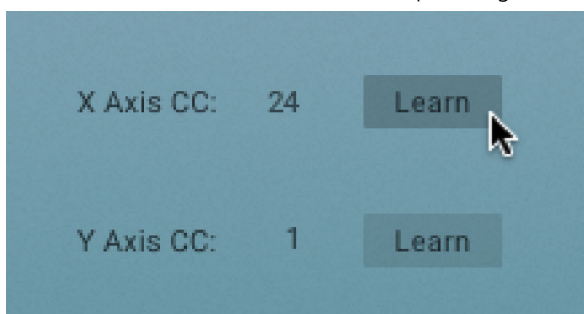


→ The MIDI CC number is assigned to the axis. Repeat these steps for the other axis.

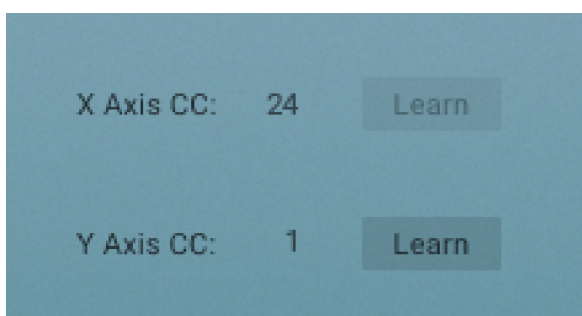
Using the MIDI Learn Function

To assign the X and Y axis using the MIDI learn function:

1. Click the **Learn** button of the corresponding axis to enable the MIDI learn function.



→ The **Learn** button starts to flash.



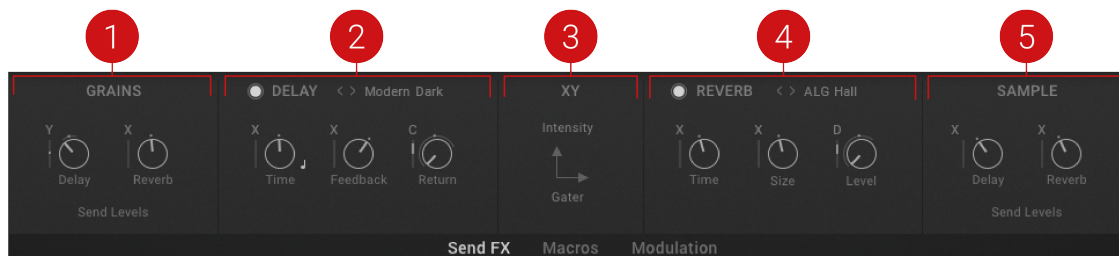
2. Move the control on your MIDI device that you want to assign to the axis.
 - The control is assigned to the axis. The **Learn** button has stopped flashing. Repeat these steps for the other axis.

12. Send FX Pane

The Send FX Pane is where the global Delay and Reverb send effects are contained. Each effect has parameter controls that determine their behavior and sonic character. Level controls dictate the amount of effect signal that is returned. Also located in the Send FX Pane are Level controls for the Grain and Sample layers' Global effects sends. Use this section to manually adjust the Send amount, or apply modulation to change the amount of effect over time. Controls for Delay and Reverb can be modulated in tandem or with disparate modulation sources to create unique interactions.

12.1. Send FX Overview

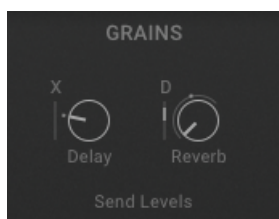
The following overview highlights the different sections of the Send FX pane.



1. **GRAINS:** Contains Send Level controls that determine the amount of the Grain layer output that is sent to the global Delay and Reverb. For more information, see [Grains](#).
2. **DELAY:** Contains controls that determine the character of the global Delay effect. For more information, see [Delay](#).
3. **XY Pad:** Controls the sound of the snapshot according to the modulation assignments for the X and Y parameters. For more information, see [XY](#).
4. **REVERB:** Contains controls that determine the character of the global Reverb effect. For more information, see [Reverb](#).
5. **SAMPLE:** Contains Send Level controls that determine the amount of the Sample layer output that is sent to the global Delay and Reverb. For more information, see [Sample](#).

12.2. Grains

This section sets the Grain layer's Send Level to the global Delay and Reverb. These sends can be individually modulated to create subtle alterations or wild sweeping effects.



Send FX pane – Grains.

- **Delay:** Sets the amount of the Grain layer output sent to the global Delay send effect.
- **Reverb:** Sets the amount of the Grain layer output sent to the global Reverb send effect.

12.3. Delay

The global Delay send effect offers 24 different delay types ranging from the classic sound of Tape Delays and BBDs (Bucket Brigade Device) to Diffused spacey delay effects. Modern and Clean types provide the tone of contemporary delay, alongside distinctive ping-pong delays. Modulating the Feedback control can create anything from soft, subtle echoes to intense exaggerated sonic artifacts, depending on the type and rate of modulation. Syncing the Delay time to the master clock enables you to create precise delay repeats that can be used for creating rhythmically complex patches.

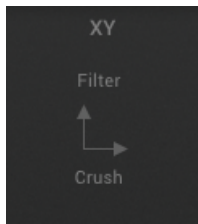


Send FX pane – Delay.

- **Delay on/off:** Switches the global Delay send effect on or off. When the button is filled out, the global Delay is active.
- **Delay Type previous/next:** Browses the different Delay types. Use the arrows to select load the previous or next Delay type.
- **Delay Type:** Selects one from 24 Delay types.
- **Time:** Determines the Delay time of the global delay send effect. Note that continuous modulation of this parameter can cause a high CPU load.
- **Sync** (crotchet icon): Determines if the Delay time is set in milliseconds, ranging from 0.00ms to 2.0k ms, or in relation to the master clock as a musical duration. When the icon is lit, the Delay time is set as divisions of musical timing, which are displayed when the Time control is adjusted.
- **Feedback:** Determines the amount of feedback of the global Delay send effect.
- **Return:** Determines the return level of the global Delay send effect.

12.4. XY

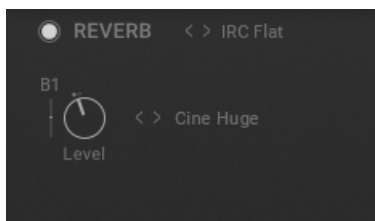
The XY Pad allows you to control the sound of the snapshot in realtime, according to the modulation assignments for the X and Y parameters. The axis labels indicate what parameter is being affected when moving the cursor.



Send FX pane – XY.

12.5. Reverb

The global Reverb send effect offers nine different reverb types that provide varying spatial and sonic effects. Use the Wide Hall Reverb to add vast spaciousness to your Grain and Sample layers, or the Plate reverb for its character metallic tone and smooth tail. Room Reverbs can be used to add natural liveliness to the sound source, without losing detail in overly dense reverb tails. Modulating the reverb level can create interesting effects from soft swells to dramatic bursts of reverberant echo. Note, the reverb is alternating between different reverb engines depending on the selected preset, which leads to different controls in the interface.

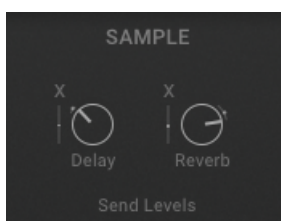


Send FX pane – Reverb.

- **Reverb on/off:** Switches the global Reverb send effect on or off. When the button is highlighted, the global Reverb is active.
- **Reverb Type previous/next**(< > icons): Browses the different Reverb types.
- **Delay Type:** Selects one from nine Reverb types.
- **Time:** Determines the time or return (Impulse response mode) of the global Reverb send effect.
- **Size:** Determines the room size of the global Reverb send effect.
- **Level:** Determines the return level of the global Reverb send effect.

12.6. Sample

This section sets the Sample layer's Send Level to the global Delay and Reverb. These send levels can be individually modulated to create subtle movement or more erratic sonic effects.



Send FX pane – Sample.

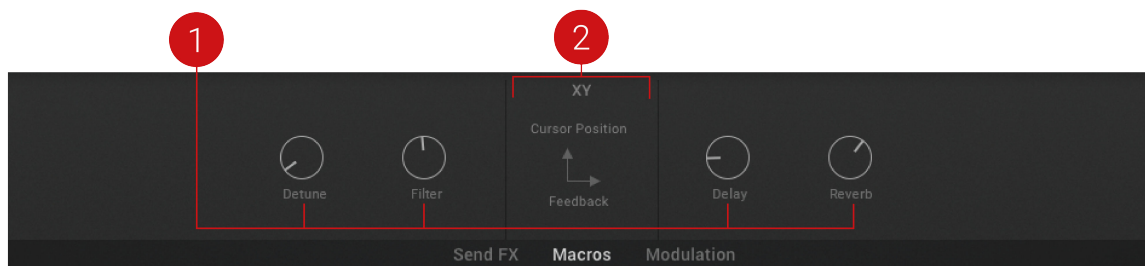
- **Delay:** Sets the amount of the Sample layer output sent to the global Delay send effect.
- **Reverb:** Sets the amount of the Sample layer output sent to the global Reverb send effect.

13. Macros

The Macros are designed to give easy access to settings that are important in production, for example an lowpass filter, or controls that may require quick accessibility, like a Send FX. Macros can be used as a master control for multiple parameters at once, or can be tailored for use as a performance tool.

13.1. Macros Pane Overview

The Macros pane contains the following controls:



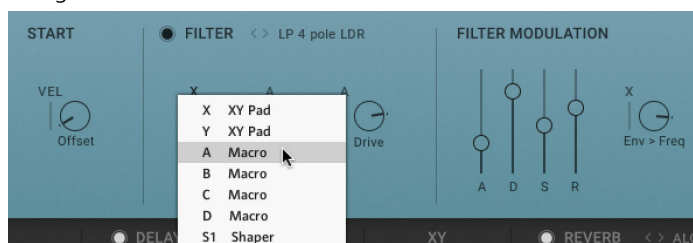
1. **Macros:** Provides level control for Macros A, B, C, and D respectively. Each of top-level parameter can be assigned to multiple modulation targets at once.
2. **XY Pad:** Controls the sound of the snapshot according to the modulation assignments for the X and Y parameters. MIDI controllers for the XY pad can be assigned on the Master page. For more information, see [XY Pad](#).

13.2. Assigning Macros

The Macros should be assigned to parameters that give quick access to important production settings, but do not necessarily require real-time control.

To assign parameters to a Macro control:

1. Click on the Modulation Connector of the parameter you wish to assign.
2. From the drop-down menu, select the Macro control that you want the parameter to be assigned to.

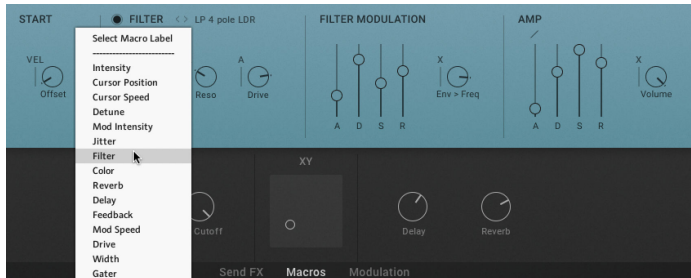


→ The assigned parameter/s will display an A, B, C, or D, indicating the Macro they are assigned to. If you want to assign multiple parameters to the same Macro control, repeat this process.

Assigning labels to the Macros can help quickly determine each Macro's primary function. This is particularly useful if you are assigning multiple parameters to create a specific control.

To assign a label to a Macro control:

1. In the Macros pane or the Perform page, click on the Macro control (A, B, C, or D) that you want to label.
2. From the drop-down menu, select the label you want to assign to the Macro.



→ The label is now assigned to the Macro control.

13.3. Macros Setup

Below is a suggested setup for the Macro controls:

Macro A	Filter / Bass Control	<ul style="list-style-type: none"> • Filter or EQ to quickly control the frequency range (bass). • Other parameters assigned in the XY section can go here when no bass control is required.
Macro B	Filter / Treble Control	<ul style="list-style-type: none"> • Filter or EQ to quickly control the frequency range (treble). • Other parameters assigned in the XY section can go here when no treble control is required.
Macro C	Motion	<ul style="list-style-type: none"> • Anything that creates motion in addition to the XY pad. This could include filter modulation, Scan and Jitter, and controls in the Modulation Pane.
Macro D	FX Amount (Reverb, Delay)	<ul style="list-style-type: none"> • FX level control, enabling you to quickly turn down effects levels.

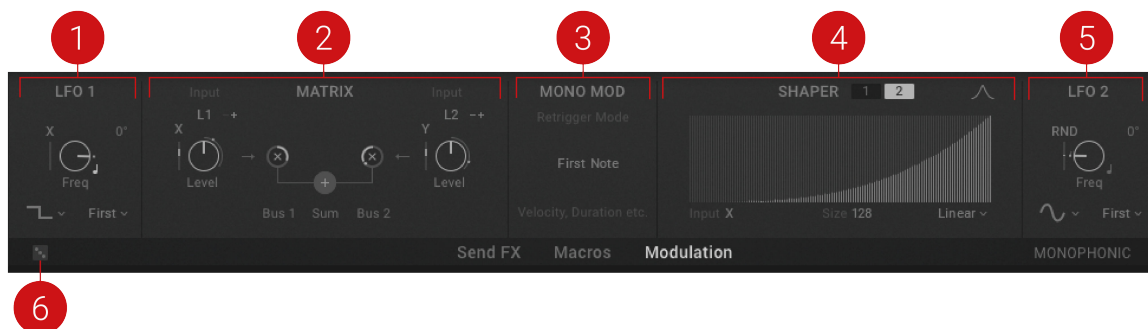
14. Modulation Pane

The Modulation pane is where the ASHLIGHT comes to life, hosting the modulation sources that bring movement and dynamics to your sound. The Modulation pane contains two LFO, two Shapers, and a Matrix for altering and combining modulation sources. The powerful routing Matrix encourages interesting modulation combinations that inspire creativity and foster unique sonic results. In this section, you can create elaborate modulation sources tailored to your Sample and Grain layers. Use the Matrix section to combine multiple modulators, for example, an LFO and a Macro control, to create a complex chain of modulators that allow for intricate shaping and manipulation. Due to the option of modulator chaining, all modulators are unipolar.

The modulation direction can be simply swapped by holding [Option] (mac) / [Alt] (Windows) + [Shift] whilst clicking on each knob. Hold down [Option] / [Alt] on a Modulation knob to adjust the knob value and the modulation range simultaneously. The signal of the individual voices is mixed down to one stereo stream at the output of the corresponding layer engine before the FX chain is entered. Polyphonic modulation is only possible before the mixdown.

14.1. Modulation Pane Overview

The Modulation pane contains the following elements and controls:

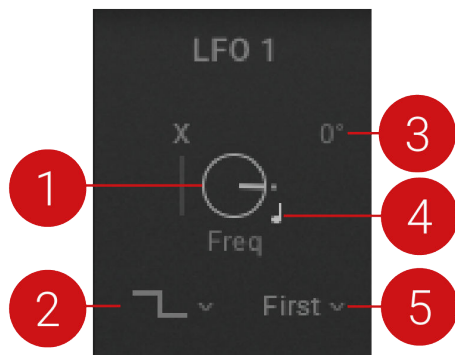


1. **LFO 1:** A modulation source that can be assigned to adjust various parameters. For more information, refer to [LFO 1](#).
2. **MATRIX:** Contains two Buses, which can either work in attenuation or summing mode. For more information, refer to [Matrix](#).
3. **Mono Modulation Trigger:** Selects which note should trigger the monophonic modulation path used for effects modulation. **First Note** is the default and most useful setting. **Highest** or **Lowest** enables the modulator to restart whenever the corresponding note changes.
4. **SHAPER:** A Shaper is used to define a new output value for every input value. For more information, refer to [Shaper](#).
5. **LFO 2:** A modulation source that can be assigned to adjust various parameters. For more information, refer to [LFO 2](#).
6. **Randomize:** Produces random values for all parameters in the Modulation pane.

14.2. LFO 1

The Modulation pane provides two LFOs that can be assigned to modulate parameters of the ASHLIGHT. Combining different LFOs in the Bus Matrix can create complex modulation sources that unfold slowly over time. Eight different waveforms provide options for intricate modulation effects, and five Trigger modes determine the behavior of the LFO.

The LFO contains the following parameters:



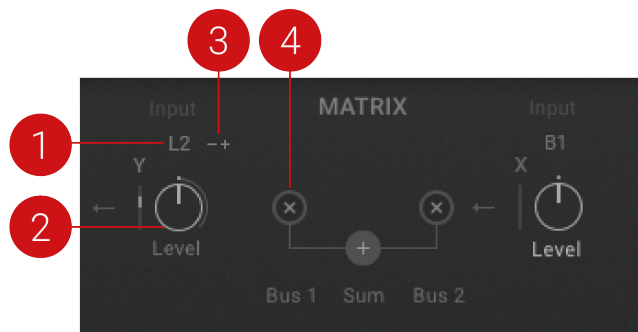
1. **Freq:** Sets the oscillation frequency of the LFO. This parameter can be synchronized to the master clock.
2. **Waveform Type:** Selects one of eight waveform types (Sine, Triangle, Square, Ramp up, Ramp down, Random, Seek 1 and Seek 2). Seek 1 and Seek 2 provide smooth, random LFOs.
3. **LFO Phase:** Sets the starting point for the LFO in degrees, ranging from 0 - 360. This setting has no affect when the LFO is in **Free** mode, or when **Random**, **Seek 1**, or **Seek 2** waveforms are selected.
4. **Sync** (crotchet icon): Determines if the LFO speed is set in Hertz or in relation to the master clock as a musical duration. When the icon is lit, the LFO speed is set as divisions of musical timing, which are displayed when the Freq control is adjusted.
5. **Trigger Mode:** Selects one of five modes (Free, First, Retrig, Once, 1st 1x), which determines the retrigger behavior of the LFO. **Free** mode provides polyphonic modulation with a random start phase. **First** mode restarts the LFO with the first note only. In **Retrig** mode, the LFO restarts for each key pressed. **Once** mode triggers only one LFO cycle. **1st 1x** triggers one LFO cycle for the first note only. In all modes, excluding **Free**, the Start phase setting is taken into account.

14.3. Matrix

The Matrix section is where you can combine sources to create more complex modulators. The Matrix contains two Buses, which can either work in Attenuation or Summing mode. Each Bus features two inputs which are processed and sent to the modulation targets Bus 1 and Bus 2. These two Buses can then be individually sent to any assignable parameter. The Matrix input signals can be converted into a bipolar modulation source. In Attenuation mode, as indicated by an **x**, the attenuator works as a multiplier. In Summing mode, as indicated by a **+**, the two modulation sources are added together. Each Bus can be assigned to a different mode and there is also the Sum of both busses available as a modulation source. You can monitor the result of each Matrix output with level indicators.

14.3.1. Attenuation Mode

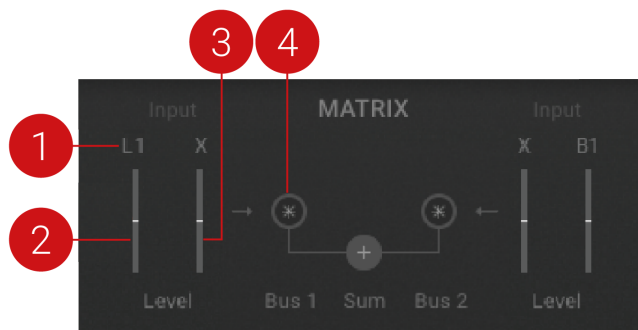
The following controls are available in Attenuation mode. Controls are the same for Bus 2.



1. **Modulation Source:** Selects the modulation source applied to this parameter. Note that some modulations, for example the Grain parameters, are polyphonic and others are monophonic.
2. **Bus 1 Level:** Determines if the input value is decreased, amplified or optionally inverted. The result is available as Bus 1 in the Modulation source menu. The range spans from -200% to 200%.
3. **Input Mode:** Defines the range of the incoming modulation signal. The values range from 0 to 1 or from -1 to 1. The latter is particularly useful for bipolar pitch modulation.
4. **Bus 1 Mode:** Determines whether the corresponding Matrix Bus works as a modulatable attenuverter/multiplier or as a simple modulation source mixer which adds the two modulation signals together.

14.3.2. Summing Mode

The following controls are available in Summing mode. Controls are the same for Bus 2.



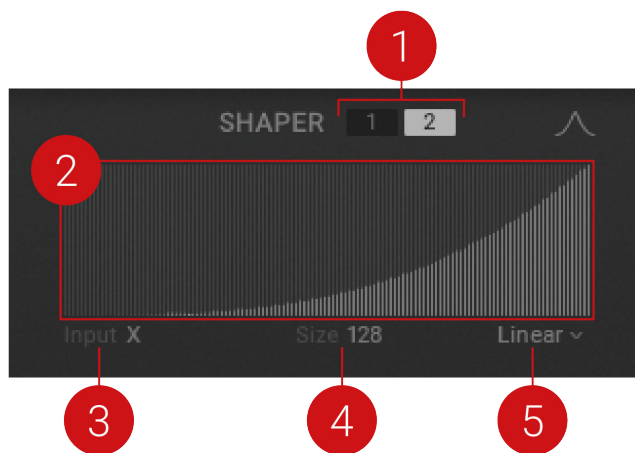
1. **Modulation Source:** Selects the modulation source applied to this parameter. Note that some modulations, for example, the Grain parameters, are polyphonic and others are monophonic.
2. **Bus 1 Mix 1:** Determines if the input modulation value is decreased or optionally inverted and subsequently summed to Matrix Bus 1. The range comprises -100% to 100%.
3. **Bus 1 Mix 2:** Determines if the input modulation value is decreased or optionally inverted and subsequently summed to Matrix Bus 1. The range comprises -100% to 100%.
4. **Bus 1 Mode:** Determines whether the corresponding Matrix Bus works as a modulatable attenuverter/multiplier or as a simple modulation source mixer which adds the two modulation signals together.

14.4. Shaper

The Modulation pane provides two Shapers that can be used to define a new output value for every input value. By using an LFO as the input of the Shaper and painting in the desired curve, you can generate many different types of waveforms. This enables you to create more interesting and elaborate modulation sources, that can achieve targeted results. The Shaper also offers different options of interpolation, which allows for smooth transition from one step to the next.

The position of the cursor per voice is available as a modulation source for the inputs of the Shapers. This is accessed by selecting **POS Cursor Position** from the Input Source menu. This allows you to define a value for all positions in the sample. For example, lowering the volume or pitch whenever the cursor scans over a certain position.

The Shapers contain the following parameters:

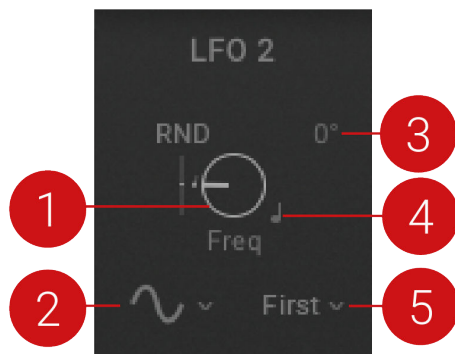


1. **Shaper 1/2:** Toggles between the two available Shapers.
2. **Shaper display:** Displays a visual representation of the current state of the Shaper.
3. **Input Source:** Selects the modulation source that is applied to the Shaper.
4. **Size:** Determines how many steps the Shaper provides. The maximum number of steps is 128.
5. **Interpolation Mode:** Determines how the Shaper interpolates when transitioning from one step to the next. This also features randomization and smoothing functions.
 - **Random:** Fills the visible shaper range with random numbers
 - **Smooth:** Removes edges from the curve whilst leaving the start and end values untouched. Click to smooth the currently visible curve. Apply the smoothing as often as necessary to achieve the desired curve.
 - **Smooth Wrap:** Removes edges from the curve while generating a smooth transition between the end and start value.

14.5. LFO 2

The second LFO provided in the Modulation pane can be assigned to modulate parameters of the ASHLIGHT . Eight different waveforms provide options for varied modulation effects, and five Trigger modes offer further control over the behavior of the LFO. Use the Bus Matrix to combine multiple LFOs and create elaborate modulation sources that evolve unexpectedly over an extended period of time.

The LFO contains the following parameters:



1. **Freq:** Sets the oscillation frequency of the LFO. This parameter can be synchronized to the master clock.
2. **Waveform Type:** Selects one of eight waveform types (Sine, Triangle, Square, Ramp up, Ramp down, Random, Seek 1 and Seek 2). Seek 1 and Seek 2 provide smooth, random LFOs.
3. **LFO Phase:** Sets the starting point for the LFO in degrees, ranging from 0 - 360. This setting has no effect when the LFO is in **Free** mode, or when **Random**, **Seek 1**, or **Seek 2** waveforms are selected.
4. **Sync** (crotchet icon): Determines if the LFO speed is set in Hertz or in relation to the master clock as a musical duration. When the icon is lit, the LFO speed is set as divisions of musical timing, which are displayed when the Freq control is adjusted.
5. **Trigger Mode:** Selects one of five modes (Free, First, Retrigger, Once, 1st 1x), which determines the retrigger behavior of the LFO. **Free** mode provides polyphonic modulation with a random start phase. **First** mode restarts the LFO with the first note only. In **Retrigger** mode, the LFO restarts for each key pressed. **Once** mode triggers only one LFO cycle. **1st 1x** triggers one LFO cycle for the first note only. In all modes, excluding **Free**, the Start phase setting is taken into account.

15. Credits

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